Appendix 4.1
EIA Scoping Report

Springwell Solar Farm

Scoping Report

21st March 2023

Springwell Energyfarm Ltd

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1. Introduction

1.1. Background

1.1.1. Springwell Energy Farm Limited (hereafter, the 'Applicant') has commissioned RSK Environment Limited (hereafter, 'RSK') to prepare an Environmental Impact Assessment (EIA) Scoping Report to accompany a request for a Scoping Opinion from the Planning Inspectorate (prepared on behalf of the Secretary of State) for the proposed Springwell Solar Farm (hereafter, the 'Proposed Development').

1.1.2. The Proposed Development comprises the installation of solar photovoltaic (PV) generating modules, battery storage facilities, and grid connection infrastructure, across a proposed site in North Kesteven, Lincolnshire (hereafter, the 'Site').

1.1.3. The Proposed Development is classified as a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO) under the Planning Act 2008 (hereafter, 'PA2008') [**Ref. 1-1**]. The Proposed Development also falls under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter, 'EIA Regulations') [**Ref. 1-2**], which require that, before consent is granted for certain types of development, an EIA must be undertaken.

1.2. Definition of an EIA

1.2.1. The term EIA describes a procedure that must be followed for certain types of project before it can be given 'consent'. The procedure is a means of drawing together, in a systematic way, an assessment of a project's likely significant environmental effects. This helps to ensure that the importance of the predicted effects and the scope for avoiding, preventing, reducing or, if possible, offsetting them are properly understood by the public and the authority granting consent (the 'determining authority') before it makes its decision.

1.3. Requirement for an EIA

1.3.1. The EIA Regulations set out the types of development which must be subject to an EIA (referred to as Schedule 1 development) and other developments, which may be subject to an EIA depending on certain parameters and / or their potential to give rise to significant environmental effects (referred to as Schedule 2 development).

1.3.2. The Proposed Development does not fall under any of the types of development set out in Schedule 1 of the EIA Regulations. However, the Proposed Development is of a type and scale described in Schedule 2 (a) of the EIA Regulations, and potentially (b) of that Schedule, as follows:

"Energy industry

a) industrial installations for the production of electricity, steam and hot water (projects not included in Schedule 1 to these Regulations);

b) industrial installations for carrying gas, steam and hot water; transmission of electrical energy by overhead cables (projects not included in Schedule 1 to these Regulations);"

1.4. Requirement for a DCO

1.4.1. The Proposed Development is defined as an NSIP under Sections 14(1)(a) and 15(2) of the PA2008 as an onshore generating station in England, exceeding 50MW.

1.4.2. Regulation 8(1) of the EIA Regulations requires the Applicant to do one of the following before carrying out statutory consultation under Section 42 of the PA2008:

a) "ask the Secretary of State to adopt a screening opinion in respect of the development to which the application relates; or

b) notify the Secretary of State in writing that the person proposes to provide an environmental statement in respect of that development."

1.4.3. As the Applicant has concluded that the Proposed Development does require an EIA, this Scoping Report represents under Regulation 8 (1)(b) a notification that the Applicant will prepare and submit an Environmental Statement (ES) in support of the DCO Application without prior request for a Screening Opinion.

1.4.4. Following the completion of the surveys, assessments, and consultation processes outlined in this EIA Scoping Report, an application for a DCO will be made to the Secretary of State for determination in accordance with the PA2008. The DCO Application will be accompanied by an ES, in accordance with Regulation 5(2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations') [**Ref. 1-3**]. The ES will set out the methods and findings of a comprehensive EIA undertaken in line with the EIA Regulations.

1.5. Purpose of the report

1.5.1. Regulation 10(1) of the EIA Regulations sets out that *"a person who is minded to make an application for an order granting development consent may ask the Secretary of State to state in writing their opinion as to the scope, and level of detail, of the information to be provided in the environmental statement*".

1.5.2. In accordance with Regulation 10(3) of the EIA Regulations and the Planning Inspectorate's Advice Note Seven [**Ref. 1-4**], this EIA Scoping Report has been prepared with the purpose of ensuring that the subsequent EIA is focused on the key impacts likely to give rise to significant environmental effects, and to obtain agreement on the EIA approach and scope.

1.5.3. As well as identifying matters to be considered in the EIA, this EIA Scoping Report also identifies those matters that are not considered necessary to assess further and are proposed to be scoped out. This approach is in line with the general aim to undertake proportionate EIA, as advocated by industry best practice.

1.5.4. Whilst this EIA Scoping Report seeks to establish the overall framework for the EIA in relation to the environmental factors and associated effects, the exact scope of the EIA will be influenced by the Scoping Opinion received, the on-going design evolution of the Proposed Development, and through on-going baseline data collection (e.g. field surveys etc.). In this regard, a list of 'scoping questions' is presented within **Chapter 6** of this EIA Scoping Report, the aim of which is to assist the determining authority and its consultees in forming the Scoping Opinion.

1.5.5. **Table 1-1** sets out what information the EIA Regulations (Regulation 10(3)) state that a request for a scoping opinion must include and where this information can be found in this EIA Scoping Report.

1.5.6. **Table 1-2** sets out what information the Planning Inspectorate's Advice Note Seven recommends that a request for a scoping opinion should include and where this information can be found in this EIA Scoping Report.

Table Error! No text of specified style in document.**-1 Information required by the EIA Regulations to accompany a request for a scoping opinion**

Information Required	Location within this report
A plan sufficient to identify the land	**Appendix A**
A description of the proposed development, including its location and technical capacity	**Chapter 2**
An explanation of the likely significant effects of the development on the environment	**Chapters 6**
Such other information or representations as the person making the request may wish to provide or make	**Chapters 2 to 7**

Table 1-2 Information required by the Planning Inspectorate's Advice Note Seven to accompany a request for a scoping opinion

Suggested Information Requirements	Location within this report
The Proposed Development	
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters.	**Chapters 2 and 3**
Referenced plans presented at an appropriate scale to clearly convey the information and all known features associated with the Proposed Development.	**Appendix C**
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option.	**Chapters 3 and 4**
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for a quick identification of issues.	**Chapter 5**
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided.	**Chapter 5**
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters.	**Chapters 5 and 6**
Details of method to be used to assess impacts and to determine significance of effects e.g. criteria for determining sensitivity and magnitude.	**Chapter 4, Chapter 6 and Appendix D**
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	**Chapter 4 and 6**
Information Sources and Guidance	
Reference to any guidance and best practice to be relied upon.	**Chapters 6 and 7**
Evidence of agreements reached with consultation bodies.	**Chapter 6**
The proposed structure and format of the ES which will comprise four main parts:	**Appendix E**

Volume I: Main Text; Volume II: Supporting Technical Appendices; Volume III: Supporting Figures and Plans; and Non-Technical Summary (NTS)	

1.5.7. In accordance with the EIA Regulations, the ES will be based on the Scoping Opinion received.

1.5.8. The outputs of the EIA will comprise:

- A Preliminary Environmental Information Report (PEIR), produced in connection with the formal statutory consultation on the Proposed Development. The PEIR will present the current understanding of the potential likely significant effects at the time of the consultation and its purpose will be to provide information that enables interested parties, including members of the public, local authorities and statutory bodies, to understand the likely significant environmental effects of the Proposed Development so that they can provide meaningful feedback; and
- The PEIR will be followed by the ES, which will be produced in support of the DCO Application. The ES will report on a detailed assessment of the likely significant effects resulting from the Proposed Development and the proposed mitigation measures.

1.6. References

- **Ref. 1-1**: The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online: https://www.legislation.gov.uk/uksi/2017/572/contents/made.
- **Ref. 1-2**: Planning Act 2008. Available online: https://www.legislation.gov.uk/ukpga/2008/29/contents
- **Ref. 1-3**: Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009. Available online: https://www.legislation.gov.uk/uksi/2009/2264/contents/made
- **Ref. 1-4**: Planning Inspectorate (June 2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environment Information and Environmental Statements (Version 7). Available online: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/.

2. Description of the Proposed Development

2.1. Introduction

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

2.1.2. The description of the Proposed Development represents the current understanding of the design parameters. However, as part of an ongoing design process, the detail provided in this chapter will be further refined for the PEIR. Following statutory consultation, further refinement to the description of the Proposed Development will be included in the ES which will confirm details for which development consent will be sought. This will include the final design parameters and any limits of deviation.

2.1.3. The installation, construction and decommissioning methods to be utilised, will, eventually, be determined by the appointed contractor(s). However, all works will be required to be undertaken within the parameters assessed for the Proposed Development. With this in mind, the EIA will represent a 'worst case', ensuring a robust assessment of the likely significant effects.

2.2. Approach to assessing uncertainty

2.2.1. In order to define the Proposed Development and determine where detail is to be included at DCO Application stage and where it may be deferred until after consent is granted, the Applicant will identify the level of flexibility required; e.g. in relation to the number of solar PV modules or construction methods.

2.2.2. Many promoters of NSIPs seek to maximise flexibility in their consents, given the long lead in times to consent and subsequent engagement of EPC (engineering, procurement, and construction) contractors. It is typical for a DCO to contain the ability to finalise the design of a scheme post-consent within set "limits of deviation" and / or parameters.

2.2.3. In order to maintain flexibility in the design, it is the Applicant's intention to use the 'Rochdale Envelope' approach within parameter ranges. The Planning Inspectorate's Advice Note Nine 'Rochdale Envelope' [**Ref 2-1**] provides specific guidance to applicants on the degree of flexibility that could be considered appropriate under the PA2008 regime.

2.2.4. The Rochdale Envelope is an acknowledged way of dealing with an application comprising EIA development where details of a project have not been fully resolved by the time the application is submitted. The term is used to describe those elements of a scheme that have not yet been finalised, but can be accommodated within certain limits and parameters, allowing the likely significant effects of a project to be presented in the ES as a 'worst case'. It also provides the opportunity to assess aspects of a development where the detailed design is to be developed by the Applicant and approved by the determining authority under a DCO Requirement, subsequent to the DCO being made.

2.2.5. Furthermore, such flexibility may be useful where a slight change in the design or capacity of the Proposed Development is anticipated, but not yet certain. Therefore it may be possible that a particular element of the design will be subject to on-going technological advancements. It will be important that a lack of flexibility in the DCO Application does not unduly hinder the Applicant's ability to consider and adopt such future technological advancements. This is of particular importance to maintaining flexibility due to the rapid pace of change in solar PV and battery storage technologies.

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

2.2.7. Further detail on draft design approach that is being used to inform the EIA is presented in **Section 2.4**. Design parameters will be further developed for statutory consultation and presented in the PEIR. Final parameters and limits of deviation will be presented in the ES, draft order and works plans. A series of design principles will be developed and will be secured in a document entitled Design Commitments.

2.3. Description of the Site

Site Location and Boundary

2.3.1. The Site is located within the administrative boundary of North Kesteven District Council, in the county of Lincolnshire. The Site measures approximately 1,702 hectares (ha) and extends across three distinct parcels (referred to as Springwell West, Springwell

Central and Springwell East). The Site boundary and three land parcels are presented in **Appendix A**.

2.3.2. The expected area of land potentially required for the construction, operation maintenance and decommissioning of the Proposed Development, which includes land required for permanent and temporary purposes, is shown at **Appendix A**. It is important to note that this will be subject to change as the design and EIA progress; however, **Appendix A** shows the envisaged current maximum extent of temporary and permanent land take for the Proposed Development.

2.3.3. Together with the description of the Proposed Development set out in **Section 2.4, Appendix A** represents the current maximum land expected to be required for the full range of possible development options which could form part of the Proposed Development. This allows for consideration of the potential environmental effects of the full range of options under consideration, to ensure that the likely significant effects of each of the component options has been scoped into the assessment.

2.3.4. At this stage of the process, there is no known existing infrastructure within the Site that will need to be removed as part of the Proposed Development.

Site and Surrounding Area

Site location

2.3.5. The Site lies in close proximity to the settlements of Blankney, Scopwick, Kirkby Green, and Ashby de la Launde. The settlements of Metheringham, Ruskington, and Digby are also located within 3 km of the Site.

2.3.6. The Royal Air Force (RAF) Digby Station is located adjacent to the Site. The station is home to the tri-service Joint Service Signals Organisation, part of the Joint Forces Intelligence Group of Joint Forces Command. Flying at RAF Digby ceased in 1953.

2.3.7. The land within the Site boundary predominantly consists of agricultural fields, interspersed with hedgerows, small woodland blocks and farm access tracks. The hedgerows within the Site range between lengths of dense tall vegetation (shrub and tree species) and thin lines of vegetation with sporadic shrubs and trees present.

2.3.8. There is variation in the features immediately surrounding each of the distinct land parcels within the Site, as presented below:

- **Springwell West:** Springwell West forms the southernmost part of the Site and is intersected by the A15. This area is characterised by relatively open agricultural landscape and

lies adjacent to the Bloxham Wood Nature Reserve in the south east corner of the Site.

- **Springwell Central:** Springwell Central is located in the centre of the Site, providing connectivity between Springwell West and Springwell East. The parcel lies adjacent to RAF Digby and B1191 to the west, Ashby de la Launde to the south and relatively open agricultural fields to the east.
- **Springwell East:** Springwell East is bounded by the settlements of Scopwick to the south, Kirkby Green to the south east, Blankney in the north and the B1188 and a railway line to the west. The parcel is interspersed with small woodland plantations and hedgerows.

Water Resources

2.3.9. There are two Main Rivers that are located in close proximity to the Site, Springwell Brook / Digby Beck and New Cut Drain, alongside several small field drains and drainage ditches. Springwell Brook is located within and to the east of Springwell West and is shown as a main river on the Environment Agency Mapping extending from Bloxham in an easterly direction until it reaches Dorrington Dike. New Cut Drain, located south of Springwell East, is located to the west of Kirkby Green. The majority of the Site is predominantly within Flood Zone 1, though some fields, particularly at the north eastern extent of Springwell East are located in Flood Zone 2 and 3.

2.3.10. The Site largely falls outside of any Source Protection Zone (SPZ), except for a small area to the west of Scopwick. This area falls within a localised inner zone (SPZ 1) which provides protection around a groundwater abstraction source located to the west of Scopwick, adjacent to Springwell Central. There are no outer catchments associated with this SPZ 1. There is also a total catchment zone (SPZ 3) located across the southern extent of Springwell West.

Access and Recreation

2.3.11. The Site is intersected by the A15 Sleaford Road, which heads in a north to south direction within Springwell West. The adjoining B1191 lies west of Springwell Central and south of Springwell East providing direct access to RAF Digby and Scopwick and the surrounding villages.

2.3.12. There is an extensive network of public rights of way (PRoW) within the Site which link with the surrounding settlements. In Springwell East, there are four promoted walks which form part of the ‘Stepping

Out' series developed by North Kesteven District Council which are detailed below:

- Spires and Steeples Trail;
- Scopwick Loop;
- Kirkby Green Loop; and
- Blankney Circuit.

2.3.13. The following PRoW identified below and displayed in **Appendix C** lie within the Site or intersect the Site boundary.

- Public Footpath (AshL/11/1) - Bloxham;
- Public Footpath (Rows/5/1) - RAF Digby;
- Public Footpath (AshL/3/1) - South of Ashby de la Launde;
- Public Footpath (AshL/4/1) - adjacent to the A15, south of Gorse Hill Lane;
- Restricted Byway (Scop/12/1) - West of Scopwick;
- Public Footpath (Scop/3/1) - North of Scopwick;
- Public Bridleway (Scop/1135/1, Scop/1135/2, Scop/1135/3, Scop/1136/1) - North of Scopwick (part of the Scopwick Loop);
- Restricted Byway (Scop/11/1, Scop/11/3, Scop/11/4) - North of Scopwick (part of the Scopwick Loop);
- Restricted Byway (Scop/10/2) - North of Scopwick (Trundle Lane);
- Public Footpath (Blan/737/1) - Scopwick / Blankney (part of the Spires and Steeples Trail);
- Public Footpath (Scop/7/1, Scop/7/2) - North of Kirkby Green (part of the Kirby Green Loop);
- Public Footpath (Blan/4a/1, Blan/4/2, Scop/7/3) - South of Blankney (part of the Blankney Circuit);
- Public Footpath (Scop/1134/1) - South of Blankney;
- Public Footpath (Blan/4/3) - East of Blankney;
- Public Footpath (Blan/5/1) - East of Blankney;
- Public Footpath (Scop/738/1, Scop/739/1) - North of Kirkby Green;
- Public Footpath (Scop/8/1) - North of Kirkby Green; and
- Public Footpath (Scop/8/2) - North of Kirby Green.

2.3.14. The Site is currently accessible from several existing field accesses capable of accommodating large agricultural machinery.

2.3.15. The Site is not covered by any statutory landscape designations. The Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB) is the closest statutory landscape designation to the Site, located approximately 23 km north-east of the Site.

Ecology and Biodiversity

2.3.16. The Site is not covered by any statutory ecological designations.

2.3.17. The Wash and North Norfolk Coast Special Area of Conservation (SAC), designated for its sublittoral sandbanks, coastal lagoons, mudflats and sandflats, large shallow inlets, reefs, saltmarsh, Atlantic salt meadows, Mediterranean and hermos-Atlantic scrubs, otters and harbour seal is the closest Natura 2000 Site[1], located approximately 35 km east of the Site.

2.3.18. There are four Local Wildlife Sites (LWS) located within the Site boundary; Blankney Brick Pit located in the north-east corner of Springwell East; and three A15 road verge LWSs located within Springwell West (Temple Road Verges, Welbourn to Brauncewell, A15 Slate House Farm to Dunsby Pit Plantation and A15 Green Man Road to Cuckoo Lane). Bloxham Wood LWS is located adjacent to the Site boundary at the southern extent of Springwell West.

2.3.19. There is no ancient woodland within the Site boundary. The Long Wood ancient woodland is located adjacent to Longwood Quarry, approximately 500m to the west of the Site (Springwell East). There are several small woodland plantations within the Site boundary including Keeper's Covert, Toll Bar Plantation, Brickyard Plantation, Ash Holt and Catton's Holt.

Geology

2.3.20. The geological sequence is varied across the Site, with superficial Tidal Flat deposits localised to the north of the Site within Springwell East and thin bands of Head Deposits and Sleaford Sand and Gravel present directly over the bedrock in Springwell Central and Springwell West.

2.3.21. The Site bedrock comprises Oxford Clay, Kellaways Formation (clays and mudstones), Cornbrash Formation (limestone), Blisworth Clay (clays and mudstones), Blisworth Limestone, Rutland Formation (mudstone with limestone beds) and the Lincolnshire Limestone Formation.

[1] Network of nature protection areas that are made up of Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and RAMSAR sites.

2.3.22. The Metheringham Heath Quarry Geological Site of Specific Scientific Interest (SSSI) designated for it being the lower part of the Lincolnshire Limestone, is the closest statutory geological designation, located 2 km north of the Site.

2.3.23. There is one local geological site (LGS), Longwood Quarry, Blankney (LGS491) located to the west of Springwell East, south of Blankney.

Cultural Heritage

2.3.24. There is one Grade II listed building, Mile Post (20 m south of Ashby Farm Lodge), located within the Site boundary. There are a number of designated heritage assets within 5 km of the Site boundary, comprising

- 11 Grade I listed buildings;
- 11 Grade II* listed buildings;
- 207 Grade II listed buildings; and
- 17 scheduled monuments including Brauncewell Medieval Village (located approximately 500m to the south of Springwell West).

2.3.25. The Scopwick Conservation Area and Blankney Conservation Area are located directly adjacent to the Site boundary. There are three other Conservation Areas located within 3 km of the Site boundary; Bloxham, Metheringham, and Martin.

2.3.26. There are no Registered Parks and Gardens within 5 km of the site boundary.

2.3.27. There are no Registered Battlefields or World Heritage Sites within 3 km of the Site boundary.

Existing Infrastructure

2.3.28. Overhead power lines (400kV transmission line) carried by pylon structures run adjacent to the westernmost parcel of land (Springwell West) and cross the southern fields in Springwell West, which will form an option for the location of the proposed grid connection.

2.3.29. A 132kV distribution line also crosses the Site at the easternmost parcel of land (Springwell East). Several overhead lines supported on wooden poles also intersect Springwell East, crossing the western side of Scopwick running north to south and criss-crossing a separate line running west to east, north of Kirby Green.

2.3.30. Utilities searches are ongoing and will help inform the design of the Proposed Development.

2.4. Operational design of the Proposed Development

Introduction

2.4.1. This section describes the main features of the Proposed Development which will consist of the following:

- Ground mounted solar PV generating station with a gross electrical output capacity to the National Grid network in the region of 800MW. The generating station will include solar PV modules and mounting structures;
- Balance of Solar System (BoSS) which comprises; inverters, transformers, switchgear;
- Collector Compounds comprising; switchgear, transformers and an operation, maintenance and welfare unit;
- A Project Substation compound, which will include; substation, switching and control equipment, office / control / welfare buildings, storage areas, and provisions for vehicular parking and material laydown;
- Battery Energy Storage System (BESS) compound(s) and associated inverters, transformers, switchgear and ancillary equipment and their containers, enclosures, monitoring systems, air conditioning, electrical cables and fire safety infrastructure;
- A National Grid Substation compound, which will include; switchgear, High Voltage (HV) transformers, circuit breakers, disconnectors, earthing devices, control building and plant, lighting, perimeter fencing, and infrastructure for access and egress (roads). The compound will also include steel gantries to facilitate the electrical connection of the National Grid Substation to the existing 400kV transmission line;
- Up to two new 400kV transmission towers to facilitate the electrical connection of the National Grid Substation to the existing 400kV transmission line;
- Ancillary infrastructure works including; underground cables, boundary treatments, security equipment, lighting, landscaping, access tracks, earthworks, surface water management, and any other works identified as necessary to enable the development;
- Landscaping, habitat management, biodiversity enhancement and amenity improvements; and
- Works to facilitate vehicular access to the Site.

Potential Design Parameters

2.4.2. Each of the components outlined above and their associated key features are set out in the following sections.

Ground Mounted Solar PV Generating Station

Potential Areas for Solar PV Generating Station

2.4.3. Based on the site selection work completed by the Project Team (further detail provided in **Chapter 3**), the potential areas within the Site considered suitable for the solar PV generating station are presented in **Appendix B.**

Solar PV modules

2.4.4. Solar PV modules convert sunlight into electrical current (as direct current (DC)). Solar PV modules are made up of individual solar cells. They are typically 2m long and up to 1m wide and consist of a series of photovoltaic cells beneath a layer of toughened glass. The frame is typically built from anodised aluminium or steel.

2.4.5. The solar PV modules are fixed to a mounting structure in groups known as 'strings'. Various factors will help inform the number and arrangement of the solar PV modules in each string, and it is likely some flexibility will be required to accommodate for future technology developments.

Mounting Structure

2.4.6. Each string of solar PV modules will be mounted on a metal rack, known as a mounting structure. The mounting structure are usually supported by galvanized steel poles, mounted into the ground. There is also an option for some structure legs to be supported by concrete footings to reduce piling depths, if required due to the ground conditions or to reduce impacts on areas of archaeological sensitivity.

2.4.7. The mounting structure carrying the solar PV modules will be designed to face southwards on a single-axis tracker or on a tracking platform. The solar PV modules would be angled at a slope of 10 to 30 degrees from horizontal to optimise daylight absorption.

2.4.8. Once attached to the mounting structure, the minimum height of the lowest part of the solar PV modules will be approximately 60cm above ground level (AGL) and the maximum height of the solar PV modules will be approximately 4m AGL. The height for each solar PV module can be influenced by several design factors including; flood risk (and associated historic flood levels), local topography,

visual receptors, land use practices, and the solar PV module type and configuration.

2.4.9. Archaeological investigation surveys (in the form of geophysical surveys and trial trenching surveys) and ground investigation surveys are being undertaken as part of the Proposed Development. Both sets of surveys will help inform the mounting structure design and construction method.

Balance of Solar System

2.4.10. The Balance of Solar System (BoSS) refers to the components and equipment that convert the direct current (DC) electricity collected by the solar PV modules into alternating current (AC). Primarily, this includes; inverters, transformers, and switchgear.

2.4.11. As the design of the Proposed Development evolves, the configuration of the BoSS will be defined. This section also sets out the different configuration options available for the Proposed Development, including the use of Collector Compounds.

Inverters

2.4.12. Inverters are required to convert the DC electricity collected by the PV modules into AC, which allows the electricity generated to be exported to the National Grid. Inverters are sized to cope with the characteristics of the DC electricity that is output from the solar PV modules.

2.4.13. It is currently expected that either string or central inverters would be used. String inverters are small enough to be mounted underneath the modules, as shown indicatively on **Figure 2-1.**

Figure 2-1: Typical String Inverter

2.4.14. Alternatively, centralised inverters may be used, which would be sited at regular intervals amongst the solar PV modules. Centralised inverters would be housed indoors (i.e. enclosed in a container).

Transformers

2.4.15. Transformers are required to step up the voltage of the electricity generated across the Site before it reaches the Project Substation or Collector Compound. Transformers could be located outdoors or housed indoors, alongside the inverters and switchgear within a container.

Switchgears

2.4.16. Switchgears are the combination of electrical disconnect switches, fuses or circuit breakers to control, protect and isolate electrical equipment. Switchgear is used both to de-energise equipment to allow work to be done and to clear faults downstream. Switchgears are typically housed indoors within a container or can be located independently outdoors, adjacent to the outdoor transformer.

Configuration options for BoSS

2.4.17. There are two options under consideration; independent outdoor equipment and inverter and transformer station (ITS). Both options would be located within fields identified as suitable for the ground mounted solar PV generating station.

2.4.18. As the design develops, the configuration of the BoSS will be determined post-consent based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the PEIR and ES.

Independent outdoor equipment

2.4.19. As presented in **Figure 2-2**, with the independent outdoor equipment option, the inverter, transformer and switchgear are placed outdoors and are independent of each other. The approximate footprint for this option is up to 20m x 4m in plan, and up to approximately 3.5m in height.

Figure 2-2: Example of independent outdoor equipment

Inverter and Transformer Station (ITS)

2.4.20. As shown indicatively in **Figure 2-3**, with the ITS option, equipment (inverter, transformer and switchgear) is enclosed within a container. Typically, within a field containing approximately 20MW of solar PV modules, there would be a requirement for approximately 4-8 ITS.

2.4.21. The ITS are typically the size of a shipping container, approximately 6m x 3m in plan, and up to approximately 3m in height. The ITS would be painted in a colour in keeping with the prevailing surrounding environment, often with a green painted finish.

Figure 2-3: Contained indoor equipment

Collector compounds

2.4.22. Consideration has been given to the potential use of Collector Compounds to reduce the underground cabling across the Site. It is anticipated that Collector Compounds would be located in each of the three land parcels. The Collector Compounds would receive the medium voltage (33kV) underground cables from the independent outdoor equipment and/or ITSs within the surrounding solar fields, depending on the final configuration. Underground cabling would then connect the Collector Compounds to the Project Substation.

2.4.23. If required, the Collector Compounds would include switchgear and transformers to step up the voltage to 66kV. The switchgear and transformers would be housed within a contained indoor unit or within an independent outdoor fenced area. The Collector Compounds would also include an operation, maintenance and welfare building, expected to be single storey.

2.4.24. The Collector Compounds are anticipated to be up to approximately 50m x 30m in plan, with the maximum height of the equipment within each compound approximately 6m in height.

Project Substation Compound

Potential areas for Project Substation

2.4.25. Based on the early site selection work completed by the Project Team (further detail provided in **Chapter 3**), the potential areas considered suitable for the Project Substation are presented in **Appendix B**.

Description

2.4.26. The Proposed Development has secured a grid connection agreement to allow export and import of electricity to and from the National Grid by 2030. The Project Substation will facilitate the export and import of electricity from the Proposed Development to the National Grid.

2.4.27. The Project Substation will consist of electrical infrastructure such as the transformers, switchgear and metering equipment. The Project Substation compound will include a control building, which would be approximately 20 x 20m in plan, and up to approximately 6m in height. This will include office space, material storage and welfare facilities, as well as operational monitoring and maintenance equipment. The control building would be a painted block building or of prefabricated construction with external colours and finishes sensitive to the context to be confirmed prior to construction.

2.4.28. It is considered likely that the Consolidated BESS (see below) will be located within the same compound as the Project Substation.

Battery Energy Storage System (BESS)

Description

2.4.29. The BESS is designed to provide peak generation and grid balancing services to the electricity grid. It will do this primarily by allowing excess electricity generated from the solar PV generating station to be stored in batteries and dispatched when required. As a secondary function, it may also import surplus energy from the electricity grid when energy available to the grid exceeds demand.

2.4.30. The BESS units each comprise of an enclosure for BESS electro-chemical components and associated equipment including transformers, inverters, switchgear, power conversion systems, monitoring and control system, Heating, Ventilation and Air Conditioning (HVAC) systems, electrical cables and fire infrastructure including water storage tanks and a shut off valve. An example of a BESS facility is shown in **Figure 2-4**.

Figure 2-4: Example BESS facility

2.4.31. The BESS typically comprises a number of shipping container units, although they could be either individual enclosures or housed within a large building, that are usually single stacked.

2.4.32. The BESS may comprise DC/DC converters to control the charge of the batteries from the PV energy output and/or AC/DC inverters to control their charge using energy drawn from the National Grid.

2.4.33. Each BESS will require a heating, ventilation and cooling (HVAC) system to ensure the efficiency of the batteries, which are integrated into the containers. This may involve a HVAC system that is external to the containerised unit located either on the top of the unit or attached to the side of the unit. If this uses air to heat and cool, it will have a fan built into it that is powered by auxiliary power.

2.4.35 A switchgear / control room operates, isolates and controls the exported power from the BESS. This would comprise a building of similar dimensions to one of the containers and would be located adjacent to the BESS within the same compound.

Configuration options for BESS

2.4.34. There are two options under consideration, Consolidated BESS and Distributed BESS.

2.4.35. Based on the early site selection work completed by the Project Team (further detail provided in **Chapter 3**), the potential areas considered suitable for the Consolidated BESS and Distributed BESS options are presented in **Appendix B**.

2.4.36. As the design develops, the configuration of the BESS will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the PEIR and ES.

Consolidated BESS

2.4.37. The Consolidated BESS option would involve locating all of the BESS infrastructure within one compound on the Site. If this option is taken forward, it is anticipated that the Consolidated BESS infrastructure will be located within the same compound as the Project Substation. The combined footprint of the Project Substation and BESS would have an approximate footprint of 500m x 250m in plan, with a height of up to 6m.

Distributed BESS

2.4.38. The Distributed BESS option would involve locating several separate BESS compounds on the Site. If this option is taken forward, it is anticipated that each Distributed BESS compound would be located next to the Collector Compound. The approximate footprint for each Distributed BESS compound would be 212m x 100m in plan, with a height of up to 6m.

National Grid Substation

Potential areas for National Grid Substation

2.4.39. The electricity generated by the Proposed Development is expected to be imported and exported via interface cables to the National Grid. The Applicant is actively engaging with National Grid and has assumed for the purpose of this EIA Scoping Report that this will be via a new substation (the 'National Grid Substation'), within the Site itself, which will tie into the existing 400kV overhead transmission line which crosses Springwell West.

2.4.40. Based on the early site selection work completed by the Project Team (further detail provided in **Chapter 3**), the potential areas considered suitable for the National Grid Substation, Project Substation and BESS within the Site boundary are presented in **Appendix B**.

Description

2.4.41. The National Grid Substation compound is expected to include the following; switchgear, transformers, circuit breakers, disconnectors, earthing devices, control building and plant, lighting, perimeter fencing, and infrastructure for access and egress (roads). The control building is assumed to include drainage.

2.4.42. The National Grid Substation compound is expected to include infrastructure to facilitate the electrical connection to the existing 400kV transmission line, including; steel gantries and two new 400kV transmission towers.

2.4.43. The National Grid Substation compound would have an approximate footprint of 500m x 500m in plan, and up to 15m in height. The majority of the infrastructure would be up to 6m in height, however, the steel gantries are assumed to be up to 15m in height.

2.4.44. The National Grid Substation is likely to sit on concrete foundations, which may require piling to be undertaken, depending on the ground conditions.

2.4.45. The National Grid Substation is likely to require a combination of concrete prefabricated trenches and buried plastic ducts for routing of cables from the control building to individual equipment within the compound. The cables will then be routed to individual equipment within the compound in buried plastic ducts.

2.4.46. In the event that the National Grid Substation is not located directly adjacent to the existing 400kV overhead transmission line, a maximum of two sealing end compounds, dependent on the configuration of the connection, would be located next to the

existing 400kV overhead transmission line which would be connected by buried 400kV cables. The sealing end compound would include gantries to receive the downleads, sealing ends to connect to the underground cables, internal access road and minor equipment such as earth switches. The sealing end compound would have an approximate footprint of 35m x 45m in plan.

New 400kV Transmission Towers

2.4.47. Up to two 400kV transmission towers will be constructed as part of the Proposed Development to facilitate the connection of the National Grid Substation to the existing National Grid network.

2.4.48. The towers would be located within 50m of the existing 400kV overhead transmission line which crosses Springwell West. The towers would be up to 60m in height and the tower base would be approximately 16m x 16m in plan.

Works to facilitate vehicular access to the Site

2.4.49. The primary point of operational access to the Site is assumed to be directly from or via the A15 Sleaford Road, utilising the existing B1191. Operational access will be confirmed as the Proposed Development design progresses and in consultation with National Highways and the County Highways Authorities.

2.4.50. The HV transformers can weigh up to approximately 100 tons; therefore, it is assumed that concrete or tarmac roads will be installed from the main site entrance to the National Grid Substation.

2.4.51. It is assumed that tarmac roads will also be required for access to the Project Substation, depending on the weight and characteristics of the infrastructure loads.

2.4.52. It is assumed that the access tracks within the Site boundaries for internal access and transportation will follow the alignment of existing agricultural tracks, where possible. The access tracks will typically be constructed of permeable materials such as gravel and will have a maximum running width of up to approximately 6m.

Landscaping, Habitat Management and Biodiversity Enhancement

2.4.53. The Proposed Development will include landscaping, habitat management, biodiversity enhancement, and amenity improvements, which will be explored as the design progresses. This will be sensitivity designed to retain and enhance ecological and recreational connectivity.

2.4.54. Where possible, existing trees, hedgerows, public rights of way and Local Wildlife Sites would be retained.

Ancillary Infrastructure Works

On site cabling

2.4.55. Low voltage on-site electrical cabling is required to connect the solar PV modules and BESS units to inverters (typically via 1.5/1.8kV cables), and the inverters to the transformers on-site (typically via 0.6/1kV cables). Higher rated cables (around 33kV) are then required between the transformers and the switchgears and from switchgears (Collector Compounds) to the on-site electrical infrastructure (typically via 66kV cables).

2.4.56. Where possible, on-site cabling will be laid underground. The dimensions of the trenches will vary depending on the number of ducts they contain and are assumed to be up to approximately 3m in width and up to approximately 2m in depth. Cabling between solar PV modules and the inverters will typically be required to be above ground level (along a row of racks), fixed to the mounting structure, and then underground (between racks and the inverter input).

2.4.57. Open-cut trenching methods would be used for a majority of the cable routing. However, subject to on-going engagement with utility providers and other stakeholders, there may be a requirement for specialist trenchless techniques (e.g. Horizontal Directional Drilling) for crossings of roads, environmental receptors, and other existing infrastructure.

Fencing and security

2.4.58. Security fencing will enclose the operational areas of the Proposed Development. The fields encompassing the solar PV modules and supporting infrastructure will likely be fenced using ‘deer fence’ with wooden post supports which would typically have a maximum height of 2.5m.

2.4.59. Pole mounted facing close circuit television (CCTV) systems which typically have a maximum height of 5m, are assumed to be deployed around the perimeter of the operational areas of the Site, including the Project Substation compound and National Grid Substation compound.

2.4.60. Permanent palisade steel fencing (up to 3m high) will be installed around the perimeter of the Project Substation compound, National Grid Substation compound, BESS and Collector Compounds

2.4.61. The National Grid Substation compound, Project Substation compound, BESS compounds, and Collector Compounds would include lighting, in accordance with relevant standards, but will not be permanently lit.

Drainage

2.4.62. A detailed operational drainage design will be carried out pre-construction with the objective of ensuring that drainage of the land to the present level is maintained. It will follow either the design of a new drainage system taking into account the proposed new infrastructure (access tracks, cable trenches, structure foundations) to be constructed, or, if during the construction of any of the infrastructure, there is any interruption to existing schemes of land drainage, then new sections of drainage will be constructed.

2.4.63. The design of new drainage systems will be based on the Flood Risk Assessment (FRA) and hydrological assessment to be undertaken in support of the DCO Application.

2.4.64. Infiltration drainage design will be in accordance with Building Research Establishment (BRE) Digest 365: Soakaway Design and Sewers for Adoption [**Ref. 2-2**].

2.4.65. Drainage and sewage systems are likely to be required at the Project Substation compound, National Grid Substation compound and BESS compound. Field drainage or ditches are assumed to be required in some areas of the solar PV generating station, depending on the topography and hydrology.

2.5. Construction phase

Construction Programme

2.5.1. It is anticipated that the construction of the Proposed Development will be completed in two phases, which will be defined as the design progresses.

2.5.2. Subject to obtaining development consent and following a final investment decision, construction is indicatively scheduled to commence in 2026 and last for approximately 48 months across two phases, followed by a commissioning period of approximately 6 months.

Construction Activities

2.5.3. The PEIR and ES will provide further details of the proposed construction activities, their assumed duration, along with an indicative programme of each phase of works. The types of construction activities that may be required include:

- Site preparation;
- Import of construction materials, plant and equipment to Site;
- Establishment of Site construction compounds and welfare facilities;

- Upgrading existing tracks and construction of new access roads within the Site;
- The upgrade or construction of crossing points (bridges / culverts) at drainage ditches within the Site;
- Marking out the location of infrastructure;
- Erection of module mounting structures and mounting of modules;
- Installation of electric cabling, inverters, transformer cabins, and battery storage units;
- Construction of Project Substation and National Grid Substation compounds, BESS compound, Collector Compounds and installation of equipment;
- Cable installation;
- Temporary construction compounds;
- Trenching in sections;
- Appropriate storage and capping of soil;
- Appropriate construction drainage;
- Sectionalised approach of duct installation;
- Excavation and installation of jointing pits;
- Cable pulling;
- Testing and commissioning; and
- Site reinstatement (i.e. returning any land used during construction, for temporary purposes, back to its previous condition).

Construction Site Compounds and Access

2.5.4. Temporary compounds would be established before commencement of the main construction works for the storage of materials, plant and equipment. The compounds would also include staff welfare facilities, waste storage, and wheel washing areas.

2.5.5. The temporary compounds would include hardstanding areas, with apron and haul road areas comprising stone laid on a geotextile membrane. The construction compounds may require lighting to ensure safety and security, especially in the winter months.

2.5.6. It is likely that the main construction access to the Site will be via the A15 Sleaford Road and onto the B1191. The construction accesses will be assessed and determined as the design progresses. The number and location of any site access points will

be discussed with National Highways and the County Highways Authorities as part of the design process and look to utilise existing accesses where possible. Temporary access tracks would be provided to link the temporary compounds to the Site access points. Where required, temporary access tracks would be constructed of stone laid on a geotextile membrane.

2.5.7. Further work will be undertaken to identify the land that is likely to be required for the temporary construction compounds (including laydown / storage areas), and access / haul routes connecting to construction site from the local highway.

2.5.8. As a result of further work on likely traffic impacts associated with the construction of the Proposed Development, it may be that street works are required to the public highway outside of the Site in order to facilitate construction access. This is expected to be confirmed for the PEIR, and in the DCO Application.

Use of borrow pits

2.5.9. The use of borrow pits during construction of the Proposed Development will be considered as the design develops. The potential benefit of including borrow pits as part of the Proposed Development include:

- Allows extracted aggregate to be transported to construction locations (largely via site access tracks) within the Site.
- Generates significantly lower levels of Heavy Goods Vehicle (HGV) movements on the local highway network than importation of aggregate from commercial quarries.
- Reduces cost risks arising from double handling, importation from commercial quarries and landfill disposal.

2.5.10. The benefit of using borrow pits will be carefully considered against any potential environmental impacts. Further detail on the approach to identifying suitable borrow pit locations and justification for their inclusions as part of the Proposed Development will be provided as part of the PEIR and ES.

Abnormal load deliveries

2.5.11. It is proposed that any Abnormal Indivisible Loads (AIL) would access the Site via the A15 Sleaford Road and onto the B1191. Swept path analysis will be undertaken to determine whether third party land or land under the ownership of National Highways and / or the County Highways Authorities is required in order to support delivery of any AIL movements and whether any street works to the public highway (or adjoining land) are required. It is anticipated that

AILs will be required for the transformers for the on-site electrical infrastructure.

Construction Environmental Management

2.5.12. An Outline Construction Environmental Management Plan (o CEMP) will be submitted in support of the DCO Application and will set out the key measures to be employed during construction to control and minimise the impacts on the environment.

2.5.13. The details and implementation of this will be secured by a DCO requirement. The purpose of the oCEMP is:

- To ensure nuisance levels as a result of construction and operation activities are kept to a minimum.
- To comply with relevant regulatory requirements and environmental commitments.
- To ensure procedures are put into place to minimise environmental effects during construction.

Construction Traffic Management

2.5.14. An Outline Construction Traffic Management Plan (oCTMP) will be developed as part of the EIA which will propose measures to control the delivery of materials and staff onto the Site during the construction phase.

2.5.15. The principles of the oCTMP will be available for comment as part of the statutory consultation process to ensure that the comments of local residents and stakeholders are taken into account in its development.

Construction Reinstatement and Habitat Creation

2.5.16. A programme of construction reinstatement and habitat creation will commence during the construction phase.

2.6. Operational phase

2.6.1. Minor maintenance works are expected to occur throughout the operating life of the Proposed Development. It is assumed that routine inspections will be carried out and access will use the previously built construction roads. Maintenance activities are likely to include:

- Regular visual inspection of all infrastructure;
- Regular scheduled inspections and testing of equipment;
- Replacement of consumable items (e.g. inverter filters);

- Cleaning of solar PV modules, if required;
- Repair or replacement of panels or other components, if damaged;
- Delivery of spare parts, replacement equipment items and consumables;
- Water management (e.g. clearing of drainage ditches); and
- Vegetation management (e.g. cut back of grass, hedges, trees).

Operational Environmental Management

2.6.2. It is anticipated that an Outline Operational Environmental Management Plan (oOEMP) will be submitted in support of the DCO Application and this document will set out the principles and key measures that will be employed during the operation of the Proposed Development to control and minimise the impacts on the environment.

Landscape and Ecology Establishment

2.6.3. A programme of landscape and ecology establishment will be carried out. An Outline Landscape and Ecological Management Plan (oLEMP) will be submitted in support of the DCO Application, and this document will set out the principles for how the land will be managed throughout the operational phase, following the completion of construction.

2.6.4. A detailed LEMP will be produced following consent and prior to the start of construction, which will be secured by a DCO requirement.

Public Rights of Way

2.6.5. In accordance with Section 55 Acceptance of Applications Checklist (version October 2019), the DCO Application will be supported by a plan identifying any new or altered means of access, stopping up of streets or roads or any diversions, extinguishments or creation of rights of way or public rights of navigation. A management plan setting out the Public Rights of Way Commitments (PRWC) will also be provided.

2.6.6. The PRWC will include a schedule of public rights of way within the Site and outline the proposed measures to manage any requirements to temporarily ‘stop up’ public rights of way within the Site during construction with a suitable diversion in place.

2.6.7. Existing public rights of way within the Site would be retained during the operation of the Proposed Development.

Battery Safety

2.6.8. A management plan for battery safety will be prepared and submitted with the DCO Application in a document entitled Battery Safety Commitments (BSC). The BSC will detail the regulatory guidance reviewed to ensure that all safety concerns around the BESS element of the Proposed Development are addressed in so far as is reasonably practicable.

Soils Management

2.6.9. An Outline Soils Management Plan (oSMP) will be prepared and submitted with the DCO Application. The oSMP will follow the principles of best practice to maintain the physical properties of the soil, with the aim of restoring the land to its pre-construction condition at the end of the lifetime of the solar farm.

2.7. Decommissioning Phase

Ground Mounted Solar PV Generating Station, Project Substation and BESS

2.7.1. For the purposes of the EIA, the decommissioning assessment will be based on a 40-year operational life span for the ground mounted solar PV generating stations, BoSS, Project Substation compound, Collector Compounds, Distributed BESS compounds, and related access tracks and ancillary infrastructure.

2.7.2. At the end of the operational phase, any above ground infrastructure would be dismantled and removed in accordance with industry best practice at the time. The use of decommissioned materials would follow the waste hierarchy such that they would be reused where possible before recycling and disposal were considered.

2.7.3. At the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered. The Applicant would consider and implement a Decommissioning Environmental Management Plan (DEMP) taking account of good industry practice, its obligations to landowners under the relevant agreements and all relevant statutory requirements. An Outline DEMP (oDEMP) will be submitted in support of the DCO Application, which will be secured by a DCO requirement.

National Grid Substation

2.7.4. The National Grid substation is assumed to be a permanent development.

2.8. References

- **Ref. 2-1**: Planning Inspectorate (July 2018) Advice Note Nine: Rochdale Envelope (Version 3). Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/.
- **Ref. 2-2**: Building Research Establishment (BRE) (2012), 'Digest 365: Soakaway Design and Sewers for Adoption' (7th Edition). Watford: BRE.

3. Reasonable Alternatives

3.1. Introduction and approach

3.1.1. Regulation 14(2)(d) of the EIA Regulations states that an ES should include:

'a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment'.

3.1.2. Section 9.3 of the Planning Inspectorate's Advice Note Seven [**Ref. 3-1**] states that a good ES is one that *'explains the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment'*. The ES will include a description of the reasonable alternatives that have been considered, including a clear narrative on the main reasons for selecting the chosen option, including a comparison of the environmental effects. The reasonable alternatives assessment will focus on; the site selection process, design layouts / opportunities within the Site, the sizing and scale of infrastructure, and alternative technologies.

3.1.3. A 'no development' alternative would not deliver the additional electricity generation capacity associated with the Proposed Development and will therefore not be considered further.

3.1.4. The consideration of alternatives and design evolution will be undertaken with the aim of avoiding and / or reducing significant adverse environmental effects, maintaining operational efficiency and cost-effective design solutions, and with consideration of other relevant matters such as available land and planning policy. This will be aided by the implementation of project design principles which will help guide the design of the Proposed Development.

3.2. Constraints Analysis

3.2.1. The design work completed to date for the Proposed Development has focussed on identifying constraints / key receptors at the Site (and in close proximity to the Site) which are relevant to the type of infrastructure being proposed, as presented in **Appendix C**. Constraints analysis is an invaluable tool in decision making and can help 'avoid' and 'reduce' potential impacts on environmental, engineering, and technical receptors from the outset of the design process.

3.2.2. Information has been drawn from publicly accessible datasets, site surveys, desk-based research, consultation with the landowner and

tenants, and consultation with utility providers. This early design work has been used to inform the scope of the EIA by identifying fields within each land parcel (i.e. Springwell West) which are considered to be 'less constrained' and potentially suitable for development.

3.2.3. The size, scale, and preferred location for key features (permanent and temporary) of the Proposed Development will require careful consideration as the design process evolves. The early constraints work has focussed on identifying potentially suitable fields for the following design elements:

- Ground mounted solar PV generating station;
- Balance of Solar System (BoSS);
- Collector Compounds;
- Project Substation compound;
- BESS compound(s); and
- National Grid Substation compound.

3.2.4. To help guide this process, specific themes have been identified which will continue to inform the design (and parameters) of the Proposed Development. These include:

- Operational impact: Including consideration of operational assets and maintenance.
- Ecology: Including consideration of statutory / non-statutory designations, protected habitats and protected species.
- Landscape and visual: Including consideration of landscape character and visual amenity.
- Cultural heritage: Including consideration of known statutory / non-statutory designations and potential archaeological assets.
- Residential properties and sensitive activities: Including consideration of amenity impacts from construction activities and operation.
- Transport and access: Including consideration of linkages to the existing highway network and public rights of way (PRoW).
- Construction impacts: Including consideration of high level costs and logistic requirements.
- Hydrology and flood risk: Including proximity to watercourses, flood zones, and private water supply.

- Agricultural Land Classification: Where possible, avoidance of areas of Best and Most Versatile (BMV) land based on information available.
- Land and property: Including consideration of any restrictions associated with landowner agreements.
- Land use: Including proximity to existing infrastructure, local planning allocations, and known planning applications.
- Community and social economic: Including consideration of community facilities and accessibility.

3.2.5. A collaborative and multidisciplinary approach to the evaluation of each land parcel has led to the development of broad zones of potential development, as presented in **Appendix B.**

3.2.6. The evolving design of the Proposed Development will consider feedback from the non-statutory consultation process, continued engagement with land owners, engagement with statutory consultees and further environmental and technical surveys. Further detail on the design process will be provided within the PEIR and ES.

4. Approach to EIA

4.1. Introduction

4.1.1. This chapter sets out the overall approach that will be taken to the EIA for the Proposed Development. The ES will contain the information specified in Schedule 4 of the EIA Regulations. The approach to the assessment has been informed by current best practice guidance.

4.1.2. An overview of the guidance and methodology adopted for each environmental factor is provided within the respective environmental factor chapters of this EIA Scoping Report.

4.1.3. The environmental factors listed under Regulation 5(2) of the EIA Regulations are presented below.

- Air quality.
- Biodiversity.
- Climate.
- Cultural heritage.
- Population.
- Human health.
- Land and soil (factors combined for the purposes of reporting).
- Landscape and visual.
- Material assets and waste.
- Water.

4.1.4. It should be noted that although not listed as specific environmental 'factors' under Regulation 5(2) of the EIA Regulations, the following are also considered within this EIA Scoping Report:

- Glint and glare.
- Heat and radiation.
- Major accidents and disasters.
- Noise and vibration.
- Utilities.
- Traffic and transport.
- Electric, magnetic and electromagnetic fields.

4.1.5. The proposed structure of the ES is set out in **Appendix E**.

4.2. Consultation

4.2.1. Consultation alongside the EIA process is critical to the development of a comprehensive and proportionate ES. The views of statutory and non-statutory consultees are important to ensure that the EIA from the outset focuses on specific issues where significant environmental effects are likely, and where further investigation is required.

4.2.2. The consultation, as an ongoing process, enables embedded and additional mitigation measures to be incorporated into the Proposed Development to limit adverse environmental effects and optimise environmental benefits.

4.2.3. Early and ongoing engagement with consultees will be important to influence the design process of the Proposed Development by seeking an appropriate level of feedback from consultees, to ensure that comments are considered in the evolving design. The consultation responses will be recorded in a Consultation Report which will be submitted in support of the DCO Application.

4.2.4. Non-statutory consultation was held in January – March 2023. The aims of non-statutory consultation are to:

- Outline the broad parameters of the Proposed Development;
- Gather feedback on key issues and options;
- Understand and develop responses to key community and stakeholder concerns;
- Reassure concerned stakeholders; and
- Continue to build advocacy for the Proposed Development.

4.2.5. Statutory consultation is expected to be held in Q3 / Q4 2023. The aims of statutory consultation are to:

- Set out current proposals, demonstrating how issues identified during earlier consultation have been accounted for and considered within the Proposed Development design;
- Take formal feedback to ensure that regard has been had to the views of local community;
- Finalise and illustrate the position on key issues and with key stakeholders.

4.2.6. As part of the EIA process, consultation will be undertaken with a range of statutory and non-statutory consultees. It is anticipated at this stage that consultees will include (but is not limited to):

- Lincolnshire County Council;

- North Kesteven District Council;
- Blankney Parish Council;
- Scopwick and Kirkby Green Parish Council;
- Ashby de la Launde with Bloxham and Temple Bruer with Temple High Grange Parish Council;
- Metheringham Parish Council;
- Historic England;
- Natural England;
- Environment Agency;
- National Highways;
- Lincolnshire Wildlife Trust;
- Canal and River Trust;
- Sustrans;
- Ramblers Society;
- RAF Digby;
- Royal Society For The Protection of Birds; and
- Lincolnshire Fire and Rescue.

4.2.7. The consultation undertaken for each of the environmental disciplines is provided in further detail in the **Chapter 6** of this EIA Scoping Report.

4.3. General difficulties and uncertainties

4.3.1. Factor-specific difficulties and uncertainties are set out in **Chapter 6** of this EIA Scoping Report. The following key general difficulties and uncertainties apply to a number of factors:

- The detailed design of the Proposed Development is still emerging, as are the environmental surveys and assessments required to support the planning and EIA process. This EIA Scoping Report is provided based on the information available at the time of writing. Where relevant, the proposed scope will be reviewed and updated to reflect developments in the Proposed Development design that may occur post-scoping and agreed with relevant statutory consultees. Any changes to the scope of the EIA will be reported in the ES.
- As the location and area of the components that the Proposed Development comprises are not yet defined or fixed, there is potential for uncertainty regarding the scope of assessment

for each factor. However, the description of the Proposed Development presented in **Chapter 2** of this EIA Scoping Report details the maximum parameters of the Proposed Development components as they are currently known, therefore outlining the 'worst case scenario'. This 'worst case scenario' is the scenario that will be assessed within the PEIR and ES and therefore whatever location or footprint is decided and applied, the PEIR and ES will ensure that the maximum level of significant effects is considered.

- Data from third parties relied upon for the baseline against which any effects will be assessed could potentially be out of date or inaccurate. However, any such data will be procured from reputational and industry standard sources. It will be reviewed and used by competent and experienced professional experts. The combination of appropriate data sources being used by competent and experienced experts should ensure that the data is suitable for its purpose, and will therefore provide an appropriate evidence base from which the existing environmental baseline will be informed.

4.4. Defining the study area

4.4.1. Study areas have been defined individually for each environmental factor, taking into account the geographic scope of the potential impacts relevant to that factor and the information required to assess those impacts. The proposed study areas are described within **Chapter 6** of this EIA Scoping Report.

4.5. Establishing baseline conditions

4.5.1. Environmental effects of the Proposed Development will be described in the PEIR and ES in relation to the extent of changes to the existing baseline environment as a result of the construction, operation, and decommissioning of the Proposed Development.

4.5.2. The baseline environment will comprise the existing environmental characteristics and conditions, based upon desk-top studies and field surveys undertaken and information available at the time of the assessment.

4.5.3. Baseline conditions will be established by:

- Site visits and surveys;
- Desk based studies; and
- Modelling.

4.5.4. The baseline conditions for each environmental factor will be set out within the respective assessment chapters.

4.5.5. As stated above in **Section 4.3**, there is potential that data obtained from third parties is not up to date. The origin of all third-party data used will be clearly identified, alongside any difficulties, uncertainties and assumptions.

4.6. Establishing future baseline conditions

4.6.1. Schedule 4(3) of the EIA Regulations requires consideration of the likely evolution of the current state of the environment (baseline scenario) in the absence of the Proposed Development, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge (the 'future baseline'). Whilst there are considerable limitations to the predictions that can be made about natural baseline conditions at a future point in time, reasonable effort will be made to characterise the future baseline in the absence of the Proposed Development in each topic assessment. In addition, some assessments require projections to account for future change, such as traffic growth within the assessment of likely significant effects associated with the Proposed Development.

4.7. Assessment Scenarios

4.7.1. The assessment scenarios that are being considered for the purposes of the EIA are as follows:

- Existing baseline (without Proposed Development) - Reported at the time that the baseline data has been collected.
- Future baseline (without the Proposed Development) – For comparison with the construction phase, operational phase, and decommissioning phase.
- Construction of the Proposed Development - As presented in Chapter 2, construction is indicatively scheduled to commence in 2026 and last for approximately 48 months across two phases, followed by a commissioning period of approximately 6 months. The technical chapters will assess the relevant 'worst case' construction scenario and where necessary, the relevant period or 'peak' of activity within the construction programme.
- Operation of the Proposed Development - The technical chapters will assess the relevant 'worst case' scenario where necessary. Consideration will need to be given to the phased approach to construction of the Proposed Development.
- Decommissioning of the Proposed Development.

4.8. Approach to mitigation

4.8.1. Mitigation can be relied on to reduce any potential significant effects from the Proposed Development. The sequential steps of the mitigation hierarchy are as follows:

- **Avoidance:** Take measures to avoid creating impacts from the outset;
- **Minimisation:** Measure taken to reduce the duration, intensity and extent of the impact if they cannot be avoided;
- **Restoration:** Measures taken to improve ecosystems following exposure to unavoidable impacts; and
- **Offset:** Measure taken to compensate for any residual impacts.

4.8.2. The Institute of Environmental Management and Assessment's (IEMA) 'Environmental Impact Assessment Guide to Shaping Quality Development' [**Ref. 4-1**] refers to three distinct forms of mitigation:

- **Primary:** An intrinsic part of the project design
- **Secondary:** Typically described within the factor chapters of the ES, but often are secured through planning conditions and/or management plans.
- **Tertiary:** Required regardless of any EIA, as it is imposed, for example, as a result of legislative requirements and / or standard sectoral practices.

4.8.3. For the purposes of this EIA Scoping Report, the PEIR and the ES, embedded 'primary' mitigation measures will form part of the Proposed Development for which consent is sought. **Table 4.1** describes the currently known embedded (primary) environmental mitigation measures that are considered to be an inherent part of the Proposed Development i.e. the project design principles adopted to avoid or prevent adverse environmental effects, based on the design of the Proposed Development to date. It should be noted that these will likely evolve over the course of the design evolution, up to submission of the DCO Application.

4.8.4. These embedded (primary) environmental mitigation measures should not be confused with additional (secondary and tertiary) mitigation measures proposed in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment, which are described under the 'Additional (Secondary and Tertiary) Mitigation Measures' section within each environmental factor assessment section [**Chapter 6**].

Table 4-1 Embedded (primary) environmental mitigation measures

Environmental Factor to which the Embedded (Primary) Mitigation Measure Relates	Embedded (Primary) Mitigation Measure
Biodiversity	The design of the Proposed Development will incorporate a minimum offset distance of 10m from any existing hedgerows.
Biodiversity	The design of the Proposed Development will incorporate a minimum offset distance of 15m to locally designated wildlife sites.
Biodiversity	The Proposed Development will avoid any development on areas of important habitat (calcareous grassland).
Biodiversity	The design of the Proposed Development will incorporate a minimum offset of 30m to active badger setts.
Biodiversity **Water**	The design of the Proposed Development will incorporate a minimum offset distance of 10m from all watercourses and ditches.
Biodiversity **Landscape and Visual**	The design of the Proposed Development will incorporate a minimum offset distance of 10m either side from any infrastructure to public rights of way.
Population **Landscape and Visual**	The existing public rights of way (PRoW) that cross the Site will be retained. Subject to the construction phasing and methodology, there may be a requirement to temporarily divert a PRoW during the construction phase, the details of which will be sought to be agreed with relevant key stakeholders, with an appropriate temporary alternative provided.
Biodiversity **Landscape and Visual**	Where possible, any existing hedgerows, woodlands, ditches and field margins will be retained. Where possible, any breaks or crossings (associated new tracks, security fencing and/or cable routes) will be designed to use existing agricultural tracks between fields and the width of any new breaks will be kept to a minimum.
Land and Soils	The design of the Proposed Development will seek to retain fields comprising majority Grade 1 or Grade 2 agricultural land within arable production where possible.

Water	The design of the Proposed Development will avoid locating any built structures (including inverters, collector compounds etc.) within Flood Zones 2 and 3.
Noise	The design of the Proposed Development will incorporate a minimum 250m offset from central inverters to residential properties.

4.9. Assessment of likely significant effects

4.9.1. The PEIR and ES will report on the likely significant environmental effects for the site preparation, earthworks and construction (hereafter referred to as 'construction'), operational (i.e. once completed and open to use, and including maintenance) and decommissioning phases of the Proposed Development.

4.9.2. The following criteria will be taken into account when determining significance:

- The receptors/resources (natural and human) which would be affected and the pathways for such effects;
- The geographic importance, sensitivity or value of receptors / resources;
- The duration (short-term, medium-term or long-term); permanence (permanent or temporary) and changes in significance (increase or decrease);
- Reversibility - e.g. is the change reversible or irreversible, permanent or temporary;
- Environmental and health standards (e.g. local air quality standards) being threatened; and
- Feasibility and mechanisms for delivering mitigating measures, e.g. Is there evidence of the ability to legally deliver the environmental assumptions which are the basis for the assessment?

4.9.3. The method for assessing significance of effects varies between environmental factors but, in principle, will be based on the environmental sensitivity (or value/importance) of a receptor/resource and the magnitude of change from the baseline conditions. The approach to assessing the significance of effects for each individual factor is outlined within **Chapter 6** and **Appendix E** of this EIA Scoping Report.

4.9.4. Summary of effect tables that summarise the likely significant effects associated with each of the environmental factors will be provided in the ES at the end of each factor assessment chapter.

These tables will outline sensitive receptors, additional mitigation measures and residual effects. A distinction will be made between direct, indirect, secondary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects. Cumulative effects will be considered as a single coordinated assessment.

4.10. Opportunities for enhancing the environment

4.10.1. Where possible, there will be a commitment to identifying opportunities for enhancement within the relevant environmental factor assessments. Enhancement is defined as '*a measure that is over and above what is required to mitigate the adverse effects of a project'* [**Ref. 4-2**]. Therefore, any identified enhancement measures will not be taken into account when determining the significance of effects.

4.10.2. Enhancement measures will be assessed in accordance with steps set out in the National Planning Policy Framework.

4.11. References

- **Ref. 4-1**: IEMA (2015), 'Environmental Impact Assessment Guide to Shaping Quality Development', Available at: https://www.iaia.org/pdf/wab/IEMA%20Guidance%20Documents%20EIA%20Guide%20to%20Shaping%20Quality%20Development%20V6.pdf
- **Ref. 4-2**: Ministry of Housing, Communities and Local Government (2021), 'National Planning Policy Framework', Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

5. Environmental factors proposed to be scoped out

5.1. Introduction

5.1.1. As part of the EIA process and based on the information available to date, there are a number of environmental factors, as listed under **Section 4.1** above, for which it is considered an assessment as part of the EIA is not justified, and therefore a standalone chapter is not proposed to be presented in either the PEIR or ES.

5.2. Glint and glare

5.2.1. Solar PV modules are specifically designed to absorb light rather than reflect it. Light reflecting from solar PV modules results in the loss of energy output. Solar PV modules are dark in colour due to their anti-reflective coatings and are manufactured with low-iron, ultra-clear glass with specialised coatings and textures to enable maximum absorption. The combination of these factors significantly increases electrical energy production of the panels and at the same time significantly reduces reflected rays.

5.2.2. There are no guidelines setting out a particular methodological approach to delivering a glint and glare assessment. The draft National Policy Statement EN-3 [**Ref. 5-1**] states in Section 2.52.4:

"Solar PV panels are designed to absorb, not reflect, irradiation. However, the Secretary of State should assess the potential impact on glint and glare on nearby homes and motorists".

5.2.3. It is therefore proposed to exclude glint and glare from the scope of the EIA. However, a detailed stand-alone glint and glare assessment will be undertaken and submitted in support of the DCO Application, considering ground-based (residential dwellings, road, and rail) and airborne (airfields, Air Traffic Control Towers, and approaching aircrafts) receptors. Detailed geometric analysis will be undertaken using a bespoke glint and glare model for all receptors potentially affected by the Proposed Development.

5.2.4. A description of any relevant mitigation measures and safety considerations of the Proposed Development will be included within the Proposed Development description chapter of the ES.

5.3. Heat and radiation

5.3.1. The requirement to consider heat and radiation in UK EIA practice was introduced via the 2017 update to the EIA Regulations. Schedule 4(5)(c) of the EIA Regulations requires that an ES includes:

'A description of the likely significant effects of the development on the environment resulting from, inter alia:

(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste.'

5.3.2. Due to the scale and nature of the Proposed Development, it is not anticipated that there will be any significant sources of heat or radiation during either construction, operation or decommissioning. It is therefore proposed to exclude heat and radiation from the scope of the EIA.

5.4. Major accidents and disasters

5.4.1. The requirement to consider major accidents and disasters in UK EIA practice was introduced via the 2017 update to the EIA Regulations. Schedule 4(8) of the EIA Regulations requires that an ES includes:

'A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU of the European Parliament and of the Council(c) or Council Directive 2009/71/Euratom(d) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. 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.'

5.4.2. Further guidance is provided by 'Major Accidents and Disasters in EIA: An IEMA Primer' (IEMA, 2020b) **[Ref. 5-2]**. This focuses on the consideration of low likelihood / high consequence events which would result in serious harm or damage to environmental receptors, and which could encompass risks exacerbated by climate change. This includes accidents or disasters originating from a proposed development as well as external events (man-made or natural).

5.4.3. In considering the potential for significant effects from the vulnerability of the Proposed Development to risks of accidents and disasters, it is important to note that the UK already has a structured framework of risk management legislation in place. Vulnerability to major accidents and / or disasters for infrastructure and other built environment developments is covered by a wide range of other safety and non-safety-related legislation, as detailed below:

- Health and Safety at Work Act 1974 [**Ref. 5-3**];

- Construction (Design and Management) Regulations 2015 [**Ref. 5-4**];
- The Construction (Health, Safety and Welfare) Regulations 1996 [**Ref. 5-5**]; and
- Electricity Safety, Quality and Continuity Regulations 2002 [**Ref. 5-6**].

5.4.4. The risk of major accidents and disasters will be considered throughout the design process of the Proposed Development. This will include siting the potentially hazardous equipment, such as the BESS and grid infrastructure, at a suitable distance from sensitive receptors.

5.4.5. The construction, operation and decommissioning phases of the Proposed Development have the potential for limited interactions which may give rise to major accidents and / or disaster. **Table 5-1** presents a list of possible major accidents and disasters that will require consideration.

Table 5-1 Possible major accidents and disasters

Major Accident and / or Disaster	Potential Receptor	Comments
Flooding	Properties Local residents	The majority of the Site is located within Flood Zone 1 (less than a 1 in 1000 AEP of flooding) and is at low risk of surface water flooding. Therefore, the Site is considered to not be at significant risk of river flooding or surface water flooding. The vulnerability of the Proposed Development to flooding and its potential to exacerbate flooding, will be covered in the Flood Risk Assessment, which will be appended to the ES.
Fire	Properties Local residents Local habitats and species	There is a potential fire risk associated with the BESS. This will be managed by a cooling system, which will form part of the BESS, which is designed to regulate temperatures to safe conditions to minimise the risk of fire. The BESS and associated grid infrastructure will be sited a suitable distance from sensitive receptors in accordance with BESS standards (UL9540).

		Lincolnshire Fire and Rescue service will be consulted as part of the DCO process. Battery Safety Commitments will be produced and submitted in support of the DCO Application to account for the potential safety risks and the relevant mitigation and management procedures.
Aircraft disasters	Pilots	The potential for glint and glare to affect aircraft will be considered within the Glint and Glare assessment which will form a technical appendix to the ES. It is also noted in draft National Policy Statement EN-3 [**Ref. 5-1**], Section 2.52.5, that: "*There is no evidence that glint and glare from solar farms interferes in any way with aviation navigation or pilot and aircraft visibility or safety. Therefore, the Secretary of State is unlikely to have to give any weight to claims of aviation interference as a result of glint and glare from solar farms*".
Rail accidents	Rail Users	The potential for glint and glare to affect rail users will be considered within the Glint and Glare assessment which will form a technical appendix to the ES.
Plant disease	Habitats and species	New planting may be susceptible to biosecurity issues, such as increased prevalence of pests and disease, due to source of provenance and climate change. The planting design and Outline Landscape and Ecological Management Plan (oLEMP) will take account and manage biosecurity risks.

5.4.6. Those major accidents and disasters that are not considered within the scope of the existing technical assessment will continue to be reviewed and addressed as part of the design process. The construction, operation and decommissioning of the Proposed Development are not considered to have a risk of major accidents or disasters that could affect existing or future receptors, which are not considered through existing design mitigation and regulatory regimes.

5.4.7. The mitigation in place is generally sufficient to manage vulnerabilities to major accidents and / or disasters without the need for additional mitigation in most circumstances. It is not expected

that inclusion of major accidents and disasters in the EIA scope would add any greater level of safety performance to that already established process. By implementing recognised and approved safety legislation and regulation, no significant effects in relation to major accidents and disasters are anticipated during the construction, operation and decommissioning phases. It is therefore proposed to exclude major accidents and disasters from the scope of the EIA.

5.5. Utilities

5.5.1. The Proposed Development has the potential to affect existing utility infrastructure located at the Site. Given the nature of the Proposed Development, potential impacts on existing utility assets would be limited to the construction phase. To identify any existing infrastructure constraints, a utility search (including consultation with the utility provider) covering the Site (and 2 km from the Site boundary) has been undertaken.

5.5.2. The utility search identified several assets within the Site boundary that will require careful consideration as the design of the Proposed Development evolves, including:

- National Grid extra high voltage transmission lines.
- Electricity distribution high voltage transmission lines.
- Anglian Water pipeline (clean).
- Cadent gas pipeline.
- Exolum pipeline (military).

5.5.3. Further consultation will be carried out with the relevant utility companies to confirm the information drawn from the utility search is accurate and up to date. In addition, consideration and advice will be sought regarding separation distances and methods of construction in close proximity to each utility to avoid any risk of impact during construction of the Proposed Development. This information will be used to inform the layout of the Proposed Development and reported within the ES as embedded (primary) mitigation.

5.5.4. The oCEMP will include any additional mitigation measures to protect against interference with below ground utilities during construction. The Applicant would also expect to agree protective provisions with each utility owner, in order to ensure the DCO includes appropriate protections and restrictions on the Applicant's exercise of its powers, for the protection of utilities.

5.5.5. Taking the above into account, it is not proposed to prepare a separate utilities chapter as part of either the PEIR or ES.

5.6. Human Health

5.6.1. It is proposed that consideration of the potential effects to human health as a result of the Proposed Development will be covered through the findings of other assessments undertaken as part of the EIA process, as follows:

- Air quality;
- Landscape and visual;
- Noise and vibration; and
- Traffic and transport.

5.6.2. Each of these chapters within the EIA Scoping Report and subsequent PEIR and ES will consider the potential effects to human health within their own assessments. Outside of the EIA process, a glint and glare assessment will be undertaken (see **Section 5.2** above), which will consider the potential human health effects from glint and glare.

5.6.3. There are a number of PRoW crossing the Site which might be used for recreational purposes. Any temporary diversions will be detailed in the Public Rights of Way Commitments, which will be submitted in support of the DCO Application.

5.6.4. Any changes to PRoW will be agreed in consultation with North Kesteven District Council and Lincolnshire County Council in order to ensure there are suitable diversions or replacements in place. Impacts to users of PRoW are therefore expected to be minimised and where they do occur they will be short term and temporary. As such, it is not expected that changes to the PRoW will significantly impact recreational use of the Site and therefore it is proposed to scope this matter out of further assessment.

5.6.5. As any potential human health impacts will be captured by the aforementioned assessments and there are not expected to be any significant human health impacts outside of these assessments, it is proposed that human health is not subject to dedicated assessment and therefore excluded from the scope of the EIA.

5.7. Material assets and waste

5.7.1. Material assets can be defined as *"substances used in each lifecycle stage of a development, with particular focus on the construction, operation and maintenance, and decommissioning or 'end of first life' (deconstruction, demounting, demolition and disposal) phases"* [**Ref. 5-7**]. Material assets can include 'material' (i.e. physical resources that are used across the lifecycle of a development) and 'excavated arisings' (i.e. soil, rock, or similar resource generated by excavations).

5.7.2. Waste is defined as *'any substance or object which the holder discards or intends or is required to discard'* [**Ref. 5-7**]. The Waste Framework Directive [**Ref. 5-8**] definition includes any substance or object that is discarded for disposal or that has not been subject to acceptable recovery (including reuse and recycling).

5.7.3. The main impacts (changes) and effects (consequences) of materials consumption and waste disposal are presented in **Table 5-2.**

Table 5-2 Material Assets (from IEMA guide to Materials and Waste in Environmental Impact Assessment)

Matter	Direct Impacts	Adverse Effects	Applicable Development Phase
Materials	Consumption of resources	Depletion of resources, resulting in the temporary or permanent degradation of the natural environment	Construction, decommissioning
Waste	Generation and disposal of waste	Reduction in landfill capacity Unsustainable use or loss of resources to landfill that results in the temporary or permanent degradation of the natural environment	Construction, decommissioning

5.7.4. The indirect impacts associated with materials consumption and waste disposal (e.g. release of greenhouse gas emissions, water consumption, amenity impacts, ecological impacts, etc) will be assessed elsewhere within the EIA. Similarly, the indirect impacts of any off-site waste management facilities and material production facilities are expected to be assessed (and where necessary, mitigated) under the planning and permitting regime for those sites and thus do not form part of an EIA for a development that uses such facilities for material supply or waste management.

5.7.5. A description of the potential streams and volumes of construction materials and waste disposal will be described within the proposed development chapter within the ES. In addition to this, the oCEMP, will set out how construction materials and waste will be managed on-site, and opportunities to recycle waste will be explored. Where possible, development-specific commitments for sustainable resource management will be presented within the ES. As part of the detailed CEMP, prepared by the Contractor following the making of the DCO, there would be a requirement to develop and

implement a Site Waste Management Plan (SWMP) and Materials Management Plan (MMP) in advance of the construction works. An Outline Decommissioning Environmental Management Plan (oDEMP) will be submitted in support of the DCO Application, which will set out how the waste will be managed and detail opportunities for re-use and recycling.

5.7.6. It is also not intended to remove significant quantities of excavated arisings from the Site during construction (there are currently no demolition works proposed, for example). There may, however, be a need to remove some soils from the Site for treatment or disposal, if found to be contaminated, and it is not practical to treat this on-Site. However, where possible, soil arisings will be balanced through a cut and fill exercise to retain volumes on Site.

5.7.7. For the operational phase, the potential streams and volumes of construction materials and waste disposal will be described within the proposed development chapter within the ES. There will be relatively little waste produced during the operation phase and the requirement for material assets will be limited to maintenance and replacement parts, as required.

5.7.8. During decommissioning, the removal of any material assets and waste will be recycled or disposed of in accordance with good practice and market conditions at that time. If items can be recycled, this will be the first-choice option.

5.7.9. Taking the above into account, it is not proposed to prepare a separate material assets and waste chapter as part of either the PEIR or ES.

5.8. Population

5.8.1. The requirement to consider population in UK EIA practice was introduced via the 2017 update to the EIA Regulations, with impacts to population taken to refer to socio-economic impacts.

5.8.2. There is no statutory guidance when assessing potential impacts to population. However, Design Manual for Roads and Bridges (DMRB) LA 112 Population and Human Health (hereafter LA 112) [**Ref. 5-9**] gives direction when assessing the impacts of a project in relation to population and human health, including at the scoping stage. Whilst it is recognised that DMRB is primarily for use when assessing transport-related developments, in the absence of other guidance, the LA 112 scoping methodology has been adopted for this EIA Scoping Report.

5.8.3. In accordance with LA 112, a population scoping assessment should consider the potential for significant effects to occur on the following receptor groups:

- private property and housing;
- community land and assets;
- development land and businesses;
- agricultural land holdings; and
- Walkers, cyclists and horse riders.

5.8.4. In line with LA 112, each of these matters is considered below.

Private property and housing

5.8.5. There are no properties or houses at risk of demolition to construct/operate the Proposed Development.

5.8.6. None of the land to be used is allocated for residential development and no new planning applications have been submitted for housing development within the Site boundary. Therefore, there will be no effects to property or housing.

5.8.7. As no significant effects are expected in relation to private property and housing, it is proposed that these matters be scoped out of further assessment.

Community land and assets

5.8.8. The Proposed Development will cover a large area of agricultural land which is therefore land not used as community land. There are no community assets located within the Site boundary. Therefore no impacts are expected to community land and assets. Impacts to public rights of way (PRoW) are discussed below under ‘walkers, cyclists and horse riders’.

5.8.9. As no significant effects are expected in relation to community land and assets, it is proposed that these matters be scoped out of further assessment.

Agricultural land holdings, development land and businesses

5.8.10. The nature of the agricultural holdings across the Site boundary varies and there will inevitably be land taken out of agricultural production. There may be businesses / tenants / occupiers currently undertaking agricultural operations across the Site boundary who may cease to do so for the duration of the operational phase of the development. The loss of these agricultural operations is not expected to lead to a significant effect in relation to employment in the local area.

5.8.11. There are no other businesses present within the Site boundary. There is no land allocated for employment use, nor are there any

planning applications yet to be determined that will generate employment opportunities at the Site.

5.8.12. The construction period is indicatively scheduled to commence in 2026 and last for approximately 48 months across two phases, followed by a commissioning period of approximately 6 months. The number of construction staff to be used is not yet unknown. However, it is expected that the construction of the Proposed Development will result in a large number of construction staff being on Site across the construction phase which is a short term beneficial socio-economic change. An increase in the number of people in the area would also likely lead to an increase in the level of spending in the local area though shops and local services.

5.8.13. The number of jobs expected to be available during the operational phase is expected to be predominantly related to ad-hoc maintenance.

5.8.14. As no significant effects are expected in relation to agricultural land holdings, development land and businesses, it is proposed that these matters be scoped out of further assessment.

Walkers, cyclists and horse riders

5.8.15. There are a number of PRoW within the Site boundary that allow movement across the Site for walkers, cyclists and horse riders. Some of these paths are routes that are actively promoted to encourage use of these paths for leisure opportunities.

5.8.16. It is anticipated that some of these PRoW will be temporarily diverted as a result of the Proposed Development during the construction phase. Therefore, Public Rights of Way Commitments (PRWC) will be prepared outside of the EIA process and submitted in support of the DCO Application. The PRWC will identify PRoW that will be temporarily affected by the Proposed Development and will detail relevant mitigation measures that will minimise the effects of these changes. The PRWC will also detail how PRoW will be managed during the construction phase to ensure as many PRoW are kept open for users, therefore minimising impacts.

5.8.17. The relevant mitigation measures identified in the PRWC will be reflected in the project description section of the subsequent ES. In line with the requirements of the Section 55 Acceptance of Applications Checklist (version October 2019), the PRWC will be submitted in support of the DCO Application.

5.8.18. As the PRWC will minimise any potential impacts to walkers, cyclists and horse riders during the construction phase and no significant permanent effects are expected in relation to walkers, cyclists and horse riders during the operational phase of the

Proposed Development, it is proposed that these matters be scoped out of further assessment.

Conclusion

5.8.19. As no significant effects to population are expected across any of the five matters detailed in LA 112, it is proposed to exclude population from the scope of the EIA. However, socio-economic benefits as a result of the Proposed Development are expected with regards to:

- Increase in the level of temporary employment;
- The subsequent gross value added to the economy;
- Uptake in the occupancy rate for beds in local hospitality venues; and
- A small number of long term employment opportunities during operation.

5.8.20. Therefore, a Socio-Economic Benefits Statement will be submitted in support of the DCO Application, highlighting the positive socio-economic impacts of the Proposed Development on the local and regional area. This statement will be produced outside of the EIA process and thus to avoid any potential for confusion or repetition, the Applicant does not consider it necessary to consider socio-economic impacts in an EIA context as well.

5.9. Water

5.9.1. According to the Environment Agency flood map for planning, the Site is predominantly located within Flood Zone 1, though areas of Flood Zones 2 and 3 do extend into some of the fields particularly in the north east of the Site within Springwell East as presented in Appendix C. Similarly, the Site is typically at a low or very low risk of surface water flooding, though some fields in the east / north east do have a greater extent of areas of low to high surface water flood risk. Elsewhere, some fields have localised areas of surface water flood risk, generally attributable to localised topographical depressions or flow paths.

5.9.2. Many of the fields within the Site are delineated by small field boundary drains / drainage ditches. The majority of these watercourses are unnamed.

5.9.3. From the Environment Agency's mapping there are no Main Rivers within the Site. There are two Main Rivers in close proximity to the Site. Springwell Brook / Digby Beck is shown as a main river extending from Bloxholm in an easterly direction until it reaches

Dorrington Dike. A second main river (New Cut Drain) is located to the west of Kirkby Green.

5.9.4. The remaining ditches and watercourses in the region would be under the jurisdiction of the Lincolnshire County Council (Lead Local Flood Authority) or the Witham First Internal Drainage Board.

5.9.5. Metheringham Beck (ordinary watercourse) is designated with a moderate ecological status under the Water Framework Directive / River Basin Management Plan (Cycle 3 – 2019) along its reach to the north of Martin Road. The watercourse flows through the northernmost fields of the Site, though is not designated within the Site.

5.9.6. Dorrington Dike (Main River), located to the east of the Site boundary, is fed by Springwell Brook / Digby Beck and is designated with a poor ecological status under the Water Framework Directive / River Basin Management Plan (Cycle 3 – 2019).

5.9.7. Ruskington Beck (ordinary watercourse), located to the south east of the Site boundary, is designated with a moderate ecological status under the Water Framework Directive / River Basin Management Plan (Cycle 3 – 2019).

5.9.8. A Source Protection Zone (SPZ) 1 is centred around western Scopwick and encroaches within the Site boundary. Areas of SPZ 3 are located to the north west of Blankney (outwith the Site) and to the south of Bloxholm which encroaches into the south west boundary of the Site.

5.9.9. The Site is not shown to lie within a Drinking Water Safeguard Zone for surface or ground water, nor is it located within a Drinking Water Protected Area.

5.9.10. There are no designated sites (Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Ramsar, Special Protection Area (SPA)) located within the Site. The closest designated site to the Site is Metheringham Heath Quarry SSSI, approximately 2 km away.

5.9.11. Appropriate mitigation will be secured through the production of an Outline Construction Environmental Management Plan (oCEMP) which will identify good working practices in line with appropriate standards. It is anticipated that the oCEMP will be agreed with Lincolnshire County Council and North Kesteven District Council. This will include the use of appropriate measures, as outlined in the Environment Agency's Pollution Prevention Guidelines. Whilst it is noted that these Guidelines were withdrawn in 2015, they still contain detailed information on good working practices and principles. The following example mitigation measures are proposed:

On-site working

- Site access points will be regularly cleaned to prevent build-up of dust and mud;
- Earth movement will be controlled to reduce the risk of silt combining with the Site run-off;
- Properly contained wheel wash facilities will be used (where required) to isolate sediment rich run-off;
- Cut-off ditches and / or geotextile silt-fences will be installed around excavations and exposed ground, stockpiles to prevent the uncontrolled release of sediments from the Site;
- Collect surface water run-off from hard standing area in a sump;
- Installation of sediment traps on all surface water drains within the Site boundary; and
- Ensure that any vehicle or plant washing is carried out on designated areas of hardstanding at least 10m from any watercourse or surface water body.

Safe storage and use of concrete and cement, concrete and cement mixing and washing areas

- Where possible the concrete used will be pre-mixed and delivered from an off-site source, thereby negating the need to mix concrete on-site and thus reducing the creation of alkaline wastewater on-site;
- Wherever possible, any mixing and handling of wet concrete that is required on-site will be undertaken in designated areas;
- A designated area will be used for any washing down or equipment cleaning associated with concrete or cementing processes and facilities provided to remove sediment prior to disposal;
- The designated area will be sited 10m from any watercourse / waterbody or surface water drain to minimise the risk of runoff entering a watercourse;
- Have settlement and re-circulation systems for water re-use, to minimise the risk of pollution and reduce water usage, and
- Dispose of contained water to either foul sewer if possible, or tanker off-site.

Safe storage and use of oils and chemicals

- Wherever possible, plant and machinery will have drip trays beneath oil tanks / engines / gearboxes / hydraulics, which will be checked and emptied regularly, and the contents of the trays will be correctly disposed of via a licensed waste disposal operator;
- Oils and hydrocarbons will be stored in designated locations with specific measures to prevent leakage and release of their contents, including the siting of the storage area away from the drainage system on an impermeable base, with an impermeable bund that has no outflow and is of adequate capacity to contain 110% of the contents. Valves and trigger guns will be protected from vandalism and kept locked when not in use; and
- To deal with the accidental spillage of oils and fuels, an emergency spillage action plan will be produced, which Site staff will have read and understood. On-site provisions will be made to contain a serious spill or leak through the use of booms, bunding and absorbent material.

Vehicle and wheel washing on Site

- Vehicle washing and cleaning will be carried out in areas that are clearly marked and isolated from surface water drainage systems, unmade ground and porous surfaces (designated washing bays); and
- A designated washing bay will be designed so that runoff is isolated using channels, gullies, gradients, directed to a silt trap or sediment tank to remove larger particles, and either collected in a sealed system for reuse or authorised disposal or discharged to public foul sewer (subject to approval).

Uncontrolled (and particulate) runoff from construction areas and access tracks

- Any compounds should, where possible, utilise a wide strip of geotextile laid on the ground covered by a nominal layer of stone to form the compound. Areas of the construction compound such as portacabins, storage systems etc, would result in the potential increase in surface water runoff;
- Generally the compounds will maintain a permeable nature; however as there would be an increase in hard standing, a form of attenuation will be required on Site to maintain flow rates at the pre-development level;

- Any excess flows will be stored in an attenuation feature and would not impact upon on land outside of the Site. The specifications of the attenuation features would be determined at the detailed design stage; and
- Where stone is used as a capping layer, the content of the stone should not include a high percentage of fines so as to not increase the risk of sediment contamination of the adjacent area and watercourses.

Potential effects during construction

5.9.12. Construction activities have the potential to result in increased localised flood risk due to earthworks and excavation activities, which are likely to change overland run-off routes. Flooding events, if significant enough, have the potential to harm construction workers on-site, particularly if they are working in excavations which have the potential to fill with water, causing temporary or permanent health and safety risks (e.g. injuries). In addition, changes in surface water flood risk have the potential to affect existing residents surrounding the Site and existing and future site users.

5.9.13. The flood risk to the Site typically ranges from low to high with respect to fluvial and surface water risk (as outlined above) and it is anticipated that any significant areas of development will be located outside of these zones. Where less vulnerable aspects of the Proposed Development are sought within the mapped flood zones, the impacts would be assessed within a Flood Risk Assessment which will be submitted in support of the DCO Application (see below). Therefore, the primary sources of flood risk at the Site are associated with fluvial and surface water / pluvial flooding.

5.9.14. Changes in flood risk from the construction of the Proposed Development will be managed by the good practice principles which will be outlined in an oCEMP, which will include a Construction Surface Water Management Plan and awareness training / talks for construction workers so that they are aware of the risks and how to mitigate them through working practices. It is also anticipated that a temporary drainage system will be implemented during construction (as outlined above).

5.9.15. When considering the design of the Proposed Development and the additional (secondary and tertiary) mitigation measures proposed, increases in flood risk to and from the Proposed Development during construction is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude flood risk during construction from the scope of the EIA.

5.9.16. Construction activities (e.g. soil stripping activities / trench excavations for cables on-site) have the potential to result in silt

laden runoff, resulting in the sedimentation and pollution of local watercourses. Silt / soil laden runoff produced during construction activities will be controlled through the implementation of an oCEMP and the provision of a Construction Drainage Management Plan. This oCEMP will be informed by the Environment Agency's Pollution Prevention Guidelines and will include the prevention measures stated above. Therefore, watercourse pollution as a result of silt laden runoff from construction activities is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude it from the scope of the EIA.

5.9.17. Construction activities have the potential to result in chemical spillages, resulting in the pollution of local watercourses. Spillages which could occur during construction activities will be controlled through the implementation of an oCEMP. The oCEMP will be informed by the Environment Agency's Pollution Prevention Guidelines and will include the prevention measures stated above. Therefore, water pollution as a result of chemical spillages used during construction activities is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude it from the scope of the EIA.

5.9.18. Construction activities have the potential to result in cement and concrete dusts being mobilised in surface water runoff, resulting in the pollution of local watercourses. Particle laden runoff which could occur during construction activities will be controlled through the implementation of an oCEMP. The oCEMP will be informed by the Environment Agency's Pollution Prevention Guidelines and will include the prevention measures stated above. Therefore watercourse pollution as a result of cements and concretes being mobilised in surface water runoff as a result of construction activities is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude it from the scope of the EIA.

5.9.19. The development and utilisation of the Site has the potential to result in marginal increased localised flood risk due to increases in impermeable area associated with the BoSS, Collector Compounds, BESS, Project Substation and National Grid substation and an associated reduction in the natural infiltration of water into the ground. The siting of solar PV generating station will only have a negligible impact on the overall permeability of the Site. There will also likely be alterations to the surface water regime and overland flow routes due to the placement of built development and landscaping, which could potentially result in increased surface water runoff. Due to increased surface water runoff rates, existing residents and future users (e.g. residents and workers) either within the Site (workers) or off-site (residents) may be subjected to risks associated with flooding. The temporal risk associated with flooding is greater during the operational phase than the construction phase

with the anticipated lifetime of the Proposed Development (40 years).

5.9.20. Through the application of mitigation, and in accordance with the detailed Flood Risk Assessment, the construction of the Proposed Development is unlikely to create any significant environmental effects on the surface water environment and therefore it is proposed to exclude it from the scope of the EIA.

Potential effects during operation

5.9.21. The flood risk to the Site typically ranges from low to high with respect to fluvial and surface water risk (as outlined above) and it is anticipated that any significant areas of development will be located outside of these zones. Where less vulnerable aspects of the Proposed Development are sought within the mapped flood zones, the impacts would be assessed within the Flood Risk Assessment to be submitted in support of the DCO Application (see below). Therefore, the primary sources of flood risk at the Site are associated with fluvial and surface water / pluvial flooding.

5.9.22. The Proposed Development will (where relevant) include surface water drainage features which will be designed in line with local and national policy (e.g. National Planning Policy Framework, Planning Practice Guidance and Lincolnshire County Council policy) and in agreement with relevant stakeholders (i.e. the Lead Local Flood Authority and Witham First Internal Drainage Board, where relevant). The network where possible, will seek to reduce the surface water runoff from the Site to agreed rates, though the utilisation of the existing drainage network at the Site may be sought, which will ensure there is no increase in flood risk downstream as a result of the Proposed Development.

5.9.23. The solar panels will not result in a direct increase in impermeable area of the Site as they will be raised above the ground level. This means that the panel areas will maintain their existing permeability, with concentrations of runoff managed through relevant grass and planting management as evidenced by Cook and McCuen (2013) [**Ref. 5-10**].

5.9.24. When considering the design of the Proposed Development and the additional (secondary and tertiary) mitigation measures proposed, increases in flood risk to and from the Proposed Development during operation is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude it from the scope of the EIA.

5.9.25. Activities at the Site during operation have the potential to result in accidental spillages and potential contaminants (diffuse highway pollution i.e. hydrocarbons) entering the surface water runoff from

the Site, resulting in the pollution of local watercourses. The Proposed Development will (where relevant) include a surface water drainage network which will be designed in line with local and national policy whilst considering the existing drainage network at the Site. Appropriate surface water treatment will be inherent in the drainage design through the incorporation of SuDS features and pollution prevention measures (e.g. interceptors), where possible. The potential magnitude of accidental spillages is also very low, with failsafe measures inherent within the design of the Proposed Development and health and safety protocol standard practice within the operational working structure of the Proposed Development. Therefore, water pollution as a result of general pollution / diffuse pollution entering local watercourses / water features as a result of the operation of the Proposed Development is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude it from the scope of the EIA.

5.9.26. The Proposed Development is expected to have an impact on the public foul water sewers in the vicinity of the Site due to the increase in foul flows arising from the Proposed Development. In addition, any downstream treatment facilities will see their peak incoming flows increase. If not managed adequately, the increase in peak flows may put both the public network and treatment facilities under pressure, ultimately leading to discharges of raw effluent into watercourses.

5.9.27. As part of a pre-development enquiry, the local sewerage supply undertaker will assess the capacity available in the conveyance / treatment infrastructure downstream of the Site. Should any upgrades to the existing public foul water network be required, these will be undertaken by Anglian Water in accordance with the standards and specifications set out in Design and Construction Guidance, part of the Sewerage Sector Guidance. These mitigation measures would be considered an integral part of the Proposed Development and would avoid any raw effluent discharge into watercourse.

5.9.28. The environmental effects of any increase in foul flows will be controlled through the discharge consent(s) or permit(s) associated with / available to Anglian Water, where consent(s) or permit(s) are only issued where environmental effects are suitably controlled. Therefore, increased foul flows to the foul sewers network during operation is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude it from the scope of the EIA.

5.9.29. The Battery Safety Commitments, as detailed in **Table 5-1**, will outline and manage the disposal of contaminated water in the event of a BESS fire.

5.9.30. The operational Proposed Development will result in the increased demand for potable water. An increase in the permanent workforce population at the Site could increase the demand on potable water supplies. However, with the Site unlikely to be fully manned 24 hours a day, this is unlikely to be significant. Therefore, increased demand for drinking water supplies during operation is not considered to be a potentially significant environmental effect and therefore it is proposed to exclude it from the scope of the EIA.

Potential effects during decommissioning

5.9.31. The potential effects during decommissioning will be similar to those expected during the construction phase. As a result, it is anticipated that there will not be any significant effects to flood risk or water quality as a result of the decommissioning works. As such, the impact of the decommissioning works on flood risk and water quality is proposed to be excluded from the scope of the EIA.

Flood Risk Assessment

5.9.32. In light of the above, it is proposed to exclude water from the scope of the EIA, subject to ensuring no deterioration of water quality or increase in flood risk and agreeing design and mitigation measures with the Environment Agency, Lincolnshire County Council (the Lead Local Flood Authority) and the Witham First Internal Drainage Board. However, flood risk will be considered separately within a Flood Risk Assessment to be submitted in support of the DCO Application, which will focus on the following:

- Obtaining and reviewing relevant data and background information from the Environment Agency and other relevant authorities, including modelled flood level and flow data for any nearby watercourses, details of historical flood events and any other pertinent information;
- Contacting Lincolnshire County Council to obtain the findings of any Strategic Flood Risk Assessment, Preliminary Flood Risk Assessment and Surface Water Management Plan commissioned by them;
- Contacting Anglian Water for details of any existing drainage apparatus in the Site area;
- Providing general advice on the feasibility of SuDS that could potentially be incorporated into the Proposed Development and the drainage design;
- Providing an assessment of the flood risk to the Proposed Development and any flood risk impacts arising from the

Proposed Development, and identifying any mitigation requirements to reduce these risks to an acceptable level; and

- Preparing a Flood Risk Assessment report and outlining surface water drainage strategy principles (where relevant) to address the management of surface water run-off from the Proposed Development, such that flood risk to the surrounding area is not increased and with due consideration of flows to the local drainage system.

5.10. Electric, magnetic and electromagnetic fields

5.10.1. Electric fields are produced by voltage, which is the pressure behind the flow of electricity, which depends on the operating voltage of the equipment. Magnetic fields are produced by current, which is a measure of the flow of electricity and depends on the electrical current.

5.10.2. Electrical fields can be blocked by fences, shrubs and buildings and the intensity of the electric and magnetic fields decreases from the source.

5.10.3. The Department for Business, Energy and Industrial Strategy (BEIS) guidance alongside the 1998 guidelines published by International Commission on Non – Ionizing Radiation Protection (ICNIRP) **[Ref. 5-11]** states that underground cables and overhead power lines at voltages up to and including 132 kV are not capable of exceeding the ICNIRP exposure guidelines. The operation of the Proposed Development will use up to 132kV underground cables.

5.10.4. Ongoing consultation with be held with RAF Digby throughout the design of the Proposed Development to avoid any interference with their operations.

5.10.5. It is therefore proposed to exclude electric, magnetic and electromagnetic fields from the scope of the EIA.

5.11. Transboundary effects

5.11.1. Regulation 32 of the EIA Regulations requires the consideration of any likely significant effects on the environment of another European Economic Association (EEA) State. The consideration of transboundary effects is also detailed within the Planning Inspectorate's Advice Note Seven [**Ref. 5-12**].

5.11.2. Due to the nature and location of Proposed Development, it is not anticipated that the Proposed Development will lead to potential for any likely significant effects on the environment of another European Economic Association (EEA) State. Therefore, a transboundary screening matrix has not been included within this EIA Scoping Report.

5.12. References

- **Ref. 5-1**: Draft National Policy Statement for Renewable Energy Infrastructure (EN 3), Department for Business, Energy and Industrial Strategy, September 2021. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015236/en-3-draft-for-consultation.pdf
- **Ref. 5-2**: IEMA (2020b), 'Major Accidents and Disasters in EIA: A Primer', Available online https://www.iema.net/resources/reading-room/2020/09/28/major-accidents-and-disasters-in-eia-an-iema-primer
- **Ref. 5-3**: HMSO (1974), 'Health and Safety at Work Act 1974'. Available online https://www.legislation.gov.uk/ukpga/1974/37/pdfs/ukpga_19740037_en.pdf
- **Ref. 5-4**: HMSO (2015), 'The Construction (Design and Management) Regulations 2015'. Available online http://www.legislation.gov.uk/uksi/2015/51/pdfs/uksi_20150051_en.pdf
- **Ref. 5-5**: HMSO (1992), 'The Workplace (Health, Safety and Welfare) Regulations 1992'. Available online http://www.legislation.gov.uk/uksi/1992/3004/made/data.pdf
- **Ref. 5-6**: HMSO (2022), 'The Electricity Safety, Quality and Continuity Regulations 2002'. Available online https://www.legislation.gov.uk/uksi/2002/2665/contents/made
- **Ref. 5-7**: IEMA (2020a), 'IEMA guide to Materials and Waste in Environmental Impact Assessment, Available online https://www.iema.net/resources/reading-room/2020/03/30/materials-and-waste-in-environmental-impact-assessment
- **Ref. 5-8**: European Parliament and of the Council (2008), Waste Framework Directive, Available online Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Text with EEA relevance) (legislation.gov.uk)
- **Ref. 5-9**: Design Manual for Roads and Bridges (2019), available online Standards For Highways | Design Manual for Roads and Bridges (DMRB)
- **Ref. 5-10**: Cook and McCuen (2013), Hydrologic Response of Solar Farms, Available online https://usesusa.org/wp-

content/uploads/2020/02/Hydrologic-Response-of-Solar-Farms.pd

- **Ref. 5-11:** International Commission on Non-Ionizing Radiation Protection (ICNIRP) (1998) ICNIRP Guidelines: For limiting exposure to time-varying electric, magnetic and electromagnetic field (up to 300GHz), Health Physics 74 (4): 494-522. Available online https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf
- **Ref. 5-12**: Planning Inspectorate (June 2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environment Information and Environmental Statements (Version 7). Available online https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/.

6. Environmental factors proposed to be scoped in

6.1. Air Quality

6.1.1 Consultation

No consultation to inform the air quality assessment has been undertaken to date. Consultation with North Kesteven District Council will be carried out to agree the following:

- The appropriate data for baseline characterisation;
- Receptor locations to be assessed (such as human receptors and ecologically sensitive sites); and
- Assessment methodology.

6.1.2 Study area

Construction and Decommissioning Phases

Based on the Institute of Air Quality Management (IAQM) construction dust guidance (IAQM, 2015), the study area for sensitive human receptors for demolition, earthworks and general construction activities will be up to 350m from the Site boundary. For trackout activities, the study area will be up to 50m from the edge of the roads likely to be affected by trackout.

The study area for sensitive ecological receptors for demolition, earthworks and general construction activities will be up to 50m from the Site boundary. For trackout activities, the study area will be up to 50m from the edge of the roads likely to be affected by trackout.

6.1.3. Data sources to inform the EIA baseline characterisation

A desk-based baseline air quality review will be carried out to establish existing air quality conditions within the study area. Information on air quality will be gathered from the monitoring stations that form a part of the national and/or local networks and from the estimated background air quality maps published by Defra.

6.1.4. Surveys to inform the EIA baseline characterisation

Considering the nature (i.e. clean, sustainable source of energy) and location (i.e. rural area where air quality is generally good), no on-site air quality monitoring to inform the assessment is proposed.

6.1.5. Baseline conditions

The Proposed Development is located within the administrative area of North Kesteven District Council. There are currently no Air Quality Management Areas declared within the district.

According to the North Kesteven District Council 2022 Air Quality Annual Status Report, North Kesteven District Council undertook non-automatic nitrogen dioxide (NO2) diffusion tube monitoring at 22No. locations during 2021. There was no automatic air quality monitoring station within North Kesteven District Council area in 2021.

The nearest monitoring location is a NO2 diffusion tube location (North Kesteven District Council ref: Ruskington) situated approximately 4.3 km from the Proposed Development. The measured annual average NO2 concentrations at this diffusion tube site, for years 2017 - 2021, ranged between 10.6µg/m3 and 14.7µg/m3, which were well below the annual mean NO2 Air Quality Objective.
Estimated background air quality data are available from the UK-AIR website operated by Defra. The website provides estimated annual average background concentrations of NO2, PM10 and PM2.5 on a 1 km2 grid basis from LAQM background maps. It is noted that estimated 2022 annual average background NO2, PM10 and PM2.5 concentrations at the Site are well below the relevant air quality objectives.
Overall, air quality is considered to be good in the local area.
There are several isolated farmhouses and residences in the area around the Site. More densely populated areas include the village of Ashby de la Launde, the village of Scopwick, the village of Metheringham, the village of Blankney and RAF Digby.
There are no statutory ecological designations with the Site. There are 22 non-statutory designated sites (Local Wildlife Sites (LWS)) either within the Site or within 2 km. Those within or adjacent to the Site are:

- Blankney Brick Pit LWS (within Site boundary)
- Temple Road Verges, Welbourn to Brauncewell 2 LWS (within Site boundary)
- A15, Slate House Farm to Dunsby Pit Plantation 1 LWS (within Site boundary)
- A15, Green Man Road to Cuckoo Lane 2 LWS (within Site boundary)
- Bloxholm Wood LWS/Lincolnshire Wildlife Trust reserve (adjacent to Site boundary).

6.1.6. Additional (secondary and tertiary) mitigation

Construction and Decommissioning Phases
Construction phase site-specific dust mitigation measures will be based on the results of pre-mitigation dust impacts assessment, which will also be applied in decommissioning phase where relevant.

6.1.7. Description of likely significant effects

Construction and Decommissioning

Construction and decommissioning works have the potential to release dust including fine particulate matter, and impact on nearby sensitive human and ecological receptors. Appropriate dust control measures can be highly effective for controlling emissions from potentially dust generating activities, and adverse effects can be greatly reduced or eliminated. With suitable dust mitigation measures in place, the effect of dust and particulate matter emissions during construction phase is unlikely to be significant. The operation of site construction equipment and machinery will result in emissions to atmosphere of exhaust gases, but with suitable controls and site management, impacts of such emissions are unlikely to be significant.
Construction and decommissioning traffic will comprise haulage/construction vehicles and vehicles used for workers' trips to and from the Site. The greatest impact on air quality due to emissions from construction phase vehicles will be in

areas adjacent to the Site access and nearby road network. Based on the temporary nature of the construction and decommissioning activities, it is considered unlikely that significant numbers of vehicle movements associated with staff commuting to and from the site will be generated.

6.1.8. Receptors / matters to be scoped into the assessment

Receptor / Matter	Phase	Justification
Dust and particulate matter emissions resulting from the Site activities, including the operation of the equipment	Construction and decommissioning	Sensitive receptors are located within 350m of the Site. A qualitative, desk-based assessment of site activities is proposed to identify the type of mitigation required. Similarly, operation of the site equipment and machinery during construction will result in emissions to atmosphere of exhaust gases. A qualitative, desk-based assessment is proposed to identify the type of mitigation required.
Traffic exhaust emissions	Construction and decommissioning	Traffic data is required to undertake a qualitative assessment, which is not yet available. A screening level qualitative assessment is proposed.

6.1.9. Receptors / matters to be scoped out of the assessment

Receptor / Matter	Phase	Justification
Site activities and road traffic exhaust emissions	Operation	Given the nature of the Proposed Development, no site activities resulting in significant emissions to air are anticipated during operation and there will only be limited movement of vehicles to the Site for maintenance.

6.1.10. Opportunities for enhancing the environment

The Proposed Development will produce energy from the sun, which is a clean, sustainable source of energy. It will help to reduce the energy requirements from fossil fuels, which will emit harmful air emissions, such as carbon dioxide, nitrogen dioxide, sulphur dioxide, and particulate matters.

6.1.11. Proposed assessment methodology

Construction and Decommissioning Phases

The potential construction and decommissioning activities will be separately assessed and reported within the PEIR and ES.

Dust and Particulate Matter Emissions

An assessment of the likely significant effects of construction phase dust and particulate matter at sensitive receptors will be undertaken following the IAQM's

guidance note '*Assessment of dust from demolition and construction 2014'*, using the available information from the project team and professional judgement.
The assessment will consider the risk of potential dust and particulate matter effects from the following four sources: earthworks; general site activities; and trackout. It will take into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to increases in dust and particulate matter levels to assign a level of risk. Dust risks will be described in terms of low, medium or high. Once the level of risk has been ascertained, the site-specific mitigation proportionate to the level of risk will be identified, and the significance of residual effects determined.
Traffic Exhaust Emissions
A screening level qualitative assessment will be undertaken with reference to the Environmental Protection (UK) and IAQM guidance entitled "Land-Use Planning & Development Control: Planning for Air Quality" (Moorcroft et al., 2017), using professional judgement and by considering the following information, where available:
The number and type of road traffic and site equipment likely to be generated;
The number and proximity of sensitive receptors to the Site and along the likely routes to be used by construction vehicles; and
The likely duration and the nature of the construction/decommissioning activities undertaken.

6.1.12. Difficulties and uncertainties

No difficulties or uncertainties with regards the air quality assessment have been identified at this stage. It is assumed that development traffic flows during construction phase will be below the relevant criteria at this stage. The Applicant will be able to confirm whether a detailed construction phase traffic emissions modelling assessment is required following a review of the relevant traffic data at a later stage.

6.1.13. References

- Institute of Air Quality Management (2014), 'Guidance of the Assessment of dust from demolition and construction, v1.1' [pdf] Available at: http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf
- Department of Environment, Food and Rural Affairs. UK-AIR Air Information Resource. [online] Available at: http://uk-air.defra.gov.uk
- Department of Environment, Food and Rural Affairs (2022), Part IV of the Environment Act 1995 as amended by the Environment Act 2021: Local Air Quality Management: Technical Guidance LAQM.TG(22), London: Crown
- Moorcroft et al., (2017), Land-Use Planning & Development Control: Planning for Air Quality v1.2, Environmental Protection and Institute of Air Quality Management, London

6.1.14. Scoping questions

- Do you agree with the proposed list of consultees?

- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of the EIA?
- Do you agree with the proposed factor-specific assessment approach?

6.2. Biodiversity

6.2.1 Consultation

No consultation to inform the biodiversity assessment has been undertaken to date.

Consultation will be undertaken with North Kesteven District Council to seek to agree the assessment methodology and biodiversity assets of sufficient importance to be considered in the EIA.

We will also consult with Natural England and Lincolnshire Wildlife Trust.

6.2.2 Study area

The survey / assessment study area includes the Site and appropriate buffer zones, which varies per receptor as discussed below:

- Background data searches for statutory and non-statutory designated sites and protected species records will focus on the Site and a 2 km buffer, extended to 10 km for Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. Therefore, the Site and 2 km surrounding is considered to be the Zone of Influence.
- The survey study area for preliminary ecological appraisal (PEA) is the entire Site.
- The survey study area for great crested newts (GCN) is the entire Site plus any ponds within 500m of the Site boundary.
- The survey study area for bat activity surveys is the entire Site.
- The survey study area for breeding bird surveys is the entire Site, due to the need to assess the overall significance of the breeding bird assemblage present and inform potential enhancement measures.
- The survey study area for preliminary bat roost assessments is all trees and structures (barns) within the Site.
- If the design of the Proposed Development determines that any small sections of watercourse will be impacted, e.g. culverted to allow for cable installation, then water vole and otter surveys will be carried out in, and adjacent to, the works area, for up to 100 m upstream and downstream,

where accessible. Adjacent waterbodies would be included to account for any effects that may extend beyond the Site boundary. A distance of 100 m upstream and downstream has been proposed as although no works are planned that would directly impact any watercourses, this distance would account for any local water vole populations that could commute further along the watercourse, into the Site boundary (Dean et al., 2016).

- The survey study area for considering reptile suitability will be the entire Site.
- The survey study area for hedgerows and invasive species will comprise all the proposed works areas within the Site, including those where ancillary works will occur, as only direct impacts to these habitats/species need to be considered.
- The survey study area for badgers will comprise the entire Site.

6.2.3. Data sources to inform the EIA baseline characterisation

The proposed assessment scope has been based on:

- A background data search from Greater Lincolnshire Nature Partnership, which included a search for designated sites and protected species records within 2 km of the Site, extended to 10 km for SPAs, SACs and Ramsar sites.
- Previous ecology reports prepared for a solar planning application in 2014, which covers part of the north-west of the Site (Springwell East) 14/0937/FUL (ESL, 2014).

The assessment to be presented in the PEIR and ES will also be informed by surveys undertaken in 2023 (see **Section 6.2.4** below for more details).

6.2.4. Surveys to inform the EIA baseline characterisation

The following surveys of the Site have been undertaken in 2022, noting that these currently exclude two fields at northern edge of Springwell West (just south of Gorse Hill Lane) and approximately five fields at southern edges of Springwell West. These have not been surveyed to date as they have recently been added into the Site boundary but will be included / considered in future surveys (see below).

- A PEA walkover survey of the Site, carried out in April and May 2022.
- A badger survey of the Site, undertaken during the PEA survey in April and May 2022.
- A reptile habitat suitability survey of the Site, undertaken during the PEA survey in April 2022.
- Preliminary bat roost assessments of trees and structures (barns) within the Site, undertaken during the PEA survey in April and May 2022.
- Habitat Suitability Index (HSI) and GCN eDNA survey of ponds on Site, undertaken in May 2022.
- Bat activity surveys (static monitoring), undertaken in August 2022 and October 2022. This involved deployment of static bat detectors in various habitat types across the Site and Site boundaries.

The following surveys are due to be undertaken in 2023:

- For the land recently added into the Site boundary, a PEA survey, including badger survey, reptile habitat suitability, preliminary bat roost assessment and GCN eDNA survey of ponds.
- Breeding bird surveys of entire Site (spring and summer).
- Water vole and otter surveys (if required).
- Hedgerow, priority grassland and invasive species survey.
- Further bat activity surveys (static monitoring) in April / May 2023.
- Bat roost surveys (if required) – hibernation surveys, internal building inspections (if access facilitated), endoscope inspections, tree climbing and emergence surveys. These will only occur if any trees and structures could potentially be directly or indirectly impacted by the construction of the Proposed Development, although it is currently envisaged this will not occur.

It is envisaged that any badger setts present within the Site will be retained within the design of the Proposed Development. Should this not be possible, additional badger surveys may be required.

6.2.5. Baseline conditions

The existing ecological baseline is based on both desk and field-based studies undertaken to date (**see Sections 6.2.3** and **6.2.4** above).

The Site predominantly consists of agricultural fields (mostly arable with some grassland) interspersed with hedgerows, small woodland blocks and farm access tracks. The hedgerows within the Site range between dense tall vegetation (shrub and tree species) and thin lines of vegetation with sporadic shrubs and trees present.

Several minor watercourses run adjacent to the Site, including the Springwell Brook and Scopwick Beck, alongside small field drains and ditches that run parallel to numerous field boundaries.

A more detailed description of the Site is provided in the project description within **Chapter 2.**

The following habitat types were recorded as present on and adjacent to the Site during the PEA survey undertaken in April and May 2022:

- Other neutral grassland (g3c)
- Modified grassland (g4)
- Lowland mixed deciduous woodland (Lincolnshire BAP habitat)
- Other woodland; mixed; mainly broadleaved (w1h5)
- Line of trees (w1g6)
- Other woodland; mixed; mainly conifer (w1h6)
- Hedgerow (h2a) (Lincolnshire BAP habitat)
- Other blackthorn scrub (h3a6)
- Hawthorn scrub (h3f)

- Mixed scrub (m3h)
- Arable field margins (c1a) (Lincolnshire BAP habitat)
- Cereal crops (c1c)
- Non-cereal crops (c1d)
- Winter stubble (c1c5)
- Developed land; sealed surface (u1b)
- Buildings (u1b5)
- Artificial unvegetated, unsealed surface (u1c)
- Built linear features (u1e)
- Standing open water (r1) – ponds (Lincolnshire BAP habitat)
- Other rivers and streams (r2b) (Lincolnshire BAP habitat)

Designated sites

There are no internationally protected nature conservation sites within 10 km of the Site boundary. There are no nationally protected statutory designated nature conservation sites within 2 km.

There are 22 non-statutory designated sites (Local Wildlife Sites (LWS)) either within the Site or within 2 km. Those within or adjacent to the Site are:

- Blankney Brick Pit LWS (within Site boundary)
- Temple Road Verges, Welbourn to Brauncewell 2 LWS (within Site boundary)
- A15, Slate House Farm to Dunsby Pit Plantation 1 LWS (within Site boundary)
- A15, Green Man Road to Cuckoo Lane 2 LWS (within Site boundary)
- Bloxholm Wood LWS/Lincolnshire Wildlife Trust reserve (adjacent to Site boundary).

Other notable sites

There is one area of ancient woodland within 2 km of the Site boundary, namely Long Wood which is approximately 475 m to the west of the Site.

Protected and noteworthy species records

The background data search returned 927 records of 143 species recorded between 2000 and 2021 within 2 km of the Site. Noteworthy species include species of principal importance that are listed under Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006.

Of these, 38 species are birds, one is fish, five are invertebrates (lepidoptera only), 10 are mammals (of these, six are bats), one is plants, and one is reptiles.

Protected and notable species

Invertebrates

The background data search returned records of four notable invertebrate species, including the Section 41 species small heath (*Coenonympha pamphilus*), cinnabar (*Tyria jacobaeae*), grayling (*Hipparchia semele*), and small blue (*Cupido minimus*).

Habitats present within the Site were considered likely to support only a common assemblage of invertebrate species, typical of hedgerows, scrub, plantation woodlands, and species-poor grasslands. It is therefore not considered that further invertebrate surveys will be required.

Fish

The background data search returned one record of European eel (*Anguilla anguilla*).

The ponds and watercourses within the Site are small and of relatively poor quality, though they connect with watercourses that are tributaries of the River Witham.

Great crested newts

The background data search revealed no records of great crested newts within 2 km of the Site.

The Site is mostly arable with occasional parcels of improved or species-poor semi-improved grassland, which is generally poor suitability terrestrial habitat for GCN.

For the ponds within the Site surveyed in May 2022, it was determined that GCN are likely absent. Out of the 12No. ponds which were eDNA analysed, 10No. were negative and 2No. were indeterminate. The 2No. ponds with indeterminate results were immediately adjacent to negative testing ponds, which GCN could easily disperse to, so the indeterminate results were also considered likely negative.

Reptiles

The background data search returned five records of reptiles within 2 km of the Site, recorded between 2015 and 2020. All records were of common lizard (*Zootoca vivipara*) and were located within RAF Digby – no other reptile species were recorded within 2 km.

Most of the Site is unsuitable for reptiles, comprising large areas of monoculture arable land. However, connecting areas of woodland, scrub, hedgerow bases, rough grassland and spoil heaps/log piles could support low numbers of common reptiles. In particular, there were two areas of tussocky grassland that are likely to be suitable for reptiles. It is considered likely that these areas could be avoided in the design, thus removing the need for further reptile surveys.

Birds

The background data search returned records of 38 bird species within 2 km of the Site, of which 86% were recorded in RAF Digby.

Eight species are listed on Annex 1 of the Birds Directive: red kite (*Milvus milvus*), marsh harrier (*Circus aeruginosus*), hen harrier (*Circus cyaneus*), Montagu's harrier (*Circus pygargus*), kingfisher (*Alcedo atthis*), merlin (*Falco columbarius*), peregrine (*Falco peregrinus*), and woodlark (*Lullula arborea*).

Fifteen species are included in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (some species are included on more than one list): quail (*Coturnix coturnix*), red kite, hen harrier, Montagu's harrier, marsh harrier, barn owl (*Tyto alba*), kingfisher, hoopoe (*Upupa epops*), merlin, hobby (*Falco subbuteo*), peregrine, firecrest (*Regulus ignicapilla*), woodlark, fieldfare (*Turdus pilaris*), and redwing (*Turdus iliacus*).

Nineteen are listed in Section 41 of the NERC Act 2006: grey partridge (*Perdix perdix*), hen harrier, Montagu's harrier, lapwing (*Vanellus vanellus*), curlew (*Numenius arquata*), turtle dove (*Streptopelia tutur*), cuckoo (*Cuculus canorus*), woodlark, grasshopper warbler (*Locustella naevia*), starling (*Sturnus vulgaris*), song thrush (*Turdus philomelos*), spotted flycatcher (*Muscicapa striata*), house sparrow (*Passer domesticus*), tree sparrow (*Passer montanus*), yellow wagtail (*Motacilla flava*), bullfinch (*Pyrrhula pyrrhula*), yellow hammer (*Emberiza citronella*), reed bunting (*Emberiza schoeniclus*), and corn bunting (*Emberiza calandra*).

Twenty-one species are included on the red list of birds of conservation concern: grey partridge, hen harrier, Montagu's harrier, lapwing, curlew, turtle dove, cuckoo, swift (*Apus apus*), merlin, skylark (*Alauda arvensis*), grasshopper warbler, starling, fieldfare, spotted flycatcher, house sparrow, tree sparrow, yellow wagtail, linnet (*Linaria cannabina*), lesser redpoll (*Acanthis cabaret*), yellow hammer, and corn bunting.

Nine are included on the amber list of birds of conservation concern: graylag goose (*Anser anser*), quail, marsh harrier, redshank (*Tringa totanus*), snipe (*Gallinago gallinago*), kingfisher, song thrush, redwing, bullfinch, and reed bunting.

The Site contains suitable habitat for ground-nesting birds. Lapwings with chicks and displaying lapwings were observed in several of the ploughed fields within the Site, and an oystercatcher (*Haematopus ostralegus*) was seen in a ploughed field close to the railway. A field adjacent to the Site held 27 lapwings and chicks. Singing skylarks were also observed in the majority of the modified grassland and cereal crop fields. Of the species identified through the background data search, the arable and grassland fields within the Site may support species including quail, grey partridge curlew, turtle dove, yellow wagtail, yellowhammer, and snipe.

Red kite was observed commuting over the Site, though no nests or nesting behavior was observed in any of the woodlands or trees within the Site.

A barn owl was flushed from a tree in the woodland adjacent to the railway line. The barn close to the railway line had a barn owl box inside it with suitable access points. Though the barn was not entered during the survey, pellets could be seen on the floor.

Marsh harrier was seen hunting at the western edge of Springwell Central (near Digby).

A corn bunting was heard singing in a field to the south of Cuckoo Lane. Corn bunting is a Section 41 species and Lincolnshire BAP species, as is lapwing which was confirmed to be breeding in several ploughed fields. Other likely breeding Section 41 and Lincolnshire BAP species observed included starling, song thrush, dunnock (*Prunella modularis*), house sparrow, yellow hammer and reed bunting.

Greenfinch (*Chloris chloris*) and linnet were observed within the Site. They appear on the red list of birds of conservation concern.

Mallard (*Anas platyrhynchos*), sparrowhawk (*Accipiter nisus*), moorhen (*Gallinula chloropus*), oystercatcher, stock dove (*Columba oenas*), woodpigeon (*Columba palumbus*), kestrel (*Falco tinnunculus*), whitethroat (*Sylvia communis*), wren (*Troglodytes troglodytes*), and pied wagtail (*Motacilla alba ssp. yarellii*) were

observed during the PEA survey. These species appear on the amber list of birds of conservation concern.

The woodlands, hedgerows, and fields provide suitable nesting habitat for a range of bird species.

Bats

The background data search returned records of the following bat species within 2 km of the Site:

- 14 records of unidentified bats;
- Six records of brown long-eared bat (Plecotus auratus) including a record of a roost approximately 1.2 km from the Site;
- Two records of common pipistrelle (Pipistrellus pipistrellus);
- Two records of soprano pipistrelle (Pipistrellus pygmaeus);
- Four records of unidentified pipistrelles; and
- Two records of Barbastelle (Barbastella barbastellus) including a record of a roost approximately 1.9 km from the Site.

Fifty-six individuals and groups of trees were identified with moderate (29 trees) to high (27 trees) suitability for supporting roosting bats.

The woodlands and hedgerows throughout the Site provided moderate suitability habitat for foraging and commuting bats.

The barn in the northeast of the Site, to the south-west of Brickyard Farm, could not be surveyed internally. The barn in the north of the Site was constructed of corrugated metal and breezeblocks, with open sides. It was considered suitable to be used as a night roost, though is unlikely to be used by large numbers of roosting bats. The barn in the centre of the Site was also open-sided and unlikely to be used by roosting bats, though may be used as a night roost.

Hazel dormice

Hedgerows within the Site were considered to provide some suitability for hazel dormice, although many were species-poor, and woodland was generally sparse so foraging opportunities were limited. However, there are no known records of hazel dormice within 2 km of the Site. Hazel dormice are mostly absent in Lincolnshire (only known record is near Wragby which is over 20 km from the Site). Therefore, hazel dormice are considered to be absent and will not be considered further in the assessment.

Water voles and otters

The background data search returned no records of water vole or otter within 2 km of the Site.

Several of the streams and ditches within the Site provide suitable habitat for water voles. The watercourses and waterbodies are likely to be too small for otter, though they may be used by foraging and individuals commuting as part of a much larger territory or home range.

Badgers

The background data search returned no records of badger within 2 km of the Site.

A five-hole badger sett, likely to be a main sett, was identified within Springwell West but there were no signs to indicate badgers present at the time of the survey. An annex sett with two holes was found approximately 740 m to the north of the main sett. An outlier sett with a single hole was also found in the hedgerow of a field within Springwell West.

No other signs of active badger presence (i.e. latrines, prints, hairs etc.) were found within the Site.

Other species

The background data search returned 42 records of brown hare (*Lepus europaeus*), a priority species, within 2 km of the Site, recorded between 2006 and 2019.

Brown hare were seen in the majority of the fields within the Site, with a peak count of 14 individuals recorded in a field to the south of Cuckoo Lane.

The background data search returned 14 records of hedgehog (*Erinaceus europaeus*), a priority species, within 2 km of the Site, recorded between 2006 and 2019.

The PEA did not record the presence of hedgehog, however, habitats within the Site, including log piles, scrub, woodland, and grassland, were considered to be suitable for hedgehog.

One or two individuals of roe deer *(Capreolus capreolus)* and fallow deer (*Dama dama)* were seen grazing within the Site during the PEA surveys.

6.2.6. Additional (secondary and tertiary) mitigation

Construction

- Production and implementation of an Outline Landscape and Ecological Management Plan (oLEMP)
- Production and implementation of an Outline Construction Environmental Management Plan (oCEMP) to include measures to safeguard ecological receptors during construction.
- Pre-construction badger survey
- Bat licence (if required)

Operation

- Continued adherence to, and implementation of, the oLEMP and Operational Environmental Management Plan.

Decommissioning

- The impacts from decommissioning (removal of solar panels) will be similar to construction impacts. The Outline Decommissioning Environmental Management Plan (oDEMP) will reference decommissioning impacts and include measures to safeguard ecological receptors during decommissioning
- Pre-decommission badger survey

6.2.7. Description of likely significant effects

Habitat loss/degradation

Although construction of the Project Substation, National Grid substation, BESS and associated compounds would result in loss of habitat during the construction and operational phase and the installation of solar panels could cause habitat degradation of species-rich grassland during the operational phase, i.e. by creating dominance of shade tolerant species, mitigation is proposed so that significant effects would not occur (refer to Section 6.2.9 below). However, potential impacts on the land yet to be surveyed (refer to Section 6.2.4 above) are currently unknown.

Ground nesting birds

Much of the Site, being large open arable and grassland fields, is suitable for ground nesting birds. Open fields, with good long-range visibility, are important for ground nesting birds as they do not provide cover for predators. The construction and operation of the Proposed Development would cause loss of the 'openness' of fields which would directly impact upon ground nesting birds. There could be significant long term impact (40 years) if significant numbers of ground nesting birds are found to use the Site.

Great crested newts

Although construction of the Project Substation, National Grid substation, BESS and associated compounds would result in loss of habitat during the construction and operational phase, most of the Site, being arable, provides unsuitable terrestrial habitat for GCN. Ponds, hedgerows, field margins and woodlands, which are highly suitable newt habitat, are not expected to be affected by the Proposed Development. Therefore, the installation of solar panels is not considered likely to cause significant loss of suitable GCN terrestrial habitat (and could in fact provide opportunities to enhance habitat for amphibians e.g. by sowing more species-rich grassland or crop diversity underneath solar panels).

GCN are considered likely to be absent over the majority of the Site as most of the ponds on Site have been surveyed (in 2022) and evidence of GCN was not found. However, the additional fields on the southern edges of Springwell West have mapped ponds which have not yet been surveyed.

6.2.8. Receptors / matters to be scoped into the assessment

Receptor / Matter	Phase	Justification
Grassland	Construction, operation and decommissioning	The fields which have not yet been surveyed (to the north and south of Springwell West) support grassland which has not yet been assessed. These areas of grassland need to be surveyed in summer 2023 to assess their conservation importance.
Ground nesting birds	Construction	Much of the Site, being large open fields, is suitable for ground nesting birds. Construction would cause loss

		of breeding habitat and directly impact upon these species. Surveys in 2023 will determine the importance of the breeding bird assemblage present and inform the design of the Proposed Development and any mitigation to provide continued availability for open space for ground nesting birds and food supply during breeding and wintering periods.
Great crested newts (GCN)	Construction, operation and decommissioning	GCN are considered likely absent for the area surveyed to date. The additional field on the southern edges of Springwell West supports mapped ponds and grassland, which could provide suitable GCN terrestrial habitat, which has not been assessed. If GCN are confirmed present, then construction activity would directly impact upon GCN terrestrial habitat, with potential for significant effects to occur.

6.2.9. Receptors / matters to be scoped out of the assessment

Receptor / Matter	Phase	Justification
Statutory designated sites	Construction, operation and decommissioning	There are no internationally protected nature conservation sites within 10 km of the Site. There are no nationally protected statutory designated nature conservation sites within 2 km of the Site.
Blankney Brick Pit LWS	Construction, operation and decommissioning	These sites are avoided by the current Proposed Development design. As stated in Table 4-1, the design will incorporate a minimum offset distance of 15m from Local Wildlife Sites. They will also be protected by the oCEMP.
Temple Road Verges, Welbourn to Brauncewell 2 LWS		
A15, Slate House Farm to Dunsby Pit Plantation 1 LWS		
A15, Green Man Road to Cuckoo Lane 2 LWS		

Bloxholm Wood LWS / Lincolnshire Wildlife Trust reserve		
Other 17 LWS within 2 km of Site.	Construction, operation and decommissioning	Their distance from the Site and a lack of relevant links or impact pathways.
Lowland Meadow Priority Habitat	Construction, operation and decommissioning	Two grassland parcels were assessed as potential priority habitat Lowland meadow (adjacent to Scopwick). However, these grasslands are avoided by the current Proposed Development design and will be protected by the oCEMP.
Hedgerows and hedgerow trees	Construction, operation and decommissioning	The Proposed Development will be designed to include a buffer from panels to boundary features including hedgerows and trees and measures in the oCEMP will safeguard their protection. Mitigation for any habitat loss will be included in the oLEMP.
Ponds	Construction, operation and decommissioning	No ponds will be lost to the Proposed Development. The implementation of the oCEMP will include standard practice pollution prevention measures.
Semi-improved grassland	Construction, operation and decommissioning	The oLEMP will include measures to sufficiently compensate for habitat loss and to protect any retained areas of this habitat during construction.
Invasive species	Construction, operation and decommissioning	No invasive species were identified during PEA survey. If any are found during further survey, then an invasive species method statement will be implemented to prevent the spread of this species during construction.

Invertebrates	Construction, operation and decommissioning	Due to a lack of records of Schedule 5 species and a lack of high-quality habitat within the Site that could support an important invertebrate assemblage.
Reptiles	Construction, operation and decommissioning	The Site, being mostly arable and improved pasture, is largely unsuitable for reptiles. Precautionary measures detailed in a oCEMP will safeguard low numbers of reptiles that may be present in semi-improved grassland areas.
Non-ground nesting birds	Construction, operation and decommission	Retention of boundary hedgerows and trees and implementation of precautionary measures detailed in a oCEMP will sufficiently safeguard nests during construction. No effects anticipated during operation.
Wintering birds	Construction, operation and decommission	The Site is not considered of importance for overwintering waders and wildfowl due to distance from coast and any significant wetland areas (i.e. it is more than 35 km from the Wash SPA).
Barn owl	Construction, operation and decommission	If nesting barn owl are present in trees or barns adjacent to works, they may be disturbed by construction and decommissioning. However, this will be mitigated by buffer zones between the solar panels and boundary features. There is not expected to be loss of foraging habitat as boundary features will be enhanced and other habitat creation and enhancement works secured through the oLEMP is likely to benefit foraging barn owls. There are not expected to be any significant effects during operation.
Marsh harrier	Construction, operation and decommission	If marsh harrier are nesting in wetland vegetation, or field margins, they may be disturbed by construction and decommissioning. However, this will

		be mitigated by buffer zones and measures detailed within the oCEMP and oLEMP. There is not expected to be a loss of foraging habitat as marsh harriers mostly hunt along field margins. Boundary features will be enhanced and other habitat creation and enhancement works secured through the oLEMP is likely to benefit foraging marsh harrier. There are not expected to be any significant effects during operation.
Bats (foraging/commuting and roosting)	Construction, operation and decommission	If bats are roosting in trees or barns adjacent to works, then they may be disturbed by construction and decommissioning. However, this will be mitigated by retention of such features, buffer zones (works buffer from hedgerows and trees) and measures detailed within the oCEMP and oLEMP. There is not expected to be significant loss of foraging habitat due to construction of solar panels as bats mostly forage and commute along hedgerows and watercourses rather than over monoculture arable and improved grassland. There is potential to enhance foraging habitat by sowing species-rich grassland or diversity of herbs under and between solar panels which would enhance invertebrate populations (a recognised food source of bats). There are not expected to be any significant effects during operation.
Water vole	Construction, operation and decommission	No ponds or watercourses will be lost to the Proposed Development. If small sections of watercourses are affected (e.g. culverted to allow for installation of cables), then standard mitigation measures will be implemented. The implementation of the oCEMP will include standard

		practice pollution prevention measures.
Otter	Construction, operation and decommission	No ponds or watercourses will be lost to the Proposed Development. If small sections of watercourses are affected (e.g. culverted to allow for installation of cables), then standard mitigation measures will be implemented. The implementation of the oCEMP will include standard practice pollution prevention measures.
European eel	Construction, operation and decommission	No ponds or watercourses will be lost to the Proposed Development. If small sections of watercourses are affected (e.g. culverted to allow for installation of cables), then standard mitigation measures will be implemented. The implementation of the oCEMP will include standard practice pollution prevention measures.
Badger	Construction, operation and decommission	All known setts will be retained with an appropriate buffer. Implementation of precautionary measures detailed in a oCEMP will mitigate for any residual risk.
Deer and other mammals	Construction, operation and decommission	Deer and other mammals such as foxes are not priority species nor LBAP species of conservation concern. However they are likely to use the site and fencing preventing foraging and dispersal may be a welfare issue. This has been scoped out as fencing will be designed to be 'semi-permeable' allowing movement across the site for deer and other mammals through connecting pathways.

6.2.10. Opportunities for enhancing the environment

Opportunities for ecological enhancement within the Site are diverse due to the number of different habitats present and their generally low biodiversity value, being intensively farmed. No specific enhancement measures have yet been agreed; however, a detailed biodiversity design will be produced and implemented outlining how a substantial net gain in biodiversity will be achieved. The biodiversity design will be cognisant of local biodiversity priorities already identified and priorities emerging from the developing Lincolnshire Nature Recovery Partnership.

These measures will focus on compensating for adverse effects on habitats and species already known to be on the Site, and to improve the Site for species that could feasibly colonise in the future given the surrounding landscape. Therefore, enhancement measures re likely to include some of the following:

- Creation and enhancement of calcareous grassland – new calcareous grassland will buffer and extend the area of species-rich grassland (the LWSs) whilst providing nesting and foraging habitat for ground nesting birds and other species.
- Creation of wetland areas in low lying areas of the Site, providing increased habitat for biodiversity, run-off capture and improved water quality, flood alleviation in wider catchment and which will provide additional foraging and nesting habitat for bird species.
- Extend and restore dry stone walls.
- Creation of herbal ‘ley’ habitat or similar underneath solar panels to restore soil health and create a nectar source for invertebrates - in particular pollinators.
- Woodland planting (primarily for screening) and creation of ‘small stepping stone’ woodland habitats within the Scopwick Valley to connect woodlands to the north and south. To increase woodland habitat and enhance wildlife corridors.
- Enhancement of field boundaries and footpaths to provide greater habitat connectivity and increased habitat for invertebrates.
- Winter food for farmland birds – leaving over winter stubbles and or provision of specific seed source within buffer strip margins between panels and boundary features.
- Ensuring any fencing is permeable to mammal species such as badger, brown hare and hedgehog. Allowing the movement of deer across the wider landscape will also be considered.

6.2.11. Proposed assessment methodology

The ecological impact assessment (EcIA) will follow the Chartered Institute of Ecology and Environmental Management’s (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland, referred to here as ‘the CIEEM Guidelines’ (CIEEM, 2018).

The significance criteria proposed for the biodiversity assessment is presented in **Appendix D.**

6.2.12. Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- The fields at northern and southern edges of Springwell West have not been surveyed. As outlined in **Section 6.2.4** above, these areas will be subject to survey in 2023.
- Some species-specific surveys have not yet been competed or undertaken. As stated in **Section 6.2.4** above, these will be completed/undertaken in 2023.
- The bat sound analysis undertaken to date has been used to inform this EIA Scoping Report. Recordings of Barbastelle bat have been identified in the August 2022 survey analysis and is one of species afforded the highest conservation status in the UK. Six other species have been identified and these are most of the species expected in the area. If any additional species are identified in the outstanding analysis, they would not change the assessment scope or mitigation requirements. Sound analysis will be completed prior to further stages of the assessment. For these reasons, this uncertainty will not affect the ability to undertake the assessment, nor its conclusions**.**

6.2.13. References

- CIEEM (2018), *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (Winchester: CIEEM).
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- The British Standards Institution (2013), 'BS 42020:2013 Biodiversity – Code of practice for planning and development', BSI Standards Limited.

6.2.14. Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of the EIA?
- Do you agree with the proposed factor-specific assessment approach?

6.3. Climate

6.3.1 Consultation

No consultation to inform the climate assessment has been undertaken to date and no specific consultation in relation to climate is envisaged, over and above the consideration of comments received to this EIA Scoping Report.

6.3.2 Study area

The study area is defined as the area within the Site boundary for climate change mitigation (i.e., assessment of greenhouse gas (GHG) emissions from the Proposed Development). Within the GHG assessment, scope 1 emissions will include those emitted directly from all facilities and infrastructure under the operational control of the Proposed Development, and likely within the Site boundary. However, scope 2 and any relevant scope 3 emissions will occur outside the proposed Site boundary. These emissions will be estimated based upon project-specific data that may relate to activities outside the Site boundary (e.g., water provision and wastewater treatment outside of the Site boundary, or the embodied carbon within construction materials and solar PV modules as a result of the energy used for production).

6.3.3. Data sources to inform the EIA baseline characterisation

Standard emission factors will be applied, sourced from reputable agencies, such as Defra UK Government GHG Conversion Factors for Company Reporting (2022). The assessment will consider the North Kesteven District Council's most recent GHG inventory from 'UK local authority and regional greenhouse gas emissions national statistics: 2005-2020', and relevant GHG emissions policies from the North Kesteven District Council Climate Emergency Strategy and Action Plan.
Data pertaining to the expected construction and operational activities will be sourced from the Applicant. This includes construction energy consumption, expected maintenance requirements, product specification (e.g., solar PV modules and BESS), and details on construction workforce.

6.3.4. Surveys to inform the EIA baseline characterisation

No surveys have been undertaken to date, and none are expected to be undertaken to inform the climate assessment.

6.3.5. Baseline conditions

The baseline conditions describe the conditions of a business-as-usual scenario whereby the Proposed Development is not undertaken. In the case of GHG emissions, the sensitive receptor is the stability of the global climate.
The current land use within the Site consists of agricultural land, predominantly fields interspersed with hedgerows, small woodland blocks and farm access tracks. There is no known existing infrastructure. It is possible that, given the considerable vegetation within the Site, the Site currently sequesters carbon. However, dependant on agricultural activities (e.g. application of fertilizers), there may also be GHG emissions associated with the Site.

6.3.6. Additional (secondary and tertiary) mitigation

Construction

The generation of GHG emissions is inevitable due to construction activities. Embodied GHG emissions will also be present due to production of solar panels and associated infrastructure. An Outline Construction Environmental Management Plan (oCEMP) will be implemented to identify good working practices in line with appropriate standards, including low carbon practices. Some mitigation measures that are anticipated to be taken account are:

- Embed carbon reduction practices as a core principle for the design team. Where reduction ideas are suggested, they should be recorded and the potential impact quantified. Earlier engagement with carbon reduction allows for the greatest returns.
- Where technical specifications allow, maximise the recycled content of construction materials such as concrete and steel.
- Maximise the specification of materials with an environmental product declaration with the aim of reducing embodied carbon emissions.
- Incentivise use of local suppliers with a view to shorten project supply chains and environmental footprint.
- Onsite mobile and non-mobile plant should conform to the latest emissions standards, with mobile vehicles conforming to EURO 6 standards as a minimum. All plant should investigate the option of using HVO fuels or electric versions where possible.
- Require main contractors to report on energy data, water usage and waste disposal and their GHG emissions as part of the oCEMP.

Operation

The operation of the Proposed Development is anticipated to have a positive effect on the climate. Nonetheless, there is scope to further improve the Site in terms of ecological enhancements and habitat creation, which can have a positive effect in terms of carbon sequestration. These will be documented by, managed and secured within the Outline Landscape and Ecology Management Plan (oLEMP).

Decommissioning

The decommissioning process is likely to result in GHG emissions, particularly from waste disposal of solar PV modules and any BESS. Additional mitigation can be employed that aligns with the hierarchy for managing project-related emissions (avoid, reduce, substitute and compensate).

6.3.7. Description of likely significant effects

Construction

With regards to GHG emissions, the global climate is the sensitive receptor. During construction, there will be unavoidable GHG emissions that result in a negative effect on the stability of the global climate. These are unlikely to be significant but

must be scoped in to understand the full life-cycle GHG effects of the Proposed Development.

Operation

During operation, renewable energy will be generated, replacing fossil-based energy in the National Grid. This has the net effect of reducing GHG emissions generated elsewhere in the national energy supply chain. Given the proposed operational life of 40 years, the cumulative effect of these GHG reductions will likely provide significantly beneficial effects on the stability of the climate.

Decommissioning

Decommissioning activities will result in unavoidable GHG emissions, predominantly from transport and waste disposal activities. As with construction-related emissions, these are unlikely to be significant but must be scoped in to understand the full life-cycle GHG effects of the Proposed Development.

6.3.8. Receptors / matters to be scoped into the assessment

Receptor / Matter	Phase	Justification
GHG emissions	Construction	Embodied carbon of solar PV modules can be relatively high when comparing against other renewable technologies. It is important to include these construction-related emissions when considering the overall lifecycle emissions of the Proposed Development, to determine an accurate 'carbon-payback' time of the Proposed Development.
GHG emissions	Operation	Given the proposed operational life of 40 years, the cumulative effect of GHG reductions associated with the operation of the Proposed Development will likely provide significantly beneficial effects.
GHG emissions	Decommissioning	The decommissioning process is likely to result in GHG emissions, particularly from waste disposal of solar PV modules and BESS. It is important to include all emissions when considering the overall lifecycle emissions of the Proposed Development, to determine an accurate 'carbon-payback' time of the Proposed Development.

6.3.9. Receptor / matters to be scoped out of the assessment

Receptor / Matter	Phase	Justification
Climate resilience	Construction, operation and decommissioning	UKCP18 projections suggest that climate change will lead to hotter drier summers, warmer wetter winters, increased likelihood of extreme weather events (e.g., heat waves, high rainfall events) and sea-level rise of up to 1.15 m (by 2070 in London, assuming a high-emissions scenario). Due to the embedded resilience of solar PV modules to high heat and wind speeds, low risk of flooding at the Site and the distance of the Site from coastline, these factors are not expected to significantly impact on the construction, operation or decommissioning of the Proposed Development.

6.3.10. Opportunities for enhancing the environment

The operational Proposed Development is expected to have a net beneficial impact on the climate, in that it will reduce GHG emissions associated with electricity consumption on a national scale. Opportunities exist to further increase the environmental benefit of the Proposed Development by ensuring that emissions associated with the construction and decommissioning process are kept to a minimum. This can be ensured by the adoption of various mitigation measures, as detailed in **Section 6.3.6.**

6.3.11. Proposed assessment methodology

The assessment of the effects of GHG emissions arising from the Proposed Development will be carried out in accordance with:

- The Institute of Environmental Management and Assessment Environmental Impact Assessment (IEMA) Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022 edition);
- PAS 2080:2016 Carbon Management in Infrastructure; and
- Royal Institute of Chartered Surveys (RICS) Whole life carbon assessment for the built environment (2017).

The assessment will quantify applicable Kyoto Protocol GHGs as measured in tonnes of carbon dioxide equivalence (tCO2e), where equivalence means having the same warming effect as CO2 over 100 years.

The GHG baseline characterisation will be conducted using a desk-based assessment of current land use, existing carbon stock and any activities that could cause GHG emissions. However, in line with the IEMA guide, any agricultural land

can generally be considered to have zero baseline emissions to ensure reasonable worst-case approach to establishing net GHG effect.

Data associated with the activities contributing to the construction, operation and decommissioning of the Proposed Development will be provided by the Applicant. Where it is not possible to collect these data, as this assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks and proxy data such as distance travelled) will be used. Emissions will then be quantified by applying the most relevant and up-to date emission factors.

The significance criteria proposed for the climate assessment is presented in **Appendix D.**

6.3.12. Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- The accuracy of a GHG assessment depends on the quality of the data provided. Primary data should always be used where available. Where it is not possible to collect these data, as this assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks and proxy data such as distance travelled) will be used. Assessments such as this, based largely on secondary data should only be viewed as an estimate of GHG emissions impact, and actual emissions may vary significantly.

An emission factor is a representative value that relates the quantity of a pollutant released into the atmosphere with an activity associated with the release of that pollutant. Emission factors are typically available from government publications, independent agencies, and scientific research journals; however, the quality and accuracy of such factors can vary significantly. Factors can differ depending on the research body and/or underlying methodologies applied. Emission factors will therefore only be sourced from reputable sources, such as Defra / BEIS (2022).

6.3.13. References

- BEIS (2022), UK local authority and regional greenhouse gas emissions national statistics: 2005-2020
- Defra and BEIS (2022), UK Government GHG Conversion Factors for Company Reporting
- IEMA (2022), Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance
- North Kesteven District Council (2020), Climate Emergency Strategy and Action Plan: Roadmap to net zero emissions for North Kesteven District Council and the district of North Kesteven https://www.n-kesteven.gov.uk/_resources/assets/attachment/full/0/106230.pdf
- PAS 2080:2016 (2016), Carbon Management in Infrastructure

- Royal Institute of Chartered Surveys (2017), Whole life carbon assessment for the built environment
- The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard (Revised Edition) https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf Accessed November 2022

6.3.14. Scoping questions

- Do you agree with the components proposed to be scoped in (GHG emissions of construction and operation) of the EIA?

6.4. Cultural heritage

6.4.1 Consultation

The Lincolnshire Historic Environment Record (HER) has been consulted in the preparation of this EIA Scoping Report for data on known heritage assets.

Lincolnshire County Council has also approved a Written Scheme of Investigation (WSI) for geophysical survey of the Site.

Further consultation with Lincolnshire County Council will be carried out to confirm the scope of and timing of any intrusive evaluation following completion of the geophysical survey. Historic England will also be consulted regarding potential impacts on designated heritage assets as a result of changes in their setting, and the LPA's Conservation Officer will be consulted regarding potential impacts on Conservation Areas and Grade II Listed Buildings as these lie outside of the remit of Historic England.

6.4.2 Study area

Following the guidance[2] from Lincolnshire County Council, a 2 km study area from the Site boundary will be used for non-designated historic assets and a study area of up to 5 km from the Site boundary, informed by the Zone of Theoretical Visibility (ZTV), will be used for designated historic assets.

6.4.3. Data sources to inform the EIA baseline characterisation

The following sources of information have been used to inform this EIA Scoping Report:

- Guidance produced by Lincolnshire County Council for nationally significant infrastructure projects[3];

[2] LCC "Guidance for large schemes including NSIPs and EIAs, General Scoping Opinion for the Historic Environment" supplied by Jan Allen via email 07/10/2022
[3] ibid

- Information on designated heritage assets from the National Heritage List for England, downloaded on 01 October 2022;
- Data on heritage assets and previous archaeological investigations from the Lincolnshire HER, obtained as a digital data extract on 23 August 2022;
- Historical Ordnance Survey mapping; and
- Lidar data.

The following additional sources will be used to inform the EIA (post-scoping):

- Aerial photographs held by Historic England Archives, Lincolnshire HER, and Cambridge University Collection of Aerial Photography (CUCAP)
- Maps and other relevant primary and secondary sources held in Lincolnshire archives
- Portable Antiquities Scheme (PAS) data.

6.4.4. Surveys to inform the EIA baseline characterisation

The following additional surveys are proposed to inform the EIA:

- Full desk-based assessment including walkover and "aerial investigation and mapping" of Lidar data and aerial photographs as a standalone report
- Setting assessments of designated heritage assets in the site and surrounding area, following the methodology in Historic England Good Practice Note 3.
- Geophysical survey (a WSI for this has already been approved by Lincolnshire County Council)

The need for, scope, and timing of intrusive evaluation will be negotiated and agreed with the statutory consultees following completion of the desk-based assessments and geophysical survey.

6.4.5. Baseline conditions

The Lincolnshire HER contains 104 records within the Site, of which ten are find spots of artefacts. The records range from prehistoric features through to World War II structures. Historic mapping records a number of lost field boundaries within the Site which have not previously been recorded in the HER. One designated asset is located within the Site, this is a grade II listed milepost.

Beyond the Site boundary within the 5 km study area there are 17 scheduled monuments. These are mainly medieval in date – village crosses, deserted or shrunken villages, a ringwork (castle), a church and two priories – but also a Neolithic barrow and the Car Dyke which is thought to date to the Roman era. There are also a further 11 Grade I, 11 Grade II* and 207 Grade II listed buildings within the study area, these include churches, houses, farmhouses, agricultural buildings, as well as World War II buildings associated with the former RAF base, war memorials and a windmill.

6.4.6. Additional (secondary and tertiary) mitigation

Where archaeological remains within the Site do not require preservation in situ and cannot be avoided through primary mitigation (changes to the Proposed Development layout and / or construction methods), it is anticipated that additional mitigation to off-set adverse impacts will take the form of a programme of archaeological investigation and recording secured by a DCO Requirement. Such a programme may include pre-commencement phases of archaeological excavation and / or archaeological "watching brief" during construction. The need for and scope of such mitigation will be agreed with the Lincolnshire County Council archaeological advisor and Historic England where necessary. The scope and methodology of the mitigation will be set out in a WSI.

No additional mitigation during the operation phase is currently proposed.

6.4.7. Description of likely significant effects

The layout of the Proposed Development is still being designed and surveys to establish the archaeological resource of the Site are ongoing, and as such there remains uncertainty regarding both the direct physical impacts on heritage assets as a result of construction, and the extent of visual change within the setting of heritage assets within the wider area. This has therefore resulted in assets being "scoped in" (see **Section 6.4.8** below) which may, following detailed design, be scoped out of the Environmental Statement as effects will have been avoided.

The list of receptors outlined in **Section 6.4.8** below is therefore a "long list" of the heritage assets which will be considered during the assessment but by no means all are likely to experience significant effects. Assets that have been scoped out at this stage (see **Section 6.4.9** below) are those where their particular characteristics and the contribution made by setting to their significance will be unaffected by the Proposed Development regardless of its final layout.

6.4.8. Receptors / matters to be scoped into the assessment

Receptor / Matter	Phase	Justification
Milepost 20 metres south of Ashby Lodge Farm, Grade II Listed Building (NHLE Ref: 1061824)	Construction	The mile post is located within the Site. Construction activity will therefore directly impact on this asset, with potential for significant effects to occur.
Avro Lancaster crash site (LCC HER Ref: MLI25416)	Construction	Although a non-designated heritage asset, military crash sites are protected by legislation. The crash site is recorded within the Site. Construction activity would directly impact on this asset, with potential for significant effects to occur.

Hawker Hurricane crash site (LCC HER Ref: MLI25417)	Construction	Although a non-designated heritage asset, military crash sites are protected by legislation. The crash site is recorded within the Site. Construction activity would directly impact on this asset, with potential for significant effects to occur.
Buildings and monuments recorded in the HER within the Site except those scoped out below	Construction and operation	Construction activity has the potential to directly impact on these assets and the operation of the Proposed Development may impact on the contribution that setting makes to their significance, with potential for significant effects to occur.
17 Scheduled Monuments within 5km	Operation	Depending on the layout of the Proposed Development, these assets may experience visual change in their setting during operation which could result in significant adverse effects.
Listed Buildings within 5 km not scoped out below	Operation	Depending on the layout of the Proposed Development, these may experience visual change in their setting during operation which could result in significant adverse effects.
Currently unknown heritage assets within the Site	Construction and operation	There remains uncertainty about the extent and significance of heritage assets within the Site and therefore the potential for significant effects is unknown.

6.4.9. Receptors / matters to be scoped out of the assessment

Receptor / Matter	Phase	Justification
Setting effects on all heritage assets within the study area	Construction	Construction phase effects resulting from changes in the setting of heritage assets will be temporary and no worse than the operational phase effects. Therefore, it is not considered necessary to repeat the settings assessment for the construction phase.
Listed dwellings within settlements	Operation	The positive contribution made by setting to the significance of residential listed buildings within

over 1 km from the Site		settlements is typically confined to their immediate street scene and does not draw on views of the wider surroundings. No significant effects are therefore predicted.
Listed K6 telephone kiosks	Operation	The K6 telephone kiosks are listed for their architectural interest which is appreciated in close proximity. Their surroundings make a neutral contribution to their significance as they are found in a variety of contexts throughout the UK. No significant effects are predicted as a result of visual change within their wider surroundings.
Findspots recorded by LCC HER: Palaeolithic hand axe (LCC HER Ref: MLI60508); Late Neolithic polished stone axehead (LCC HER Ref: MLI60579); Roman oil lamp (LCC HER Ref: MLI84530); Romano-British finds (LCC HER Ref: MLI86164); Brass jetton found south of Blankney Hall (LCC HER Ref: MLI82650); Roman coin from near Brickyard Farm; (LCC HER Ref: MLI82653); Roman coin from near Brickyard Farm (LCC HER Ref: MLI82653); Middle Bronze Age socketed spearhead, near Ermine Street, Temple Bruer with Temple High Grange	Construction and operation	As findspots, these have been removed from the Site and the heritage significance of their former locations will not be harmed by the Proposed Development.

(LCC HER Ref: MLI86690); A few Romano-British pot sherds, north of Kirkby Green, Scopwick (LCC HER Ref: MLI87384); Bronze pendant from west of Dunsby Pit Plantation, Brauncewell (LCC HER Ref: MLI86162)		
Milepost 20 metres south of Ashby Lodge Farm, Grade II Listed Building (NHLE Ref: 1061824)	Operation	The positive contribution made by setting to the significance of the milepost derives from its relationship with the road network, and this will not be altered by the Proposed Development during operation.
Avro Lancaster crash site (LCC HER Ref: MLI25416)	Operation	The significance of this asset does not draw on its wider surroundings.
Hawker Hurricane crash site (LCC HER Ref: MLI25417)	Operation	The significance of this asset does not draw on its wider surroundings.
Sites of former extractive pits, Ashby de la Launde and Bloxholm (LCC HER Ref: MLI89157, MLI89158, MLI89203 and MLI89204) and Site of former extractive pit, Rowston (LCC HER Ref: MLI89163)	Construction and operation	These assets have negligible importance and significant effects upon them are therefore unlikely.
All heritage assets within the study area	Decommissioning	Decommissioning will not result in impacts to any additional heritage assets not affected during construction and operation. Decommissioning phase effects resulting from changes in the setting of heritage assets in the surrounding

		area will be no worse than the construction or operational phase effects. Decommissioning will reverse any adverse effects resulting from changes to the setting of heritage assets during operation.

6.4.10. Opportunities for enhancing the environment

Potential enhancement opportunities include replanting of lost hedgerow boundaries and reinstatement or repair of historic walled boundaries within the Site. Where residual effects remain during operation, measures to enhance the significance of heritage assets not affected by the Proposed Development would provide additional beneficial effects to be counted in the planning balance.

6.4.11. Proposed assessment methodology

The Proposed Development would result in a change to the existing baseline, and change might be considered as impacts according to the degree of change in relation to heritage significance. In accordance with EIA Regulations, the assessment would identify impacts and effects as direct or indirect, adverse or beneficial, and short-term, long-term or permanent.

Direct impacts are those which physically alter an asset and therefore its heritage significance. Impacts upon setting are those which affect the heritage significance of an asset by causing visual or sensory change within its setting. The assessment of effects resulting from change within the setting of heritage assets will follow the four-stage process set out in *Historic England's Good Practice Advice Note 2: The Setting of Heritage Assets.*

The assessment of effects will follow the significance criteria in **Appendix D.**

The residual effect is a product of the importance of the heritage asset and the magnitude of impact following mitigation. The importance of a heritage asset reflects any statutory or non-statutory designation or in the case of undesignated assets the professional judgement of the assessor with reference to regional research frameworks. Conclusions of the assessed magnitude of impacts is a product of the consideration of the elements of an asset and its setting that contribute to its cultural significance and the degree to which the Proposed Development would change these contributing elements. The assessment therefore reflects the varying degrees of sensitivity of different assets to change brought about by different types of development.

6.4.12. Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- Existing records for the historic environment do not record all heritage assets. This will be addressed through the desk-based assessment and aerial investigation and mapping survey to identify previously unrecorded assets and assess the potential for below ground archaeological remains.

The geophysical survey will also further investigate the potential for below ground archaeological remains.

6.4.13. References

- Ministry of Housing, Communities and Local Government (2021) *National Planning Policy Framework*
- Historic England (2017) *Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (Second Edition)* Historic England: Swindon

6.4.14. Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors / assets / resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors / matters that are proposed to be scoped in and out of the EIA?
- Do you agree with the proposed factor-specific assessment approach?

6.5. Landscape and visual

6.5.1 Consultation

No consultation to inform the Landscape and Visual Impact Assessment (LVIA) has been undertaken to date.

Following submission of this EIA Scoping Report, discussions will be held with Natural England, Lincolnshire County Council and North Kesteven District Council to agree the finer detail of the LVIA. Agreement will be sought on a selection of assessment viewpoints to be used in the LVIA, including the illustrative techniques to be used for any visualisations of the Proposed Development.

6.5.2 Study area

Best practice guidance for the assessment of landscape and visual effects (Guidelines for Landscape and Visual Impact Assessment - GLVIA 3) states:

'Scoping should … identify the area of landscape that needs to be covered in assessing landscape effects. This should be agreed with the competent authority, but it should also be recognised that it may change as the work progresses, for example as a result of fieldwork, or changes to the proposal. The study area should

include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner.'

and:

'Scoping should identify the area that needs to be covered in assessing visual effect, the range of people who may be affected by these effects and the related viewpoints in the study area that will need to be examined. The study area should be agreed with the competent authority at the outset and should consider the area from which the proposed development will potentially be visible. The emphasis must be on a reasonable approach which is proportional to the scale and nature of the proposed development.'

To assist in the determination of an appropriate and proportionate study area for the LVIA, a series of preliminary Zone of Theoretical Visibility (ZTV) plans have been prepared and these are presented in **Appendix F Figures 1-5**. The ZTVs illustrate the 'worst case scenario' of visibility for various structures of the Proposed Development based on the maximum parameters set out in Chapter 2. The purpose of the ZTVs at this scoping stage is simply to identify the maximum possible extents of visibility and to help identify potential visual receptors.

It should be noted that the ZTVs presented in **Figures 1-5** take account of the screening effect of significant blocks of woodland and also buildings but do not take account of walls, hedgerows, tree lines, or smaller tree groups. As is typical for all such ZTVs, the visibility shown on the plans is exaggerated and the actual extent of visibility of any development on the Site would be considerably more constrained than is indicated on these preliminary ZTVs.

The following ZTVs have been produced:

- Figure 1a – ZTV of the maximum extents of the solar array in Springwell West. This ZTV tests the theoretical visibility of just the solar arrays assuming 4 m high panels.
- Figure 1b – ZTV of the distributed collector compounds / BESS within Springwell West assuming a maximum height of 6 m.
- Figure 2a – ZTV of the maximum extents of the solar array in Springwell Central. This ZTV tests the theoretical visibility of just the solar arrays assuming 4 m high panels.
- Figure 2b – ZTV of the distributed collector compound / BESS within Springwell Central assuming a maximum height of 6m.
- Figure 3a – ZTV of the maximum extents of the solar array in Springwell East. This ZTV tests the theoretical visibility of just the solar arrays assuming 4 m high panels.
- Figure 3b – ZTV of the distributed collector compound/BESS within Springwell East assuming a maximum height of 6 m.
- Figure 4 – ZTV of the substation infrastructure and centralised BESS. The ZTV illustrates visibility of the tallest likely structure within the substation compound (i.**e** gantries) at 15 m in height but also visibility of other structures

within the substation/centralised BESS which would have a typical maximum height of 6 m.

- Figure 5 – ZTV illustrating a comparison between the visibility of existing pylons across Springwell West and the potential visibility of new national grid connecting towers (up to 60 m in height) within a 100 m buffer either side of the existing overhead line.

In the case of the solar array ZTVs (**Figures 1a, 2a and 3a**), these test the visibility of each parcel assuming that the entire extent of the potential zone for solar arrays is filled with solar panels.

In the case of the ZTVs for the distributed collector compounds / BESS (**Figures 1b, 2b and 3b**), the ZTVs assume that the full extent of the potential zones identified for these structures are filled with them. In reality, the collector compounds / BESS would occupy a fraction of the land area modelled and therefore visibility would be considerably less than implied by these ZTVs.
Similarly in the case of the ZTV for the National Grid and Project substation compounds (**Figure 4**), the ZTV assumes substations at each of the three potential locations. As only one of these three locations would go forward as the final selection, this ZTV again overemphasises the likely extent of actual visibility.

Based on analysis of the ZTVs (**Figures 1-3**) and field work undertaken to date, it is considered unlikely that there would be any view of the solar array or collector compounds / distributed BESS beyond 3 km of the Site boundary. In most locations, visibility would in reality be restricted to much closer than this. It is therefore proposed that a 3 km study area offset from the boundaries of the Site is more than adequate and proportionate for the consideration of landscape and visual effects arising as a result of the solar array and collector compounds / distributed BESS.

Figure 4 suggests any visibility of the National Grid and Project Substation would be limited to a maximum distance of 5 km from the Site. Beyond this distance, visibility of the National Grid and Project Substation would be barely discernible. **Figure 5** indicates that whilst a new connecting tower at a height of up to 60 m may be visible over 10 km away, the new tower would be no more visible than the existing pylons in Springwell West and any visual effects are likely to be localised where, for example, the new tower is closer to a receptor than the existing pylons. It is therefore proposed that a 5 km study area is adequate and proportionate for the consideration of landscape and visual effects arising as a result of the National Grid substation and National Grid connecting tower.

These above study areas are considered adequate to identify all non-negligible effects on landscape and visual receptors.

It is therefore proposed that the detailed study area and the main focus of the LVIA will be within 3 km of the Site boundary for all features of the Proposed Development, except the National Grid and Project Substation and National Grid connecting tower for which the study area will be extended to 5 km.

6.5.3. Data sources to inform the EIA baseline characterisation

The LVIA will draw upon information in the following published landscape character assessments:

- National Character Area (NCA) Profile 47 - Southern Lincolnshire Edge (Natural England, 2014); and
- North Kesteven Landscape Character Assessment (David Tyldesley and Associates, 2007)

The LVIA will consider relevant policy contained within:

- Central Lincolnshire Local Plan 2012-2036 (adopted, 2017);
- Scopwick and Kirkby Green Neighbourhood Plan 2021 – 2036 (Referendum Version, 2022)

The Central Lincolnshire authorities are preparing a new Local Plan to replace the Local Plan adopted in 2017. Consultation on a Proposed Submission Local Plan took place between 16 March 2022 and 9 May 2022 and on 8 July 2022 the Local Plan Review was submitted to the Planning Inspectorate in order for it to commence its examination. The Local Plan Review will be taken into account as it progresses through examination.

The LVIA will also consider the following sources of baseline information as appropriate:

- Green Infrastructure Study for Central Lincolnshire (CBA, 2011)
- Scopwick and Kirkby Green Design Codes, Final Report (Aecom, 2020)

Recreational walks and trails in North Kesteven including the Spires and Steeples Trail, the Ridge and Furrows Trail and a series of circular 'Stepping Out Walks' are promoted locally. The published description of these walks will be reviewed as appropriate and can be viewed at the following web address:

https://www.hillholtwood.co.uk/stepping-out-walks

6.5.4. Surveys to inform the EIA baseline characterisation

Several visits to the Site and the surrounding landscape have already been undertaken and all of the footpaths within the Site boundary have been walked.

Further site visits will be undertaken in winter 2022 / 2023 and again in summer 2023 to photograph the baseline views from a range of locations (viewpoints) within and surrounding the Site to represent a range of views and visual receptors of the Site. The location of the viewpoints will be agreed through further consultation with statutory consultees.

Where possible and access to private property can be arranged, visits will also be made to selected residential properties within 200 m of the Site to assess the potential for visual effects on residential amenity.

6.5.5. Baseline conditions

Landscape Designations

No part of the Site or its immediate surrounding context falls within a statutory designated landscape. The nearest Area of Outstanding Natural Beauty (AONB) or National Park to the Site is the Lincolnshire Wolds AONB which is located more than 20 km to the northeast and would not be affected by any development within the Site.

There are no Registered Parks and Gardens within 5 km of any part of the Site; the nearest is located just over 6.5 km to the northwest. Again, there would be no visibility of the Proposed Development at this distance.

There are also no local landscape designations covering any part of the Site. The nearest local designation is the Lincolnshire Cliff Area of Great Landscape Value (AGLV); an escarpment west of and parallel to the A607 between Grantham and Lincoln. This AGLV is located approximately 3 km to the west of Springwell West. The ZTVs indicate that there would be no visibility of the Site from the AGLV and this has been confirmed through Site work.

Landscape Character

The three land parcels (Springwell West, Springwell Central and Springwell East) fall across a broad and undulating plateau and dip slope which falls gradually eastwards from the A607 between Grantham and Lincoln towards the Lincolnshire Fens. Landform across the plateau is relatively gentle and this would limit the distance over which any new structures may be visible. Vegetation structure and the degree of enclosure created by hedgerows, woodland blocks and tree groups across the Site is variable. The landscape is notably more open in the west near the A15 and more enclosed in the east around Scopwick, Blankney and Kirkby Green.

Part of the plateau has a history of use for airfields and RAF airbases (notably RAF Digby). Modern large scale arable farming now sits alongside an older, sparse settlement pattern of small scale hamlets and isolated farmsteads.

National Character Area Profile 47 defines this as the Southern Lincolnshire Edge. The North Kesteven Landscape Character Assessment (NKLCA) records that the full extent of the Site falls within the 'Central Plateau' landscape character type (LCT).

Figure 6 in **Appendix F** illustrates the boundaries of the identified Landscape Character Areas (LCAs) taken from the NKLCA.

Springwell West and Springwell Central fall within the Limestone Heath LCA. Springwell East falls within the Central Clays and Gravels LCA.

Initial field work has identified that there are notable differences in the landscape character across the three identified parcels of land. Notably, the landscape within Springwell West and Springwell Central is more open with limited mature vegetation structure whereas the landscape within Springwell East is more enclosed with more dense and established vegetation. It is proposed to further analyse and characterise the landscape across the Site as part of the LVIA.

Visual Receptors

A review of the Lincolnshire County Council Definitive Map shows that there are several public rights of way (PRoW) in the surrounding area and across the three parcels, including locally promoted routes.

The Spires and Steeples Trail (a regionally promoted recreation walk) runs north to south through Springwell East connecting Blankney and Scopwick. The Ridge and Furrow Trail (another regionally promoted recreation walk) passes approximately 1 km to the west of the Site but appears to have little visibility of the Site. A series of

locally promoted 'Stepping Out' walks pass through Springwell East and traverse the boundaries of the Site within Springwell Central and Springwell West.

Whilst there is a relatively high concentration of PRoW in Springwell East, there is a relative sparsity within Springwell West and Springwell Central. Recreational users of PRoW would however likely be the most sensitive visual receptors of any change in the landscape.

Areas of Springwell West and Springwell Central are also openly visible from the A15 trunk road and the B1191 (Heath Road) which runs between the A15 and Scopwick. Other minor roads and country lanes pass through Springwell West, but again these are sparse.

The villages/hamlets of Scopwick, Kirkby Green and Blankney lie just beyond the boundaries of Springwell East. Depending on the final design and layout of the Proposed Development, there is the potential for there to be views of the Proposed Development from the fringes of these villages but there is also potential through design and mitigation to minimise the view from properties and community infrastructure within these villages.

The residential quarters within the barracks at RAF Digby lie just beyond the boundaries of Springwell Central. Again, depending on the final design and layout of the Proposed Development, there is the potential for there to be views of the Proposed Development from the barracks but there is also potential through design and mitigation to minimise the view from these facilities.

Elsewhere there are isolated residential properties and farmsteads which will be considered as necessary in the LVIA.

There are no tourist attractions or recognised viewpoints from which the Proposed Development may be visible.

6.5.6. Additional (secondary and tertiary) mitigation

Construction

Consideration will be given to the site selection for compounds and equipment laydown areas to minimise landscape and visual effects as far as practicable. There is, however, limited potential for secondary mitigation of short term landscape and visual construction effects.

Lighting of any construction compounds will be designed to minimise visual intrusion.

Existing trees, woodlands and hedgerows would be protected in accordance with best practice for construction in proximity to trees and in accordance with relevant British Standards, principally BS5837.

Operation

A high quality design will be secured firstly through careful site selection for the various components of the Proposed Development, taking account of the potential landscape and visual effects. Removal or disruption to any existing landscape fabric (i.e trees, hedgerows) will be minimised to that which is absolutely necessary for the implementation of the Proposed Development.

Detailed landscape and habitat mitigation proposals will be developed in accordance with the project principles to integrate the Proposed Development into the landscape and mitigate visual effects as far as practicable. The landscape strategy will be complementary to any biodiversity and other environmental objectives. The landscape design will seek to deliver landscape enhancements over and above the requirement to simply mitigate adverse effects.

The landscape strategy will seek to manage and restore existing vegetation and habitats within the Site, as well as implement the planting of extensive areas of new native vegetation and creation of new biodiverse habitats.

An Outline Landscape and Ecological Management Plan (oLEMP) will be developed in consultation with relevant consultees to secure the long term management of the landscape and biodiversity strategy.

Decommissioning

This stage will be similar to the construction stage, albeit in reverse. Given the anticipated operational life time of the Proposed Development (40 years), mitigation landscaping will have reached maturity and short-term landscape and visual decommissioning effects will be more filtered and / or screened than at the construction stage. No secondary mitigation is envisaged during this phase.

6.5.7. Description of likely significant effects

At this stage, prior to any formal assessment and in the absence of fixed development proposals, it is acknowledged that there is the potential for significant landscape and visual effects to arise during construction, operation and decommissioning. It is also, however, noted that further assessment based on firm development proposals and taking account of mitigation may result in a finding of limited significant effects.

The LVIA will therefore consider the potential effects upon:

- landscape fabric;
- landscape character; and
- visual receptors including residential, transport and recreational receptors.

Whilst the ZTVs presented in **Figures 1-5** illustrate theoretical visibility out to 3 km (for the solar array and collector compounds / distributed BESS) and 10 km (for the National Grid and Project Substation and National Grid connecting towers), it is likely that any significant effects will only extend across a much narrower radius of the Site boundary than this.

Based on Site analysis to date and previous experience of assessing the significance of landscape and visual effects for solar farms in similar landscapes, it is considered likely that any significant landscape and visual effects arising from the solar array and the collector compounds / distributed BESS would be limited to within a distance of approximately 1 km. Significant effects associated with the National Grid and Project Substation and connecting towers may extend further to approximately 3 km.

6.5.8. Receptors / matters to be scoped into the assessment		
Receptor / Matter	**Phase**	**Justification**
Landscape Character Area 7 (LCA 7): Limestone Heath (North Kesteven Landscape Character Assessment)	Construction, operation and decommissioning	Springwell West and Springwell Central fall within this LCA and there would be a large scale of change in localised parts of this LCA.
Landscape Character Area 11 (LCA 11): Central Clays and Gravels (North Kesteven Landscape Character Assessment)	Construction, operation and decommissioning	Springwell East falls within this LCA and there would be a large scale of change in localised parts of this LCA.
Users of the A15 and B1191	Construction, operation and decommissioning	A large volume of traffic passes along these two roads which have a largely open view across part of the Site. Receptors are generally not of high sensitivity but the views are likely to be experienced by large numbers of people from these two roads.
Users of the PRoWs and local road network which passes through and within 3 km of the Site (including the Spires and Steeples Trail and the Stepping Out walks)	Construction, operation and decommissioning	Higher sensitivity receptors which may have both direct and indirect views of the Proposed Development
Residents and visitors to the villages of Scopwick, Kirkby Green, Blankney and Ashby De La Launde	Construction, operation and decommissioning	Depending on the final layout and design of the Proposed Development, there may be views of the Proposed Development from these villages, although it is intended to minimise as far as possible visual intrusion

		on these receptor groups.
Residents of the barracks at RAF Digby	Construction, operation and decommissioning	Depending on the final layout and design of the Proposed Development, there may be views of the Proposed Development from the residential quarters of the barracks, although it is intended to minimise as far as possible visual intrusion on this receptor group.
Isolated farmsteads and residential properties within 1 km of the Site	Construction, operation and decommissioning	Higher sensitivity receptors – consideration will be required of residential visual amenity.

6.5.9. Receptors / matters to be scoped out of the assessment

Receptor / Matter	Phase	Justification
Lincolnshire Wolds AONB	Construction, operation and decommissioning.	This AONB is situated over 20 km from the Site and there would be no intervisibility at this distance.
Lincoln Cliff Area of Great Landscape Value (AGLV)	Construction, operation and decommissioning.	The AGLV is a west facing scarp slope, orientated north-south and located over 3 km to the west of the Site. Field work has already confirmed that there would be no visibility of the Proposed Development in views to or from the scarp slope.
Other LCAs in the North Kesteven Landscape Character Assessment	Construction, operation and decommissioning.	Despite the fact that the ZTVs indicate some distant visibility from other LCAs, field work

		has established that there would be no intervisibility between the Site and any other LCAs.
Villages/hamlets of Metheringham, Bloxham, Digby, Dorrington, Ruskington, Leasingham, Cranwell, RAF Cranwell, Wellingore and Navenby and other settlements along the A607	Construction, operation and decommissioning.	Despite the fact that the ZTVs indicate some distant visibility in some cases from the edges of these villages, once intervening hedgerows and other vegetation is taken into account, it is highly unlikely there would be any views of the Proposed Development from these settlements. Any glimpses would be distant, filtered and negligible.
PRoW and local roads beyond 3 km	Construction, operation and decommissioning.	It is unlikely that there would be any views of the Proposed Development at this distance, but any glimpses of the Site beyond this distance are not likely to result in effects which would reach the threshold of a significant effect.
Isolated residential properties over 1 km from the Site	Construction, operation and decommissioning.	Whilst there may be glimpses from individual properties beyond 1 km of the Site, this will be a matter of private visual amenity and under no circumstances would this give rise to an overbearing effect on residential amenity.

Users of the rail network, specifically section between Metheringham and the level crossing on the B1191	Construction, operation and decommissioning.	Medium / Low sensitivity receptor which would have both direct and intermittent views of activity during construction, operation and decommissioning. The potential for significant effects to occur is considered low.

6.5.10. Opportunities for enhancing the environment

A comprehensive landscape mitigation strategy for the entire Site will be developed and this will seek to deliver significant landscape as well as biodiversity enhancement.

6.5.11. Proposed assessment methodology

The LVIA will be undertaken in accordance with published best practice, namely the Guidelines for Landscape and Visual Impact Assessment (Third Edition) (GLVIA3), (Landscape Institute and IEMA, 2013) and associated technical guidance notes published by the Landscape Institute, including:

- Technical Guidance Note 06 / 19: Visual Representation of Development Proposals, published by the Landscape Institute (2019)
- Technical Guidance Note 02 / 21: Assessing landscape value outside national designations
- Technical Guidance Note 02 / 19: Residential Visual Amenity Assessment
- Technical Guidance Note 04 / 20: Infrastructure.

Wherever possible, identified effects are quantified, but the nature of landscape and visual assessment requires interpretation using professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and assessment of significance of the residual landscape and visual effects will be based on pre-defined criteria.

GLVIA3 states that *'professional judgement is a very important part of the LVIA' (paragraph 2.23) and that 'in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others.' (paragraph 2.24).* It goes on at paragraph 3.32 to state that *'there are no hard and fast rules about what effects should be deemed 'significant" but LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects.'*

The LVIA will define the existing landscape and visual baseline environment; assess its sensitivity to change; describes the key landscape and visual related

aspects of the Proposed Development; describes the nature of the anticipated changes and assess the effects arising during construction, operation and decommissioning.

Although linked, landscape and visual effects are considered separately. Landscape effects derive from changes in the landscape fabric, which may result in changes to the character, whereas visual effects are the effect of these changes as experienced by people (visual receptors).

The specific significance criteria to be used in the LVIA are set out in **Appendix D.**

All above ground primary and secondary elements of the Proposed Development will be considered in the LVIA as visible features which either individually or collectively have the potential to give rise to significant landscape and visual effects.

A selection of viewpoints, agreed with statutory consultees, will be used in the LVIA to consider effects on different receptor groups, at various distances from the Site and to illustrate any particularly sensitive views identified through scoping.

Annotated photographs (both winter and summer views) will be provided for each of the assessment viewpoints used in the LVIA. The annotated photographs will accord with guidance for 'Type 1' visualisations as defined in Landscape Institute Technical Guidance Note 06/19 (TGN 06 / 19).

A series of photomontages will be presented for key viewpoints (locations to be determined through further consultation). The photomontages will be produced using the same base photographs as the annotated photographs and accord with guidance for 'Type 3' or 'Type 4' visualisations as defined in TGN 06 / 19.
Mitigation measures will be developed as appropriate and taken into consideration in the assessment of effects.

The LVIA will conclude by summarising which if any effects are considered to be 'significant'.

As set out within LI Technical Guidance Note 02 / 19 'Residential Visual Amenity Assessment (RVAA)':
'Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view.'
and:
'It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before.'

The LVIA will present, as an appendix to the main assessment, a residential amenity assessment of visual effects on residential properties for any property where these is a possibility that the visual effects may approach the threshold described above.

At the time of writing, the Applicant is not aware of any other major developments within the vicinity of the Site which would require a cumulative LVIA.

However if other projects are identified during the EIA process, cumulative landscape and visual effects will be assessed as appropriate.

6.5.12. Difficulties and uncertainties

No difficulties or uncertainties with regards the LVIA have been identified at this stage.

6.5.13. References

- *Guidelines for Landscape and Visual Impact Assessment*, (2013), Third Edition, Landscape Institute and Institute of Environmental Management and Assessment
- *Landscape Institute Technical Guidance Note 06/19: (2019), Visual Representation of Development Proposals, published by the Landscape Institute*
- *Landscape Institute Technical Guidance Note 02/21: Assessing landscape value outside national designations*
- *Landscape Institute Technical Guidance Note 02/19: Residential Visual Amenity Assessment*
- *Landscape Institute Technical Guidance Note 04/20: Infrastructure*
- *National Character Area Profile (NCA) 47 - Southern Lincolnshire Edge,* Natural England, 2014. Available at: http://publications.naturalengland.org.uk/publication/4991055606841344?category=587130
- *North Kesteven Landscape Character Assessment,* David Tyldesley and Associates, 2007. Available at: https://www.n-kesteven.gov.uk/residents/planning-and-building/planning/planning-applications/north-kesteven-landscape-character-assessment/
- *Central Lincolnshire Local Plan 2012-2036 (adopted 2017).* Available at: https://www.n-kesteven.gov.uk/residents/planning-and-building/planning/planning-policy/central-lincolnshire-local-plan/
- *Scopwick and Kirkby Green Neighbourhood Plan 2021 – 2036 (Referendum Version, 2022)*
- *Central Lincolnshire Local Plan Review (draft).* Available at: https://www.n-kesteven.gov.uk/central-lincolnshire/local-plan-review/
- *Lincolnshire Public rights of Way Map (2022).* Available at: http://lincs.locationcentre.co.uk/internet/internet.aspx?articleid=L4h7HM4AmHM~&preview=true
- *Green Infrastructure Study for Central Lincolnshire,* CBA, 2011
- *Scopwick and Kirkby Green Design Codes, Final Report,* Aecom, 2020
- *North Kesteven Stepping Out Walks Available at:*

  https://www.hillholtwood.co.uk/stepping-out-walks

6.5.14. Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of the EIA?
- Do you agree with the proposed factor-specific assessment approach?
- Are there any specific viewpoints that you would like us to consider and/or illustrate as a photomontage?
- Are there any other developments which you consider it will be necessary for us to address in a cumulative landscape and visual impact assessment?

6.6. Land, soils and groundwater

6.6.1 Consultation

No consultation regarding land, soils and groundwater has been undertaken to date. A significant amount of site-specific information has been obtained from the Site Envirocheck Report (environmental database search), which incorporates records from bodies such as local authorities, the Environment Agency and the British Geological Survey.

6.6.2 Study area

For the purposes of this EIA Scoping Report, the Site and a 1 km buffer have been considered with regard to identifying land, soil and groundwater related receptors that could be impacted by the construction, operation and / or decommissioning of the Proposed Development.

A preliminary risk assessment (PRA) report has been prepared to provide a desk-based analysis of the Site with respect to land, soils and groundwater. This EIA Scoping Report has been prepared based on information provided in the PRA report.

6.6.3. Data sources to inform the EIA baseline characterisation

The baseline of the Site has been assessed with data obtained from a number of sources, with the findings provided in the PRA report, as referenced above. These sources included:

- Geological maps (bedrock and superficial geology);
- Hydrogeological and groundwater vulnerability maps;
- Soil survey maps;
- Historical site investigation and assessment reports, where available;
- Environment Agency surface water quality, abstraction and discharge records plus aquifer designation and source protection zones;
- Environment Agency , local authority and British Geological Survey data on the location of waste sites, pollution incidents and potentially contaminated sites;
- Mineral sterilisation and geological conservation review sites;
- Historical mapping for the Site; and
- An internet search for any other relevant issue in the public domain.

Some data has been accessed via gov.uk and other freely accessible databases and a Site Envirocheck Report has been obtained.

6.6.4. Surveys to inform the EIA baseline characterisation

- A walkover survey of the Site and surrounding area has been undertaken as part of the baseline assessment (20 - 21 October 2022, as reported in the PRA report). This included taking notes, annotating site plans and taking photographs.
- An Agricultural Land Classification (ALC) survey is underway to provide confirmation of ALC across all areas of the Site**.**
- Intrusive ground investigations are due to be undertaken in 2023.

6.6.5. Baseline conditions

Designated geological sites

There is a Site of Special Scientific Interest (SSSI) designated for geological reasons located approximately 2 km to the north of the Site. The distance from this SSSI to the Site is considered sufficient to ensure that there will be no adverse impacts on the SSSI as a result of the Proposed Development. There are no recorded geological conservation review sites close to the Site.

No designated geological sites therefore need to be considered as part of this assessment.

Mineral extraction sites and mineral safeguarding

Historical mineral extraction has been widespread across the area of the Proposed Development, with extraction of limestone bedrock from stone pits being

commonplace on historical maps. Some areas of sand and gravel excavation are also indicated to have been present.

No part of the Site is located within an adopted minerals site.

A large limestone Mineral Safeguarding Area (intended to protect valuable mineral resources from sterilisation by new development) is present within the Site boundary. Consultation with Lincolnshire County Council will be required in relation to this area. This area is also classified as a Mineral Consultation Area (requiring involvement of the Mineral Planning Authority in determination of development proposals that could impact upon identified mineral resources). The mapping shows the extent of the Mineral Safeguarding Area, which corresponds to the area where limestone bedrock is present across the Site. This incorporates the whole of Springwell West and the western sections of Springwell Central and Springwell East. There are also two Site-Specific Minerals Safeguarding areas located around Brauncewell Quarry, located to the south western corner of Springwell West and Longwood Quarry located on the western edge of Springwell East.

The Minerals Safeguarding Area and Site Specific Minerals Safeguarding Areas are displayed on the Environment Features Plan located in Appendix C.

It should be noted that for the Proposed Development, the majority of the land take is temporary (i.e. where the solar arrays are located). Even though the Site is partly within a mineral safeguarding area, future extraction of minerals will be possible after decommissioning of the Proposed Development.

Geology

The Site is primarily underlain by limestone bedrock with some areas of sandstone, mudstone and siltstone. Superficial deposits appear to be largely absent, with occasional deposits (including sand and gravel) being present along some watercourses. Further details are provided in the PRA report.

There are no mapped zones of artificial ground shown on the British Geological Survey mapping, but it remains likely that infilling of quarries and pits has occurred and there may be areas of made ground present in association with tracks or existing structures.

Geological faults are apparent within the Site, with no particular consistency to the orientation of these.

British Geological Survey borehole records have been assessed, and these primarily show the presence of shallow limestone bedrock, covered by thin deposits of topsoil and subsoil.

There may be geological hazards at the Site relating to the presence of shallow limestone, as this stratum can be prone to ground dissolution stability hazards. Some areas of the Site are classified in the Envirocheck Report as being at risk of moderate hazards due to bedrock dissolution and the presence of shrinking or swelling clay.

Soils

An ALC survey is currently being undertaken at the Site.

National level data shows that most of Springwell Central and the southern section of Springwell West is classified as Grade 2 agricultural land. Percentages of best

and most versatile (BMV) land across the Site calculated to date using the National Level Data show that 32.8% of the Site is Grade 2 land (497Ha) and 67.2% of the Site is classified as Grade 3 land (1,020Ha). Grade 2 is defined as very good quality agricultural land and Grade 3 is defined as good to moderate quality agricultural land.

Publicly available soils mapping shows the whole Site to be covered by soils within Soilscape 3, which are defined as shallow lime-rich soils over chalk or limestone. These are categorised as freely draining and are generally used as arable and grassland.

Hydrogeology

The bedrock deposits underlying the Site form a principal aquifer of high vulnerability. A principal aquifer is defined as groundwater that provides significant quantities of drinking water and water for business needs and it may also support rivers, lakes and wetlands. Depths to groundwater are variable across the Site, ranging from 2 m to 3 m in some weathered limestone and superficial deposits and at greater depth from 1 2m to 30 m in most limestone bedrock.

A Source Protection Zone (SPZ) is present close to Scopwick. This is an inner zone (SPZ 1), providing protection around a groundwater abstraction source located to the west of Scopwick.

There is also a total catchment zone (SPZ 3) located across the southern section of Springwell West.

The environmental database did not identify any other groundwater or surface water abstractions within the Site.

Discharge consents

There are a number of recorded discharge consents within the Site and in the surrounding area, as detailed in the PRA report. Within the Site, these are either for domestic properties (involving discharge to land) or the sewage treatment works located close to Scopwick Heath (RAF Digby).

Historical site usage

Historical mapping shows the Site has been in use for agricultural purposes since the earliest editions of the maps in the late 1800s. Maps show numerous locations where stone pits, quarries and sand and gravel pits have been present over the years. A sewage treatment works is located adjacent to the Site close to Scopwick Heath (RAF Digby). There do not appear to have been any other structures present within the Site, with the exception of some farm buildings and wind pumps. There are some electrical overhead cables passing over the Site. The proximity of RAF Digby suggests that there is the potential for unexploded ordnance to have been present at the Site.

Landfill sites and waste transfer sites

There are no recorded historical or current landfill sites or waste transfer sites within the Site. However, there are known to have been many quarries and pits within the Site and it is possible that some of these have been infilled with made ground and waste materials over time.

The closest recorded landfill is located just south of Long Wood, to the west of Springwell East. This site was known as Longwood Quarry and was a landfill and waste transfer site for the deposition of non-biodegradable waste and treatment of waste to produce soil. Brauncewell Quarry landfill site is located adjacent to the Site to the south east of Springwell West and accepted non-biodegradable waste from 2001. There was also a waste treatment facility at Brauncewell Quarries (over 450 m to the south east of Springwell West), for transfer and treatment of inert and excavation waste.

Land contamination

The Site history indicates that land use has been predominantly agricultural, although mineral extraction has also occurred in many locations. Contamination may be present associated with agriculture, and with the machinery used in excavating limestone, sand and gravel. Made ground is likely to be present within infilled pits and quarries, and along tracks and close to buildings or structures located within the Site. There is also potentially made ground and contamination associated with the railway that passes adjacent to the eastern boundary of Springwell East and the nearby sewage works and landfills.

The Envirocheck Report has been reviewed in relation to significant pollutions incidents on or close to the Site and none have been recorded in the last 20 years.

There are fuel filling stations located off-site to the south east (approximately 60 m from the boundary at Digby Aerodrome, now obsolete) and 100 m to the north west of Springwell Central.

There are no contaminated land register entries within or close to the Site.

Natural hazards and mining

There is the potential for low to moderate geological hazards within the Site due to ground dissolution stability hazards and risks from the presence of shrinking or swelling clay.

Mining related hazards are not expected to be relevant across this Site.

6.6.6. Additional (secondary and tertiary) mitigation

The majority of mitigation measures required to address potential effects relating to land, soil and groundwater are standard good practice for construction projects.

Construction

The following measures would also be expected to be incorporated into site good practice documents e.g. an Outline Construction Environmental Management Plan (oCEMP), to ensure that damage to ground, groundwater and surface water can be minimised during the construction phase:

- soil management during works will incorporate guidelines for soil handling, to include replacement of soil in temporary laydown areas;
- during construction works, surface water drains should be designed to carry only uncontaminated water. Foul drains should carry contaminated water to a sewage treatment works under suitable discharge consent; and

- concrete mixing would be undertaken in designated areas to minimise the potential for impact on watercourses.

Standard mitigation to be applied will be protective of all groundwater resources and this will mean that there are no negative effects on the groundwater within the abstraction zones. It is also intended that the collector compounds, battery energy storage system (BESS), Project Substation and National Grid Substation should be located away from the SPZs, where possible.

Operation

No further mitigation measures would be expected to be required during operation beyond the embedded mitigation incorporated into the design of the Proposed Development.

A desk-based PRA Report has been prepared, which assesses the potential risks on the existing land, soil and groundwater baseline, including contamination issues. The PRA report conclusions and intrusive ground investigations will determine necessary mitigation measures to ensure that the construction, operation and decommissioning of the Proposed Development do not result in significant effects on the receiving land and soil environment.

An Outline Soils Management Plan will be submitted in support of the DCO Application, and this document will set out the principles to prevent impacts on the soil resource.

6.6.7. Description of likely significant effects

Potential significant effects during construction include damage to soils due to compaction from plant. It is also anticipated that there will be a reduction in the availability of BMV land.

The majority of the land use will be short-term and temporary (during construction); however, some will be long-term but temporary (construction and operation) and some will be permanent (for example the National Grid substation).

The ground mounted solar PV generating stations, BoSS, Project Substation, Collector Compounds and BESS compound(s) will be removed from the Site during decommissioning; therefore, the loss of the ability to use the BMV land in these areas would not be permanent.

6.6.8. Receptors / matters to be scoped into the assessment

Receptor / Matter	Phase	Justification
Soils (soils and agricultural land)	Construction	The nature of the Proposed Development means that some areas of BMV land will not be available for agricultural production during construction. Although an Outline Soils Management Plan will be submitted in support of the DCO Application, which will set out the principles to prevent impacts on the soil resource, there may

		also be adverse effects on the quality of topsoil if trafficking over soils results in compaction occurring. It should be acknowledged that changes to the hydrogeological regime as a result of the Proposed Development may also affect the quality of soils within the Site, with potential knock-on effects to off-site resources. Construction works also have the potential to impact on agricultural field drains (for example via piling or damage due to construction plant), which could result in negative impacts on soil quality or future agricultural yield. Construction activity will therefore directly impact on the soils within the site, with the potential for significant effects to occur.
Agricultural land	Operation	The operational Proposed Development will lead to a loss of agricultural and BMV land and will therefore directly impact on the availability of such land.
Agricultural land	Decommissioning	The solar panels and associated infrastructure will be removed during decommissioning and therefore that land will be returned to the landowner in a state suitable for continued agricultural use. The National Grid Substation will be permanent development which will lead to a continued loss of agricultural and (potentially) BMV land and will therefore directly impact on the availability of such land.
6.6.9. Receptors / matters to be scoped out of the assessment		
Receptor / Matter	**Phase**	**Justification**
Land	Construction, operation and decommissioning	Embedded mitigation measures are considered sufficiently effective to minimise impacts to land. There are not shown to be any significant sensitive receptors based on the findings of the

		PRA, and industry best practice procedures will prevent damage to the land during construction, operation or decommissioning activities. Consultation will be undertaken with Lincolnshire County Council to ensure that any negative implications for Mineral Safeguarding Areas are minimised and considered as part of the Proposed Development design.
Groundwater	Construction, operation and decommissioning	The quality of groundwater in source protection zones will be appropriately protected by embedded mitigation measures. The project surface water strategy will mirror the existing surface water regime, so having minimal effect on the existing groundwater conditions.
Soils	Operation	Significant vehicle movements within the Site during operation are not anticipated and therefore the potential for such vehicle movements to cause compaction is considered limited.
Soils	Decommissioning	Any effects on soils during decommissioning would not be expected to be significant as the number of vehicle movements is anticipated to be less than during the construction phase, limiting the potential for compaction of soils to occur. Decommissioning works are also less likely than construction works to adversely impact on agricultural field drains as there would be no requirement for piling etc., so are less likely to result in deterioration of soil quality .

6.6.10. Opportunities for enhancing the environment

If any contamination issues are identified within the Site, remediation may be necessary prior to construction commencing, which would qualify as an enhancement opportunity. Remediation work, if required, could result in improvement in existing soil or groundwater conditions.

6.6.11. Proposed assessment methodology

The following documents are relevant in preparation of the assessment:

- Part IIA, Environmental Protection Act, 1990 (relevant in terms of assessment of contaminated land)
- The Environmental Permitting Regulations (England & Wales) 2016 (last revised March 2020) (relevant with respect to environmental permits)
- The National Planning Policy Framework, July 2021 and relevant National Planning Guidance documents
- Land Contamination Risk Management (LCRM), October 2020
- Natural England Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile land, 2nd edition (2012)
- Minerals and waste development plans for local authorities.

The assessment will include review of the information obtained for the Site for the matters that are to be scoped in (as detailed in **Section 6.6**Error! Reference source not found.), and each will be considered using professional judgement to determine whether the level of available information is acceptable (for example a large landfill site that is off-site and separated by a physical barrier such as a valley or stream may not require additional consideration, but a smaller contamination incident closer to the Site may require further consideration).

Significance of potential impacts is assigned based on a set of definitions, as provided in **Appendix D**, and professional judgement will be used as appropriate to assess potential risks.

The assessment will consider the potential short-term environmental effects during construction and will also consider long-term environmental effects during operation. It is proposed to scope out most matters from the decommissioning phase, with the exception of agricultural land.

Additional mitigation measures will be detailed to ensure that damage to soils and agricultural land can be reduced and avoided as far as possible.

Consideration of cumulative effects will include a regional-scale assessment of impacts from the reduction in availability of BMV land.

6.6.12. Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- Data on site history have been obtained from historical maps, and there may be developments that occurred between map editions that are not evident.

6.6.13. References

- Environment Agency (2020), Land contamination risk management, https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm, April 2021.
- Geology, UXO, Mining and Ground Stability Envirocheck Report (2022)

6.6.14. Scoping questions

- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors / assets / resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of the EIA?

6.7. Noise and vibration

6.7.1 Consultation

No consultation regarding noise and vibration has been undertaken to date.

The local Environmental Health department at North Kesteven District Council will be consulted regarding the methodology detailed below. Consultation would be sought in order to seek agreement on the following:

- Baseline noise survey locations and programme of monitoring;
- Guidance and standards pertinent to the assessment(s);
- Receptors for inclusion in the assessment(s) where necessary; and
- Agreement on relevant criteria.

6.7.2 Study area

The study area is not defined within the applicable noise and vibration standards and guidance proposed for the assessment(s). The study area shall therefore be defined based on the Applicant's experience of solar farm developments and proposed locations of operational equipment / structures and construction/decommissioning pathways. In this case, those receptors adjacent to the Site boundary shall be adopted. These shall include isolated receptors / properties or those indicative of a group of dwellings.

The extent of the study area and proposed assessment locations would be agreed with North Kesteven District Council as part of the initial consultation phase.

6.7.3. Data sources to inform the EIA baseline characterisation

The following sources of information have informed the scope of the baseline surveys:

- Site boundary – detailing extents of the Proposed Development location and proximity to nearby receptors;

Online aerial imagery – Determine locations of nearest receptors to inform both the baseline survey and future assessment(s).

6.7.4. Surveys to inform the EIA baseline characterisation

A comprehensive baseline noise survey is proposed to quantify and characterise the existing noise environment across the study area.

It is proposed that a baseline noise monitoring exercise will be undertaken in accordance with British Standard (BS) 7445-1:2003 *'Description of environmental noise – Guide to quantities and procedures'*, and the equipment used will conform to the requirements of BS EN 61672-1:2013 *'Electroacoustics. Sound level meters. Specifications'*.

Monitoring will be undertaken in the form of long-term noise measurements, typically of 1-week duration, in order to quantify the existing noise environment and sources of noise impacting the assessment receptors. Monitoring would encompass continuous periods throughout daytime and night, accounting for the likely operational times of the Proposed Development (i.e. 24 hours per day, 7 days per week). Baseline monitoring would be used to inform the criteria for both the construction and operational phases.

Monitoring would likely occur along the Site boundary and adjacent to public rights of way at positions representative of those nearest receptors. Where positions along the Site boundary are deemed to not be representative of nearby receptors, it is recommended that positions are within the receptors premises..

6.7.5. Baseline conditions

Baseline noise levels are expected to be of low order, considering the largely rural setting of the Site. Typically, those receptors positioned closest to the A15 would be expected to experience the highest baseline noise levels of the entire study area due to their proximity to road traffic from this source.

Review of aerial imagery indicates that the baseline environment may also be influenced by mineral extraction activity from Brauncewell Quarry (off A15) and Longwood Quarry (off Long Wood Lane); noise levels from these activities would be captured as part of the baseline noise survey. No further significant sources of noise are noted.

The receptors likely to be incorporated into the assessment are all residential in nature and therefore have the highest level of sensitivity.

6.7.6. Additional (secondary and tertiary) mitigation

Potential measures to mitigate levels of noise and vibration during the construction, operational and decommissioning phases are outlined below:

Construction

In developing the control measures during the construction phase, best practicable means (BPM), as defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environmental Protection Act 1990, would be applied during all construction works to minimise noise (including vibration) at neighbouring

residential properties and other sensitive receptors. In doing so, due consideration would be given to the recommendations contained within BS5228:2009+A1:2014.

Measures to minimise levels of noise and vibration during the construction phase may include:

- The use of lower emitting noise level plant items
- Management of operations to more appropriate periods
- Use of noise barriers / temporary enclosures

Operation

When choosing attenuation measures or implementing an effective noise reduction program, there are two possible approaches for treatment:

- Mitigation at source – modify the source to radiate at a lower sound power level
- Mitigation through transmission – deflect or block the acoustic path of noise.

It should be noted that this list of additional mitigation is not exhaustive, the specifics of which (and the extent) would be determined as part of the assessment.

Decommissioning

Measures outlined as part of the construction phase would likely be applied during the decommissioning phase in accordance with BS5228:2009+A1:2014.

6.7.7. Description of likely significant effects

Construction

The construction phase would likely lead to an increase in existing noise levels at receptors as a result of the use of large earthmoving/lifting equipment, plus increase in vehicle/HGV numbers along the road network and new access tracks. Temporary significant effects may occur during this phase.

Operation

The operational phase will inevitably introduce new noise sources into the locality, with those sources having the potential to be tonal in nature. Given the likely low background noise levels, particularly during the night-time period, the impact of the Proposed Development may be significant and permanent at a number of existing receptors.

Decommissioning

The decommissioning phase would likely lead to an increase in existing noise levels at receptors as a result of the use of large earthmoving/lifting equipment, plus increase in vehicle/HGV numbers along the road network and new access tracks. Temporary significant effects may occur during this phase.

6.7.8. Receptors / matters to be scoped into the assessment

Receptor / Matter	Phase	Justification
Noise	Construction and decommissioning	Activities likely to involve large earthmoving / lifting plant items with the potential for significant effects to occur.

Road traffic	Construction and decommissioning	Potential increase in HGV / vehicle movements may cause significant effects in the short term.
Vibration	Construction and decommissioning	Activities likely to involve large earthmoving / lifting plant items with the potential for significant effects to occur.
Noise	Operation	Operational plant items are likely to have an impact on the existing noise environment and affect local amenity.

6.7.9. Receptors / matters to be scoped out of the assessment

Receptor / Matter	Phase	Justification
Vibration	Operation	Operational elements including fixed plant items / structures will not emit discernible levels of vibration.
Road traffic	Operation	The increase in road traffic during operation is likely to be negligible, with vehicles only likely to be required for routine maintenance.

6.7.10. Opportunities for enhancing the environment

No opportunities for enhancement in relation to noise and vibration have been identified at this stage.

6.7.11. Proposed assessment methodology

Noise and vibration will be quantified using a combination or spreadsheet calculations and / or computational noise modelling. Calculations will be based on algorithms set out in ISO 9613-2:1996 'Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation', BS 5228-1:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites. Noise'*, BS 5228-2:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites. Vibration' and* DMRB *'LA111 Noise and Vibration, 2020'*.

Those phases of assessment comprise:

- Construction - infrastructure including fixed plant and road traffic.
- Operational - infrastructure fixed plant.
- Decommissioning - infrastructure including fixed plant and road traffic.

Computational Noise Modelling

Noise modelling will be undertaken using nationally recognised modelling software (SoundPLAN v8.2) and widely accepted modelling algorithms (Calculation of Road Traffic Noise (CRTN) for road traffic, ISO 9613 for industrial and BS 5228 for construction). Data gathered during the baseline noise monitoring survey (see

Section 6.7.5 above) would be used in conjunction with local terrain data and masterplans plans to generate a model of the proposals. The computer noise model will take into account existing and future terrain data, any existing or proposed mitigation schemes and any existing or proposed structures.

The noise model would utilise the plant noise source data to predict likely noise levels at those closest receptors. Information such as construction areas and durations, would all feed into the model. Where information is not provided, datasheets from the plant manufacturer or in-house data, measured from similar plant items would be used for prediction purposes.

The computer noise model output will provide site wide noise contour plots and visually depict how the noise will likely attenuate across the Site. The model would allow for predictions at nearby receptors to determine compliance with the appropriate assessment criteria and assist, where applicable, with project specific mitigation measures.

Construction Assessment

The construction assessment would account for the following (primary) activities:

- Groundworks – cut and fill activities, access tracks, site establishment
- Cable trenching
- Vehicle / HGV movements
- Installation of infrastructure – to include PV system, BESS and Project Substation, National Grid Substation, grid connections, installation of new overhead line towers.

The contribution of the different construction activities would be assessed in line with the guidance in BS 5228-1:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites – Noise'*, plus any specific requirements of North Kesteven District Council. Where construction noise levels are considered to be excessive or intrusive, recommendations for noise control measures would be made.

The effect of construction traffic on the existing road network would be assessed in accordance with the requirements of Design Manual for Roads and Bridges (DMRB) 'LA 111 Noise and Vibration, 2020'. The assessment would determine the level of noise increase in the short term, due to the inclusion of construction traffic on the existing network.

In terms of vibration impacts, sensitive receptors and possible vibration generating construction activities would be identified. Activities which may have the potential to generate perceptible levels of vibration at sensitive receptors, or levels which may cause early signs of cosmetic or structural damage include, but are not limited to, piling, rolling and compaction. Where these activities are identified as occurring within the construction programme and within a short separation distance from a sensitive receptor, predictions of possible vibration levels would be made using guidance contained within BS 5228-2:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites – Vibration'*, and through empirical formulae. Predicted vibration levels would be assessed against appropriate criteria within BS 5228-2. Where the impact is predicted to be high or

significant as a result of construction induced vibration, control measures would be recommended, including the specification of minimum distances from construction.

Operational Assessment

The operational assessment would account for the following (primary) activities:

- Inverter / transformer stations
- Collector compounds (containing switchgear and transformer)
- Project Substation and BESS
- National Grid substation.

Operational impact will be assessed to the requirements of BS 4142:2014+A1: 2019 *'Methods for rating and assessing industrial and commercial sound'.* Noise predictions of the Proposed Development, derived from the computer noise modelling, would be compared with the existing background noise level ($L_{A90, T}$) at the nearest receptors to determine the level of impact. The assessment would utilise information regarding the number, type and noise emission data for the proposed fixed plant operating on the Site, in addition to the proposed Site layout. Where the assessment identifies potential and unreasonable impacts, guidance on potential noise control methods for the fixed plant and machinery will be provided (typically noise barriers, enclosures etc.). This will ensure the final design of the proposed installations can be developed to incorporate the required noise mitigation.

Decommissioning Assessment

The impact of decommissioning would follow the assessment outlined as part of the construction phase. At this stage, it is assumed that activities would not be significantly different to those proposed during construction, merely in reverse order. Where appropriate, the contribution of decommissioning and the movement of vehicles/HGVs would be assessed in accordance with BS 5228-1:2009+A1:2014 and Design Manual for Roads and Bridges (DMRB) 'LA 111 Noise and Vibration, 2020',

The significance criteria proposed for the Noise and vibration assessment are set out in **Appendix D.**

6.7.12. Difficulties and uncertainties

The ability to undertake the assessment is dependent upon the following relevant information:

- Details of development phasing plans (where applicable).
- Construction methodologies
  - plant lists
  - on-times
  - work hours
  - haul routes
  - detailed work areas.

- Confirmation of manufacturer's data (technical specification) document (in 1:3 octave bands) for all operational plant items.
- HGV movements (numbers as 18hr Averaged Annual Weekday Traffic, traffic composition and speed) for the construction phase, including route layouts.

6.7.13. References

- British Standards Institution (2019), 'British Standard 4142: 2014+A1: 2019, Methods for rating and assessing industrial and commercial sound'.
- British Standards Institution (2014), 'British Standard 5228-1: 2009+A1: 2014, Code of practice for noise and vibration control on construction and open sites – Noise'.
- British Standards Institution (2014), British Standard 5228-2: 2009+A1: 2014, Code of practice for noise and vibration control on construction and open sites – Vibration.
- British Standards Institution (2003), British Standard 7445-1:2003, Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.
- Design Manual for Roads and Bridges (2020), LA111 Noise and Vibration
- Welsh Office HMSO (1988), Department of Transport, 'Calculation of Road Traffic Noise'.

6.7.14. Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors / assets / resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors / matters that are proposed to be scoped in and out of the EIA?
- Do you agree with the proposed factor-specific assessment approach?

6.8. Traffic and transport

6.8.1 Consultation

No consultation to inform the traffic and transport assessments has been undertaken to date.

The key consultees will be the local highway authority and planning authority which may be impacted during the construction phase of the Proposed Development, as well as National Highways. Anticipated consultees are:

- North Kesteven District Council
- Lincolnshire County Council
- National Highways

Agreement of a study area for construction traffic is required, along with traffic distribution. Additionally:

- Specify aspects of the environment and issues relating to those that should be considered and addressed in the Environmental Statement (with emphasis on any issues local to the Site);
- Comment on or recommend, where appropriate, assessment methodologies, particularly in relation to sensitive receptors; and
- Highlight other relevant bodies or organisations that may have a vested interest in the Proposed Development or be able to provide relevant information.

Once the scoping opinion has been received, the response will be reviewed, and the relevant points raised therein taken forward and used to inform the EIA process. The specific outputs to support the DCO Application will depend on the outcome of the agreed scope.

6.8.2 Study area

The study area, focussing on the construction phase impacts, will comprise the following links , at the proposed site access points. At this stage, the location of access points is not known and as such, the following links will comprise the study area (at the site access points along the Site boundary):

- B1189
- B1188
- B1191
- A15.

These study area links have been identified assuming that all construction traffic routes to the Proposed Development will follow these links for access.

The extent of the study area would be discussed and agreed with the local highway authorities prior to assessment following the agreement of the access locations and the anticipated construction traffic routeing.

6.8.3. Data sources to inform the EIA baseline characterisation

There are a number of Department for Transport (DfT)traffic count points across the study area links. It is proposed that these datasets will provide suitable baseline traffic data, classified by vehicle type, along with any relevant local highway authority datasets where available. Any data gaps in this information may be supplemented with specifically commissioned traffic surveys (see **Section 6.8.4** below).

Local imagery and Ordnance Survey mapping would be utilised in the assessment.

6.8.4. Surveys to inform the EIA baseline characterisation

Existing relevant DfT traffic count data is available along the following links, which would be reviewed in reference to construction traffic routeing to each respective access and will be considered in line with traffic estimate data provided by the Applicant for the construction phase of the Proposed Development:

- B1189 (no DfT data available – supplementary traffic data to be used as required)
- B1188 2021 (data available for point North at Metheringam: 809565. Data for the following points is limited to 2008: North at Scopwick: 806250; South: 940400; East at Kirkby Green: 940394)
- B1191 (data is limited to 2008: 940402)
- A15 (2021 data available for points North: 16208 and South: 36224).

Where data is limited to 2008, and on any links within the study area which may be affected by construction traffic, then supplementary traffic data or new surveys may be required.

6.8.5. Baseline conditions

A preliminary review of the DfT online traffic data portal suggests that historic traffic counts are available for most of the main roads within the study area approaching the Proposed Development. Data for more local roads is less evident.

No information on land ownership/highways boundary is known at this stage but would be relevant based on the access location, if alterations are required.

The land use surrounding the Proposed Development is generally agricultural fields and local highway network with a number of existing local settlements. The Longwood Quarries site, which is located adjacent to the Site, would be considered in the assessment.

6.8.6. Additional (secondary and tertiary) mitigation

At this stage, the requirement for additional mitigation is not anticipated. However, this is subject to understanding the preferred construction traffic routes and upon definitive agreement of the study area with the Lincolnshire County Council as the local highway authority.

6.8.7. Description of likely significant effects

Construction and decommissioning works have the potential to impact sensitive receptors within the study area whereby increased traffic affects these receptors. Appropriate traffic control measures can be effective for minimising impacts by traffic generating activities associated with the construction and decommissioning phases with any adverse effects reduced or eliminated.

Construction and decommissioning traffic will comprise haulage / construction vehicles and vehicles used for workers' trips to and from the Site. The greatest impact will be in areas adjacent to the Site access and nearby local highway network. As the phases are temporary (construction and decommissioning), it is considered unlikely that significant numbers of vehicle movements associated with staff commuting to and from the site will be generated. Likewise, following the peak construction period, HGV vehicles are expected to be limited. The assessments proposed will determine this, with any significant impacts addressed within the EIA.

6.8.8. Receptors / matters to be scoped into the assessment

Receptor / Matter	Phase	Justification
B-Road B1189	Construction	During the construction phase, traffic will be generated by a range of activities including: • Construction workers arriving and leaving site areas/compounds; • Supply of construction materials and plant associated with the establishment of compounds and main construction works; • Movement of plant; • Removal of soil resources, spoil or waste; and • Service vehicles and visitors. Construction traffic estimates are as yet unknown. As such, this phase of works has been scoped in to enable consideration of impacts on receptors within the study area against the Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993).
B-Road B1188	Construction	
B-Road B1191	Construction	
A-Road A15	Construction	
Local (minor) roads	Construction	
B-Road B1189	Decommissioning	As with the Construction phase, the movement of workers, materials and plant during decommissioning are
B-Road B1188	Decommissioning	
B-Road B1191	Decommissioning	

A-Road A15	Decommissioning	likely to generate trips on the local highway network. At this stage, the number of anticipated trips is unknown and as such, consideration of the decommissioning phase has been scoped in.
Local (minor) roads	Decommissioning	

6.8.9. Receptors / matters to be scoped out of the assessment

Receptor / Matter	Phase	Justification
All	Operation	Once operational, the effect on the local road system is expected to be minimal. Access will be required from time to time for routine maintenance, and less frequently for major maintenance and upgrades. Therefore, it is not expected that the changes in traffic on the existing network will change by more than 30% for HGVs or all vehicle movements, these being defining thresholds for environmental effects on the local transport network.

6.8.10. Opportunities for enhancing the environment

With the exception of encouraging sustainable travel to and from the Site and use of sustainable vehicles where possible, it is not considered that there are opportunities for enhancement in relation to traffic and transport that can be identified at this stage.

6.8.11. Proposed assessment methodology

Assessment of the traffic and transport environmental impacts and their significance will be based on the Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment, 1993). This guidance provides two broad rules to be used as a screening process to identify the appropriate extent of the assessment area and likelihood of impacts. These are:

"Rule 1 - Include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%); and

Rule 2 - Include any other specifically sensitive areas where traffic flows would increase by 10% or more."

Where the predicted increase in traffic flow is lower than the thresholds, the Guidelines suggest the significance of the effects can be stated to be low or insignificant and further detailed assessments are not warranted.

Where construction traffic flows do exceed these thresholds, the significance of traffic and transport effects (including cumulative) will be determined by assessing the sensitivity of receptors against the magnitude of change to categorise

significance as Major, Moderate, Minor or Negligible. The environmental effects that may be assessed are namely:

- Severance
- Driver delay
- Pedestrian delay
- Pedestrian amenity
- Fear and intimidation
- Accidents and safety

Given that the day-to-day variation of traffic on a road is frequently at least plus or minus 10%, the Guidelines consider that projected changes in traffic flows of less than 10% create no discernible environmental impact, hence the second threshold as set out in Rule 2.

The following criteria will be used to evaluate the magnitude of identified adverse effects that may result from the Proposed Development:

- Major – where total traffic flows and/or HGVs are predicted to increase by `more than 30% or 10% in specifically sensitive areas
- Moderate – where total traffic flows and/or HGV traffic is predicted to increase between 10% and 30%
- Minor – where up to 10% increase in total traffic flows and/or HGV traffic is predicted
- Negligible – where there are no sensitive groups, locations or areas that would be affected by an increase in total traffic flows and HGV traffic.

The definitions of ‘major’, ‘moderate’, ‘minor’, and ‘negligible’ have been derived from the Guidelines. Effects of ‘major’ and ‘moderate’ are considered to be significant.

Significance of effect is a judgement about the combination of the magnitude of effect and the sensitivity of the receiving environment/receptor. The Environmental Statement will record judgements about the likely significance of effects arising from the Proposed Development.

6.8.12. Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- The overview of baseline conditions is based on desk-based studies only at scoping stage and is based on data available at the time of writing.
- The construction assessment will assume the use of standard construction techniques commensurate for the type of works being undertaken. The final techniques, plant selection and programme are expected to be determined by the appointed contractor, in consultation with relevant authorities prior to commencement of construction.

Traffic estimates for any stage of the Proposed Development are not confirmed at this time and may be subject to change but will be confirmed prior to assessment.

6.8.13. References

- Guidelines for the Environmental Assessment of Road Traffic (GEART)' (Institute of Environmental Assessment (1993)

6.8.14. Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of the EIA?
- Do you agree with the proposed factor-specific assessment approach?

7. Cumulative Effects

7.1. Proposed assessment methodology

7.1.1. Schedule 4(5)(e) of the EIA Regulations states that the ES should include *"a description of the likely significant effects of the development on the environment resulting from… the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".*

7.1.2. Regulation 4(2) states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors…..population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and the landscape. Regulation 4(2)(e) refers to the need to assess *'the interaction between those factors".*

7.1.3. There is no widely accepted methodology for assessing cumulative effects, although various best practice and guidance documents exist. However, relevant guidance has been considered, including from the Institute of Environmental Management and Assessment (IEMA) [**Ref. 7-1**]. and the assessment guidance set out in the Planning Inspectorate's Advice Note: Cumulative Effects Assessment [**Ref. 7-2**].

7.1.4. The following approach will be adopted for the assessment of cumulative effects, based on previous experience, the types of receptors being assessed, the nature of the Proposed Development, the other developments under consideration and the information available to inform the assessment.

7.1.5. The following types of cumulative effects will be considered in accordance with the EIA Regulations and best practice guidance:

- Intra-project combined effects – the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor; and
- Inter-project cumulative effects – the combined residual (post-mitigation) effects of the Proposed Development and other projects on a single receptor/resource, considering the deviation from the baseline conditions at common sensitive receptors/resources as a result of changes brought about as a result of the Proposed Development in combination with one or more other existing development and/or approved developments.

Intra-project combined effects

7.1.6. The approach to the assessment of interactions of environmental effects will consider the changes in baseline conditions at common sensitive receptors (i.e. those receptors that have been identified as experiencing likely significant effects by more than one environmental factor) due to the Proposed Development. The assessment will be based upon residual (post-additional mitigation) effects of **'slight / minor'** or greater significance only. The study area for the assessment will be informed by the study areas for the individual factor assessments.

7.1.7. The assessment of the intra-project combined effects will be undertaken using a two-stage approach:

Stage 1 – Screening

7.1.8. Screening will be undertaken to determine whether a sensitive receptor is exposed to more than one type of residual (post-additional mitigation) effect during the construction, operation and decommissioning phases of the Proposed Development. Those common sensitive receptors exposed to two or more types of residual (post-additional mitigation) effects, with significance of **'slight / minor'** or greater, will be taken forward to Stage 2 of the assessment.

7.1.9. If there is only one type of effect on a sensitive receptor (i.e. only one technical chapter has identified effects on that sensitive receptor), then it will be considered that there are no potential intra-project combined effects and the sensitive receptor will not be taken forward to Stage 2 of the assessment.

Stage 2 – Assessment of intra-project combine effects

7.1.10. A quantitative assessment of the overall significance of the cumulative effects on common sensitive receptors identified at Stage 1 will be undertaken based on technical information provided in the technical chapters and supporting appendices as well as professional judgement. Given that the types of effects may be very different in some cases, a quantitative assessment may not be possible, and it may be necessary to apply professional judgement in determining the significance of each individual effect.

7.1.11. The evaluation at the receptor level will consider: the magnitude of change at the common receptor; previously identified sensitivity; duration and reversibility of interaction. The focus will be on determining a change in the level of effect likely to be experienced and whether this is significant or not.

Inter-project cumulative effects

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

7.1.13. In accordance with Advice Note Seventeen, two clear stages will be taken in identifying the list of other existing development and / or approved developments which will be included within the inter-project cumulative effects assessment:

- Stage 1: establish a long list of other existing development and/or approved developments based on appropriate spatial and temporal limits.
- Stage 2: apply a clear rationale to establish a short list of other existing development and / or approved developments which, in combination with the Proposed Development, have the potential to result in a significant cumulative effect for inclusion within the assessment.

Stage 1: Long list methodology

7.1.14. In accordance with the 'Tier 1' and 'Tier 2' descriptions in Table 2 of Advice Note Seventeen, the following criteria will be used to establish the 'long list' of other existing development and/or approved developments, as at the time of submitting the DCO Application for the Proposed Development:

- Projects that are under construction but that will not be completed prior to the Proposed Development commencing (N.B. in accordance with Table 2 of Advice Note Seventeen, other projects that are expected to be completed before construction of the Proposed Development, and the effects of those projects have been fully determined within their respective applications, will be considered as part of the baseline);

- Projects with planning permission within the last five years[4] (whether under the PA2008 or other regimes), but not yet implemented;
- Submitted applications (whether under the PA2008 or other regimes), but not yet determined;
- Refusals subject to appeal procedures not yet determined; and
- Projects for which an application has not been submitted but have been the subject of an EIA scoping request.

7.1.15. It should be noted that with reference to 'Tier 3' descriptions in Table 2 of Advice Note Seventeen, the following will not be considered in the above criteria, as none of the below will have sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment, nor are any of the below considered by the Applicant to be 'existing and/or approved development':

- Projects that have not been the subject of an EIA scoping request;
- Projects that have been identified in the relevant Development Plan(s) (and emerging Development Plans);
- Projects identified in other plans and programmes (as appropriate) which set the framework for future development consents / approvals, where such development is reasonably likely to come forward.

7.1.16. Where an existing development and/or approved development meets one of the above criteria, it will be taken forward for further consideration against the following spatial limits to form the long list of other existing development and / or approved developments, as at the time of submitting the planning application for the Proposed Development:

- Employment developments: must lie within the Zone of Influence (ZoI) of the Proposed Development;
- Residential developments: must comprise 10+ dwellings and lie within the ZoI of the Proposed Development;
- Minerals and waste applications: must lie within the ZoI of the Proposed Development;

[4] A five-year period is considered a reasonable time period to capture all other existing development and/or approved developments that still have the potential to be built. Developments with planning permission older than five years will likely have been built or will not likely be built at all

- NSIP or DNS developments[5]: must lie within the ZoI of the Proposed Development;
- Transport infrastructure developments[6]: must lie within the ZoI of the Proposed Development; and
- Approved energy infrastructure developments must lie within the ZoI of the Proposed Development.

7.1.17. The ZoI is defined here as the study area for each environmental factor considered in the EIA for the Proposed Development. The environmental factor-specific study areas, and appropriate justifications for these study areas, will be provided in the ES. The search area for forming the long list of other existing development and/or approved developments will be based on the greatest ZoI in terms of distance.

7.1.18. A planning application search will be conducted to identify other existing development and/or approved developments using relevant planning portals. However, it is recognised that North Kesteven District Council, as the local planning authority, may be aware of additional proposals not yet fully in the public domain and hence comment is sought on any further developments that should, in the authority's opinion, be included in the cumulative effects assessment process.

7.1.19. Only if the other existing development and / or approved developments meet the Stage 1 criteria will they then been taken forward to Stage 2.

Stage 2: Short list methodology

7.1.20. Following the formation of the long list, the eligible other existing development and/or approved developments identified require further assessment (Stage 2) to establish a short list of other existing development and / or approved developments which, in combination with the Proposed Development, have the potential to result in significant cumulative effects.

7.1.21. The criteria used to determine whether to include or exclude an existing development and / or approved development on the short list will reflect the process established by Advice Note Seventeen and have regard to relevant policy and guidance documents and consultation with the appropriate statutory consultation bodies (particularly the local planning authority). Advice Note Seventeen states that the criteria should address the following:

[5] As defined by the Planning Act 2008 (as amended) and the Planning (Wales) Act 2015 and the Developments of National Significance (Wales) Regulations 2016 (as amended).
[6] Trunk roads or motorways only, as smaller transport infrastructure proposals would not likely have a significant cumulative effect.

- ***"Temporal scope:*** *The applicant may wish to consider the relative construction, operation and decommissioning programmes of the 'other existing development and/or approved development' identified in the ZOI together with the programme, to establish whether there is overlap and any potential for interaction.*
- ***Scale and nature of development****: The applicant may wish to consider whether the scale and nature of the 'other existing development and/or approved development' identified in the ZOI are likely to interact with the proposed development. Statutory definitions of major development and EIA screening thresholds may be of assistance when considering issues of scale.*
- ***Other factors:*** *The applicant should consider whether there are any other factors, such as the nature and/or capacity of the receiving environment that would make a significant cumulative effect with 'other existing development and/or approved development' more or less likely and may consider utilising a source-pathway-receptor approach to inform the assessment.*
- ***Documentation:*** *The CEA shortlisting process may be documented using Matrix 1 (Appendix 1). The reasons for excluding any development from further consideration should be clearly recorded. This will provide decision makers, consultation bodies and members of the public with a clear record of 'other existing development and/or approved development' considered and the applicant's decision making process with respect to the need for further assessment."*

7.1.22. Advice Note Seventeen suggests that professional judgement may also be used to supplement the threshold criteria and in order to avoid excluding 'other existing development and / or approved development' that is:

- *"Below the threshold criteria limits but has characteristics likely to give rise to a significant effect; or*
- *Below the threshold criteria limits but could give rise to a cumulative effect by virtue of its proximity to the proposed development."*

7.1.23. Taking the above into consideration, the other existing development and/or approved developments on the long list will be reviewed against the following criteria to form the short list of other existing development and/or approved developments, as at the time of submitting the planning application for the Proposed Development:

- **Criteria 1**: The other existing development and / or approved development has a construction, operational and/or demolition phase that is concurrent with the Proposed Development;
- **Criteria 2**: The other existing development and/or approved development and the Proposed Development share common sensitive receptors / resources which are assessed and described in the supporting environmental documentation, and have the potential to be significantly affected by the combination of the other existing development and / or approved development and the Proposed Development; and
- **Criteria 3**: The other existing development and/or approved development has sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment. The assessment of each existing development and / or approved development on the short list will be proportionate to the environmental assessment information available (N.B: An attempt will not be made to assess the potential environmental effects of any other development to inform the inter-project cumulative effects assessment. If there is an existing development and/or approved development that it is known will be progressed but has insufficient environmental assessment information, it still may be prudent to consider it in the inter-project cumulative effects assessment. This might take the form of listing the project and why it hasn't been considered in detail, or the potential cumulative effect could be discussed at a high level (qualitatively) using professional judgement).
- Where an existing development and / or approved development meets all of the above criteria, it will be taken forward for further consideration in the assessment.

7.1.24. Where an existing development and/or approved development approved development meets all of the above criteria, it will be taken forward for further consideration in the assessment.

7.2. Determining significant cumulative effects

7.2.1. There is no formal guidance on the criteria for determining significance of cumulative effects. The following principles will be considered when assessing the significance of cumulative effects in relation to both intra-project and inter-project cumulative effects:

- Is there an intra-project and/or inter-project effect on any receptors / resources;

- The nature of the receptors/resources affected;
- How the impacts identified combine to affect the condition of the receptor / resource;
- The probabilities of the impacts occurring in relation to each other in such a way so as to produce a cumulative effect, considering the extent and duration of the impact change;
- The ability of the receptor / resource to absorb further impacts; and
- Is the level of effect different to that considered at the project level and is the in-combination effect significant or not.

7.3. Difficulties and uncertainties

7.3.1. The assessment of inter-project cumulative effects will be limited to publicly available information obtained from the relevant planning applications on the Planning Inspectorate and North Kesteven District Council planning portal. For some of the identified other existing development and / or approved developments, relevant information for this assessment may not be available. Where this is the case, the inter-project cumulative effects assessment will be based upon assumptions and professional judgement, and some statements made would rely on the review of mitigation measures proposed as part of the other existing development and / or approved developments rather than the Proposed Development.

7.4. References

- **Ref. 7-1**: Institute of Environmental Management and Assessment (IEMA) (2011) 'The State of Environmental Impact Assessment in the UK'. Available at: https://s3.eu-west-2.amazonaws.com/iema.net/documents/knowledge/policy/impact-assessment/2011-State-of-EIA-IEMA.pdf
- **Ref. 7-2**: Planning Inspectorate (August 2019) Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects' (Version 2). Available online https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/

Appendix A – Site Boundary Plan

LEGEND:

Site Boundary

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
05	16/03/2023	RLB & Fig No.	FA	JG	DP
04	04/01/2023	Updated RLB	FA	JG	DP
03	16/12/2022	Parcel names	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
P663620_siteBoundary_A3L

TITLE:
Site Boundary Plan

FIGURE NUMBER:
Appendix A – Figure 1

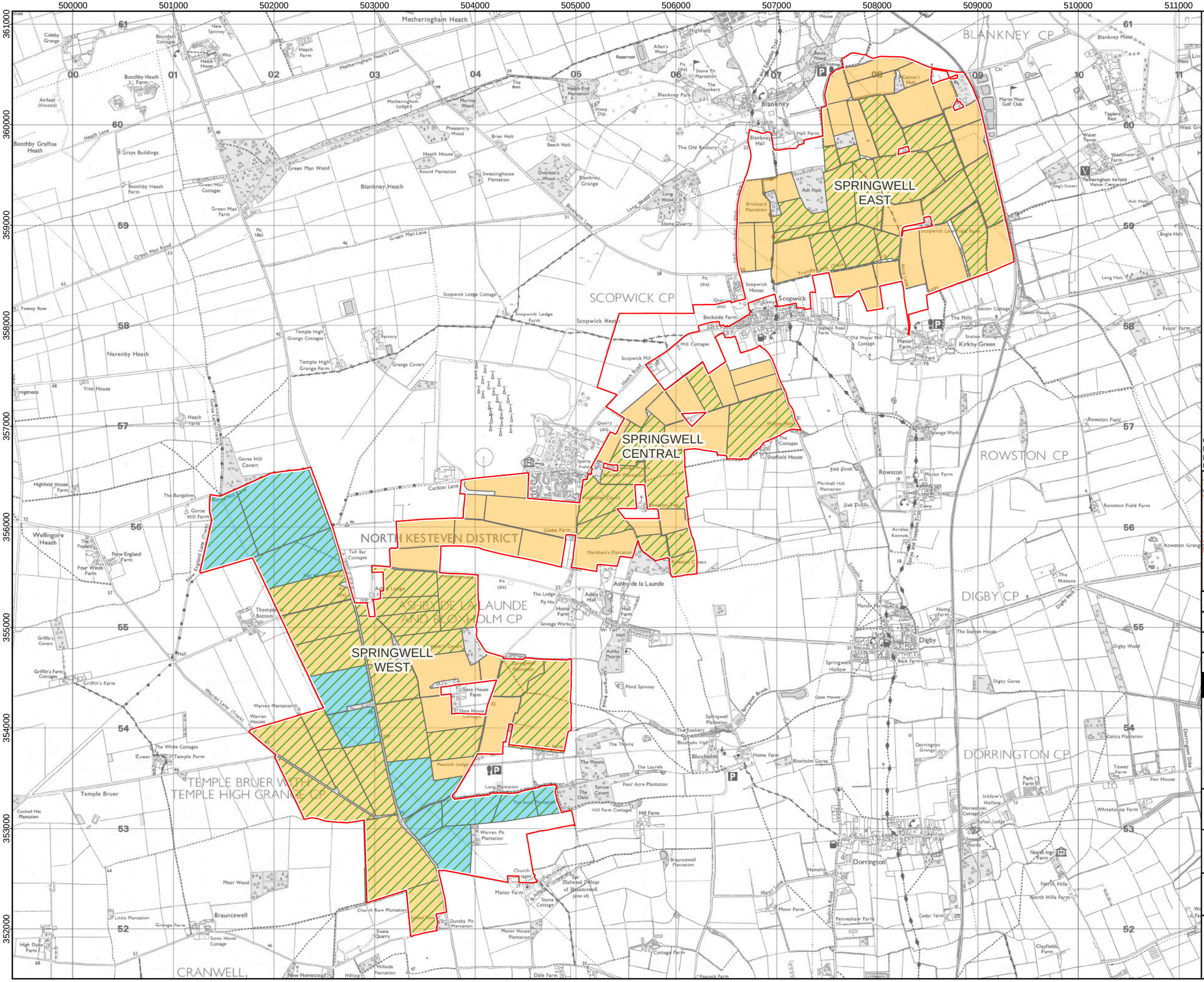
0 0.5 1
Kilometers

Scale: 1:35,000 @ A3

REV 05

P:\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\03Figures\01Final

Appendix B – Zonal Masterplan



LEGEND:

- Site Boundary
- Potential area suitable for collector compounds and distributed BESS
- Potential area for solar PV generating station
- Potential area for solar PV generating station, national grid substation, project substation, and/ or consolidated BESS

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
10	16/03/2023	RLB & Fig No.	FA	JG	DP
09	13/02/2023	Updated RLB	FA	JG	DP
08	04/01/2023	Updated RLB	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
P663620_fieldZonalMasterplan_A3L

TITLE:
Zonal Masterplan

FIGURE NUMBER:
Appendix B- Figure 1

0 0.5 1
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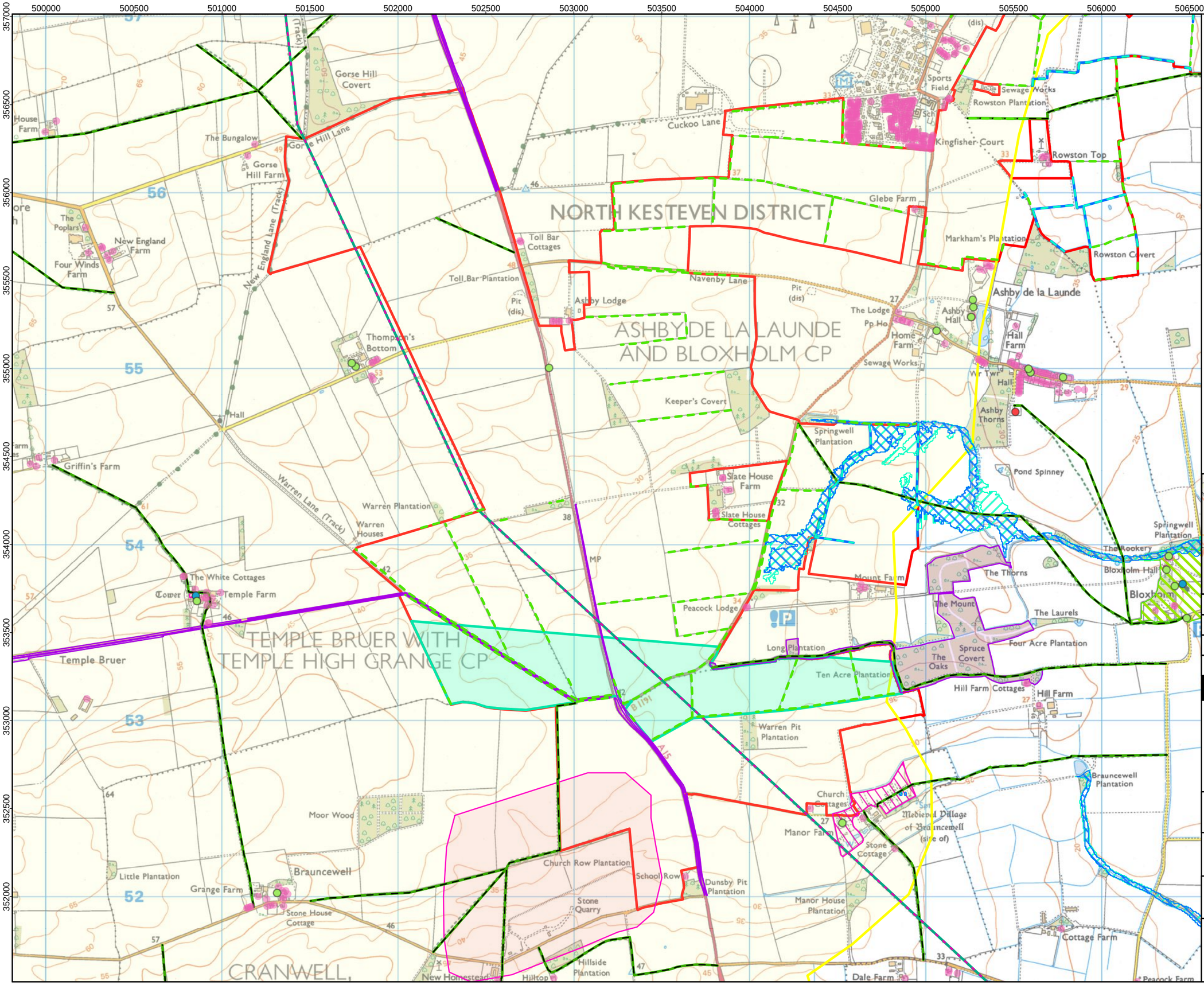
Scale: 1:35,000 @ A3

REV 10

P:\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\03Figures\01Final

Appendix C – Environmental Features Plan



LEGEND:

- Site Boundary
- Residential Properties

Listed Buildings

- I
- II
- II*

- Heritage Conservation Area
- National Grid OHL (400kV)
- Watercourse
- Watercourses Suitable for Water Vole
- Priority Hedgerow
- Public Rights of Way
- Scheduled Monuments
- Local Wildlife Sites
- Site Specific Minerals Safeguarding Area
- Limestone Minerals Safeguarding Area
- Flood Zone 3
- Flood Zone 2

Source Protection Zone

- Zone III - Total Catchment

Rev	Date	Description	Drn	Chk	App
07	16/03/2023	RLB & Fig No.	FA	JG	DP
06	23/02/2023	Added ALC Blankney	FA	JG	DP
05	09/01/2023	Updated Symbology	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
P663620_envFeatPlanWest_A3L

TITLE:
Environment Features Plan

FIGURE NUMBER:
Appendix C- Figure 1

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Kilometers

Scale: 1:20,000 @ A3

REV 07

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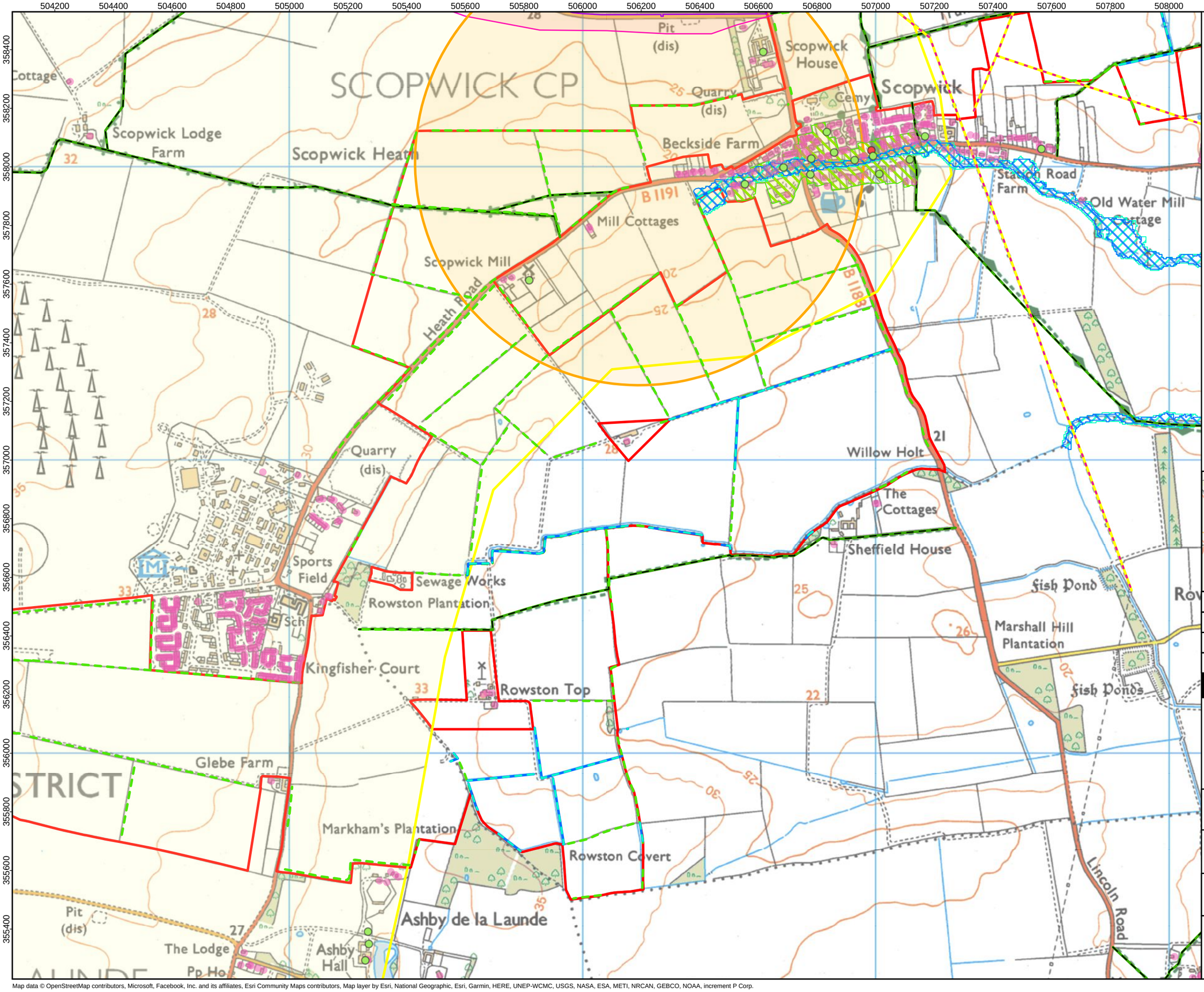

LEGEND:

- Site Boundary
- Residential Properties

Listed Buildings

- II
- II*
- Heritage Conservation Area
- Overhead Lines (132kV)
- Watercourse
- Watercourses Suitable for Water Vole
- Priority Hedgerow
- Public Rights of Way
- Local Wildlife Sites
- Site Specific Minerals Safeguarding Area
- Limestone Minerals Safeguarding Area
- Flood Zone 3
- Flood Zone 2

Source Protection Zone

- Zone I - Inner Protection Zone

Rev	Date	Description	Drn	Chk	App
06	16/03/2023	RLB & Fig No.	FA	JG	DP
05	09/01/2023	Updated Symbology	FA	JG	DP
04	05/01/2023	Updated Symbology	FA	JG	DP

Springwell Solar Farm

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

DOCUMENT:
P663620_envFeatPlanCentral_A3L

TITLE:
Environment Features Plan

FIGURE NUMBER:
Appendix C- Figure 2

0 0.5
Kilometers

Scale: 1:12,000 @ A3

REV 06

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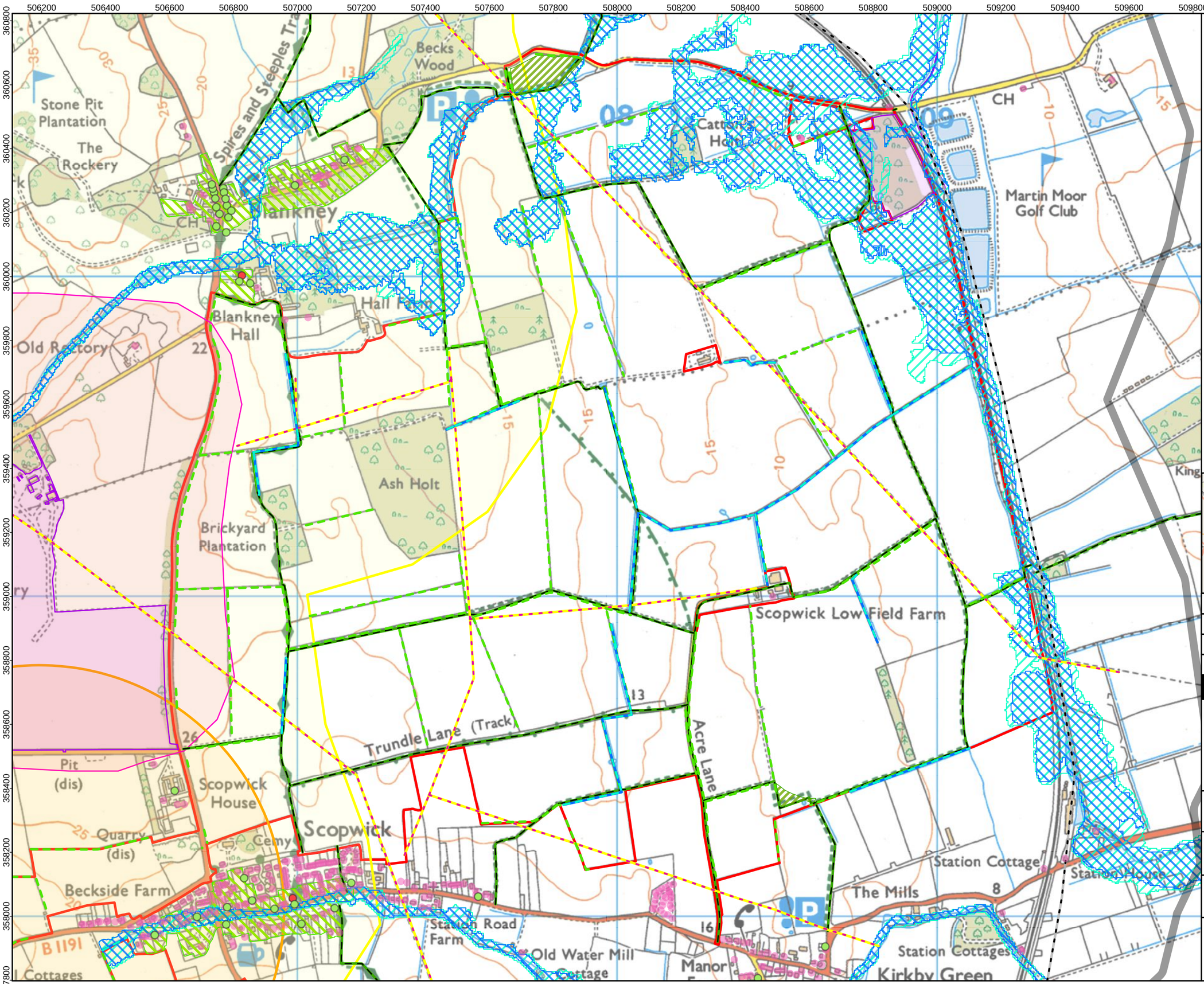


LEGEND:

- Site Boundary
- Residential Properties

Listed Buildings

- II
- II*
- Heritage Conservation Area
- Railway
- Overhead Lines (132kV)
- Watercourse
- Watercourses Suitable for Water Vole
- Priority Hedgerow
- Public Rights of Way
- National Grid Gas Pipe
- Grassland Suitable for Reptiles
- Local Wildlife Sites
- Site Specific Minerals Safeguarding Area
- Limestone Minerals Safeguarding Area
- Flood Zone 3
- Flood Zone 2

Source Protection Zone

- Zone I - Inner Protection Zone

Rev	Date	Description	Drn	Chk	App
06	16/03/2023	RLB & Fig No.	FA	JG	DP
05	09/01/2023	Updated Symbology	FA	JG	DP
04	05/01/2023	Updated Symbology	FA	JG	DP

Springwell Solar Farm

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

DOCUMENT:
P663620_envFeatPlanEast_A3L

TITLE:
Environment Features Plan

FIGURE NUMBER:
Appendix C- Figure 3

0 0.2 0.4
Kilometers

Scale: 1:11,000 @ A3

REV 06

P:\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\03Figures\01FinalConstraints\P663620_envFeatPlanCentral_A3L

Appendix D – Signifiance Criteria

APPENDIX D – SIGNIFICANCE CRITERIA

Air Quality

The significance level attributed to each effect will be assessed based on the magnitude of change due to the Proposed Development and the sensitivity of the affected receptor.

Construction Phase: Dust and Particulate Matter Emissions Impact

The Institute of Air Quality Management (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' criteria and methodology will be adopted to determine the sensitivity of the receptor and the magnitude of change.

Table D1.1 below sets out the general principles, along with professional judgement, that will be considered to determine the scale of sensitivity that will be applied to receptors identified and considered within the construction phase assessment.

Table D1.1 Scale of receptor sensitivity to be used in the construction phase assessment

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	Users can reasonably expect an enjoyment of a high level of amenity. The appearance, aesthetics or value of their property would be diminished by soiling. The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day) Examples include residential properties, hospitals, schools and residential care	Locations with an international or national designation and the designated features may be affected by dust soiling. Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain. Examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
	land. Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home. The appearance, aesthetics or value of their property could be diminished by soiling. The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples include parks and places of work.	Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Examples include office and shop workers, but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition. Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
Low	The enjoyment of amenity would not reasonably be expected. Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.	Locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. Example is a local Nature Reserve with dust sensitive features.

Table D1.2 below presents the potential magnitude of change for dust emissions that will be used in undertaking the construction phase assessment. The descriptors included in this table are based upon the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction'.

Table D1.2 Scale of magnitude for dust emission impacts to be used in the construction phase assessment

Activity	Magnitude	Description
Demolition	Large	Total building volume >50,000m3, potentially dusty construction material, on-site crushing and screening, demolition activities >20m above ground level.
	Medium	Total building volume 20,000m3 – 50,000m3, potentially dusty construction material, demolition activities 10m – 20m above ground level.
	Small	Total building volume <20,000m3, construction material with low potential for dust release, demolition activities <10m above ground, demolition during wetter months.
Earthworks	Large	Total site area >10,000m2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonnes.
	Medium	Total site area 2,500 – 10,000m2, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8m in height, total material moved 20,000 – 100,000 tonnes.
	Small	Total site area < 2,500m2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <10,000 tonnes, earthworks during wetter months.
Construction	Large	Total building volume >100,000m3, piling, on site concrete batching.

Activity	Magnitude	Description
	Medium	Total building volume 25,000 – 100,000m3, potentially dusty construction material (e.g. concrete), piling, on site concrete batching.
	Small	Total building volume <25,000m3, construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout	Large	>50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m.
	Medium	10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100m.
	Small	<10 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m.

The sensitivity of receptor and magnitude of change will then been combined using the significance matrix as detailed in **Table D1.3** below to determine the potential risks from emissions from unmitigated demolition, earthworks, construction and trackout activities, which will be used to recommend site-specific mitigation measures. The classification of risk is based upon the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction'.

Table D1.3 Classification of risk of unmitigated impacts

Sensitivity of Area		Dust Emission Magnitude		
		Large	**Medium**	**Small**
Demolition	High	High Risk	Medium Risk	Medium Risk
	Medium	High Risk	Medium Risk	Low Risk

	Low	Medium Risk	Low Risk	Negligible
Earthworks	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Construction	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Trackout	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Low Risk	Negligible
	Low	Low Risk	Low Risk	Negligible

Construction Phase: Traffic Exhaust Emissions Impact

The significance of effects of exhaust emissions arising from construction vehicles will be evaluated qualitatively using professional judgement and the principles of the EPUK/IAQM 'Land-Use Planning & Development Control: Planning for Air Quality' significance criteria. **Table D1.4** presents the EPUK-IAQM guidance screening criteria for when an air quality assessment might be required. If none of the criteria are exceeded, it is considered unlikely that there will be any significant effects on air quality during the operational phase.

Table D1.4 Air quality screening criteria from EPUK-IAQM 2017 guidance

The Development will…	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV)	A change of LDV flows of:

The Development will…	Indicative Criteria to Proceed to an Air Quality Assessment
traffic slows on local roads with relevant receptors.	- more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors.	A Change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA
Introduce a new junction or remove an existing junction near to relevant receptors.	Where the change is 5m or more and the road is within an AQMA
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA - more than 100AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors.	Typically, any combustion plant where the single or combined NOx emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion.

The Development will…	Indicative Criteria to Proceed to an Air Quality Assessment
	In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

Biodiversity

The determination of ecologically significant effects for ecological impact assessment (EcIA), as discussed below, is taken from 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)

Significant Effects

For the purpose of EcIA, a significant effect is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. It is a positive or negative effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales, from international to local.

A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects have been lawfully permitted following EIA procedures. Significant effects should be qualified with reference to an appropriate geographic scale. For example, a significant effect on a Site of Special Scientific Interest is likely to be of national significance. European case law is specific regarding significance in relation to European sites and Annexed habitats. However, the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, an effect on a species which is on a national list of species of principal importance for biodiversity may not have a significant effect on its national population. Examples of other relevant scales include regional and county. It should be noted that effects may be significant at the local scale, particularly in view of policies for no net loss of biodiversity.

When seeking mitigation and/or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and/or compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Determining Ecologically Significant Effects

Designated/defined sites and ecosystems

Significant effects encompass impacts on the structure and function of defined sites and ecosystems. The following need to be determined:

- for designated sites – is the project and associated activities likely to undermine the conservation objectives of the site, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features?
- for ecosystems – is the project likely to result in a change in ecosystem structure and function?

Consideration should be given to whether:

- any processes or key characteristics will be removed or changed
- there will be an effect on the nature, extent, structure and function of component habitats
- there is an effect on the average population size and viability of component species.

Consideration of functions and processes acting outside the formal boundary of a designated site is required, particularly where a site falls within a wider ecosystem e.g. groundwater dependent terrestrial ecosystems can be damaged where the proposed activity impacts on the quantity or quality of groundwater that feeds these habitats. Predictions should always consider wider ecosystem processes.

Many ecosystems have a degree of resilience to perturbation that allows them to tolerate some biophysical change. Ecological effects should be considered in light of any information available or reasonably obtainable about the capacity of ecosystems to accommodate change.

Habitats and species

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area
- species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

In many cases (e.g. for species and habitats of principal importance for biodiversity), there may be an existing statement of the conservation status of a feature and objectives and targets against which the effect can be judged. However, not all species or habitats will be described in this way and the conservation status of each feature being assessed may need to be agreed with the relevant statutory nature conservation body and set out in the EcIA. The conservation status of a habitat or species will vary depending on the geographical frame of reference.

When assessing potential effects on conservation status, the known or likely background trends and variations in status should be taken into account. The level of ecological resilience or likely level of ecological conditions that would allow the population of a species or area of habitat to continue to exist at a given level, or continue to increase along an existing trend or reduce a decreasing trend, should also be estimated.

Precautionary Principle

The evaluation of significant effects should always be based on the best available scientific evidence. If sufficient information is not available, further survey or additional research may be required. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect should be assumed. Where uncertainty exists, it must be acknowledged in the EcIA.

Climate

Given the international urgency of climate change, the sensitivity of the receptor (i.e. global climate) to fluctuations in greenhouse gas emissions is considered 'Very High'. Thus, the level of the significance of effects is determined by the magnitude, and timing, of greenhouse gas emissions and the likelihood of avoiding severe climate change.

Aligned with IEMA's Guide 'Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition' (February 2022), any project that causes greenhouse gases to be avoided, or removed from the atmosphere, has a beneficial effect that is always significant (**Table D2.1**). In such a scenario, the project substantially exceeds the national net zero requirements and is thus aligned with the goal of the Paris Agreement to limit temperature rise to well below 2°C, aiming for 1.5°C.

Table D2.1 Framework for assessment of significant effects

Significance	Level	Criteria
Significant	Major adverse	Project adopts a business-as-usual approach, not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement (i.e., a science-based 1.5°C trajectory). Greenhouse gas impacts are not

Significance	Level	Criteria
		mitigated or reduced in line with local or national policy for projects of this type.
	Moderate adverse	Project's greenhouse gas impacts are partially mitigated, and may partially meet up-to-date policy; however emissions are still not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement.
Not significant	Minor adverse	Project may have residual emissions, but the project is compatible with the goals of the Paris Agreement, complying with up-to-date policy and good practice.
	Negligible	Project has minimal residual emissions and goes substantially beyond the goals of the Paris Agreement, complying with up-to-date policy and best practice.
Significant	Beneficial	Project causes greenhouse gas emissions to be avoided or removed from the atmosphere, substantially exceeding the goals of the Paris Agreement with a positive climate impact.

Cultural Heritage

Importance of Heritage Assets

The importance of a heritage asset is a measure of the degree to which the heritage significance of that asset is sought to be protected through legislation and planning policy . The level of importance will therefore reflect any statutory and non-statutory heritage designation or, in the case of undesignated assets, the professional judgement of the assessor as to the degree of importance that the asset has with reference to regional research frameworks.

The criteria presented in **Table D3.1** will be used to establish the importance of heritage assets. These criteria have been derived from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland.

Table D3.1 Criteria for establishing importance of heritage assets

Importance	Description of receptors
Very High	World heritage sites; assets of acknowledged international importance; assets that can contribute significantly to acknowledged international research objectives; Historic landscapes of international value (designated or not) and extremely well preserved historic landscapes with exceptional coherence, time depth or other critical factor(s).
High	Scheduled monuments and non-designated assets of schedulable quality and importance; Grade I and II* listed buildings and Grade II listed buildings that can be shown to have exceptional qualities in their fabric or associations; Conservation Areas with exceptional qualities; non-designated structures of clear national importance; designated and non-designated historic landscapes of historic interest; assets that can contribute significantly to acknowledged national research objectives.
Medium	Grade II listed buildings; Non-designated assets that contribute to regional research objectives; Locally listed buildings and other historic unlisted buildings that have exceptional qualities; Conservation Areas.
Low	Non-designated assets of local importance including those compromised by poor preservation; assets of limited value but with the potential to contribute to local research objectives; robust non-designated historic landscapes.
Negligible	Assets with very little surviving archaeological interest; buildings of little architectural or historic note; landscapes with little historic interest

Magnitude of Impact

The magnitude of impact will reflect the scale of change which would be caused by the Proposed Development and the effect this would have on ability to interpret significance and appreciate the historic asset. Impacts can result either from physical changes to the fabric of a historic asset or through sensory changes within its setting.

An impact may be positive where for example, as part of the Proposed Development, an intrusive building or feature is removed or replaced with a more harmonious one; historic features are restored or revealed; a new feature is added which adds to public

appreciation; new views are introduced that add to public experience of an asset; or public interpretation or access is improved to an asset or its setting.

Impacts may impart major change, for example where groundworks completely destroy important archaeological remains, to minor change to part of a historic assets' setting, leading to a limited impact on our ability to interpret it, or its context.

Utilising the key principles for assessing the implications of change outlined above, an assessment of the magnitude of impact will be implemented for each baseline heritage asset using the criteria presented in **Table D3.2** below. These criteria have been derived from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland .

Conclusions of the assessed magnitude of impacts are a product of the consideration of the elements of an asset and its setting that contribute to its heritage significance and the degree to which the Proposed Development would change these contributing elements. The assessment therefore reflects the varying degrees of sensitivity of different assets to change brought about by different types of development.

Table D3.2 Criteria for classifying magnitude of impact

Impact Magnitude	Criteria
Major	Change to key historic building elements so that an asset is totally altered; OR change to most/all key archaeological materials such that the resource is totally altered; OR comprehensive change to the setting such that the significance of the asset is severely compromised
Moderate	Change to many key historic building elements, such that the asset is significantly modified; changes to many key archaeological materials such that the resource is clearly modified; changes to setting of an asset, such that the significance of the asset is compromised
Minor	Change to key historic building elements, such that the asset is slightly different; changes to key archaeological materials such that the asset is slightly altered; changes to setting of an historic building, such that its significance is slightly compromised
Negligible	Very minor changes to historic building elements, archaeological materials or setting that hardly affect them/it

Impact Magnitude	Criteria
No Change	No change to fabric, archaeological materials or setting

Significance of Effect

The assessment of effects will combine analysis of the data gathered during the desk-based assessment and site visit, photographs and any wireframe visualisations of the topography and Proposed Development.

These assessments will be carried out using professional judgement, taking into account designations and heritage significance as assessed against national standards. Significance of effect will be based on a combination of importance (in other disciplines sometimes referred to as sensitivity) of the asset (receptor) and the magnitude of impact upon that asset (receptor). The significance of effect matrix is presented in **Table D3.3** below and provides a guide to decision-making but is not a substitute for professional judgement and interpretation, particularly where the importance or impact magnitude levels are not clear or are borderline between categories. The significance of effect may be described on a continuous scale from 'no effect' to 'major'. These criteria have been derived from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland .

It is also common practice to identify effects as significant or not significant, and in this sense major and moderate effects are regarded as significant, while minor and negligible effects are not significant'.

Table D3.3 Criteria for assessing the significance of effect

Magnitude of Impact	Importance				
	Negligible	**Low**	**Medium**	**High**	**Very High**
Major	Minor	Moderate	Moderate	Major	Major
Moderate	Negligible	Minor	Moderate	Moderate	Major
Minor	Negligible	Negligible	Minor	Minor	Moderate
Negligible	Negligible	Negligible	Negligible	Minor	Minor

No Change	No effect	No effect	No effect	No effect	No effect

Landscape and Visual

The 'Guidelines for Landscape and Visual Assessment (Third Edition)' (GLVIA3) state that "professional judgement is a very important part of the LVIA" (paragraph 2.23) and that "in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others." (paragraph 2.24). It goes on at paragraph 3.32 to state that "there are no hard and fast rules about what effects should be deemed 'significant" but LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects."

Landscape and visual assessments are separate, though linked processes which GLVIA3 notes are "related but very different considerations". The assessment of the potential effect on the landscape is carried out as an effect on the environmental resource (i.e. the landscape). Visual effects are assessed as an inter-related effect on people.

Landscape effects

The **sensitivity** (high, medium, low) of the landscape to a particular development is considered on a case by case basis and considers the susceptibility of the landscape, which varies depending on the type of development proposed and the particular site location, and the landscape value (identified as national, regional, or community). As stated in GLVIA3, 'LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning, but is not the same'.

- **Landscape value**: The importance attached to a landscape, often used as a basis for designation or recognition which expresses national or local authority consensus, because of its special qualities/attributes. The factors which are considered in landscape include aesthetic or perceptual aspects such as scenic beauty, tranquillity or wildness or cultural associations as well as recreational/community value, conservation interests, landscape character and condition and representativeness/rarity.

- **Landscape susceptibility** according to GLVIA3 means "the ability of the landscape to accommodate the proposed Development without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies". Judgements on landscape susceptibility (high, medium, low) include references to both the physical and aesthetic characteristics and the potential scope for mitigation.

The criteria and the detailed judgements regarding susceptibility and value of landscape receptors will be set out in the LVIA. Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor aa

illustrated by **Table D4.1** below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Table D4.1 Landscape sensitivity criteria

		Susceptibility		
		High	**Medium**	**Low**
Value	**National**	High	High/medium	Medium
	Regional	High/Medium	Medium	Medium/Low
	Community	Medium	Medium/Low	Low

The **magnitude of landscape change** arising from the Proposed Development at any particular location is assessed in terms of its size or scale, geographic extent of the area or receptor that is influenced and its duration and reversibility.

The **scale** of the change takes account of:

- Degree of loss or alteration to key landscape features/elements; characteristics; and for designated areas – special qualities and/or purposes of designation;
- Distance from the Proposed Development;
- Landscape context to the Proposed Development;

Having established the size/scale of change (large, medium, small, negligible) to the landscape baseline, the geographic **extent** of the change can be identified (wide, intermediate, localised or limited) and a judgement made as to the degree of change for each landscape receptor.

Duration and reversibility can be linked depending on the nature of the development. Reversibility is a judgement about the ability and practicality of the Proposed Development to be reversible (such as wind farms which are predominantly reversible) or a permanent change in the landscape (such as housing). Duration reflects how long the change will last. The duration of the change would be considered short term when

lasting less than 2-3 years; medium term when lasting between 2 and 10 years; or long term when lasting between 10 and 25 years, and permanent for more than 25 years.

Magnitude is considered taking into account the three contributory factors as illustrated by the diagrams presented in **Figure E4.1** below.

Visual effects

In order to identify the significance of a visual effect, it is necessary to establish the relative sensitivity of the viewers and the magnitude of the change they experience. In this case, sensitivity is a combination of both susceptibility of the viewer to the proposed change and the value of the views.

Those living within view of the Proposed Development are usually regarded as the highest susceptibility group as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective. The susceptibility of potential visual receptors will also vary depending on the activity of the receptor. For visual receptors, susceptibility and value are closely linked - the most valued views are also likely to be those where viewer's expectations will be highest.

The **value** of public views, which is the focus of GLVIA3, is identified as national, regional or community and will vary depending on the nature, location and context of the view and the recognised importance of the view. Considerations include cultural associations; designation or policy protection; views of or from landmarks; and/or the scenic quality of the view. The value attributed relates to the value of the view, e.g. a National Trail is nationally valued for access, but not always for the available views from every section.

Visual receptor **susceptibility** is defined as in accordance with the criteria below.

- **High** - Local residents; users of outdoor recreation focussed on the appreciation of views including footpaths, beauty spots and picnic areas; people experiencing views to or from important features of physical, visual, cultural or historic interest.

- **Medium** - Local road users and travellers on trains. People engaged in outdoor recreation with some appreciation of the landscape e.g. road cycling, nature conservation, golf and water based recreation.

- **Low** - Workers, users of facilities and commercial buildings (indoors) experiencing views from buildings. Road and rail users on fast moving commuting or trunk routes. Visual receptors where views are incidental to the activity and/or location.

Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor, as illustrated by **Table D4.2** below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Table D4.2 Visual sensitivity criteria

		Susceptibility		
		High	**Medium**	**Low**
Value	**National**	High	High/medium	Medium
	Regional	High/Medium	High/Medium	Medium/Low
	Community	High/Medium	Medium	Low

The **magnitude of visual change** arising from the Proposed Development at any particular location is assessed in terms of its size or scale (large, medium, small, negligible), geographic extent of the area or receptor that is influenced (wide, localised, limited) and its duration (short, medium, long, permanent). Effects are described in such a way as to identify where views towards the Proposed Development are likely to arise and what the scale and duration and extent (wide, intermediate, Localised, Limited) of those views are likely to be.

The **scale of effect** arising from the Proposed Development at any particular viewpoint reflects the degree to which the nature of the views from that location would be changed and is taking into account:

- The distance of the viewpoint from the Proposed Development;
- The degree to which the Proposed Development is visible or screened;
- The angle of view in relation to main receptor activity or main focus of the view;
- The horizontal and vertical field of view occupied by the Proposed Development; and
- The extent and nature of other built development visible.

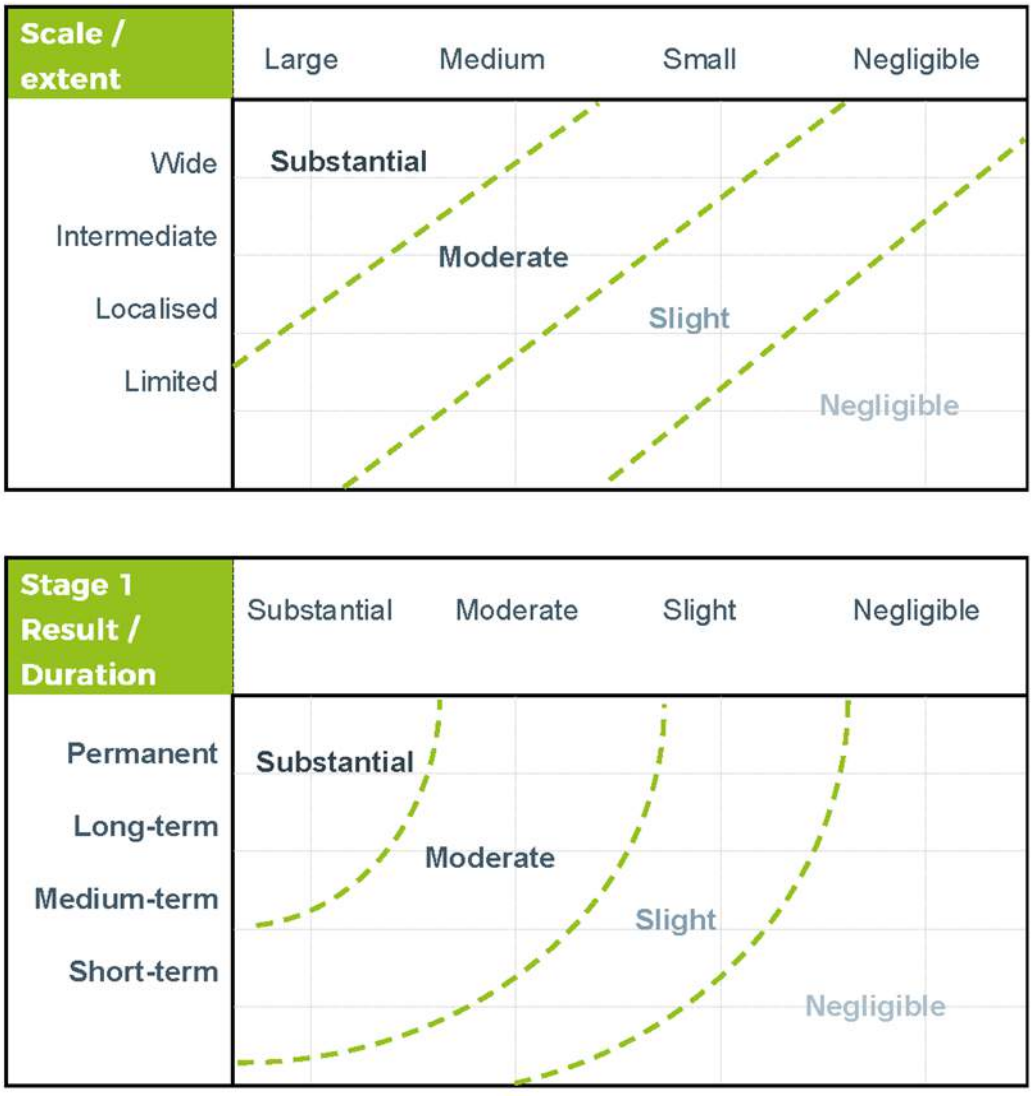
Duration reflects how long the change will last and are rated in the same way as described above for landscape effects. The effects as a result of the Proposed Development would be considered short term when lasting less than 2-3 years; medium term when lasting between 2 and 10 years; or long term when lasting between 10 and 25 years, and permanent for more than 25 years. For visual receptors moving through the landscape (e.g. road and rail users), the length of their journey during which they would see the Proposed Development is reflected in the judgement of the geographic extent of effects.

Magnitude is considered taking into account the three contributory factors as illustrated by the diagrams presented in **Figure D4.1** below.

Magnitude of landscape and visual change

Scale of effect is the first factor in determining magnitude; which may be higher if the effect is particularly widespread and/or long lasting, or lower if it is constrained in geographic extent and/or timescale. The diagrams below presented in **Figure D4.1** illustrate how this judgement is considered as a two-step process. Firstly, scale and extent are considered, for which the outcomes are illustrated by the first part of the diagram; the second part of the diagram illustrates the influence of duration on this initial judgement. Where magnitude is judged to lie between levels, an intermediate assessment will be adopted.

Figure E4.1 Scale of effect diagrams



Significance of landscape and visual effects

The significance of any identified landscape or visual effect is assessed as major, moderate, minor or negligible. These categories are based on the consideration of

sensitivity with the predicted magnitude of change. **Table D4.3** below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.

Table D4.3 Significance of effect criteria

		Magnitude of Change			
		Substantial	**Moderate**	**Slight**	**Negligible**
Receptor Sensitivity	**High**	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/Negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

Where the effect has been classified as Major or Major/Moderate, this is considered to be equivalent to likely significant effects. Where 'Moderate' effects are predicted, professional judgement will be applied to ensure that the potential for significant effects arising has been thoroughly considered.

Landscape and visual effects can be beneficial or adverse and in some instances may be considered neutral. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both. Whether an effect is beneficial, neutral or adverse is identified based on professional judgement. GLVIA3 indicates at paragraph 2.15 that this is a "particularly challenging" aspect of assessment, especially in the context of a changing landscape.

Land, Soils and Groundwater

Receptor Sensitivity

Sensitivity criteria, derived from professional judgement, are defined in **Table D5.1.**

Table D5.1: Receptor sensitivity

Sensitivity	Definition
Very High	The receptor is highly sensitive and could be easily damaged by activities associated with the Proposed Development. The

Sensitivity	Definition
	receptor is likely to be of national significance. The recovery of the receptor is either impossible or very long term.
High	The receptor is of high sensitivity and is of importance at a local or regional level. The receptor is vulnerable to the effects of the Proposed Development and recovery would be slow and/or costly (e.g. remedial measures to groundwater may be required to prevent a wider impact).
Medium	The receptor is of medium value and is likely to be of local importance. The receptor is slightly vulnerable to impacts from the Proposed Development and would be expected to recover over a moderate timescale (e.g. up to 5 years for groundwater to return to its current or an improved condition).
Low	The receptor is of low value and has little contribution to local, regional or national resources. The receptor is not generally vulnerable to impacts that may arise from the Proposed Development and/or will recover over a short timescale (e.g. up to 1 year before groundwater returns to its current or improved condition).
Negligible	The receptor is of negligible positive value. The receptor is not vulnerable to impacts that may arise from the Proposed Development and/or will recover quickly.

Magnitude of Impact

Where an impact is considered to be present, the magnitude of the impact will be classified using the criteria presented in **Table D5.2** below, which are derived from professional judgement. Impacts can be beneficial or adverse.

Table D5.2 Magnitude of impact criteria

Magnitude of impact	Definition
Major	These impacts are likely to be important considerations at a regional or district scale, and if adverse, are potential concerns, depending upon the relative importance attached to the issue

Magnitude of impact	Definition
	during the decision-making process. Mitigation measures and detailed design work are unlikely to remove all the impacts upon the affected communities or interests. Examples include short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA; short-term risk of pollution of sensitive water resources; catastrophic damage to buildings or property; and short-term risk to an ecosystem or part of an ecosystem.
Moderate	These impacts, if adverse, while important at a local scale, are not likely to be key decision-making issues. The cumulative effect of such issues may lead to an increase in the overall impacts on a particular area or on a particular resource. They represent issues where impacts will be experienced but mitigation measures and detailed design work may ameliorate/enhance some of the consequences upon affected communities or interests. Some residual impacts will still arise. Examples include chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000); pollution of sensitive water resources; and significant change in an ecosystem or organism forming part of that ecosystem.
Minor	These impacts may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in the detailed design of the Proposed Development and consideration of mitigation or compensation measures. Examples include pollution of non-sensitive water resources; significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000); and damage to sensitive buildings, structures or the environment.
Negligible	No change or a barely perceptible change from the baseline position. Examples include non-permanent human health impacts easily prevented by use of personal protective

Magnitude of impact	Definition
	clothing; and easily repairable damage to buildings, structures and services.

Significance of Effect

The significance of effect will be based on the sensitivity of the receptor and the magnitude of impact, as outlined in **Table D5.3** below. The significance of effect can be adverse or beneficial.

Table D5.3: Significance of effect criteria

		Magnitude of Impact			
		Major	**Moderate**	**Minor**	**Negligible**
Sensitivity	**Very High**	Very High	High	Moderate	Moderate/Low
	High	High	Moderate	Moderate/ Low	Low
	Medium	Moderate	Moderate/ Low	Low	Very Low
	Low	Moderate/ Low	Low	Very Low	Very Low
	Negligible	Low	Very Low	Very Low	Very Low

Noise and Vibration

The method for assessing the significance of noise from construction activities are provided within Annex E of BS 5228. One such method of applying significance to noise effects is repeated in **Table D6.1.**

Table D6.1 Criteria for assessing potential significant effects

Assessment Category and Threshold Value Period, L_{Aeq}	Threshold Value in Decibels, dB		
	Category A[1]	Category B[2]	Category C[3]
Night-time (23.00−07.00)	45	50	55
Evenings and weekends [4]	55	60	65
Daytime (07.00−19.00) and Saturdays (07.00−13.00)	65	70	75

[1] Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

[2] Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

[3] Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

[4] 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

A significant effect has been deemed to occur if the site noise level (construction only), exceeds the threshold level for the Category appropriate to the ambient noise level for a month or more. If the baseline ambient noise level exceeds the Category C values, then a significant effect is deemed to occur if the total noise level (construction + ambient noise) for the period increases by more than 3 dB.

Works for a shorter duration that might result in a significant effect are considered by using the trigger levels for sound insulation and time criteria from Annex E.4 of BS 5228-1.

BS 5228-2: 2009 +A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration'

BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration' (BS5228) provides guidance on vibration levels that can be used to assess the likely impacts of construction activities on buildings and on humans. Annex B of the standard gives guidance on the significance of vibration effects in terms of human response to vibration and structural response, as presented in **Table D6.2** and **Table D6.3** respectively below.

Table D6.2 Guidance on effects of vibration levels perceptible on humans

Vibration Level (PPV)	Effect
0.14 mms^{-1}	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration
0.3 mms^{-1}	Vibration might be just perceptible in residential environments
1.0 mms^{-1}	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents
10 mms^{-1}	Vibration is likely to be intolerable for any more than a very brief exposure to this level

Table E6.3 Transient vibration guide values for cosmetic damage

Line	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures/industrial and heavy commercial buildings	50 mms-1 at 4 Hz and above	
2	Unreinforced or light framed structures	15 mms-1 at 4 Hz increasing to 20 mms-1 at 15 Hz	20 mms-1 at 15 Hz increasing to 50 mms-1 at 40 Hz and above
	Residential or light commercial buildings		

Note 1 – values referred to are at the base of the building;

Note 2 – for line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

BS5228 states that the guide values in **Table D6.3** predominantly relate to transient vibration which does not give rise to resonant responses in structures, and to low-rise buildings. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table D6.3 might need to be reduced by up to 50%.

British Standard 4142: 2014 + A1: 2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142: 2019 describes the methods for rating and assessing noise from industrial or commercial sources, including manufacturing processes, fixed installations and plant equipment, loading of goods and sound from mobile plant. The standard is applicable for the purpose of assessing sound at proposed new dwellings, through the determination of a rating level of an industrial or commercial noise source.

Where certain acoustic features are present at the assessment location, a character correction should be applied to the specific sound level to give the rating level to be used in the assessment.

- A difference of around +10 dB 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 adverse impact depending on the context.
- 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.

Where the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be taken into account, including:

- The absolute level;
- The character and level of the residual sound;
- The sensitivity of the receptor and whether dwellings will already (or likely) to incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as: i) façade insulation treatments, ii) ventilation and/or cooling, and iii) acoustic screening.

BS 4142 states that, "A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall

change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor; 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible".

Design Manual for Roads and Bridges, LA111 Noise and Vibration, 2020

The assessment is based on the procedure set out in Design Manual for Roads and Bridges (DMRB). The assessment covers both the magnitude and significance of any change as a result of any new or amended highway scheme however is relevant for noise assessment of other project types. DMRB refers specifically to noise impacts and as such will be discussed in these terms for the purposes of this assessment.

A significant change is defined as an increase in the 18-hour traffic flow which is equal or greater than 25%, or a decrease which is equal or greater than 20%. Changes of this magnitude are equivalent to a change in noise level of at least 1 dB.

The magnitude of noise impact is therefore assessed by comparing the increase and decrease in noise levels between both short term and long-term scenarios. DMRB defines this impact both in the short term (immediate impact) and long term (future impact), as defined in **Table D6.4** below.

Table D6.4 DMRB magnitude of noise impact criteria

Magnitude of Change	Noise Change, dB $L_{A10, 18hr}$	
	Short Term	Long Term
Major	Greater than or equal to 5.0	Greater than or equal to 10.0
Moderate	3.0 to 4.9	5.0 to 9.9
Minor	1.0 to 2.9	3.0 to 4.9
Negligible	Less than 1.0	Less than 3.0

Assessment Criteria

Based on the above, assessment criteria used to establish significance of effect from the Proposed Development will be developed and agreed with the Environmental Health Officer at Lincolnshire County Council.

Appendix E – Proposed Structure of the Environmental Statement

APPENDIX E – PROPOSED STRUCTURE OF THE ENVIRONMENTAL STATEMENT

The ES will form three volumes and a Non-Technical Summary (NTS) as detailed below, alongside the anticipated chapters that will form part of Volume 1.

Volume 1 – Non Technical Summary

Volume 2 – Main Report

Introductory Chapters

Chapter 1: Introduction

Chapter 2: Proposed Development

Chapter 3: Alternatives and Design Evolution

Chapter 4: Consultation

Chapter 5: EIA Methodology

Technical Chapters

Chapter 6: Air Quality

Chapter 7: Biodiversity

Chapter 8: Climate

Chapter 9: Cultural Heritage

Chapter 10: Landscape and Visual

Chapter 11: Land, Soils and Groundwater

Chapter 12: Noise and Vibration

Chapter 13: Traffic and Transport

Chapter 14: Cumulative Effects

Concluding Chapters

Chapter 15: Summary of Effects

Volume 3 – Supporting Technical Appendices

Volume 4 – Supporting Figures and Plans

Non-Technical Summary (NTS)

Volume 1 will form the form the main report and body of the Environmental Statement. This will provide details about the proposed scheme, consultation, assessment scope and methodology, likely significant effects arising from the Proposed Development, and the proposed mitigation measures.

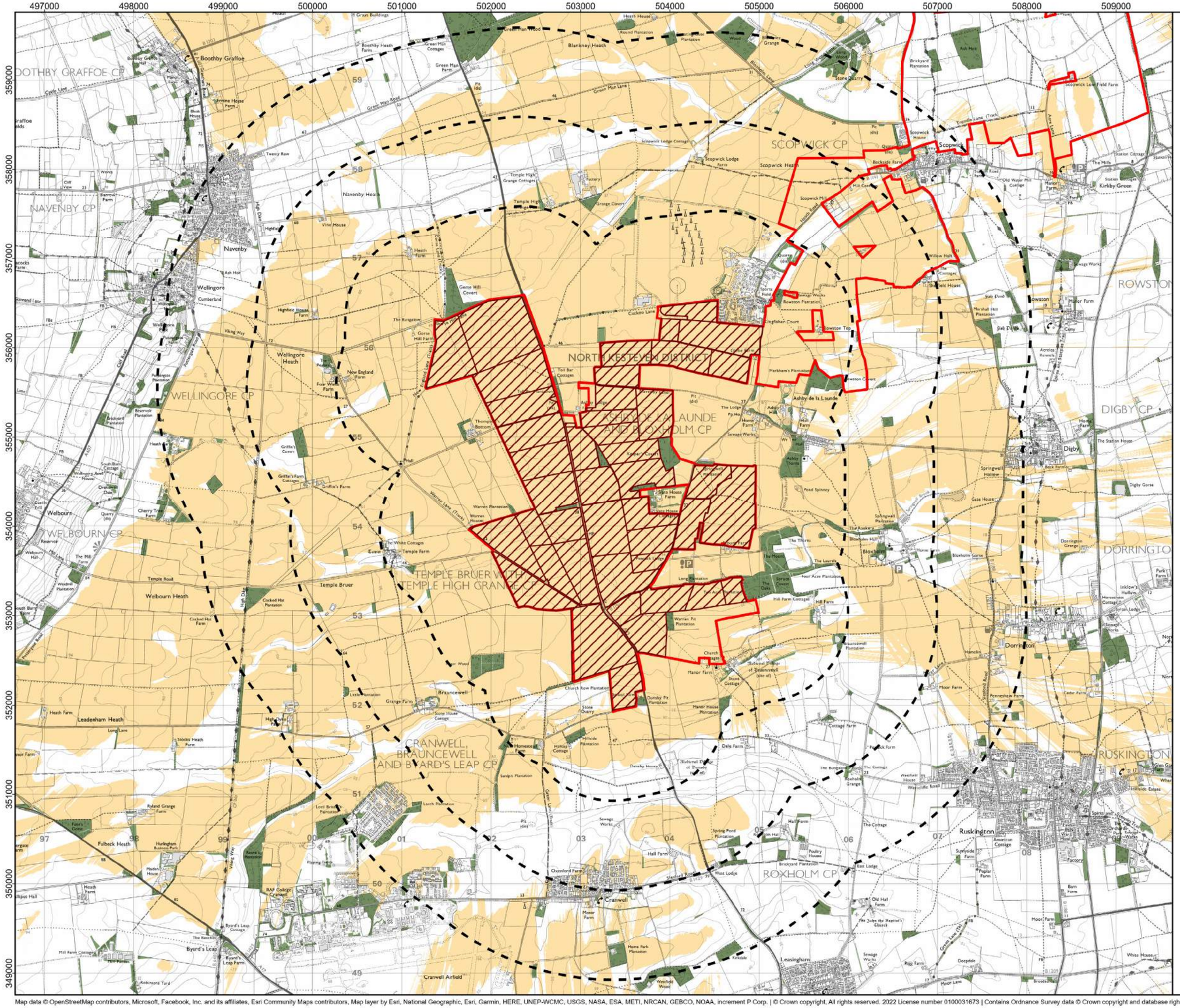
In accordance with the EIA Regulations, **Volume 1** will include a chapter detailing the main reasonable alternatives that have been considered by the Applicant and the process of the design evolution of the Proposed Development.

Volume 2 will comprise a set of technical appendices. These will include technical reports to support the assessments which will be detailed in **Volume 1.**

Volume 3 will include a set of figures to support the assessments which will be detailed in Volume 1.

The **Non-Technical Summary (NTS)** will form a separate document to the Main Report in **Volume 1.** The **NTS** will form a concise description of the scheme, alternatives, assessment methodology, potential environmental effects and mitigation measures. The **NTS** will be presented in an accessible format which can be easily understood by a wide audience.

Appendix F – Landscape and Visual Figures



Legend:

- Proposed Site Boundary
- Potential Area of PV Generating Station
- Distance Radii from Solar Array (1, 2, 3,km)
- Existing Woodland

Zone of Theoretical Visibility

- 4m high panels may be visible

NOTES.
Layout file: D002-obvs-panels3m-LiDAR5m-5km.shp; D002-obvs-panels4m-LiDAR5m-5km.shp
Terrain data: DEFRA-LiDAR-2020-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2020 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from DEFRA 2020 2m DSM height data.
The model does not take into account some localised features such as hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	25/01/2023	Third Draft	MP	JI	
01	14/12/2022	Second Draft	MP	JI	
00	06/12/2022	First Draft	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
Scoping

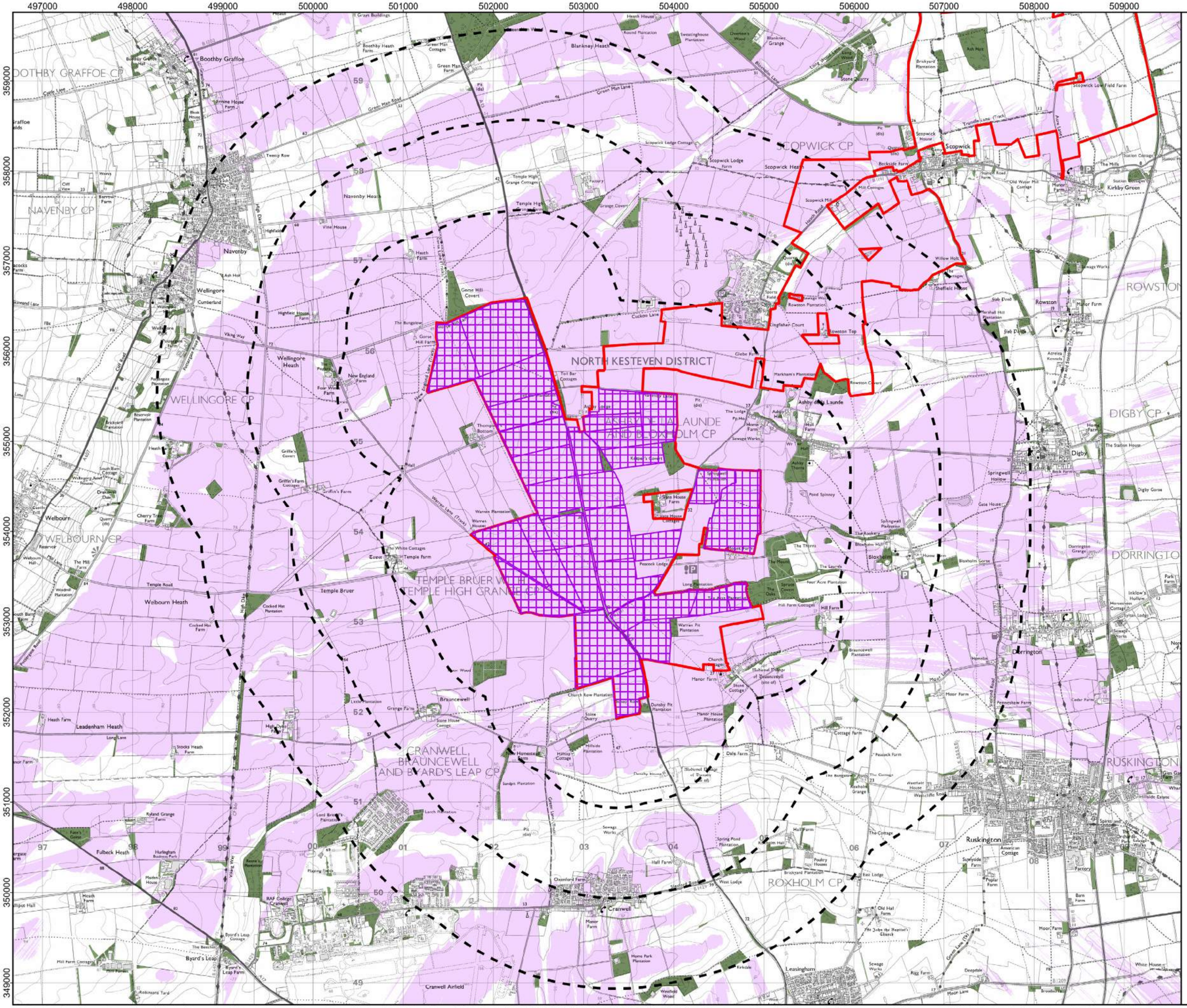
TITLE:
Screening ZTV - Springwell West Solar Array

FIGURE NUMBER:
1A

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\Scoping Solar Panel ZTVs



Legend:

- Proposed Site Boundary
- Potential area suitable for Collector Compounds and Distributed BESS
- Distance Radii from Collector Compounds and BESS (1, 2, 3km)
- Existing Woodland

Zone of Theoretical Visibility

- 6m high collector compounds and/or BESS may be visible

NOTES:
Layout file: D001-obvs-collectors6m-LiDAR5m-5km.shp
Terrain data: DEFRA-LiDAR-2020-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
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Units: Meter

Rev	Date	Description	Drn	Chk	App
01	25/01/2023	Third Draft	MP	JI	
01	14/12/2022	Second Draft	MP	JI	
00	30/11/2022	First Draft	MP	JI	

Springwell Solar Farm

DOCUMENT:
Scoping

TITLE:
Screening ZTV - Springwell West Potential Collector Compounds and BESS

FIGURE NUMBER:
1B

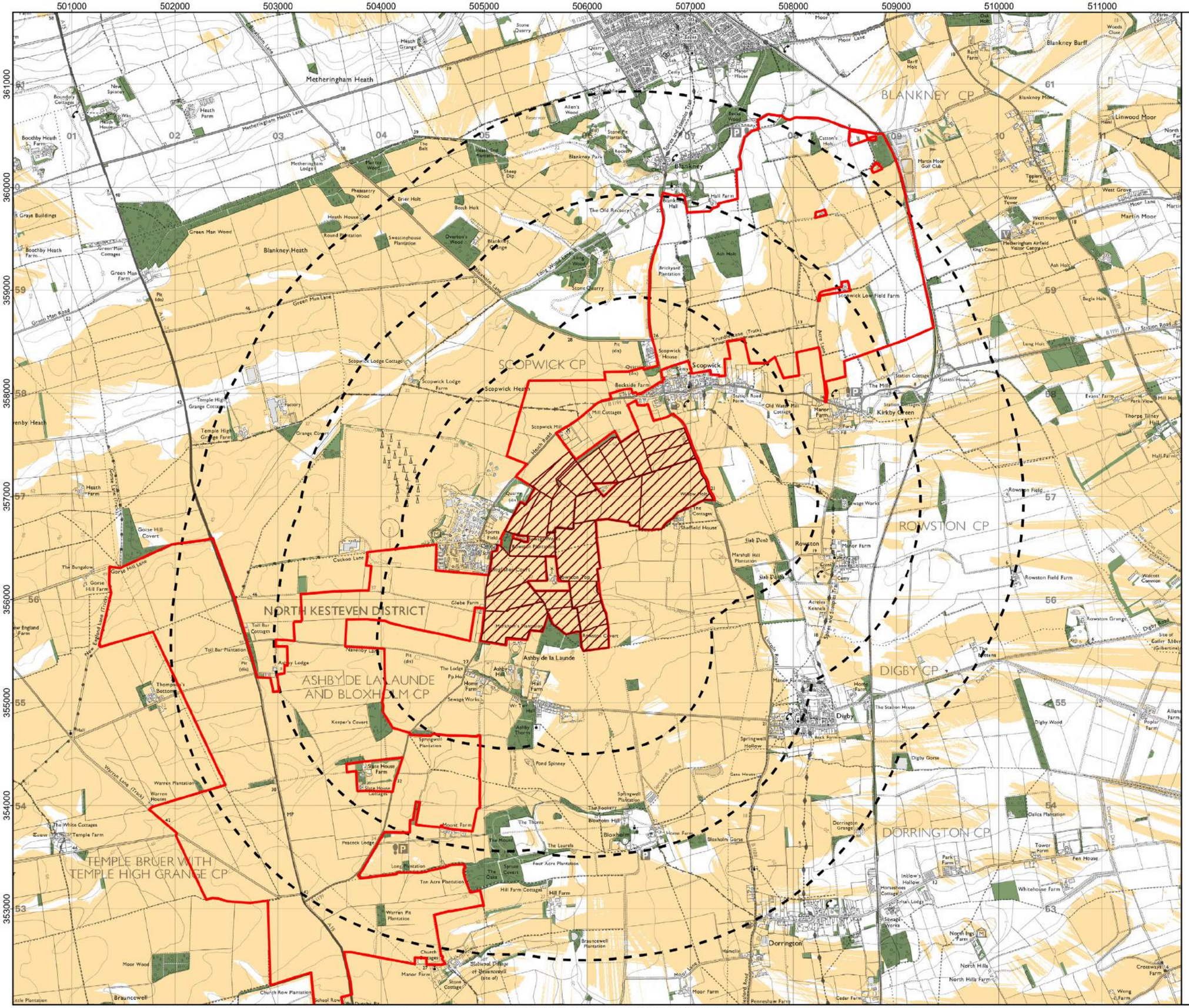
0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\Scoping Collectors ZTVs

501000 502000 503000 504000 505000 506000 507000 508000 509000 510000 511000

361000 360000 359000 358000 357000 356000 355000 354000 353000



Legend:

- Proposed Site Boundary
- Potential Area of PV Generating Station
- Distance Radii from Solar Array (1, 2, 3km)
- Existing Woodland

Zone of Theoretical Visibility

- 4m high panels may be visible

NOTES.
Layout file: D002-obvs-panels3m-LiDAR5m-5km.shp; D002-obvs-panels4m-LiDAR5m-5km.shp
Terrain data: DEFRA-LiDAR-2020-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2020 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from DEFRA 2020 2m DSM height data.
The model does not take into account some localised features such as hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	25/01/2023	Third Draft	MP	JI	
01	14/12/2022	Second Draft	MP	JI	
00	06/12/2022	First Draft	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
Scoping

TITLE:
Screening ZTV - Springwell Central Solar Array

FIGURE NUMBER:
2A

0 0.5 1
Kilometers
Scale: 1:35,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\Scoping Solar Panel ZTVs

501000 502000 503000 504000 505000 506000 507000 508000 509000 510000 511000

361000 360000 359000 358000 357000 356000 355000 354000 353000

Metheringham Heath
BLANKNEY CP
Blankney
Blankney Heath
SCOPWICK CP
Scopwick
Kirkby Green
ROWSTON CP
NORTH KESTEVEN DISTRICT
ASHBY DE LA LAUNDE AND BLOXHOLM CP
DIGBY CP
Digby
TEMPLE BRUER WITH TEMPLE HIGH GRANGE CP
DORRINGTON CP
Dorrington
Brauncewell

Legend:

- Proposed Site Boundary
- Potential area suitable for Collector Compounds and Distributed BESS
- Distance Radii from Collector Compounds and BESS (1, 2, 3km)
- Existing Woodland

Zone of Theoretical Visibility

- 6m high collector compounds and/or BESS may be visible

NOTES:
Layout file: D001-obvs-collectors6m-LiDAR5m-5km.shp
Terrain data: DEFRA-LiDAR-2020-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
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The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	25/01/2023	Third Draft	MP	JI	
01	14/12/2022	Second Draft	MP	JI	
00	30/11/2022	First Draft	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
Scoping

TITLE:
Screening ZTV - Springwell Central Potential Collector Compounds and BESS

FIGURE NUMBER:
2B

0 0.5 1
Kilometers
Scale: 1:35,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\Scoping Collectors ZTVs

503000 504000 505000 506000 507000 508000 509000 510000 511000 512000 513000

364000 363000 362000 361000 360000 359000 358000 357000 356000 355000

DUNSTON CP
METHERINGHAM CP
BLANKNEY CP
SCOPWICK CP
ROWSTON CP
DIGBY CP
NORTH KESTEVEN DISTRICT
ASHBY DE LA LAUNDE AND BLOXHOLM CP

Nocton Heath
Dunston Heath
Metheringham
Metheringham Heath
Blankney Heath
Blankney
Scopwick
Rowston
Digby
Kirkby Green
Walcott
Martin Moor
Metheringham Fen
Blankney Fen
Linwood Moor
Blankney Moor
Blankney Barff
Thorpe Tilney
Timberland
Ashby de la Launde
Scopwick Heath

Legend:

- Proposed Site Boundary
- Potential Area of PV Generating Station
- Distance Radii from Solar Array (1, 2, 3km)
- Existing Woodland

Zone of Theoretical Visibility

- 4m high panels may be visible

NOTES.
Layout file: D002-obvs-panels3m-LiDAR5m-5km.shp; D002-obvs-panels4m-LiDAR5m-5km.shp
Terrain data: DEFRA-LiDAR-2020-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
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The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	25/01/2023	Third Draft	MP	JI	
01	14/12/2022	Second Draft	MP	JI	
00	06/12/2022	First Draft	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
Scoping

TITLE:
Screening ZTV - Springwell East Solar Array

FIGURE NUMBER:
3A

0 0.5 1
Kilometers
Scale: 1:35,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\Scoping Solar Panel ZTVs

503000 504000 505000 506000 507000 508000 509000 510000 511000 512000 513000

364000 363000 362000 361000 360000 359000 358000 357000 356000 355000

DUNSTON CP
METHERINGHAM CP
BLANKNEY CP
SCOPWICK CP
ROWSTON CP
DIGBY CP
ASHBYDE LA LAUNDE AND BLOXHOLM CP
NORTH KESTEVEN DISTRICT

Dunston
Metheringham
Blankney
Scopwick
Kirkby Green
Rowston
Digby
Ashby de la Launde
Walcott
Thorpe Tilney
Martin
Martin Moor

Dunston Heath
Metheringham Heath
Blankney Heath
Nocton Heath
Metheringham Fen
Blankney Fen
Scopwick Heath

Legend:

- Proposed Site Boundary
- Potential area suitable for Collector Compounds and Distributed BESS
- Distance Radii from Collector Compounds and BESS (1, 2, 3km)
- Existing Woodland

Zone of Theoretical Visibility

- 6m high collector compounds and/or BESS may be visible

NOTES:
Layout file: D001-obvs-collectors6m-LiDAR5m-5km.shp
Terrain data: DEFRA-LiDAR-2020-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2020 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from DEFRA 2020 2m DSM height data.
The model does not take into account some localised features such as hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	25/01/2023	Third Draft	MP	JI	
01	14/12/2022	Second Draft	MP	JI	
00	30/11/2022	First Draft	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
Scoping

TITLE:
Screening ZTV - Springwell East Potential Collector Compounds and BESS

FIGURE NUMBER:
3B

0 0.5 1
Kilometers
Scale: 1:35,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\Scoping Collectors ZTVs

Legend:

🟥 Proposed Site Boundary

▨ Potential Alternative Substation Locations

- - Distance Radii from Substations (5, 10km)

🟩 Existing Woodland

Zone of Theoretical Visibility

🟪 Gantries up to 15m high may be visible

🟦 Features of the substation up to 6m high may be visible

NOTES:
Layout file: D001-obvs-substations6m-LiDAR5m-15km.shp;
D001-ZTV-screening-15mSubstations-T50-15km.tif
Terrain data: T50-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 50m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from OS Terrain50 height data with the locations of woodland and buildings taken from the OS Open Map Local dataset.
Buildings have been modelled with an assumed height of 7.5m and woodland with an assumed height of 10m, representing a conservative estimate of average heights within the study area.
The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a $50m^2$ resolution.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

01	15/12/2022	Second Draft	MP	JI	
00	09/11/2022	First Draft	MP	JI	
Rev	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
Scoping

TITLE:
Screening ZTV - National Grid and Project Substation

FIGURE NUMBER:
4

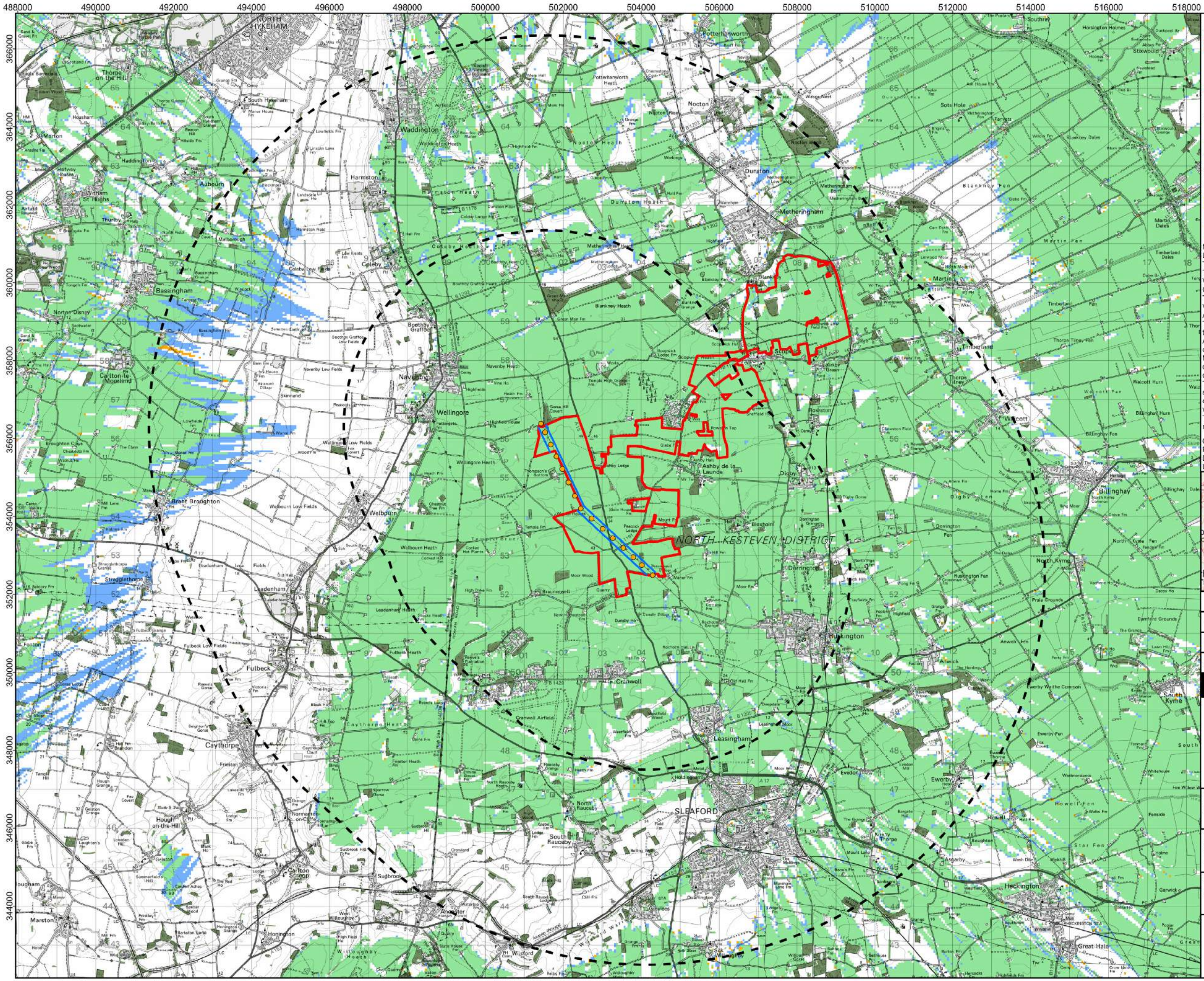
0 1 2
Kilometers
Scale: 1:90,000 @ A3

N W E S

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\Scoping 10km Substation ZTV

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



Legend:

- Proposed Site Boundary
- Existing Pylons
- Potential Zone for Additional Connecting Towers
- Distance Radii from Potential Additional Towers (5, 10km)
- Existing Woodland

Zone of Theoretical Visibility (54m high towers)

- Existing pylons may be visible
- Potential towers may be visible
- Both may be visible

NOTES:
Layout file: obvs-pylons-60m-T50-10km.shp; obvs-pylons-offset-60m-T50-10km.shp
Terrain data: T50-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 50m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from OS Terrain50 height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 7.5m and woodland with an assumed height of 10m, representing a conservative estimate of average heights within the study area.
The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 50m^2 resolution.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	08/02/2023	Updated pylon heights	MP	JI	
00	09/11/2022	First Draft	MP	JI	

Springwell Solar Farm

DOCUMENT:
Scoping

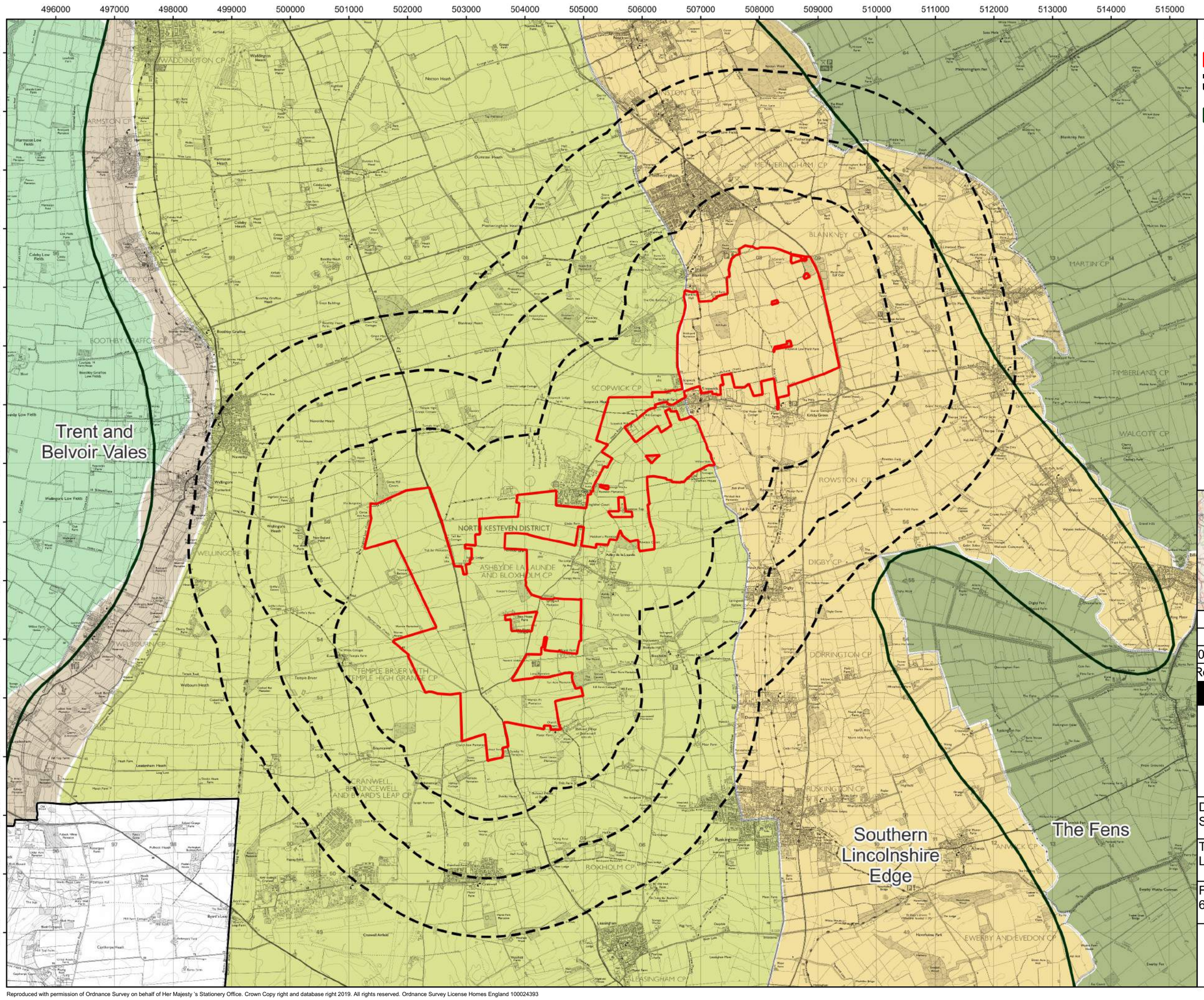
TITLE:
Screening ZTV - National Grid Connecting Tower ZTV

FIGURE NUMBER:
5

0 1 2
Kilometers
Scale: 1:90,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\Scoping 10km Pylons ZTV



Legend:

- Proposed Site Boundary
- Distance Radii from Solar Array (1, 2, 3km)
- National Character Areas Boundary

North Kesteven Landscape Character

- 5 Witham Brent Vales
- 6 Lincoln Clif
- 7 Limestone Heath
- 11 Central Clays and Gravels
- 13 Fenland

Rev	Date	Description	Drn	Chk	App
002	12/12/202	First draft	JM	JI	JI

Springwell Solar Farm

DOCUMENT:
Scoping

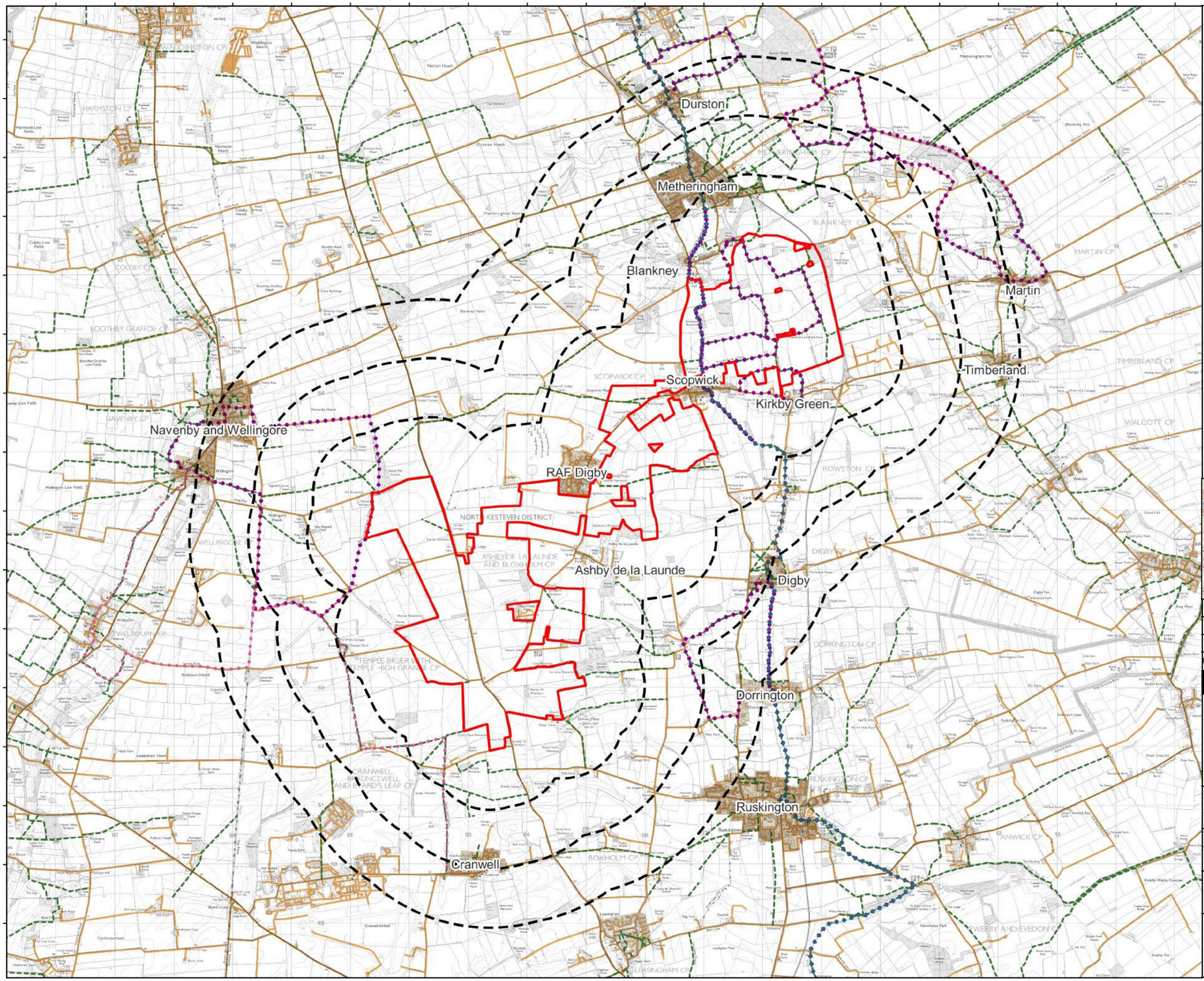
TITLE:
Landscape Character

FIGURE NUMBER:
6

0 1 2 km

Scale: 1:60,000 @ A3

REV 00



Rev	Date	Description	Drn	Chk	App
00	05/12/2022	First draft	JM	JI	JI

Springwell Solar Farm

DOCUMENT:
Scoping

TITLE:
Visual Receptors

FIGURE NUMBER:
7

0 1 2 km

Scale: 1:60,000 @ A3

REV 00

Appendix G – Glossary and Abbreviations

APPENDIX G – GLOSSARY AND ABBREVIATIONS

Term	Definition
Abnormal Indivisible Load (AIL)	Any load which cannot be broken down into smaller loads for the purposes of transportation, without undue expense or risk of damage.
Above-Ground Heritage Asset	An above ground building, monument, site, place, area or Landscape identified as having a degree of significance meriting consideration in planning decisions, because of its **Heritage** interest. **Heritage Assets** include Designated Heritage Assets and Non-Designated Heritage Assets.
Agricultural Land Classification (ALC)	A framework for determining the physical quality of the land at national, regional, and local levels. This is based on the long-term physical limitations of land for agricultural use. There are a number of factors that affect the grade, and the main ones are climate, site and soil characteristics, and the interactions between them.
Air Quality Management Area (AQMA)	Air Quality Management Areas (AQMAs) are areas that are likely to exceed the national air quality objective for a specific pollutant. They are determined by **Local Authorities.**
Ancient Woodland	Ancient Woodland is defined as an area that has been wooded continuously since at least 1600 AD. Ancient Woodland is divided into ancient semi-natural woodland and plantations on Ancient Woodland sites. Both types are classed as ancient woods.
Applicant	The organisation (Springwell Energy Farm Ltd) preparing and submitting the DCO Application.
Application	The application for a Development Consent Order submitted by the Applicant.
Aquifer	Underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand, or silt).

Archaeological Interest	There will be archaeological interest in a **Heritage Asset** if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.
Authorised Development	The development that will be described in the **draft Development Consent Order (DCO)**. This is also referred to as the **Proposed Development.**
Balance of Solar System (BoSS)	The components and equipment that convert the direct current (DC) electricity collected by the solar PV modules into alternating current (AC) comprised of inverters, transformers, and switchgear associated cables, monitoring and control equipment and structures.
Baseline	A reference level of existing **Environmental Conditions** against which a project is measured and controlled.
Baseline Studies	Work done to determine and describe the **Environmental Conditions** against which any future changes can be measured or predicted and assessed.
Battery Energy Storage System (BESS)	The area within the Solar Farm Site which will contain batteries, inverters, transformers and switchgear, Low Voltage Distribution Cables, some Primary Access Tracks, fencing and other associated works. This equipment allows for the storage, importation and exportation of energy to the National Grid.
Below-Ground Heritage Asset	Below-ground heritage assets include both known and hitherto unknown buried archaeological remains.
Best and Most Versatile Agricultural Land (BMV)	Defined as Grades 1, 2 and 3a in the Agricultural Land Classification by the revised **National Planning Policy Framework (NPPF)** and **Planning Practice Guidance (PPG).** This is the land, which is determined to be most flexible, productive, and efficient in response to inputs

	and which can best deliver future crops for food and non-food uses such as biomass, fibres, and pharmaceuticals. Grades 3b, 4, and 5 are used to classify land that is of moderate quality to very poor quality.
Best Available Techniques (BAT)	The available techniques which are the best for preventing or minimising **Emissions** and **Impacts** on the environment
Biodiversity	The biological diversity of the earth's living resources. The total range of variability among systems and organisms at the following levels of organisation: bioregional, **Landscape**, ecosystem, **Habitats**, communities, **Species**, populations, individuals, genes, and the structural and functional relationships within and between these different levels.
Biodiversity Net Gain (BNG)	Biodiversity Net Gain is an approach to development that leaves **biodiversity** in a better state than before.
Book of Reference	A list of all of the land over which compulsory acquisition powers will be sought for the **Proposed Development**, as well as the owners and occupiers of the affected land and those with an interest in it.
Borrow Pits	Excavation in the ground to provide material for elsewhere on the site.
Cables	The cables, which transmit electricity from different components on the Site.
Cable Route Corridor	Corridor which represents the maximum extent of land within which the cable route would be located.
Catchment	The total area which drains to a specific point on a watercourse.
Circular Economy	Maximising the sustainable use and value of resources, eliminating waste from all stages of the resource lifecycle, whilst benefiting both the economy and the environment.

Climate Change	Large scale, long term shift in the Earth's weather patterns or average temperature.
Collector Compounds	System comprising of switchgear and transformers and associated infrastructure, which will collect electricity via the buried MV cables from the inverter and transformer stations (ITS) and transmit via further cables to the Project Substation.
Combined Effects	The interaction and combination of different residual (post mitigation) environmental effects of the **Proposed Development** affecting the same **Receptor**. For example, visual and noise effects during construction affecting the same residential dwelling.
Competent Authority	The relevant **Secretary of State** is the Competent Authority for the purposes of the **Habitats Directive** and the **Habitats Regulation** in relation to applications for **Nationally Significant Infrastructure Projects (NSIPs)**.
Code of Construction Practice	Document setting out methods to avoid, minimise and mitigate Impact on the environment and surrounding area and the protocols to be followed in implementing these measures in accordance with environmental commitments during the **Construction Stage**.
Construction Stage	The stage during which construction works for the **Proposed Development** will take place.
Consultation Documents	The documents submitted to support the formal preapplication consultation under the **PA2008**. They included "*plans and maps showing the nature and location of the proposed development*" as stated in subsection (4) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009.
Construction Compound	A secure area from which construction activities are managed and resourced, including but not limited to temporary offices, workshops, parking and storage.

Construction Contractor	The person or organisation appointed by the **Applicant** to undertake the construction of the **Proposed Development**, including the management of the construction process and health and safety on **Site**.
Consultation Zone	The **Health & Safety Executive** (HSE) sets a Consultation Distance around major hazard sites and major accident hazard pipelines after assessing the risks and likely effects of major accidents at the major hazard site/pipeline. The area enclosed within the Consultation Distance is referred to as the consultation zone. The **Local Planning Authority** is notified of this Consultation Distance and has a statutory duty to consult HSE on certain proposed developments within the zone the Consultation Distance forms.
Contaminated Land	Land where substances are causing or have a significant possibility to cause significant harm to people, property or protected species; or, where significant pollution is being caused or has a significant possibility of being caused to controlled waters.
Corrosion	Corrosion is the deterioration and loss of a material and its critical properties due to chemical, electrochemical and other reactions of the exposed material surface with the surrounding environment. Corrosion of metals takes place due to the gradual environmental interaction on the material surface.
Cumulative Effects	The effects of the **Proposed Development** in cumulation with other existing development and/or approved development.
Decommissioning	The process of shutting down, and where relevant, removing the infrastructure comprised in the Proposed Development when it is no longer required once it has reached end of life.
DCO Application	The Application for a **Development Consent Order** (DCO) that is submitted by the Applicant to **the**

	Secretary of State (SoS) for Business, Energy, and Industrial Strategy (BEIS).
Development Consent Order (DCO)	A Development Consent Order (DCO) is a Statutory Instrument (SI) made by the **Secretary of State** (SoS) pursuant to the **Planning Act 2008 (as amended)** (PA2008).
DCO Requirement	The conditions which govern how the project is to be delivered. These will form part of the Schedule of Requirements.
Dewatering	The removal of surface or ground water to dry and/or solidify a **Construction Compound** to enable construction activity.
Direct Effect	An effect that is directly attributable to the **Proposed Development.**
Direct Employment	An increase in local employment arising from further economic activity (jobs, expenditure, or income) associated with additional local income and local supplier purchases.
Disaster	In the context of the **Proposed Development**, a naturally occurring phenomenon such as an extreme weather event (e.g. storm, flood, temperature) or ground-related hazard events (e.g. subsidence, landslide, earthquake) with the potential to cause an event or situation that meets the definition of a **Major Accident**.
Easement	An easement is a legal, propriety agreement that confers a right to cross/use someone else's land for a particular purpose e.g. installing a pipeline along with access rights to enter the land to undertake routine inspections or repairs. Once the agreement is legally completed, the easement is registered with the Land Registry and binds future successors in title.
Enhancement	Measures to improve the environment, such as landscape resource and the visual amenity of the

	Proposed Development and its wider setting, over and above its Baseline condition.
Environmental Effect	The consequence of an action (**impact**) upon the environment such as the decline of a breeding bird population as a result of the removal of hedgerows and trees.
Environmental Impact	The change in the environment from a development, such as the removal of a hedgerow.
Environmental Impact Assessment (EIA)	A systematic means of assessing the significance of effects from the **Proposed Development**, undertaken in accordance with The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (**DCO EIA Regulations**).
EIA Directive	Directive 85/337/EEC (as amended). The initial Directive of 1985 and its three amendments have been codified by Directive 2011/92/EU of 13 December 2011. Directive 2011/92/EU has been amended in 2014 by Directive 2014/52/EU.
EIA Regulations	For the purpose of the **DCO Application**, the EIA Regulations are the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
Environmental Statement (ES)	A statement prepared in accordance with the **EIA Regulations** that includes the information that is reasonably required to assess the likely effects of a development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile.
European Designated Site	An area of land subject to protection through European legislation, including **Special Area of Conservation** (SAC), **Special Protection Area** (SPA) and Ramsar.
Examining Authority (ExA)	Planning Inspector(s) responsible for conducting the examination and recommending a decision on a **DCO** application to the **Secretary of State** (SoS).

Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate quality standard.
Expansive Study Area	The Expansive Study Area extends to the availability of construction materials and the capacity of waste management facilities within the UK and the regions where the **Proposed Development** is located.
External Influencing Factor	A factor which occurs beyond the limits of the **Proposed Development** that may present a risk to the Proposed Development, e.g. if an external disaster occurred (e.g. earthquake, COMAH site major accident) it would increase the risk of serious damage to an environmental receptor associated with the Proposed Development.
Flood Map for Planning	Defines **Flood Zones** based on annual probability of flooding from Fluvial and tidal sources to inform development planning and flood risk assessment. Nationally consistent delineation of 'high', 'medium' and 'low' flood risk updated by the Environment Agency as deemed appropriate, typically on a quarterly basis.
Flood Risk Assessment (FRA)	An assessment of the risk of flooding. A document that reviews a development in its proposal form to assess it against the risk of flooding, whether that be from groundwater, river (fluvial), surface water (pluvial), estuary / coastal (tidal), or from sewer sources.
Flood Zones	Zones based on the annual probability of flooding from Fluvial and tidal sources, as defined in the **Flood Map for Planning**. Areas are categorised into one of the following: **Flood Zone 1, Flood Zone 2, Flood Zone 3a or Flood Zone 3b.**
Flood Zone 1	This zone comprises land assessed as having less than a 1 in 1,000 (0.1%) annual probability of flooding from rivers or the sea in any year.
Flood Zone 2	This zone comprises land assessed as having between a 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of flooding from rivers, or between a 1 in 200 (0.5%) and

	1 in 1,000 (0.1%) annual probability of flooding from the sea in any year.
Flood Zone 3a	This zone comprises land assessed as having a 1 in 100 (1%) or greater annual probability of flooding from rivers or a 1 in 200 (0.5%) or greater annual probability of flooding from the sea in any year.
Flood Zone 3b	This zone comprises land where water has to flow or be stored in times of flood.
Fluvial	Processes associated with rivers and streams and the deposits and landforms created by them.
Future Baseline	The likely evolution of the baseline without implementation of the **Proposed Development**.
Gantries	Steel apparatus that are required for the stringing of overhead bus conductors from the transmission line to form a bus bar inside a substation.
Geographical Information System (GIS)	A system that captures, stores, analyses, manages, and presents data linked to location. It links spatial information to a digital database.
Geomorphology	Study of landforms, their processes, form, and sediments at the surface of the Earth.
Geophysical Survey	Geophysical survey is a non-intrusive pre-construction archaeological evaluation technique that exploits a variety of physical or chemical characteristics of rocks and soils etc, in an attempt to locate underground features of archaeological interest. Types of geophysical survey include magnetometer survey, magnetic susceptibility survey and resistivity survey.
Geotechnical Survey	An investigation to determine the nature and engineering properties of the soil and other materials and to determine soil profiles and property assignments for the purpose of design and construction.

Greenfield Runoff Rate	The peak rate of runoff for a specific return period due to rainfall falling on a given area of vegetated land (predevelopment)
Greenhouse Gas (GHG)	Gases that absorb and emit reflected solar radiation which result in the warming of the Earth's atmosphere. It is absorbed and emitted at specific wavelengths within the spectrum of infrared radiation emitted by the earth's surface, the atmosphere, and clouds. The six main GHGs whose emissions are human caused are: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbon, and sulphur hexafluoride. In combination, these GHG emissions are commonly expressed in terms of 'carbon dioxide equivalents' (CO2e) according to their relative global warming potential. For this reason, the shorthand 'carbon' may be used to refer to GHGs.
Grid Connection	The export and import of electricity to the National Grid from the **National Grid Substation** which will tie into the existing 400kV overhead transmission line.
Ground Investigation (GI)	The physical investigation stage of the **Geotechnical Survey** of which **Geophysical Surveys** may be one element. Comprised of targeted investigations including both intrusive and non-intrusive techniques to prove ground conditions, determine soil / rock parameters and identify hazards associated with the ground conditions to inform the construction of the proposed development.
GI Contractor	The contractor tasked with undertaking the **Ground Investigation**, including all associated activities and consents.
Groundwater	Groundwater is the store of water present beneath Earth's surface in rock and soil pore spaces and in the fractures of rock formations.
Groundwater Dependent Terrestrial Ecosystems (GWDTE)	Wetlands such as springs, flushes and fens which are fed by groundwater rather than rainfall or surface runoff.

	They are particularly sensitive to hydrological and ecological changes caused by development.
Groundwater Source Protection Zone (SPZ)	Also, **Source Protection Zone** (SPZ), defined for 2,000 groundwater sources such as wells, boreholes and springs used for public drinking water supply, show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The SPZ maps show three main zones (inner, outer, and total catchment) and a fourth zone of special interest, which the Environment Agency occasionally apply to a groundwater source.
Habitat	The environment in which populations or individual species live or grow.
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 (as amended) which covers the terrestrial environment.
Habitats Regulations Assessment (HRA)	A **Habitats Regulations Assessment** (HRA) refers to the stages of assessment carried out by the competent authority in accordance with **Habitats Regulations** and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) to determine if a project may affect the protected features of a European site and European offshore marine site, before deciding whether to undertake, permit or authorise it.
Habitats Site	Any site which would be included within the definition at regulation 8 of the Conservation of Habitats and Species Regulations 2017 for the purpose of those regulations, including candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation, Special Protection Areas and any relevant Marine Sites.

Haul Road	Haul roads are temporary roads to allow for the movement of construction materials, construction machinery and/or construction labour around the **Site**.
Hazard	Anything with the potential to cause harm, including ill-health and injury, damage to property or the environment; or a combination of these.
Hazardous Waste	Waste that by legal definition may cause particular harm to human health or the environment.
Heavy Goods Vehicle (HGV)	Vehicles with 3 axles (articulated) or 4 or more axles (rigid and articulated).
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
Heritage Asset	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. Heritage Assets include Designated Heritage Assets and Non-Designated Heritage Assets.
Historic Environment Record (HER)	The record of archaeological and built heritage features in a county or district, usually held and maintained by the relevant County Council.
Indirect Effect	An effect that results indirectly from the **Proposed Development,** as a consequence of a '**Direct Effect**', 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 in time from the **Source** of the **Environmental Effect**.
Indirect Employment	Employment growth arising locally through manufacturing services and suppliers to the construction process (indirect or supply linkage multipliers).

Induced Employment	Employment associated with local expenditure as a result of those who derive incomes from the direct and supply linkage impacts of the **Proposed Development**.
Interface Cables	Buried high-voltage cables linking the on-site electrical infrastructure to the National Grid via the National Grid Substation.
Internal Drainage Board (IDB)	Each internal drainage board is a public body that manage water levels in an area, known as an internal drainage district, where there is a special need for drainage. They undertake works to reduce flood risk to people and property and manage water levels for agricultural and environmental needs within their district.
Internal Influencing Factor	A factor which occurs within the limits of the **Proposed Development** that may present a risk to the **Proposed Development**.
Inverter	Inverters convert the direct current (DC) electricity collected by the PV modules into alternating current (AC), which allows the electricity generated to be exported to the National Grid. BESS also use inverters to convert between DC and AC. The batteries function in DC and electricity must be converted to/from AC to pass into or from the grid.
Inverter and Transformer Station (ITS)	Enclosed facility that hosts the inverters and transformer within one combined container.
Jointing Pit	Underground structures constructed at regular intervals along the cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
LAeq	Equivalent Continuous Level. When a noise varies over time, the LAeq is the equivalent continuous sound which would contain the same sound energy as the time varying sound.

Land Cover	The surface cover of the land usually expressed in terms of vegetation cover or lack of it. Related to, but not the same as, **Land Use**.
Land Drainage	The disposal of rainwater, achieved by a combination of watercourses of various types.
Land Use	The purpose for which land is used, based on broad categories of functional land cover, such as urban and infrastructure use and the different types of agricultural and forestry.
Landfill	A facility designed to receive disposed waste. Usually involves the infill of pre-existing voids.
Landform	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation, and physical processes.
Landscape	An area, as perceived by people, the character of which is a result of the action and interaction of natural and/or human factors.
Landscape and Ecological Management Plan	A document to set out the principles for how the land will be managed throughout the operational phase, following the completion of the construction phase.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significant effect of change resulting from development both on the **Landscape** as an environmental resource in its own right and on people's views and **Visual Amenity**.
Landscape Character	A distinct, recognisable and consistent pattern of Elements in the Landscape that makes one Landscape different from another.
LAmax	LAmax is the maximum A - weighted sound pressure level recorded over the period stated. LAmax is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall LAeq noise level but will still affect the noise environment.

Lead Local Flood Authority (LLFA)	The local authority responsible for taking the lead on local flood risk management as defined within the Flood and Water Management Act 2010.
Likely Significant Effect	The significance of an environmental effect is typically a function of the 'value' or 'sensitivity' of the **Receptor** and the 'magnitude' or 'scale' of the **Impact**. Combining the environmental value of the resource or receptor with the magnitude of change produces a significance of effect category. The definition of a significant effect for each environmental topic will be contained within their respective chapters of the **Environmental Statement**.
Limit of Deviation	These limits show the maximum area within which the **Proposed Development** could be installed. This flexibility is required in order to deal with unforeseen circumstances, such as ground conditions and local features.
Limit of Land to Be Acquired Or Used	The limits of land to be acquired or used, as shown on the **Land Plans**.
Local Development Plan (LDP)	The set of documents and plans that sets out the **Local Planning Authority's** policies and proposals for the development and use of land in their area.
Local Wildlife Site (LWS)	A site of importance that has been identified and selection locally for their wildlife value.
Local Planning Authority (LPA)	The function of a local authority that is empowered by law to exercise statutory town planning functions for a particular area of the UK.
Lowest Observed Adverse Effect Level (LOAEL)	The level above which adverse effects on health and quality of life can be detected as a result of noise or vibration.
Main River	A watercourse shown as such on the **Flood Map for Planning** and can include any structure or appliance for controlling or regulating the flow of water in, into or out of a main river. Main Rivers are usually larger streams

	and rivers, but also include smaller watercourses of strategic drainage importance. Main Rivers are under the jurisdiction of the Environment Agency who have powers to carry out flood defence works to Main Rivers.
Major Accident	In the context of the **Proposed Development**, an event that threatens immediate or delayed serious damage to human health, welfare and/or the environment and requires the use of resources beyond those of the **Applicant** or its contractors to respond to the event. Serious damage includes the loss of life or permanent injury and/or permanent or long-lasting damage to an environmental receptor that cannot be restored through minor clean-up and restoration efforts. The significance of this effect will take into account the extent, severity and duration of harm and the sensitivity of the receptor.
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 effects arising from the whole or specific elements of the **Proposed Development** on the environment.
National Grid Substation	A compound containing electrical equipment to enable connection, transmission and distribution of electricity to the grid.
National Planning Policy Framework (NPPF)	The document that sets out Government's planning policies for England and how these are expected to be applied. The NPPF was last revised in July 2021.
National Policy Statement (NPS)	Policy designated under the Planning Act 2008 (as amended) (PA2008) concerning the planning and consenting of **Nationally Significant Infrastructure Projects** (NSIPs) in the UK. Where applicable, they form the primary policy framework for the consenting of NSIPs.
National Trail	Designated long-distance paths.

Nationally Significant Infrastructure Project (NSIP)	Projects which fall under one of the categories in Part 3 of the Planning Act 2008 (as amended) (**PA2008**).
Nationally Designated Ecological Site	Areas of land subject to project through UK legislation, including **Sites of Special Scientific Interest** (SSSI) and **National Nature Reserves** (NNR).
Noise Sensitive Receptor	Any identified **Receptor** likely to be affected by noise. These are generally human Receptors, and may include residential dwellings, work places, schools, hospitals, community facilities, places of worship, recreational spaces and ecological Receptors.
Nomis	Nomis is a service hosted by the Office for National Statistics (**ONS**) which provides access to the most detailed and up-to date UK labour market statistics from official sources.
No Observed Effect Level (NOEL)	The level below which no effect from noise or vibration can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
Non-Statutory Consultation	Consultation with stakeholders on the **Proposed Development** which occurs in addition to the **Statutory Consultation.**
Non-Statutory Consultees	Consultees who – whilst not designated in law – are likely to have an interest in the **Proposed Development** and which the **Applicant** has therefore decided to consult with.
Operational Stage	The stage after which the **Proposed Development** is handed over by the relevant construction contractors and approved for operation. It will remain in its **Operational Stage** until operations cease.
Ordinary Watercourse	Any river, stream, ditch, drain, cut, dyke, sluice, sewer (other than a public sewer) and passage through which water flows that does not form part of a **Main River**. The **Lead Local Flood Authority** (LLFA) or **Internal**

	Drainage Board (IDB) where relevant, has powers for Ordinary Watercourses that are similar to those held by the Environment Agency for **Main Rivers.**
Parameters	A limit or boundary which defines the maximum or minimum height/width/length/depth parameters of infrastructure, which will be shown on parameter plans and secured through the **DCO**.
Phase 1 Habitat Survey	An ecological survey technique that provides a standardised system to record vegetation and wildlife **Habitat**. It enables a basic assessment of **Habitat** type and its potential importance for nature conservation.
Planform	The shape or outline of a watercourse when viewed from above.
Planning Inspectorate (PINS)	The Government agency responsible for administering applications for development consent under the **Planning Act 2008** (as amended) (PA2008) on behalf of the **Secretary of State** (SoS).
Planning Practice Guidance (PPG)	The Planning Practice Guidance (PPG) provides context and guidance to the **National Planning Policy Framework** (NPPF). The PPG has been updated to reflect changes to the revised NPPF.
Potential Area for Solar Development	The proposed maximum area of solar infrastructure, including **Solar PV modules** and **Balance of Solar System.**
Pollution	The introduction of harmful materials into an environment.
Preliminary Ecological Appraisal (PEA)	Preliminary ecological surveys have a range of purposes; one key use is to gather data on existing conditions, often with the intention of conducting a preliminary assessment of likely impacts of proposed developments or establishing the baseline for future monitoring. As a precursor to a proposed project, some evaluation is usually made within these appraisals of the ecological features present, as well as scoping for

	notable **Species** or **Habitats**, identification of potential constraints to the **Proposed Development** and recommendations for **Mitigation Measures**.
Preliminary Environmental Information (PEI)	Information which has been compiled by the **Applicant** and is reasonably required for the consultation bodies to develop an informed view of the **Likely Significant Effect** of the **Proposed Development**.
Preliminary Environmental Information Report (PEIR)	The Preliminary Environmental Information Report (PEIR) is the report prepared by the Applicant, containing **Preliminary Environmental Information** (PEI).
Primary Mitigation	Modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken.
Principal Aquifer	Layers of rock or drift deposits that have high intergranular and / or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, Principal Aquifers are aquifers previously designated as major aquifers.
Project Substation	A compound containing electrical equipment to enable connection to the National Grid Substation.
Proposed Development	The development for which a **Development Consent Order** (DCO) is sought. In this instance, this includes the following: • Ground mounted solar PV generating station with a gross electrical output capacity to the National Grid network in the region of 800MW. The generating station will include solar PV modules and mounting structures. • Balance of Solar System (BoSS) which comprises; inverters, transformers, switchgear, and the use of Collector Compounds.

	• An onsite Project Substation compound, which will include; substation, switching and control equipment, office / control / welfare buildings, storage areas, and provisions for vehicular parking and material laydown. • Battery Energy Storage System (BESS) compound(s) and associated inverters, transformers, switchgear and ancillary equipment and their containers, enclosures, monitoring systems, air conditioning, electrical cables and fire safety infrastructure. • National Grid Substation • Works to facilitate vehicular access to the Site. • Ancillary infrastructure works including; underground cables, boundary treatments, security equipment, lighting, landscaping, access tracks, earthworks, surface water management, and any other works identified as necessary to enable the development. • Equipment facilitating electrical connection to the proposed National Grid Substation. • New public footpaths and amenity improvements. • Areas for habitat management and biodiversity enhancement.
Preliminary Risk Assessment	Report that presents a summary of readily-available information on the geotechnical and/or geo-environmental characteristics of the site and provides a qualitative assessment of geo-environmental and/or geotechnical risks in relation to the proposed development.
Q95	The flow in cubic metres per second which is equalled or exceeded for 95% of the time. The Q95 flow is a significant low flow parameter particularly relevant in the assessment of river water quality consent conditions.
Ramsar Site	Wetlands of international importance designated under the Ramsar Convention 1971.

Receptor	A component of the natural, created or built environment such as a human being, water, air, a building, or a plant that has the potential to be affected by the **Proposed Development.**
Recovery	Processing waste to prevent it being disposed of to landfill. Recovery processes include incineration with energy recovery, advanced thermal treatment, anaerobic digestion, and composting.
Recycle	Any recovery operation where waste is reprocessed into products, materials or substances whether for its original or other purposes. Recycling includes the reprocessing of organic material but excludes energy recovery and the reprocessing of waste into materials to be used as fuels or for backfilling operations.
Remediation	The removal of pollution or contaminants from the environment (usually soil, groundwater, sediment, or surface water).
Residual Effects	Effects arising from the **Proposed Development** that cannot be mitigated following implementation of **Mitigation Measures**.
Resilience (climate change)	The vulnerability of the **Proposed Development** to climate change.
Reuse	Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived; reuse presumes that significant reprocessing is not required.
Riparian	Relating to or living or located on the bank of a natural watercourse (such as a river) or sometimes of a lake or a tidewater
Risk	The likelihood of an impact occurring, combined with the effect or consequence(s) of the impact on a receptor if it does occur.

Risk Event	An identified, unplanned event, which is considered relevant to the **Proposed Development** and has the potential to be a **Major Accident** and/or **Disaster** subject to assessment of its potential to result in a significant adverse effect on an environmental **Receptor**.
Rochdale Envelope	The Rochdale Envelope is an acknowledged way of dealing with an application where details of a project have not been fully resolved by the time the application is submitted. The term is used to describe those elements of a scheme that have not yet been finalised, but yet can be accommodated within certain limits and parameters allowing the likely significant effects of a project to be presented in the **Environmental Statement** as a reasonable worst case. It also provides the opportunity to assess aspects of a development where the detailed design is to be developed post grant of a **DCO** and approved by the **Local Planning Authority** under a **DCO Requirement**.
Scoping	An exercise undertaken pursuant to the **EIA Regulations**, to determine the environmental topics and environmental elements to be addressed within the **Environmental Statement** (ES).
Scoping Boundary	The boundary considered to be the limits of the **Proposed Development**, as studied as part of the **Scoping Report**.
Scoping Opinion	The Scoping Opinion is the **Secretary of State's** written opinion as to the scope, and level of detail, of the information to be provided in the Environmental Statement.
Scoping Report	The Scoping Report is a report prepared by an applicant to provide the information required under the EIA Regulations to request a **Scoping Opinion** from the **Secretary of State**.
Secondary Aquifer	These include a wide range of rock layers or drift deposits with an equally wide range of water

	permeability and storage. Secondary Aquifers are subdivided into two types: • Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. • Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons, and weathering. These are generally the water bearing parts of the former non-aquifers. The term 'Secondary Undifferentiated' is also used in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
Secondary Mitigation	Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent, or through inclusion in the **Environmental Statement.**
Secretary of State (SoS)	In the case of the **Proposed Development**, the Secretary of State for Business, Energy, and Industrial Strategy (BEIS).
Setting	The surroundings within which a heritage asset is experienced and any element, which contributes to the understanding of its significance.
Significance	A measure of the importance or gravity of the effect defined by significance criteria specific to the environmental topic.

Significant Observed Adverse Effect Level (SOAEL)	The level above which significant adverse effects on health and quality of life occur as a result of noise or vibration. (see also: **Significance**).
Site	For the **DCO Application**, this is the land within the **Order Limits** that will be shown on the **Works Plans**.
Site Boundary	The maximum extent of land potentially required temporarily and/or permanently for the construction, operation and maintenance of the **Proposed Development**.
Site of Importance for Nature Conservation (SINC)	Sites of Importance for Nature Conservation are usually selected within a local authority area and support both locally and nationally threatened **Habitats** and **Species** that are priorities under the county or UK Biodiversity Action Plan (BAP).
Site of Special Scientific Interest (SSSI)	A site statutorily notified under the Wildlife and Countryside Act 1981 (as amended) as being of special nature conservation or geological interest. Site of Special Scientific Interest (SSSIs) include **Habitats**, geological features, and landforms.
Site Waste Management Plan (SWMP)	A system or document for implementing, monitoring, and reviewing waste prevention measures.
Solar Farm	Proposed generating station including solar PV modules mounted on racks and connected via associated infrastructure to the National Grid.
Solar Photovoltaic (PV) Array	Linked collection of Solar PV Modules
Solar Photovoltaic (PV) Generating Station	Comprised of **Solar PV Modules** and **Solar PV Mounting Structures**
Solar Photovoltaic (PV) Modules	Panels comprised of photovoltaic cells beneath a layer of toughened glass that convert sunlight into electrical current.

Source Protection Zone (SPZ)	Areas which show the level of risk to the source of groundwater from contamination. SPZ 1 (Inner zone) is based on a 50 day travel time of pollutant to source with a 50 metres default minimum radius. SPZ2 (outer zone) is based on a 400 day travel time of pollutant to source with 250 or 500 metres minimum radius around the source depending on the amount of water abstracted. SPZ 3 (total catchment) area around a source within which all the groundwater ends up at the abstraction point.
Special Area of Conservation (SAC)	Areas of protected habitats and species as defined in the **Habitats Directive**.
Special Crossing	The crossing of a pipeline of features such as watercourse, rail or road which require particular consideration with regards to the construction methods.
Special Protection Area (SPA)	Sites classified in accordance with Article 4 of the EC Birds Directive (79/409/EEC) which came into force in April 1979. They are classified for rare and vulnerable birds (as listed on Annex 1 of the Directive), and for regularly occurring migratory **Species**.
Species	A group of interbreeding organisms that seldom or never interbreed with individuals in other such groups, under natural conditions; most species are made up of subspecies or populations.
Study Area	The area around the **Scoping Boundary** within which impacts could occur and therefore within which specialist assessment is undertaken.
Statutory Consultation	The **Planning Act 2008** (as amended) (PA 2008) requires an applicant to undertake public consultation in advance of submitting a **Development Consent Order** (DCO) application to the **Secretary of State** (SoS).
Statutory Consultees	Planning law prescribes circumstances where the **Secretary of State** is required to consult specified bodies prior to a decision being made on an application.

	Includes bodies such as: Environment Agency, Highways England, Historic England, Natural England, Parish Councils, among others.
Statutory Undertaker	The various companies and agencies who are given general licence to carry out certain development and highways works. Generally these are utilities and telecoms companies or nationalised companies.
Statement of Community Consultation	The **Planning Act 2008** (as amended) (PA2008) requires an applicant to undertake public consultation in advance of submitting a **Development Consent Order** (DCO) application to the Secretary of State (SoS). A **Statement of Community Consultation** (SoCC) must be prepared, setting out how the **Applicant** proposes to consult people living in the vicinity of the **Proposed Development**.
Strings	Group of solar PV modules which are fixed to a mounting structure.
Survey Area	The area within which an environmental survey is undertaken.
Sustainable Drainage System (SUDS)	A collection of water management practices that aim to align modern drainage systems with natural water processes.
Switchgear	Combination of electrical disconnect switches, fuses or circuit breakers to control, protect and isolate electrical equipment.
Temporary Works	Those parts of the works that allow or enable construction of the **Proposed Development** and which do not remain in place at the completion of the works.
Temporary Construction Laydown Area	Temporary secure storage area that is associated with the construction works of the Proposed Development.
Tertiary Mitigation	Actions that would occur with or without input from the **EIA** feeding into the design process. These include

	actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental **Effects**.
Transect	Survey technique for surveying birds, wintering birds and breeding birds, with surveyors walking pre-defined routes.
Transformer	A static piece of apparatus with two or more windings which, by electromagnetic induction, transforms a system of alternating voltage and current into another system of voltage and current usually of different values and at the same frequency for the purpose of transmitting electrical power.
Tributaries	Smaller watercourses which drain to a large watercourse.
Visual Amenity	Overall enjoyment of a particular area, surroundings, or views in terms of people's activities - living, recreating, travelling through, visiting, or working.
Visual Effect	An effect on specific views and on the general visual amenity experienced by people.
Visual Receptor	Heritage assets, individuals and / or defined groups of people, that have the potential to be affected by the **Proposed Development**.
Vulnerability	In the context of the 2014 EU Directive, the term refers to the ‘exposure and resilience’ of the **Proposed Development** to the risk of a major accident and/or disaster. Vulnerability is influenced by sensitivity, adaptive capacity, and magnitude of impact.
Waste	Any substance or object which the holder discards or intends or is required to discard.
Waste Hierarchy	A guiding theme for waste policy at all levels. Establishes an order of preference for the management of waste, to maximise the prevention of waste, whilst

	minimising disposal. The Waste (Management) Hierarchy is established in the Waste Framework Directive (Directive 2008/98/EC), and prescribes the following: • Prevention (Most preferred option) • Preparing for reuse • Recycling • Recovery • Disposal (Least preferred option)
Water Abstractions	The process of taking water from any source, either temporarily or permanently, for flood control or to obtain water for, for example, irrigation.
Water Framework Directive (WFD)	European directive which commits member states to achieve good qualitative status of all water bodies.
Water Quality	The chemical, physical, and biological characteristics of water based on the standards of its usage
Wetlands	Areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.
Wildlife and Countryside Act 1981 (as amended)	The principal piece of UK legislation relating to the protection of wildlife.
Zone of Influence (ZOI)	The areas / resources that may be affected by the changes caused by activities associated with the **Proposed Development**.
Zone of Theoretical Visibility (ZTV)	A map, digitally produced, showing areas of land within which, the **Proposed Development** is theoretically visible.

Abbreviations

Abbreviations	Definition
AADT	Annual Average Daily Traffic
AC	Alternating Current
ADMS	Advances Dispersion Modelling Software
AEGLs	Acute Exposure Guideline Levels
AGI	Above Ground Installation
AIL	Abnormal Indivisible Load
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
ASSI	Area of Special Scientific Interest
ATC	Automatic Traffic Count
BAP	Biodiversity Action Plan
BAT	Best Available Techniques
BES	Building Research Establishment Environmental Sustainability Standard
BESS	Battery Energy Storage System
BGS	British Geological Society
BMV	Best and Most Versatile agricultural land
BOAT	Byways Open to All Traffic
BoSS	Balance of Solar System
BPM	Best Practicable Means
BSI	British Standards Institution
BGS	British Geological Survey
BTO	British Trust for Ornithology

CA	Conservation Area
CCC	Committee on Climate Change
CCS	Carbon Capture and Storage
CD	Consultation Distance
CDE	Construction, Demolition and Excavation
CDM	Construction, Design, 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
CL:AIRE	Contaminated Land: Applications in Real Environments
COMAH	Control of Major Accidents and Hazards
COPA	Control of Pollution Act 1974
CoSHH	Control of Substances Hazardous to Health
CSM	Conceptual Site Model
CWTP	Construction Workers Travel Plan
dB	Decibel
DCO	Development Consent Order
DECC	Department for Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DEPZ	Detailed Emergency Planning Zone
DfT	Department for Transport
DHRA	Development in a High Risk Area (Coal Mining)
DLL	District Level Licensing
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DoS	Degree of Saturation
DTM	Digital Terrain Model
EA	Environment Agency

EC	European Commission
EclA	Ecological Impact Assessment
eDNA	Environmental DNA
Efw	Energy from Waste
EIA	Environmental Impact Assessment
END	Environmental Noise Directive
EPC	Engineering, Procurement and Construction
EPD	Environmental Product Declarations
EPUK	Environmental Protection UK
ERP	Emergency Response Plan
ES	Environmental Statement
ESG	Environmental, social and governance
EU	European Union
ExA	Examining Authority
FCA	Flood Consequence Assessment
FRA	Flood Risk Assessment
FTE	Full time equivalent
GCN	Great Crested Newt
GCR	Geological Conservation Review
GIS	Geographic Information Systems
GHG	Greenhouse Gas
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GPS	Global Positioning System
GVA	Gross Value Added
GWDTE	Ground Water Dependent Terrestrial Ecosystem
H&S	Health and Safety
H&SP	Health and Safety Plan
Ha	Hectare
HASWA	Health and Safety at Work Act

HAZID	Hazard Identification Studies
HDD	Horizontal Directional Drill / Drilling
HEDBA	Heritage Environmental Desk Based Assessment
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment
HM	His Majesty's
HMG	His Majesty's Government
HMWB	Heavily Modified Waterbody
HPI	Habitats of Principle Importance
HRA	Habitat Regulations Assessment
HSE	Health and Safety Executive
HSI	Habitat Suitability Index
HVAC	Heating, Ventilation and Cooling
IA	Noise Important Areas
IAQM	Institute of Air Quality Management
ICE	Inventory of Carbon and Energy
ICSS	Integrated Control and Safety Systems
IEMA	Institute of Environmental Management and Assessment
IMD	Index of Multiple Deprivation
INNS	Invasive Non-Native Species
JSNA	Joint Strategic Needs Assessment
ktCO2	Total greenhouse gas emissions
kV	Kilovolt
LA90 dB	Background Sound
LAeq, T dB	Equivalent Continuous Sound Level
LAQM	Local Air Quality Management
LCA	Landscape Character Area
LCC	Lincolnshire County Council

LCRM	Land Contamination: Risk Management
LDP	Local Development Plan
LGV	Light Goods Vehicle
LI	Landscape Institute
LIDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
Lmax	Highest Measured Sound Pressure Level
Lmin	Lowest Measured Sound Pressure Level
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LPA	Local Planning Authority
LRN	Local Road Network
LSOA	Lower Layer Super Output Area
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MA&D	Major Accidents and Disasters
MAGIC	Multi Agency Geographic Information for the Countryside
MAH	Major Accident Hazard
MCZ	Marine Conservation Zone
MPP	Materials Management Plan
MRA	Mineral Resource Assessment
MSA	Mineral Safeguarding Area
MS	Method Statement
MW	Megawatts
MWp	Mega Watt Peak
N/A	Not Applicable
NAPPA	Noise Action Plan Priority Areas
NCA	National Character Area
NCN	National Cycle Network

NE	Natural England
NERC	Natural Environment Research Council
NKDC	North Kesteven District Council
NNR	National Nature Reserve
NO2	Nitrogen dioxide
NOEL	No Observed Effect Level
NOx	Nitrogen oxides
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
NVQ	National Vocational Qualification
OCZ	Outer Consultation Zone
ONS	Office for National Statistics
OS	Ordnance Survey
PEA	Preliminary Ecological Appraisal
PEI	Preliminary Environmental Information
PEIR	Preliminary Environmental Information Report
PHE	Public Health England
PIA	Personal injury accident data
PINS	Planning Inspectorate
PM	Particulate Matter
PM10	Particulate Matter with an aerodynamic diameter of less than 10 micrometres
PM2.5	Particulate Matter with an aerodynamic diameter of less than 2.5 micrometres
PPE	Personal Protective Equipment

PPG	Pollution Prevention Guidance
PRA	Preliminary Risk Assessment
PRoW	Public Right of Way
PV	Photovoltaic
PWS	Private Water Supplies
RBMP	River Basin Management Plan
RCN	Regional Cycle Network
RCP	Representative Concentration Pathway
REAC	Register of Environmental Actions and Commitments
RICS	Royal Institute of Chartered Surveyors
RIGS	Regionally Important Geological Site
RSPB	Royal Society for the Protection of Birds
SAB	SuDS Approving Body
SAC	Special Area of Conservation
SFRA	Strategic Flood Risk Assessment
SINC	Site of Importance for Nature Conservation
SOAEL	Significant Observed Adverse Effect Level
SoCC	Statement of Community Consultation
SoS	Secretary of State
SPA	Special Protection Area
SPD	Supplementary Planning Document
SPZ	Source Protection Zone
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
SuDS	Sustainable Drainage System
TAN	Technical Advice Note
TCO2e	Tonnes of Carbon Dioxide Equivalent
TGN	Technical Guidance Note

TMP	Traffic Management Plan
TPO	Tree Preservation Order
UK	United Kingdom
UKBAP	UK Biodiversity Action Plan
UKCP	UK Climate Projections
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UXO	Unexploded Ordnance
W	Watts
WEL	Workplace Exposure Limit
WFD	Water Framework Directive
WFDa	Water Framework Directive Assessment
WFDUKTAG	Water Framework Directive – United Kingdom Technical Advisory Group
WHO	World Health Organisation
WSI	Written Scheme of Investigation
WTN	Waste Transfer Note
ZOI	Zone of Influence
ZTV	Zone of Theoretical Visibility

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