Springwell Solar Farm

Preliminary Environmental Information Report

Volume 1
Chapter 1: Introduction
Chapter 2: Description of the Proposed Development
Chapter 3: Reasonable Alternatives Considered
Chapter 4: Approach to EIA

Phase 2 consultation
Springwell Energyfarm Ltd

Table of Contents

1. Introduction

1.1. Purpose of Preliminary Environmental Information Report

1.1.1. The purpose of this Preliminary Environmental Information Report (PEIR) is to present a preliminary account of the likely significant environmental effects that have been identified to date for Springwell Solar Farm (hereafter, the 'Proposed Development') to inform the statutory consultation process, in accordance with the Planning Act 2008[1], Guidance on the pre-application process[2], the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations')[3] (Regulation 12) and the Planning Inspectorate's Advice Note 7[4].

1.1.2. This PEIR has been prepared to enable interested parties (including members of the public, local planning authorities and statutory bodies), to develop an informed view of the likely significant environmental effects of the Proposed Development and to help inform their consultation responses on the Proposed Development during this pre-application stage.

1.1.3. This PEIR outlines the environmental assessment work undertaken to date, the likely significant environmental effects identified to date, proposed embedded mitigation and residual significant environmental effects (taking onboard any additional mitigation proposed), based on the environmental baseline information currently available and the current design of the Proposed Development. This PEIR also details the further work that is required to inform the Environmental Statement (ES), which will be submitted as part of the Development Consent Order (DCO) application.

1.1.4. The design of the Proposed Development, as presented in this PEIR, has been informed by the ongoing environmental assessment process and consultation and engagement responses. **It does not represent the final design**. Further survey and design work is currently being undertaken to further inform the design of the Proposed Development. The feedback received from this statutory consultation process will also inform further development

[1] Planning Act 2008. Available online: https://www.legislation.gov.uk/ukpga/2008/29/contents
[2] Planning Act 2008: Guidance on the pre-application process. Available online: Preliminary pages - Template A (publishing.service.gov.uk)
[3] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online: The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)
[4] Planning Inspectorate (June 2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environment Information and Environmental Statements (Version 7). Available online: Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements | National Infrastructure Planning (planninginspectorate.gov.uk)

of the design. The refined design of the Proposed Development will be reported and assessed within the ES.

1.2. Legislative and planning policy context

Planning Act 2008

1.2.1. The Proposed Development is defined as a Nationally Significant Infrastructure Project (NSIP) under Sections 14(1)(a) and 15(2)[5] of the Planning Act 2008, as it comprises:

- The construction or extension of an electricity generating station (Part 3, Section 14(1)(a)); and
- Its capacity is more than 50MW (Part 3, Section 15(2)(c)).

1.2.2. Therefore, an application for DCO pursuant to the Planning Act 2008 is required and will be sent to the Planning Inspectorate as the examining authority on behalf of the Secretary of State.

1.2.3. Section 104 of the Planning Act 2008 applies where a relevant National Policy Statement (NPS) has effect[6]. At present, the Proposed Development's energy generating technology (i.e., solar) is not specifically considered by an NPS. This means that, at present, the DCO application for the Proposed Development would be determined under Section 105 of the Planning Act 2008, which applies where no NPS has effect. Under Section 105, the Secretary of State must have regard to any local impact report, any matters prescribed in relation to the Proposed Development and any other matters which the Secretary of State thinks are both important and relevant.

1.2.4. However, the Government recently consulted on revised versions of the energy NPSs with the new versions anticipated to be published imminently. The consultation draft of NPS EN-3 (Renewable Energy) contains a chapter dedicated to solar energy technology. This PEIR has been drafted to include references to the draft NPSs. It is envisaged that the revised Energy NPSs will be adopted prior to the submission of the DCO application. Assuming

[5] Planning Act (2008). Available online: https://www.legislation.gov.uk/ukpga/2008/29/section/14.
[6] On the 22nd November 2023 the Secretary of State for Energy Security and Net Zero presented five revised Energy National Policy Statements for parliamentary approval. These include revised Overarching National Policy Statement for Energy (EN-1), National Policy Statement for Renewable Energy Infrastructure (EN-3) and National Policy Statement for Electricity Networks Infrastructure (EN-5). At the time of writing this PEIR, Parliament is now considering these revised NPSs following which it is anticipated that they will be designated. Once designated, the 2011 National Policy Statements will no longer be policy and any reference in this PEIR to the 'currently adopted National Policy Statements' should be read accordingly. As a result of the publishing of the revised NPSs on the 22nd November 2023, the March 2023 draft NPSs are no longer the "Draft NPS"; however, this was not the case at the time of the rest of this PEIR being written. As such, the rest of this PEIR continues to refer to the March 2023 publication of the draft NPSs as the 'Draft NPSs'. In any event there are minimal changes in respect of solar PV assessment principles between the March 2023 draft EN-3 NPS and the November 2023 revised EN-3 NPS.

that occurs, then the technology specific policy will be in place and Section 104 of the Planning Act 2008 would apply.

1.2.5. In accordance with Section 104(2) of the Planning Act 2008, the Secretary of State is required to have regard to any relevant NPS amongst other matters, when deciding whether or not to grant a DCO. The relevant NPS would be the newly adopted NPS EN-3.

1.2.6. If granted, the DCO will provide planning consent for development and additional consents and authorisation, where specified, removing the need for some consents (such as planning permission).

1.2.7. Section 115 of the Planning Act 2008 also states that a DCO can include consent for 'associated development', which is development that is not a NSIP in its own right but is associated to the Proposed Development.

Currently adopted National Policy Statements

1.2.8. The Overarching National Policy Statement for Energy (NPS EN-1) (2011)[7] sets out the national policy for delivering major energy infrastructure in England and Wales. For renewable energy projects, NPS EN-1 has effect in combination with the relevant technology-specific NPS, National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[8], and together, they provide the primary basis for decisions made by the examining authority.

1.2.9. Part 3 of NPS EN-1 identifies the need for nationally significant energy infrastructure. With regards to decision making, paragraph 3.1.1. of NPS EN-1 states how *"the UK needs all the types of energy infrastructure covered in this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions"*.

1.2.10. NPS EN-3, taken together with NPS EN-1, provides the primary basis for decisions by the examining authority on applications it receives for nationally significant renewable energy infrastructure.

1.2.11. NPS EN-3, whilst providing an assessment and technology-specific information on certain renewable energy technologies, does not include solar farm development because utility-scale solar development was not feasible at the time of publishing NPS EN-3.

[7] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[8] National Policy Statement for Renewable Energy (EN-5) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure

Draft National Policy Statements

1.2.12. In March 2023, the Department for Energy Security and Net Zero published updated drafts of the NPSs for Energy. The consultation on these revised drafts was recently extended to the end of June 2023, and the Government has indicated its intentions for them to be designated as soon as possible after the close of the consultation; this could be the end of this year or early 2024, subject to the parliamentary process.

1.2.13. The key draft NPSs relevant to the consideration of Proposed Development are as follows:

- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[9]; and
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[10].

1.2.14. Strategic UK Government Policy has an overwhelming focus on delivering the change in energy generation and usage that will ensure that the UK meets its legally binding target of Net Zero by 2050. The Draft NPSs for Energy Infrastructure further emphasise the importance of solar in the UK's future energy mix and the benefits of the rapidity of its deployment in helping the UK meet Net Zero and increase energy security of supply.

1.2.15. In a planning-specific context, the suite of Draft NPSs further strengthen the need for the timely delivery of new renewable energy sources. Para 3.10.2 of Draft NPS EN-3 stresses the importance of solar in delivering the Government's goals for greater energy independence. It references the British Energy Security Strategy, which states that the government expects a five-fold increase in solar deployment by 2035 (up to 70GW).

1.2.16. In terms of transitional arrangements for a suite of Draft NPSs, the consultation document published alongside the Draft NPSs, Consultation: Planning for New Energy Infrastructure (2023)[11], advises:

1.2.17. *"The Secretary of State has decided that for any application accepted for examination before designation of the updated energy NPSs, the original suite of energy NPS should have effect. The amended energy NPSs will therefore only have effect in relation to those applications for development consent accepted for*

[9] Draft National Policy Statement for Energy (EN-1) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

[10] Draft National Policy Statement for Renewable Energy (EN-5) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

[11] Consultation: Planning for New Energy Infrastructure (2023). Available online: Planning for New Energy Infrastructure: revised draft National Policy Statements (publishing.service.gov.uk)

examination after the designation of the updated energy NPSs. However, any emerging draft energy NPSs (or those designated but not having effect) are potentially capable of being important and relevant considerations in the decision-making process. The extent to which they are relevant is a matter for the relevant Secretary of State to consider within the framework of the Planning Act and with regard to the specific circumstances of each development consent order application."

1.2.18. As stated above, the Applicant considers that the Draft NPSs should be adopted by the time the DCO Application is submitted for acceptance.

National planning policy Framework

1.2.19. Under both Section 104 and Section 105 of the Planning Act 2008, the Secretary of State must have regard to other matters which the Secretary of State considers are important and relevant, which will include national and local planning policy, for example, the revised National Planning Policy Framework (NPPF)[12]. The NPPF also provides relevant context for individual factor assessments.

1.2.20. The NPPF was published by the Department for Levelling Up, Housing & Communities (formerly the Department for Communities and Local Government) in March 2012 and was updated in September 2023. The NPPF sets out the Government's planning policies and how these are expected to be applied in England.

1.2.21. The NPPF does not contain specific policies for NSIPs; however, Chapter 2 of the NPPF, 'Achieving sustainable development' sets out that the planning system should contribute to the achievement of sustainable development, considering economic, social and environmental roles.

Local planning policy

1.2.22. Local development plans do not carry the same weight under the Planning Act 2008 in respect of decision-making for NSIPs as they do with determining planning applications made pursuant to the Town and Country Planning Act 1990. The afore-mentioned NPSs are the primary consideration for NSIP applications. Nevertheless, a local development plan is still a matter that can be considered important when determining an application for an NSIP. However, in the event of any conflict, the NPS prevails.

1.2.23. The Proposed Development lies within the areas for which North Kesteven District Council and Lincolnshire County Council are the responsible relevant local planning authorities. Therefore, the relevant local planning policies of the adopted local development

[12] National Planning Policy Framework (2023). Available online: https://www.gov.uk/government/publications/national-planning-policy-framework--2

plans for each of the 'host' planning authorities will be considered part of the assessment. Local planning documents relevant to the Proposed Development comprise the following:

Lincolnshire County Council

- Lincolnshire County Council Minerals and Waste Plan (adopted 2016)[13]
- Lincolnshire County Council Green Masterplan 2020 – 2025 (adopted 2020)[14]
- Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050[15]
- Local Transport Plan 5 (LTP 5), Lincolnshire County Council (2022)[16]

North Kesteven District Council

- Central Lincolnshire Local Plan Policy 2018-2040 (adopted 2023)[17]

Consideration of planning policy in EIA

1.2.24. Within the ES, each environmental factor chapter will reference the national and local planning policies relevant to their topic of assessment. The PEIR does not consider the planning balance of the Proposed Development in line with the planning policy. This will be undertaken and set out in the Planning Statement, which will be submitted as a standalone document in support of the DCO application.

EIA Regulations 2017

1.2.25. The Proposed Development is considered to be 'EIA development', as defined by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations')[18].The Applicant notified the Secretary of State under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an ES in respect of the Proposed Development and by virtue of Regulation 6(2)(a)[19]

[13] https://www.lincolnshire.gov.uk/planning/minerals-waste
[14] https://www.lincolnshire.gov.uk/homepage/128/green-masterplan
[15] https://www.lincolnshire.gov.uk/directory-record/63754/flood-risk-and-water-management-strategy
[16] https://www.lincolnshire.gov.uk/downloads/file/7200/local-transport-plan-5
[17] https://www.n-kesteven.gov.uk/planning-building/planning/planning-policy/central-lincolnshire-local-plan-2018-2040
[18] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online: The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)
[19] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, Regulation 6(2)(a). Available online: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk).

the Proposed Development is considered 'EIA development', thus requiring an Environmental Impact Assessment ('EIA').

1.2.26. Regulation 12 of the EIA Regulations requires the Applicant to set out in its Statement of Community Consultation ('SOCC') how it intends to publicise and consult on preliminary environmental information relating to the Proposed Development.

1.2.27. Regulation 12(2) of the EIA Regulations states that the purpose of the PEIR is to provide information reasonably required to enable consultees to develop an informed view of the likely significant environmental effects of the development being proposed. The Planning Inspectorate's Advice Note 7[20] (Section 8.4) states that there is no prescribed format as to what preliminary environmental information should comprise and it is not expected to replicate or be a draft of the ES. However, it also states that if the Applicant considers this to be appropriate (and more cost-effective), it can be presented in this way.

1.2.28. Following the completion of the surveys, assessments, and consultation and engagement as detailed in this PEIR, a DCO application will be made to the Secretary of State for determination in accordance with the Planning Act 2008. 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[21]. The ES will set out the methods and findings of a comprehensive EIA undertaken in line with the EIA Regulations.

1.3. The Applicant

1.3.1. The Applicant, Springwell Energyfarm Limited, is a joint venture between EDF Renewables and Luminous Energy.

1.3.2. EDF Renewables UK, subsidiary of EDF Group, is one of the world's largest low carbon electricity companies. EDF has an operating portfolio of 41 renewable energy sites including battery, onshore and offshore wind (together totalling more than 1GW) which is providing much needed affordable and low carbon electricity. EDF's investment and innovation is reducing costs for customers and bringing significant benefits for communities. EDF

[20] Planning Inspectorate (June 2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environment Information and Environmental Statements (Version 7). Available online: Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements | National Infrastructure Planning (planninginspectorate.gov.uk) https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/

[21] Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations (2009). Available online: The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (legislation.gov.uk)

invests in projects and the communities where they operate for the long term. EDF remains involved in projects over their lifetime from development, construction and operation, all the way through to decommissioning.

1.3.3. Luminous Energy, founded in 2013, is an established UK-based renewable energy developer with projects in the UK, US, Chile and Australia. Luminous Energy is now regarded as a leading player in the market, having delivered 1GW of projects globally and with the company's core values of providing people around the world with affordable, renewable energy remaining firmly at the heart of the business.

1.4. Structure of the PEIR

1.4.1. This PEIR is structured as follows:

Volume 1 – PEIR

Provides details on the location and description of the Proposed Development, together with a preliminary account of the likely significant environmental effects that have been identified to date as a result of the construction, operation (including maintenance) and decommissioning of the Proposed Development.

Volume 2 – Supporting Figures

Comprises figures to support the information detailed in **Volume 1**. The supporting figures are provided in a separate volume to enable the figures to be shown at a suitable scale to aid access and interpretation.

Volume 3 – Supporting Reports

Comprises a set of supporting reports, which include technical survey reports and survey data, to support the environmental information detailed in **Volume 1**.

Volume 4 – Landscape Figures

Comprises annotated photosheets for the landscape and visual viewpoints to support the information detailed in **Chapter 9** of **Volume 1**.

2. Description of the Proposed Development

2.1. Introduction

2.1.1. This chapter provides an overview of the location of the Proposed Development and description of the Proposed Development for the purposes of identifying and reporting the preliminary likely significant environmental effects during construction, operation (including maintenance) and decommissioning.

2.1.2. The design of the Proposed Development has evolved (and will continue to evolve) throughout the environmental assessment process to avoid or minimise environmental effects and in response to consultation and engagement feedback, where appropriate. The evolution of the design of the Proposed Development to date is summarised in **Chapter 3**.

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, this PEIR (and the ultimate ES to be submitted in support of the DCO application) will represent a reasonable 'worst case' scenario, ensuring a robust assessment of the likely significant environmental effects. This chapter details the maximum and, where relevant, minimum parameters of the Proposed Development which have been assessed to determine the preliminary likely significant environmental effects for the purposes of this PEIR.

2.1.4. This chapter is supported by the following figures located in **Volume 2**:

- **Figure 1.1** – Location Plan;
- **Figure 2.1** – Environmental Features Plan;
- **Figure 2.2** – Site Boundary;
- **Figure 2.3** – Zonal Masterplan;
- **Figure 2.4** – Indicative Height Parameters Plan;
- **Figure 2.5** – Indicative Green Infrastructure Parameters Plan;
- **Figure 2.6** – Indicative Operational Access & Movement Parameters Plan;
- **Figure 2.7** – Indicative Cable Routes;
- **Figure 2.8** - Indicative Locations Suitable for the Main and Satellite Construction Compounds; and
- **Figure 2.9** – Indicative Construction Access Parameter Plan.

2.1.5. The main elements of the Proposed Development comprise the following:

- Solar PV development comprising;
  - Ground mounted Solar PV generating station. 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 ('Springwell 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) including batteries and associated inverters, transformers, switchgear and ancillary equipment and their containers, enclosures, monitoring systems, air conditioning, electrical cables, fire safety infrastructure and welfare facilities;
- 400kV Grid Connection Corridor to connect the Springwell Substation and future National Grid Navenby Substation;
- Underground cabling to connect the Solar PV modules to the BoSS, Collector Compounds and to the Springwell Substation.
- Ancillary infrastructure works including; boundary treatments, security equipment, earthing devices, fencing, lighting, 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.

2.1.6. The proposed extent of the Solar PV development and areas that are being considered for the location of the Collector Compounds, BESS and Springwell Substation are shown in **Figure 2.3**

2.1.7. The areas that are proposed for mitigation and enhancement or retained agricultural land are shown in **Figure 2.3** and **Figure 2.5**.

2.1.8. Each of the elements outlined above and their associated features are set out in the following sections within this chapter.

2.1.9. It should be noted that the National Grid Navenby Substation and National Grid connecting towers no longer form part of the Proposed Development. The PEIR has assessed appropriate connections, including a siting zone for the Grid Connection Corridor, to allow Springwell to connect to a future National Grid Navenby Substation. The Site boundary has therefore been amended to include the siting zone for the Grid Connection Corridor. The Proposed Development remains materially the same

as the proposed development which was subject to the Scoping Opinion, therefore the assessment is based upon this Opinion as there are no additional aspects or matters where a likely significant effect may occur.

2.1.10. National Grid Electricity Transmission (NGET) is working to identify the most appropriate location for their new substation; however, it is not now proposed to form part of the Springwell DCO application and consent. It is expected to be applied for by NGET in due course through the Town and Country Planning Act 1990 regime.

2.2. Location of the Proposed Development

2.2.1. The Site comprises approximately 1,971.45 hectares (ha) of land, located within the administrative boundary of North Kesteven District Council and Lincolnshire County Council.

2.2.2. The location of the Proposed Development is shown in **Figure 1.1**. The Site boundary, presented in **Figure 2.2**, is the anticipated maximum area of land that will be required to facilitate the construction, operation and decommissioning of the Proposed Development. The Site boundary may be subject to change in response to the statutory consultation process and as the design of the Proposed Development progresses.

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

2.2.4. 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.

2.2.5. 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.

2.2.6. The land within the Site is currently used for agriculture. The fields typically contain dried grass, lucerne, maize, spring barley, sugar beet, winter barley, vining peas and winter wheat.

2.2.7. There is variation in the features immediately surrounding each of the distinct land parcels within the Site, as presented below and illustrated on **Figure 2.2**:

- **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 east. The parcel is interspersed with small woodland plantations and hedgerows.

2.3. Project design parameters

2.3.1. The design of the Proposed Development is an iterative process informed by ongoing environmental assessment and consultation and engagement with statutory and non-statutory consultees.

2.3.2. 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'[22] provides specific guidance to applicants on the degree of flexibility that could be considered appropriate under the Planning Act 2008 regime.

2.3.3. 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 environmental effects of a project to be presented as a reasonable '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 relevant defined authority under a DCO Requirement, subsequent to the DCO being made.

2.3.4. 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. This is of particular importance to maintaining flexibility due to the rapid pace of change in solar PV and energy storage technologies.

[22] Planning Inspectorate (July 2018) Advice Note Nine: Rochdale Envelope (Version 3). Available online: Advice Note Nine: Rochdale Envelope | National Infrastructure Planning (planninginspectorate.gov.uk)

2.3.5. The design parameters for each element of the Proposed Development are detailed within the following sections and these have been used to inform the assessment detailed within this PEIR. They comprise:

- Preliminary parameter plans, which define the broad extents within which development can take place, as detailed in **Figures 2.4**, **2.5** and **2.6**.
- Preliminary design principles as outlined below within **Chapter 2**, which define the detailed parameters for specific aspects of the Proposed Development.

2.3.6. A Zonal Masterplan is shown on **Figure 2.3** in accordance with the Preliminary parameter plans and Preliminary design principles. This will form the basis of Works Plans within the DCO application.

2.3.7. The refined design will be presented in the ES in support of the DCO application.

2.4. Ground mounted Solar PV Generating Station

Solar PV modules

2.4.1. Solar PV modules convert sunlight into electrical current (as DC). Solar PV modules, commonly known as solar panels, are made up of individual bifacial photovoltaic cells.

2.4.2. The Solar PV modules would contain bifacial cells which are located at the rear of the Solar PV module and are transparent (glass or polymer) so that each Solar PV module is exposed to light at the back and front to increase the energy generation.

2.4.3. The Solar PV modules are typically dark blue/black in colour and held together by a metallic frame. The Solar PV modules will have an anti-reflective coating.

2.4.4. The Solar PV modules are fixed to a mounting structure (see further details below) and are known as a ‘table’. Once the Solar PV modules are electrically connected together in groups they are known as ‘strings’. Various factors will help inform the number and arrangement of the solar PV modules and it is likely some flexibility will be required to accommodate for future technology developments.

2.4.5. The Solar PV modules would measure approximately 2.4m in length, 1.3m in width with a depth of up to 30mm and consist of a series of photovoltaic cells beneath a layer of toughened glass.

2.4.6. The Solar PV modules would be separated with a minimum row separation space of 3m. The spacing between the rows will vary across the Site to minimise effects of overshadowing and to ensure optimal efficiency.

2.4.7. For the purposes of the preliminary assessment, we have assumed that there will be 1.5 million PV modules required, however, this is based on a reasonable worst case assumption. The total number and arrangement of solar PV modules will depend on the iterative design process and available technology at the time of construction.

Mounting structure

2.4.8. The Solar PV modules would typically be mounted on a galvanised steel structure supported by vertical posts, known as a mounting structure, as shown indicatively in **Plate 2.1** and **Plate 2.2**.

2.4.9. The posts would be mounted into the ground to a depth of up to approximately 2.5m using pile driven, drilled cast or micro pile methodology for installation. The site ground conditions will determine the appropriate anchoring system and depth for the posts. 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.

2.4.10. The mounting structure would typically be built from anodised aluminium or steel.

2.4.11. The mounting structure carrying the Solar PV modules will be designed to face southwards on a fixed platform. The Solar PV modules would be angled at a tilt of 13 to 25 degrees from horizontal to optimise daylight absorption.

2.4.12. Once attached to the mounting structure, the minimum height of the lowest part of the Solar PV modules will be approximately 0.8m above the existing ground level (AGL) and the maximum height of the Solar PV modules will be 3.5m AGL, except in areas of flood risk where the maximum height will be up to 4m AGL.

2.4.13. 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.

Plate 2.1 Example of a Solar PV module and mounting structure

Plate 2.2 Typical mounting structure

2.4.14. The different height parameters for the Solar PV modules across the Site are provided in **Figure 2.4**.

2.4.15. The preliminary Ground Mounted Solar PV Generating Station design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.1**.

Table 2.1 Preliminary Ground Mounted Solar PV Generating Station design principles

Component	Parameter type	Design Principle
Solar PV development	Maximum extent of Solar PV Generating Station	The maximum total extent of Solar PV development will be located in the areas defined on the Works Plans, which will be informed by the Zonal Masterplan shown on **Figure 2.3**.
Solar PV Module	Maximum height of Solar PV module AGL	3.5m except in areas of flood risk which will be at 4m AGL as displayed in **Figure 2.4**.
	Minimum height of Solar PV module AGL	0.8m AGL
	Dimensions	The Solar PV modules would measure up to approximately 2.4m in length, 1.3m in width with a depth of up to 30mm.
	Slope and angle	The Solar PV modules would be sloped towards the south, at a fixed angle of 13 to 25 degrees from horizontal.
	Module colour	The Solar PV modules would be dark blue or black in colour, or similar, held with a metallic frame structure.
	Solar PV Panel technology	Bifacial
	Minimum separation distances between rows	Minimum inter row spacing of 3m
Solar PV Mounting Structure	Depth of foundations	Up to approximately 2.5m
	Foundation type	Pile driven, drilled cast, micro pile, screw piles or concrete footings
	Mounting Structure material	Aluminium or galvanised steel

2.5. Balance of Solar System

2.5.1. The BoSS refers to the components and equipment that convert the DC electricity collected by the solar PV modules into alternating current (AC), comprising inverters, transformers, and switchgear.

2.5.2. As the design of the Proposed Development evolves, the configuration of the BoSS will be defined post-consent. This section also sets out the different configuration options available for the Proposed Development.

Inverters

2.5.3. 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 manage the characteristics of the DC electricity that is output from the Solar PV modules.

2.5.4. 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 in **Plate 2.3**.

Plate 2.3 Typical string inverter

2.5.5. String inverters are typically 1.2m in width, 0.9m in height and have a depth of approximately 400mm. A string inverter would be required for every PV string.

2.5.6. String inverters are typically white or light grey in colour.

2.5.7. Alternatively, centralised inverters may be used, as shown indicatively in **Plate 2.4**, which would be sited at regular intervals amongst the Solar PV modules. Centralised inverters would sit grouped together with the transformer and switchgear outside or within its own container compound as part of the Inverter Transformer Station (ITS) as detailed in **paragraphs 2.5.17 - 2.5.19** below.

Plate 2.4 Typical outdoor centralised inverter

Transformers

2.5.8. Transformers are required to step up the voltage of the electricity generated across the Site before it reaches the Springwell Substation or a Collector Compound. Transformers would be located at regular intervals across the Site, adjacent to the Solar PV Generating station. Transformers would be located standalone outdoors adjacent to the inverters and switchgear or housed indoors, alongside the inverters and switchgear within a container. A typical outdoor transformer is shown indicatively in **Plate 2.5**.

2.5.9. Transformers that are located outdoors are typically located in the same area as the standalone inverters and switchgear and as a compound would typically have a maximum footprint of 20m x 4m with a height of up to 3.5m.

Plate 2.5 Typical outdoor transformer

Switchgears

2.5.10. 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.

2.5.11. Switchgears are typically housed within a container with the transformer and/or inverter or can be located independently outdoors, adjacent to the outdoor transformer as shown indicatively in **Plate 2.6** below.

2.5.12. Switchgear that are located outdoors, typically located adjacent to the outdoor transformer will typically be sited within an area with a maximum footprint of 20m x 4m with a height up to 3.5m.

2.5.13. The switchgear would be located alongside the transformer and it is assumed that the ITS would contain the switchgear and have a footprint of 20m x 30m in plan and up to 6m in height.

Plate 2.6 Typical outdoor switchgear

Configuration options for BoSS

2.5.14. There are two options under consideration; independent outdoor equipment and ITS. Both options would be located within fields identified as suitable for the Ground Mounted Solar PV Generating Station and outside of Flood Zones 2 and 3.

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

Independent outdoor equipment

2.5.16. As presented in **Plate 2.7**, with the independent outdoor equipment option, the centralised inverter, transformer and switchgear are located separate to each other outdoors. The approximate footprint for this option is up to 20m x 4m in plan, and up to approximately 3.5m in height.

2.5.17. It is anticipated that the independent outdoor equipment would sit on compacted hardcore material or concrete pad foundations.

Plate 2.7 Example of independent outdoor equipment

Inverter and Transformer Station

2.5.18. As shown indicatively in **Plate 2.8** with the ITS option, equipment (inverter, transformer and switchgear) is enclosed together within a container. Typically, within a field containing approximately 20MW of Solar PV Modules, there would be a requirement for approximately 4-8 ITS.

2.5.19. Each ITS is typically the size of a shipping container, approximately 6m x 3m in plan, and up to approximately 3m in height. The ITS containers would be dark green or grey in colour.

2.5.20. The ITS would sit on compacted hardcore material or concrete pad foundations.

Plate 2.8 Typical Inverter Transformer Station

2.5.21. The preliminary Balance of Solar System (inverter, switchgear and transformer) design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.2**.

Table 2.2 Preliminary BoSS design principles

Parameter type	Design principle
Configuration of BoSS	The BoSS comprises the inverter, transformer and switchgear. These would be grouped together within the same outdoor compound or within an ITS.
Type of inverter	There are two options including String or Central inverters. String inverters are located alongside each Solar PV Module or attached to the rear of the Module. Central Inverters are distributed at regular intervals amongst the Solar PV Modules as part of an outdoor compound or ITS.
Dimensions of string inverter	String inverters are typically 1.2m in width, 0.9m in height have a depth of approximately 400mm.
Number of string inverters	Assumed approximately 2700 string inverters.

Parameter type	Design principle
Number of central inverters	Assumed approximately 270 central inverters.
Type of transformer	Transformers may be independent outdoor units or be located within a container alongside the inverters and switchgear.
Dimensions of outdoor transformer, inverter and switchgear compound	There is an option for the inverter, transformer and switchgear to be placed outdoors and be independent of each other within the same outdoor compound. The approximate footprint for this option is up to 20m x 4m in plan, and up to approximately 3.5m in height.
Dimensions of ITS	Each ITS container would be approximately 6m x 3m in plan and up to 3m in height.
Colour of independent inverters, transformers and switchgear	Light grey, white, dark green or similar.
Colour of ITS	Dark green, grey or similar.
Number of ITS	Approximately 270 ITS would be required across the Site.
Indicative location	The location of the BoSS has not been defined and will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES. For the purposes of the preliminary assessment, it has been assumed that the BoSS equipment would be located in an ITS that would be located within each Solar PV field as marked in light blue on the Zonal MasterPlan provided in **Figure 2.3** but excluding Indicative Siting Areas for the BESS, Collector Compounds and Springwell Substation.

2.6. Collector compounds

2.6.1. Consideration has been given to the potential use of Collector Compounds to manage the underground cabling across the Site and/or provide local maintenance facilities. It is anticipated that there would be a main Collector Compound located adjacent to the Springwell Substation and satellite Collector Compounds located within each Parcel. It is anticipated that there would be one satellite Collector Compound within both Springwell East and Springwell Central and up to two in Springwell West, as displayed in the Zonal Masterplan in **Figure 2.3**.

2.6.2. 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 will then connect the Collector Compounds to the Springwell Substation.

2.6.3. The Collector Compounds may include switchgear and transformers to step up the voltage to 66kV. The switchgear and transformers would be located in a contained indoor unit or within a separate outdoor fenced area. The Collector Compounds would also include an operation, maintenance, security and welfare building, assumed to be single storey.

2.6.4. The Collector Compounds are expected to sit on shallow concrete pad foundations.

2.6.5. The containers are expected to be grey or dark green in colour. The buildings could be formed in grey or dark green containers, or may be brick or block built which may be rendered/painted to be sensitive to the local environment.

2.6.6. The satellite Collector Compounds are anticipated to be approximately 1,500m², with the maximum height of the equipment within each compound approximately 6m in height AGL.

2.6.7. The main Collector Compound is anticipated to be approximately 21,600m², with the maximum height of 6m AGL.

2.6.8. Based on the site selection work (further detail provided in **Chapter 3**), the potential areas within the Site considered suitable for the location of the Collector Compounds are presented in **Figure 2.3**.

2.6.9. The preliminary Collector Compound design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.3**.

Table 2.3 Preliminary Collector Compound design principles

Parameter type	Design principle
Satellite Collector Compound dimensions and height	Approximately 1,500m² and up to 6m in height AGL
Main Collector Compound dimensions and height	Approximately 21,600m² and up to 6m in height AGL
Colour	The collector compound containers would be grey, dark green or similar. The buildings will be formed in grey or dark green containers, or may be brick or block built and will be rendered/painted to be sensitive with the local environment.
Indicative Location	**Figure 2.3** presents the potential areas within the Site considered suitable for the location of the Collector Compounds. For the purposes of the preliminary assessment, it has been assumed that one Collector Compound is located within each of the Indicative Siting Zones shown on the Zonal MasterPlan provided in **Figure 2.3**. Height parameters for the Collector compounds are up to 6m as shown in the Height Parameter Plan as outlined in **Figure 2.4**. Collector compound siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.

2.7. Battery Energy Storage System

2.7.1. The Battery Energy Storage System (BESS) is designed to provide peak generation and grid balancing services to the electricity grid. It can do this 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.

Plate 2.9 Example BESS facility

2.7.2. The BESS typically comprises a number of container-sized units which would house the BESS batteries and associated equipment.

2.7.3. It is anticipated that each BESS and control and transformer containers would be up to 13.5m in length x 2.5m width and up to 6m in height AGL. The BESS containers would be up to approximately 3m in height and the associated electrical infrastructure would be up to 6m.

2.7.4. It is anticipated that the BESS compound would be up to 125,000 m². The defined number of BESS containers will depend upon the most appropriate design power output capacity and duration of energy storage required at the time of construction. For the purposes of the preliminary assessment, it has been assumed that there would be 1150 BESS containers and 385 BESS control and transformer containers within the BESS compound.

2.7.5. 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, fire safety equipment, water storage tanks and a shut off valve. An example of a BESS facility is shown in **Plate 2.9.**

2.7.6. 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.

2.7.7. Each BESS would 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 would have a fan built into it that is powered by auxiliary power from an incoming supply from the grid.

2.7.8. 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 unit containers and will be located adjacent to the BESS within the same compound.

2.7.9. Welfare facilities and security gatehouses are likely to be located within the BESS compound.

2.7.10. The BESS would sit on shallow concrete pad foundations.

2.7.11. The BESS would be grey or dark green in colour and contained within a palisade fence for security measures.

2.7.12. The BESS containers are modular and will be configured to fit the field size, fit with the location of the Springwell Substation and respond to any environmental constraints. The configuration of the BESS will be detailed and assessed within the ES.

2.7.13. The BESS would be located in one centralised area.

2.7.14. The BESS would be located in close proximity to the Springwell Substation within the north of Springwell West or located in the fields to the southern extent of Springwell West.

2.7.15. The location and configuration of the BESS will be developed as the design of the Proposed Development progresses and will be informed by the EIA and consultee responses.

2.7.16. Based on the site selection work (further detail provided in **Chapter 3**), the potential areas within the Site considered suitable for the location of the BESS are presented in **Figure 2.3**.

2.7.17. The preliminary BESS design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.4**.

Table 2.4 Preliminary BESS design principles

Parameter type	Design principle
Dimensions and height of one BESS container unit or one control and transformer unit	The unit would be up to 13.5m in length x 2.5m width and up to 6m in height.
Compound dimensions	Up to 125,000m².
Colour	Grey, dark green or similar. The buildings would be formed in grey, dark green or may be brick or block built

Parameter type	Design principle
	which would be rendered/painted to be sensitive to the local environment.
Foundations	Shallow concrete pad foundations.
Indicative locations	**Figure 2.3** presents the potential areas within the Site considered suitable for the location of the BESS. For the purposes of the preliminary assessment, it has been assumed that the BESS is either located within 1) Indicative Siting Zones in the north of Springwell West, OR 2) within the Indicative Siting Zone in the southern extent of Springwell West. Both options have been assessed. Height parameters for the BESS Indicative Siting Zone in the southern extent of Springwell West are up to 6m as shown in the Height Parameter Plan provided in **Figure 2.4**. Height parameters for the BESS Indicative Siting Zone in the north of Springwell West reflect the higher Springwell Substation (up to 12m). BESS siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.

2.8. Springwell Substation

2.8.1. 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 Springwell Substation would facilitate the export and import of electricity from the Proposed Development to the National Grid. Further detail on the future National Grid Navenby Substation in provided in **paragraph 2.1.9 and 2.1.10** within this chapter.

2.8.2. The Springwell Substation would consist of electrical infrastructure such as the transformers, switchgear and metering equipment. The Springwell Substation would include a building which will comprise an office, control functions, warehouse, welfare and workshop facilities in one or more buildings with a total footprint of approximately 500m² and up to 6m in height AGL.

2.8.3. Switch rooms would also be housed within a single storey container building which is anticipated to be approximately 28m x 7m with a maximum height of 6m AGL.

2.8.4. The building would be a painted block building or of prefabricated construction with external colours and finishes sensitive to the landscape.

2.8.5. The Springwell Substation is expected to include up to six transformers to step up the voltage of the electricity generated across the Site. Each transformer would sit on a concrete stand with a low boundary wall. It is anticipated that the total footprint of the transformer would be 8m x 25m in plan with the transformer equipment up to 12m in height AGL.

2.8.6. Security gatehouses to facilitate two people are anticipated to be located within the Springwell Substation compound.

2.8.7. The footprint of the entire Springwell Substation compound is anticipated to be approximately 62,500m² with a height up to 12m AGL. The final configuration of the Springwell Substation will be detailed and assessed within the ES.

2.8.8. Based on the site selection work (further detail provided in **Chapter 3**), the potential areas for the location of the Springwell Substation are presented in **Figure 2.3**. The defined location of the Springwell Substation will be informed by ongoing design development, the EIA and consultee responses.

2.8.9. The preliminary Springwell Substation design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.5**.

Table 2.5 Preliminary Springwell Substation design principles

Parameter type	Design principle
Springwell Substation building (office, welfare, warehouse and workshop facilities) dimensions	Approximately 500m² in one or more buildings and up to 6m AGL in height.
Switchgear room dimensions	28m x 7m with a maximum height of 6m AGL.
Springwell Substation compound material	The control building is expected to be a painted block building or of prefabricated construction with external colours.
Dimensions of the main transformers	The bund in which each of the transformers would sit are anticipated to be approximately 8m x 25m, and up to approximately 12m AGL in height.
Springwell Substation compound	It is anticipated the overall Springwell Substation compound would be approximately 62,500m² with a height up to 12m AGL.

Parameter type	Design principle
Indicative location	**Figure 2.3** presents the potential areas within the Site considered suitable for the location of the Springwell Substation. For the purposes of the Preliminary assessment, it has been assumed that the Springwell Substation is located within the A Zones shown on the Zonal MasterPlan as provided in **Figure 2.3**. Height parameters for Springwell Substation are up to 12m as shown in the Height Parameter Plan provided in **Figure 2.4**. Springwell Substation siting within Indicative Siting Zone A is assumed to be closest to the nearest sensitive receptor for that particular assessment.

2.9. Underground cabling

Grid Connection cabling

2.9.1. The electricity generated by the Proposed Development would be exported via 400kV underground cabling from the Springwell Substation to a new National Grid Substation.

2.9.2. The siting zone for Grid Connection Corridor is shown in **Figure 2.3**. The total length of the underground cabling is to be determined; however, for the purposes of this PEIR, it is assumed that the cable route would be up to 2km to the north of Gorse Hill Lane.

2.9.3. The Grid Connection cabling will avoid woodlands, watercourses and the area underneath the overhead line and will seek to avoid any impacts to high value trees and hedgerows. It is likely that the Grid Connection cabling would need to cross two minor roads.

2.9.4. The Grid Connection cabling, which forms part of the Proposed Development, exceeds 132kV and therefore has the potential to cause electromagnetic fields with adverse effects on human health. The Grid Connection cabling will be buried underground at a suitable depth in accordance with the relevant guidance[23]. Therefore, electromagnetic fields are unlikely to have any adverse effects on residential receptors.

2.9.5. The location of the Grid Connection cabling is subject to an iterative design process informed by ongoing environmental and engineering surveys, engagement with landowner(s) and engagement with stakeholders. The location of the Grid Connection

[23] Department of Energy and Climate Change (2012). Demonstrating compliance with EMF public exposure guidelines: voluntary code of practice. Available online: Demonstrating compliance with EMF public exposure guidelines: voluntary code of practice - GOV.UK (www.gov.uk)

cabling will be refined as engagement and the design progresses and will be presented in the ES.

2.9.6. The Grid Connection cabling would form a single circuit connection between the Springwell Substation and the National Grid Navenby Substation.

2.9.7. The cable trenches are expected to be up to approximately 2m wide and to a depth of approximately 1.5m, apart from in areas where cables would be joined at jointing bays (see **paragraph 2.9.14**) and in areas where cables would need to cross roads, utilities or ditches, where the depth may be greater. The exact depth of the cable trench in these locations is dependent on the nature and requirements of the feature that the cable route would need to cross, which will be determined as the engagement and design progresses.

2.9.8. Open-cut trenching methods will be used for the 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 and to avoid or reduce impacts to environmental receptors.

2.9.9. The Grid Connection cabling working width would be up to 25m to account for the inclusion of the cable trench, two lane haul road for construction and maintenance access, space for temporary storage of topsoil and subsoil and working space between these features.

2.9.10. Jointing bays would be required along the Grid Connection cabling route to connect the lengths of the cable and to help with any maintenance and replacement requirements, should a fault develop.

2.9.11. The jointing bays would comprise a main jointing pit where the cables are joined, and a smaller link box which provides for connections between the cable screens. There may also be a small fibre optic chamber adjacent to the link box, if fibre optic communications cables need to be joined.

2.9.12. It is anticipated that the cables would need to be joined at every 500-800m in a jointing bay. The jointing bay would be approximately 5.5m in width, 20m in length and up to approximately 2.5m in depth.

2.9.13. These would be buried underground and would typically include concrete chambers with concrete or metal inspection covers. For example, the jointing bay may have concrete slab floors or one or more concrete chambers, and may include concrete roof slabs to facilitate maintenance access.

2.9.14. The jointing bays would be positioned at the field boundaries, as far as practicable, to reduce the impact on agricultural activities.

2.9.15. The preliminary Grid Connection cabling design principles that have been assumed for the purposes of this preliminary assessment are detailed in **Table 2.7**.

2.9.16. The PEIR assessment is based on the siting zone of the Grid Connection Corridor presented in **Figure 2.3** and design principles presented in **Table 2.6**. The Grid Connection cabling within the siting zone presented in **Figure 2.3** is assumed to be closest to the nearest sensitive receptor for that particular assessment to ensure a reasonable worst case scenario.

Table 2.6 Preliminary Grid Connection cabling design principles

Parameter type	Design principle
Maximum width of the cable trench	The cable trench would be up to 2m wide
Depth of the cable trench	Approximately 1.5m in depth, except when the cable routes need to cross roads, ditches or known utilities, where the depth may be greater.
Maximum Grid Connection cable working width	Up to 25m to account for the inclusion of the cable trench, two lane haul road for construction and maintenance access, space for temporary storage of topsoil and subsoil and working space between these features
Joint bay	Approximately 5.5m in width, 20m in length and up to approximately 2.5m in depth.

Cabling

2.9.17. Low voltage electrical cabling is required to connect the Solar PV modules to inverters (typically via 1.5/1.8kV cables), and the inverters to the transformers (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 electrical infrastructure within the Springwell Substation and BESS.

2.9.18. Cabling will be laid underground, apart from cabling between the Solar PV modules and string inverters. The dimensions of the trenches will vary depending on the number of circuit ducts they contain and therefore could be up to 19m wide in some locations across the Site which would be limited to areas where there are large numbers of circuit ducts, typically adjacent to the Springwell Substation and main Collector Compound. The cabling is expected to be up to approximately 2m in depth, apart from in areas where utilities, road or ditch crossings may be required.

2.9.19. It is anticipated the working width for the cable route construction will be approximately 5m on either side of the trench. It has therefore been assumed that the maximum cable route corridor width would be up to 29m in width.

2.9.20. Open-cut trenching methods will 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 such as the A15, environmental receptors, and other existing infrastructure.

2.9.21. Data cables are anticipated to be installed alongside the electrical cables to allow monitoring of the infrastructure during the operational phase of the Proposed Development.

2.9.22. Based on the site selection work (further detail provided in **Chapter 3**), the indicative options for the location of the main cable route connection to the Springwell Substation are displayed in **Figure 2.7**. This PEIR has based the assessment on all of the cable route options that are identified in **Figure 2.7** to be taken forward to assume a worst case approach. The defined location of the cable routes will be informed by ongoing design development, the EIA and consultee responses.

2.9.23. The preliminary cabling design principles that have been assumed for the purposes of this preliminary assessment are detailed in **Table 2.7.**

Table 2.7 Preliminary cabling design principles

Parameter type	Design principle
Maximum width of the cable trench	The trenches would be up to 19m wide in some locations across the site which would be limited to areas where there are large numbers of circuit ducts, typically adjacent to the Springwell Substation and main Collector Compound. There would be a 5m working width on either side of the trench. It has therefore been assumed that the maximum cable route corridor width would be up to 29m in width.
Maximum depth of the cable trench	Up to approximately 2m in depth, except when the cable routes need to cross roads, ditches or known utilities.

2.10. Ancillary infrastructure works

Fencing and security

2.10.1. Security fencing would enclose the operational areas of the Proposed Development. The fields encompassing the Solar PV

modules and supporting infrastructure will likely be fenced using 'deer-proof fencing' which is formed of wooden posts and wire mesh, which typically would be 2.5m in height and up to a maximum height of 3m.

2.10.2. It is proposed that mammal gates would be included in the deer-proof fencing to allow other wildlife to move across the Site.

2.10.3. The location of the security fencing is likely to be positioned close to the infrastructure allowing an offset of at least 10m from trees and hedgerows, where practicable, to avoid any impact to tree root zones and to provide a biodiversity corridor. The defined location of the security fencing is still to be determined.

2.10.4. Palisade fencing would be installed around the perimeter of the Springwell Substation compound, BESS, Collector Compounds and Grid Connection cable jointing bays. Palisade fencing is made of steel rails attached to horizontal-running rails, connected to vertical steel joints. It is anticipated that the fencing will be up to 3m in height.

2.10.5. Pole mounted facing closed circuit television (CCTV) systems which typically have a maximum height of 5m are assumed to be positioned around the perimeter of the operational areas of the Site with fixed views of the Proposed Development as a security measure. The CCTV would be positioned in the locations including the Ground Mounted Solar PV Generating Station, BESS, Collector Compound and Springwell Substation compound and will not be positioned in view of any residential properties. CCTV lighting will be infrared (not visible).

2.10.6. The Springwell Substation compound, BESS compound, and Collector Compounds is assumed to include manually operated lighting, in accordance with relevant standards. No areas of the Site are assumed for the purposes of the preliminary assessment to be permanently lit.

2.10.7. The lighting design will be directional and only operated in case of emergency or when needed during maintenance works being undertaken during hours of darkness.

2.10.8. The preliminary fencing and security design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.8**.

Table 2.8 Preliminary fencing and security design principles

Component	Parameter type	Design principle
Fencing	Type	Deer-proof fencing would be installed around the operational areas of the Proposed Development. Palisade Fencing would be installed around the perimeter of the Springwell Substation compound, BESS, Collector Compounds and Grid Connection Jointing Bays.
	Maximum height	The deer-proof and palisade fencing would have a maximum height of 3m.
Security	Type	Pole mounted closed CCTV systems.
	Maximum height	The pole mounted CCTV would have a maximum height of 5m.

Drainage

2.10.9. The Solar PV modules would not increase the impermeable area, and therefore are not anticipated to increase the volume of surface water runoff. The Solar PV modules will be separated by a rainwater gap to allow rainwater to drain feely to the ground between the panels helping to replicate the greenfield runoff conditions.

2.10.10. Drainage and sewage systems are likely to be required at the Springwell Substation compound and BESS compound due to the increase in impermeable hard standing material that would form the base for the equipment.

2.10.11. A detailed operational drainage design will be carried out pre-construction to account for the areas of hardstanding at the Springwell Substation and BESS.

2.10.12. The design of new drainage systems will be based on the Flood Risk Assessment (FRA) and hydrological assessment which will determine the requirement and location for sustainable urban drainage systems. The FRA will be submitted in support of the DCO application.

2.10.13. Infiltration drainage design will be in accordance with Building Research Establishment (BRE) Digest 365: Soakaway Design and Sewers for Adoption.

2.10.14. To ensure potentially contaminated runoff does not enter the wider hydrological network, a system would be installed to isolate and contain any firewater runoff in the event of an emergency. This

would likely include the use of a system which can stop surface water discharge offsite within the onsite drainage network. The potentially contaminated runoff would then be contained within an underground attenuation tank prior to being collected and tankered offsite to be suitably tested and disposed.

Internal site access tracks

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

Works to facilitate vehicular access to the Site

2.10.16. The primary point of construction and operational access to the Site is assumed to be directly from or via the A15 Sleaford Road, utilising the existing B1191. Further work which includes a swept path analysis of the preferred field access locations has been undertaken to understand if there is a requirement for any street works to the public highway (or adjoining land) to accommodate heavy goods vehicles (HGV) or abnormal indivisible loads (AIL). The layout of field accesses has been checked and geometrical changes to the access layouts will be incorporated and included in the developing design, where necessary. The Gorse Hill Lane junction with the A15 Sleaford Road will require improvement to safely facilitate vehicle movements to/from the Springwell Substation for articulated HGVs and AILs, which form part of the Proposed Development.

2.10.17. The HV transformers can weigh up to approximately 200 tons; therefore, it is assumed that concrete or tarmac roads would be installed from the main site entrance to the Springwell Substation.

2.10.18. Temporary access tracks would be provided to link the temporary construction compounds to the Site access points. It is anticipated that onsite access tracks would follow the existing agricultural tracks, where possible, to limit the soil disturbance and any tree and hedge removal. Where required, the internal access tracks would likely be constructed of stone laid on a geotextile membrane, with any required excavation kept to a minimum.

2.10.19. The indicative options for the location of construction accesses are displayed in **Figure 2.9**. The final access locations will be confirmed as the Proposed Development design progresses and in consultation with the County Highways Authorities.

Recreation and amenity improvements

2.10.20. The Proposed Development will include recreation and amenity improvements. These will be designed to retain and enhance recreational connectivity across the Site.

2.10.21. Based on feedback from non-statutory consultation, the Proposed Development is exploring several Rights of Way improvements and permissive paths within the Site, as detailed below:

- Proposed new permissive path linking RAF Digby to Scopwick;
- Proposed new permissive path from Heath Road to link to the existing Public Rights of Way (PRoW) between RAF Digby and Rowston and to enable a circular walking route for the Heath Farm austism care centre;
- Proposed new permissive path along the western edge of the Proposed Development linking New England Lane to Brauncewell;
- Improvements to the Bloxham Wood access on Heath Road; and
- Rights of Way Improvements to the existing route between Scopwick and Blankey.

2.10.22. The Rights of Way improvements and new permissive path proposals are illustrated in **Figure 2.5**.

Green infrastructure

2.10.23. The Proposed Development will include landscaping, habitat management, biodiversity enhancement, which will be defined as the design progresses. This will be designed to retain and enhance ecological and recreational connectivity and will be defined with inputs from the EIA and consultee responses.

2.10.24. The existing hedgerows, woodland and field margins will be retained as part of the Proposed Development, with the exception of gaps required for new access points, visibility at turnings and for the installation of cabling. Existing agricultural tracks and field margins would be used for access points where possible and, if required, the width of any new gaps will be kept to a minimum.

2.10.25. The design will incorporate a minimum offset of 10m from all existing trees and hedgerows, where practicable, to reduce the environmental impact and to ensure there is a sufficient distance between the infrastructure and the field boundary to allow habitat connectivity and biodiversity and landscape improvements.

2.10.26. Landscaping, including new hedgerow and tree planting is proposed to avoid or minimise significant environmental effects.

The location and scale of planting is to be determined and will take into consideration the landscape character of each parcel by allowing views to remain open, where planting will not be appropriate.

2.10.27. The planting type would be resilient to climate change and comprise of majority native (and of local provenance) species that contribute towards biodiversity enhancement.

2.11. Construction phase

Indicative construction programme

2.11.1. Subject to obtaining development consent and following a final investment decision, construction is assumed for the purposes of the assessment to commence no earlier than 2026 and last for up to 48 months, followed by a commissioning period, including site restoration, landscaping and grid connection of approximately 6 months.

2.11.2. It is anticipated that the construction of the Proposed Development will be completed in two phases within the 48 month construction period. The construction phasing is not defined at this stage and will be presented and assessed within the ES.

2.11.3. It is anticipated that the initial works for each phase would include enabling works comprising access works including installation of any internal access tracks that may be required, enabling works, installation of temporary construction compounds and installation of fencing. Following this, the main construction works including construction of the Springwell Substation, Solar PV development, Collector Compounds and BESS would take place.

Construction activities

2.11.4. The ES will provide further details of the proposed construction activities, their assumed duration, along with an assumed programme of each phase of works.

2.11.5. The types of construction activities that would be required comprise (not necessarily in order):

- Site preparation, including minor localised site levelling, vegetation clearance, landscape planting and establishment of perimeter fencing and security measures;
- Import of construction materials, plant and equipment to Site;
- Establishment of Site construction compounds and welfare facilities;
- Appropriate storage and capping of soil;

- Upgrading existing tracks and construction of new access roads within the Site;
- Marking out the location of infrastructure;
- Cable installation;
- Trenching in sections;
- 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).

2.11.6. The site preparation and enabling works would involve the following activities (not necessarily in order):

- Preparation of the land, including any localised site levelling for the Springwell Substation (where required);
- Construction of the internal access tracks;
- Construction of the construction compounds;
- Marking out the locations for the infrastructure;
- Installation of the perimeter fencing and security features; and
- Delivery of construction materials, equipment and plant to the Site.

2.11.7. The erection of the Solar PV Mounting Structures and the mounting of the Solar PV modules would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Piling (where required) and installation of the Solar PV Mounting Structures (see **Plate 2.10** and **Plate 2.11**); and
- Mounting of the Solar PV modules.

Plate 2.10 Typical Solar PV Module Mounting Structure installation

Plate 2.11 Example of the use of pilling rigs for the preparation and installation of Solar PV Module Mounting Structure

2.11.8. The installation of electric cabling, inverters, transformer, switchgear, Collector Compounds and BESS infrastructure would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Trenching and installation of cabling;
- Transformer, Inverter and Switchgear installation and construction. It is likely cranes would be used to lift the equipment into position;
- Foundation excavation for the BESS and Transfer, Inverter and Switchgear (if required);
- Pouring of the concrete foundation base, where required;
- Installation of transformers that form part of the BESS;
- Construction of control buildings that form part of the Collector Compounds and BESS; and

- Installation of control, monitoring and communication systems.

2.11.9. The construction of Springwell Substation compound and installation of equipment would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Foundation excavation and construction;
- Pouring of the concrete foundation base; and
- Installation of the Springwell Substation.

Construction plant

2.11.10. It is anticipated that the construction plant utilised for the construction of the temporary compounds and site access tracks would comprise excavators, dump trucks and vibrating rollers.

2.11.11. It is anticipated that the construction plant utilised for the construction of the Solar PV development, Springwell Substation would comprise excavators, piling rigs, concrete mixers, tele-handlers, cranes and mobile elevating work platforms. It is anticipated that the piling rigs used for the installation of the Solar PV modules would be small units which will be installed by driven or helical steel piles. There may be a requirement to use large piling rig units for the construction of the foundations for the Springwell Substation buildings, if required due to the ground conditions.

Construction site compounds

2.11.12. Temporary compounds would be established before commencement of the main construction works for the storage of materials, plant and equipment. The compounds would typically include staff office and welfare facilities, security gatehouse, waste storage, plant and machinery storage, drainage, fencing and CCTV.

2.11.13. The temporary compounds would include hardstanding areas, with haul road areas comprising stone laid on a geotextile membrane. The construction compounds would include manually operated lighting systems to ensure safety and security, especially in the winter months.

2.11.14. It is anticipated that there would be three main construction compounds located across the Site which would be approximately 250m x 100m. It is likely that there would be up to six smaller satellite compounds in other fields across the Site which will measure approximately 50m x 25m. The indicative location of the construction compounds are detailed in **Figure 2.8.**

2.11.15. For the purposes of the preliminary assessment, it has been assumed that one main construction compound and one satellite construction compound are located within each of the indicative siting zone locations displayed in **Figure 2.8**.

Construction access

2.11.16. The primary point of construction and operational access to the Site is assumed to be directly from or via the A15 Sleaford Road, utilising the existing B1191. It is anticipated that the main construction access to the Site for the construction of the National Grid and Springwell Substation will be via the A15 Sleaford Road.

2.11.17. The construction access strategy is still being developed in coordination with the environmental inputs and engagement with National Highways and the County Highways Authority. Two routes have been considered for construction traffic including HGVs to access the Site from the strategic road network. These include an assumed primary and secondary construction route:

- Primary Construction Route: Primary access to the Site is anticipated to be directly from the A15 and via the B1191 to provide access to the east section of Springwell West, Springwell Central and Springwell East.
- Secondary Construction Route: Secondary access to the Site which is anticipated to be used as a contingency route should there be any roadworks on the B1191 and to avoid any potential temporary conflict with harvesting traffic. It is anticipated that secondary access to the Site will be via one-way routing from the A15 and via the B1202 (Metheringham Heath Lane) and south along the B1188 and outbound via Bloxham Lane and onto the B1202 (Metheringham Heath Lane).

2.11.18. There are several access point and road crossing options to the three parcels across the Site which have been identified in order to access the Site. The final construction accesses will be determined by technical surveys, ongoing engagement with the County Highways Authority and following the development of the arrangement and layout of the Proposed Development. The final access points will be detailed and assessed within the ES.

2.11.19. The indicative options for access points for construction and operation are displayed in **Figure 2.6**.

2.11.20. The requirement and extent for any improvements will be determined following the completion of the visibility and swept path analysis assessment. Initial swept path analysis has been completed for the preferred field access locations. Improvements to field access has been identified and included in the development of the design. Improvements to the Gorse Hill Lane

junction with A15 Sleaford Road will be required to facilitate a safe means of access to/from the substation. Any areas requiring highway accesses or improvements will be detailed and assessed within the ES.

2.11.21. The construction, operation and decommissioning access will be confirmed as the design progresses and in consultation with the County Highways Authorities.

2.11.22. Temporary access tracks would be constructed 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.

2.11.23. It is anticipated that onsite access tracks used for construction and operation (including maintenance) would follow the existing agricultural tracks, where possible, to limit the soil disturbance and any tree and hedge removal. Where required, the internal access tracks would likely be constructed of stone laid on a geotextile membrane, with excavation kept to a minimum.

Abnormal load deliveries

2.11.24. It is proposed that any Abnormal Indivisible Loads (AIL) would access the Site via the A15 Sleaford Road and onto Gorse Hill Lane. Initial swept path analysis has been undertaken to determine whether third party land or land under the ownership of National Highways and/or the Local Highways Authority 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. This has been completed in two-dimensions only at likely pinch-points at this stage with checks for vertical clearance to bridges and ‘humps in the road’ to be completed as the design of the Proposed Development develops. It is assumed that AILs would be required for the transformers for the Springwell Substation, accessed directly from Gorse Hill Lane. The swept path analysis will be updated following the confirmation of specific plant requirements during the development of the design. Where the AIL would access the site at Gorse Hill Lane, improvements would be required at this junction to make this manoeuvre safe and compliant to design standards. These highway improvement works form part of the Proposed Development and are within the order limits.

2.11.25. An initial swept path analysis has been carried out for field accesses using standard HGV articulated vehicles. Further engagement with the Local Highways Authority will be undertaken to discuss and agree the approach and any additional requirements that may need to be considered.

Construction traffic and management

2.11.26. In the absence of a detailed phasing strategy and defined origins of materials, it has been assumed for the purposes of this preliminary assessment that c.40 HGV arrivals and c.40 HGV departures could occur on any road link considered for construction traffic. Realistically, this would be spread across a small number of compounds at any specific period of construction and may be dispersed across the road network. This is a reasonable worst case scenario which has been assessed in accordance with the methodology.

2.11.27. In the absence of a detailed phasing strategy and defined origins of materials, it has been assumed for the purposes of the preliminary assessment that 40 HGV arrivals and 40 HGV departures could occur on any road link considered for construction traffic for the duration of the entire programme of 48 months to ensure a reasonable worst case.

2.11.28. The ES will provide a detailed breakdown of the final assumptions on the type and number of construction vehicles during the construction phase.

2.11.29. Measures to control the delivery of materials and staff onto the Site during the construction phase will be documented within and secured by the Outline Construction Traffic Management Plan. This will include the following details:

- Access and parking arrangements for site personnel, contractors and visitor arrangements for delivery and removal of materials;
- Arrangements for loading, unloading and storage of plant and materials;
- A scheme for routing and control of traffic associated with the construction and temporary signage during the construction phase;
- Implementation programme including the proposed construction period and hours of operation; and
- Details of any additional management measures, including details of wheel washing facilities and condition surveys.

Construction working hours

2.11.30. It is anticipated that the working hours on site would be from 7am until 7pm Monday to Friday and typically 7am – 12 noon on Saturday. No working on Sunday or Bank Holidays.

Construction staff

2.11.31. It is assumed that approximately 10 staff per compound would be on site for the initial site set-up including the forming of the access points and preparation of the ground, which would shortly increase once the compounds are set-up and construction of the access tracks within each parcel begins. It is anticipated that this would increase to a maximum of 600 workers during the peak construction period.

2.11.32. For the purposes of the preliminary assessment, it has been assumed, that at any given compound and time, it is anticipated that 400 workers would be required. The preliminary assessment has assumed a conservative estimate of 1.5 workers per vehicle, acknowledging that the majority of workers will travel as a team on a daily basis.

2.11.33. An Outline Travel Plan will be prepared as part of the Outline Construction Traffic Management Plan. The Outline Travel Plan will set out strategies to encourage the use of sustainable transport for the construction workforce. This will include details on initiatives to increase car sharing, while other measures will be explored for the preparation of the ES such as shuttle services to/from temporary compounds and provision of staff parking facilities, as well as other measures to encourage mode shift away from private car use.

Public rights of way

2.11.34. All PRoW would be kept open during construction as far as is practicable and safe. Where it would not be practicable and safe, there may be a requirement for some existing PRoW to be temporarily diverted or stopped for a duration of approximately 3 months. However, as the detailed construction phasing and development of the design (particularly the location of internal access tracks) is ongoing, a maximum period of 24 months is assumed for the purposes of this preliminary assessment. This maximum period is expected to reduce for the ES stage.

2.11.35. The temporary closure of PRoW will be avoided and diversions will be provided, where possible. If a diversion is required, this would be designed to provide a safe alternative route which would be discussed and agreed with the County PRoW Officer.

2.11.36. 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 Public Rights of Way Management Plan setting out the public rights of way commitments will also be submitted in support of the DCO application.

2.11.37. The Public Rights of Way Management Plan will include a schedule of public rights of way within the Site and outline the proposed measures to manage any requirements to temporarily close PRoW within the Site during construction.

Construction water consumption

2.11.38. It is anticipated that potable water (drinking water) for the purposes of the construction welfare facilities would be delivered to Site by bowser, where required, or provided by a mains water supply. Where required, raw water for the construction phase is expected to be brought to Site by bowser or may be provided from an existing private irrigation network or using mains water supplies, however, this is to be determined and agreed with the relevant consultees. The reasonable worst case has been assumed for the purposes of the preliminary assessment.

Construction waste

2.11.39. The Proposed Development is likely to generate waste during the construction phase including general construction waste, comprising packaging waste from materials delivered to Site, construction materials from enabling works and general waste from the construction worker welfare facilities.

2.11.40. Measures to manage construction waste will be documented within and secured by the Outline Site Waste Management Plan and the Outline Construction Environmental Management Plan. The Outline Site Waste Management Plan and Outline Construction Environmental Management Plan would likely be managed by the construction contractor to manage the waste arisings and implement the waste hierarchy to ensure as much construction waste is avoided, reused and recycled to reduce the amount of waste that will require disposal.

2.11.41. It is assumed that there would be approximately 5-10 waste skips per week on average for the duration of the 48 month construction period.

2.11.42. All waste to be removed from the Site would be undertaken by fully licenced waste carriers and licenced waste facilities.

Soil management

2.11.43. It is anticipated that during construction any topsoil that is stripped for the purposes of access tracks, the cable trenching works or construction compounds would be stored temporarily within areas adjacent to the cable route or within the temporary construction compounds. The soil would be used to backfill the cable trenches and reinstate any temporary construction compounds and temporary access tracks used for the construction phase.

2.11.44. Measures for soil management, following the principles of best practice to maintain the physical properties of the soil, will be documented within and secured by the Outline Soil Management Plan, with the aim of restoring the land to its pre-construction condition following the temporary construction use and at the end of the lifetime of the Proposed Development.

Construction Environmental Management

2.11.45. Key measures to be employed during construction to control and minimise the impacts on the environment will be documented within and secured by the Outline Construction Environmental Management Plan.

2.11.46. The purpose of the Outline Construction Environmental Management Plan is:

- To ensure impact and 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 reinstatement and habitat creation

2.11.47. A programme of reinstatement and habitat creation would commence following the construction phase programme. This would include landscaping, habitat management and biodiversity enhancement. This will be designed to retain and enhance ecological and recreational connectivity and will be defined with inputs from the EIA and consultee responses. All such measures will be documented within and secured by An Outline Landscape and Ecological Management Plan.

Commissioning

2.11.48. Following construction and during the 6 month commissioning period, the Proposed Development would be required to undergo a stage of testing before the electricity can be generated and supplied to the National Grid network. The commissioning work is likely to involve a period of inspections and electrical and equipment testing before the Proposed Development can become operational.

2.12. Operational phase (including maintenance)

2.12.1. Maintenance works are expected to occur throughout the operating life of the Proposed Development as and when appropriate. It is assumed that routine inspections would be carried out and access

will be via the previously built construction roads. Maintenance activities are likely to include:

- Regular visual inspection of all infrastructure;
- Regular scheduled inspections and testing of equipment;
- Repair, adjustment, alteration, refurbishment or replacement of consumable items (e.g. inverter filters) and reconstruct the same. The aim being to improve the items operational capability;
- Cleaning of solar PV modules, if required;
- Repair, adjustment, alteration, refurbishment or replacement of panels or other components. The aim being to improve the infrastructure's operational capability or repair any defaults;
- Removal of infrastructure where replaced;
- 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 staff and transport

2.12.2. It is anticipated that there would typically be up to approximately 24 permanent operating staff and security based at the Springwell Substation and BESS facility, with the potential for additional staff attending the facility during repowering activities or Site visits.

2.12.3. It is assumed that external contractors would visit the Site to undertake regular vegetation management and PV cleaning. The ES will set out the estimated number of operational staff, vehicle types and numbers.

2.12.4. In the event that there may be a requirement to replace any equipment, there may be a small number of HGV movements, however, this is anticipated to be low in frequency and on an ad hoc basis.

Operational Environmental Management

2.12.5. 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 will be documented within and secured by the Outline Operational Environmental Management Plan, including best practice guidelines on waste and water management.

2.12.6. Any equipment that is damaged or requires replacement during the operational phase will be disposed of following the waste hierarchy, with materials being reused of recycled, wherever possible. Any electrical waste will be disposed of in accordance with the Waste from Electrical and Electronic Equipment (WEEE) Regulations[24].

[24] Waste Electrical and Electronic Equipment (WEEE) Regulations (2018). Available online: Regulations: Waste Electrical and Electronic Equipment (WEEE) - GOV.UK (www.gov.uk)

Landscape and ecological establishment

2.12.7. A programme of landscape and ecology establishment would be carried out. The principles for how the land will be managed throughout the operational phase, following the completion of construction, will be documented within and secured by the Outline Landscape and Ecological Management Plan.

Public Rights of Way

2.12.8. Existing PRoW and proposed permissive paths within the Site will be retained during the operation of the Proposed Development.

Operational water consumption and drainage

2.12.9. It is anticipated that potable water (drinking water) for the purposes of the operational facilities would be delivered to Site by bowser, where required or provided by a mains water supply. Where required, raw water for the operational phase is expected to be brought to Site by bowser or may be provided from an existing private irrigation network or using mains water supplies, however, this is to be determined and agreed with the relevant consultees. The reasonable worst case has been assumed for the purposes of the preliminary assessment.

2.12.10. Effluent from the operational substation facilities is anticipated to be routed to septic tanks which will in turn feed into a filtration system which could be discharged to watercourses. This is to be determined following the detailed Surface Water Drainage Strategy and agreed with the relevant consultees.

Battery safety

2.12.11. A management plan for battery safety will be prepared and submitted with the DCO application in a document entitled Battery Safety Commitments. The Battery Safety Commitments 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.

2.13. Decommissioning phase

Ground Mounted Solar PV Generating Station, Springwell Substation and BESS

2.13.1. The Proposed Development is assumed to be operational for a period of 40 years (this depends on the operational capability of the Proposed Development as a result of its maintenance regime as with any generating asset). Following the operational period, the Proposed Development would require decommissioning. This would involve the removal of all of the Solar PV infrastructure,

including the Ground Mounted Solar PV Generating Stations, Collector Compounds, Springwell Substation, BESS and ancillary infrastructure including any on site compounds.

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

2.13.3. Solar PV modules are made up of several materials including a metal frame of which approximately 99% can currently be recycled. At the time of decommissioning, options to re-use or recycle materials will be explored to ensure as much of the materials as possible are recycled and diverted from landfill.

2.13.4. It is assumed that all concrete, hardstanding areas, foundations for the infrastructure and any internal tracks will be removed to a depth of up to 1m. It is assumed that all the below ground cables will be left in situ.

2.13.5. It is anticipated that after the operational period of 40 years, that the land within the Site will be returned to agricultural use and established habitats and planting, such as hedgerows and woodland would be retained.

2.13.6. The retention of permissive paths will be subject to the landowners' discretion post-decommissioning, therefore due to this uncertainty, the retention (or otherwise) of these permissive paths post-decommissioning has not been considered within this PEIR and will be addressed within the ES.

2.13.7. It is likely that structural long term planting proposed as part of the Proposed Development will be retained post – decommissioning to ensure the development of long term legacy habitats, however, this will be subject to the landowners' discretion.

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

2.13.9. Decommissioning is expected to take approximately 24 months and may be undertaken in phases of work. Decommissioning works would generally mirror the construction phase in reverse.

3. Reasonable Alternatives Considered

3.1. Introduction

3.1.1. This chapter provides a summary of the reasonable alternative options that have been considered by the Applicant for the Proposed Development to date, including the initial selection of the Site and through the development of the design.

3.1.2. This chapter also details how the assessment of sites and design alternatives has been undertaken and details the factors that have been considered and the main reasons for discounting alternative design options.

3.1.3. The following alternatives have been considered during the design evolution process to date:

- Alternative sites;
- Alternative renewable technologies;
- Alternative solar technologies; and
- Alternative layouts including for the solar PV development, Battery Energy Storage System (BESS), Springwell Substation and associated cable routes.

3.2. Need for the Proposed Development

3.2.1. The compelling need for global action to decarbonise, continues to be reinforced. On 20th March 2023, the U.N. Intergovernmental Panel on Climate Change (IPCC) published its 2023 assessment of global climate change. The report concludes that the world is likely to pass a dangerous temperature threshold within the next 10 years, pushing the planet past the point of catastrophic warming — unless nations drastically transform their economies and immediately transition away from fossil fuels[25].

3.2.2. In May 2023, the World Meteorological Organisation stated that the likelihood of one of 2023 – 2027, and the five-year period, being the hottest on record was 98%.

3.2.3. There is a growing body of UK energy and climate change international commitments, law, policy and guidance which highlights an urgent need for new energy generation infrastructure, particularly from renewable sources such as solar. Alongside this drive for new energy generation, the UK Government has committed to achieving net zero greenhouse gas emissions by 2050 and decarbonisation of the energy sector by 2035.

[25] Intergovernmental Panel on Climate Change (2023). Climate Change Report. Available here: AR6 Synthesis Report: Climate Change 2023 — IPCC

3.2.4. Decarbonisation is a UK legal requirement and is of global significance. In June 2019, the Government passed law to end the UK's contribution to global warming by 2050: Net Zero.

3.2.5. UK electricity demand is expected to double by 2050. Decarbonisation requires the electrification of energy which is currently sourced from fossil fuels (including gas, petrol and diesel). The UK's pathway to achieving Net Zero by 2050 must also involve wider transitions outside of the power sector, including decarbonising transport, industry, agriculture and homes.

3.2.6. In June 2023, the Committee on Climate Change (CCC) published their Progress Report to Government[26]. The report stated that *"To achieve the NDC (Nationally Determined Contribution) commitment of at least a 68% fall in territorial emissions from 1990 levels, the rate of emissions reduction outside the power sector must almost quadruple."*

3.2.7. Extensive electrification requires the major expansion of renewable and other low-carbon power generation to ensure that the UK is capable of securely meeting future electricity demand, and with a significantly lower carbon intensity. The decarbonisation of UK electricity generation is therefore vitally important to meet the UK's legal obligations on carbon emissions and ensure sustainable energy resilience. Yet the CCC also stated in their June 2023 Progress Report that *"Some of the key planks of the UK Net Zero Strategy have substantial lead-times,"* implying that these "planks" may not make significant (if any) contributions to achieving the 2030 Nationally Determined Contribution.

3.2.8. The decommissioning of existing generation assets also increases the requirement to develop new low-carbon generation with urgency in order to "keep the lights on".

3.2.9. Nuclear power has historically met circa 20% of UK electricity demand, but existing nuclear stations began to close in 2021. Only one existing plant (1.2GW) is scheduled to remain operational beyond 2028. One new nuclear project (Hinkley Point C, funded and currently under construction) is scheduled to be commissioned in the late 2020s. At the time of writing, the only other new nuclear power station with development consent is Sizewell C. Sizewell C started a private investment process in September 2023 and is proposed to be a replica of Hinkley Point C. Great British Nuclear announced six winners of a Small Modular Reactor (SMR) competition in October 2023, the winners being those technologies which Great British Nuclear viewed as most likely to meet the objective of a final investment decision in 2029. National Grid ESO's Future Energy Scenarios report (2023) includes a commissioning

[26] Committee on Climate Change (2023). Progress Report to Parliament. Available here: 2023 Progress Report to Parliament - Climate Change Committee (theccc.org.uk)/

assumption for the first Sizewell C unit and the first SMR in the UK in 2034.

3.2.10. Only one UK coal station is still in operation and is currently scheduled to close in September 2024. Carbon Capture Utilisation and Storage (CCUS) is a key plank under development to support Net Zero by facilitating the decarbonisation of the UK's thermal (carbon emitting) fleet, currently circa 40GW, decarbonising industry, producing low-emissions hydrogen and delivering greenhouse gas removal technologies. Recent progress has been made towards bringing CCUS clusters forward by the end of the decade however Government recognises that the technology has not been delivered at scale and significant risks remain.

3.2.11. Hydrogen is another key plank, but its development is not yet guaranteed. Technological hurdles must be overcome, grid connection, funding and consents must be secured. Blue hydrogen relies on functional CCUS operating at GW-scale; pink hydrogen on abundant electricity from new nuclear facilities; and green hydrogen on abundant low-carbon electricity. Not all enablers to hydrogen production are yet guaranteed, and while the future path to a low-carbon future is incredibly uncertain, much progress has already been made in the delivery of renewable generation facilities.

3.2.12. The UK has substantial renewable energy resources, and the Government is targeting 50GW of offshore wind to be operational by 2030 to harness that resource and shield consumers from volatile international energy markets. But wind on its own is not sufficient and the Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[27] states at Paragraph 3.3.20 that *"a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar".*

3.2.13. The development of large-scale solar in the UK (National Grid estimates up to 39.1GW by 2030 rising to 92GW by 2050) will provide an essential diversity to the UK's low-carbon generation portfolio, working with other technologies to deliver security of supply and value to UK consumers. The British Energy Security Strategy (April 2022)[28] set an ambition of 70GW of solar by 2035 (an increase of 56GW from the current provision).

3.2.14. Mission Zero[29], published in January 2023 by Rt Hon Chris Skidmore MP, Chair of government's Independent Review of Net Zero, finds that *"The benefits of net zero will outweigh the costs"* and believes that *"This is too important to get wrong"*. Mission Zero

[27] Draft National Policy Statement for Energy (EN-1) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

[28] https://www.gov.uk/government/publications/british-energy-security-strategy

[29] Department for Energy Security and Net Zero (2023). Mission Zero: Independent Review of Net Zero. Available here: Review of Net Zero - GOV.UK (www.gov.uk)

recommends the *"Full-scale deployment of solar…to harness one of the cheapest forms of energy, increase our energy independence and deliver up to 70GW of British solar generation by 2035"*.

3.2.15. Government's Powering Up Britain strategy (updated April 2023)[30] concludes that an acceleration of the deployment of renewables is critical to the delivery of the Government's plans: *"Our goal is to develop up to 50GW of offshore wind by 2030 and to quintuple our solar power by 2035"* [p7], noting that 14GW of solar was already installed in the UK at the time of writing the report.

3.2.16. Solar generation is therefore a critical element of the plan to decarbonise the UK electricity sector with urgency and is already a leading low-cost generation technology in the UK. The national need for solar generation is urgent and the capacity required is significantly greater than the capacity of projects currently understood to be in development.

3.2.17. Solar addresses all important aspects of existing and emerging government policy. It will make a critical and timely contribution to decarbonisation and security of supply in the UK, will help shield consumer bills from volatile energy prices and international supply markets, and provides the potential to deliver biodiversity net gains through its development.

3.2.18. It is therefore important that the assessment of alternatives is considered in the context of the urgent national need.

3.3. Alternatives considered

Policy Background

3.3.1. NPS EN-1 paragraph 4.4.1 confirms that from a policy perspective, there is no general requirement to consider alternatives or to establish whether a development represents the best option. This is reinforced by paragraph 4.2.11 of the Draft NPS EN-1 (March 2023).

3.3.2. The Applicant's focus was on the land suitable for solar and available for development, which is in accordance with NPS EN-1 paragraph 4.4.1, and reinforced by paragraph 4.2.11 of the Draft NPS EN-1. The Applicant's view is that this is a good site for solar which is suitable in planning and environmental terms.

3.3.3. Regulation 18(2)(d) of the EIA Regulations[31] requires *"a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option*

[30] Department for Energy Security and Net Zero (2023). Powering up Britain. Available here: Powering up Britain - GOV.UK (www.gov.uk)
[31] The Planning (Environmental Impact Assessment) Regulations (2017). Available here: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)

chosen, taking into account the effects of the development on the environment" to be presented in the ES. A description of the alternatives considered to date is therefore presented in this PEIR and a full description of the alternatives will be provided in the ES.

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

3.3.5. Taking this overall context, the Applicant's site selection process is outlined below.

Alternative sites

3.3.6. Before setting out the Applicant's site selection process, it is important to note that the Applicant started by seeking to identify a suitable site which met their central objective to deliver an NSIP-scale project across a large site, equivalent to around 250-500MW using the rule of thumb in paragraph 3.10.8 of Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[32].

3.3.7. The Applicant did not consider sites which could deliver smaller scale projects on the basis of the urgent need to deliver as much solar as possible to meet ambitious Government targets (see section on Need above) and the viability of delivering the Proposed Development given the significant upfront investment to facilitate the new grid connection. Indeed, given the limited availability of connections into the National Electricity Transmission System (NETS) (which utility scale solar is required to do), it is important that any connection is used as efficiently as possible. The reasons why existing connections could not be utilised are also set out below.

3.3.8. This approach is supported at the NPS level: paragraph 4.2.21 of Draft NPS EN-1 states that only alternatives that can meet the same objectives of the proposed development need to be considered. Paragraph 4.2.2 states that the Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivery of the same infrastructure capacity in the same timescale as the proposed development. Smaller scale alternatives which would not meet the objective of meeting the same urgent need as the Proposed Development would not be considered reasonable alternatives for the purposes of paragraphs 4.2.21 and 4.2.22 of Draft NPS EN-1.

[32] Draft National Policy Statement for Renewable Energy (EN-5) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

3.3.9. It is critical to understand that site selection is a complex process with many variables and conditions that have to be sufficiently favourable across key areas to proceed. Some matters are more definitive in terms of the ability to proceed while others are matters balanced and weighed against alternative options.

Suitability for solar and consistency with project objectives

3.3.10. The Applicant aims to develop a nationally significant solar generation facility on a large site in order to contribute to meeting the UK's urgent and national need for low-carbon electricity. The Applicant therefore considered general factors associated with irradiance and site topography and found that the East Midlands is characterised by large swathes of flat or undulating land (which is highly suitable for solar generation) and relatively high levels of irradiation.

3.3.11. The East Midlands is also crossed, from north to south, by a number of high voltage transmission lines. These lines are important arteries of the NETS, located between the demand centres of the south and the northern generation zones. They provide resilience through strength in depth to the NETS to enable very high levels of reliability to all users and are therefore likely to be well suited to connect large-scale solar generation facilities and allow the bulk transmission of power to consumers nationally whenever that power is demanded.

3.3.12. Having prioritised a broad geography, the next driver for the site location, consistent with paragraphs 3.10.36-38 of Draft NPS EN-3, was the availability of a suitable grid connection with sufficient capacity to enable a large solar farm, to maximise the lifetime output potential of the Proposed Development through a 400kV line connection and the development of a new substation.

3.3.13. The Applicant started engagement with National Grid Electricity System Operator (NGESO) (as the point contact for new connection requests) to discuss the potential opportunities for a connection offer within the target geography. In November 2020, the Applicant prioritised the two 400kV overhead lines West Burton to Bicker Fen line and Cottam to Eaton Socon line. This is because both were found to have available capacity following discussions with NGESO, due to the decommissioning of the coal plants at Cottam and West Burton and are part of the "backbone" of the UK transmission network.

3.3.14. Grid connections with spare capacity are finite, and no connection offers were provided that could deliver the output proposed by NGESO to the Applicant for already available capacity at already existing substations in the target geography. This is somewhat inevitable given the context of the urgent national need for renewable energy (specifically solar), as developments have

already been proposed to make use of existing substation capacity where it occurs. However, the capacity of projects currently under development is not yet sufficient to meet the urgent national need for solar as explained above.

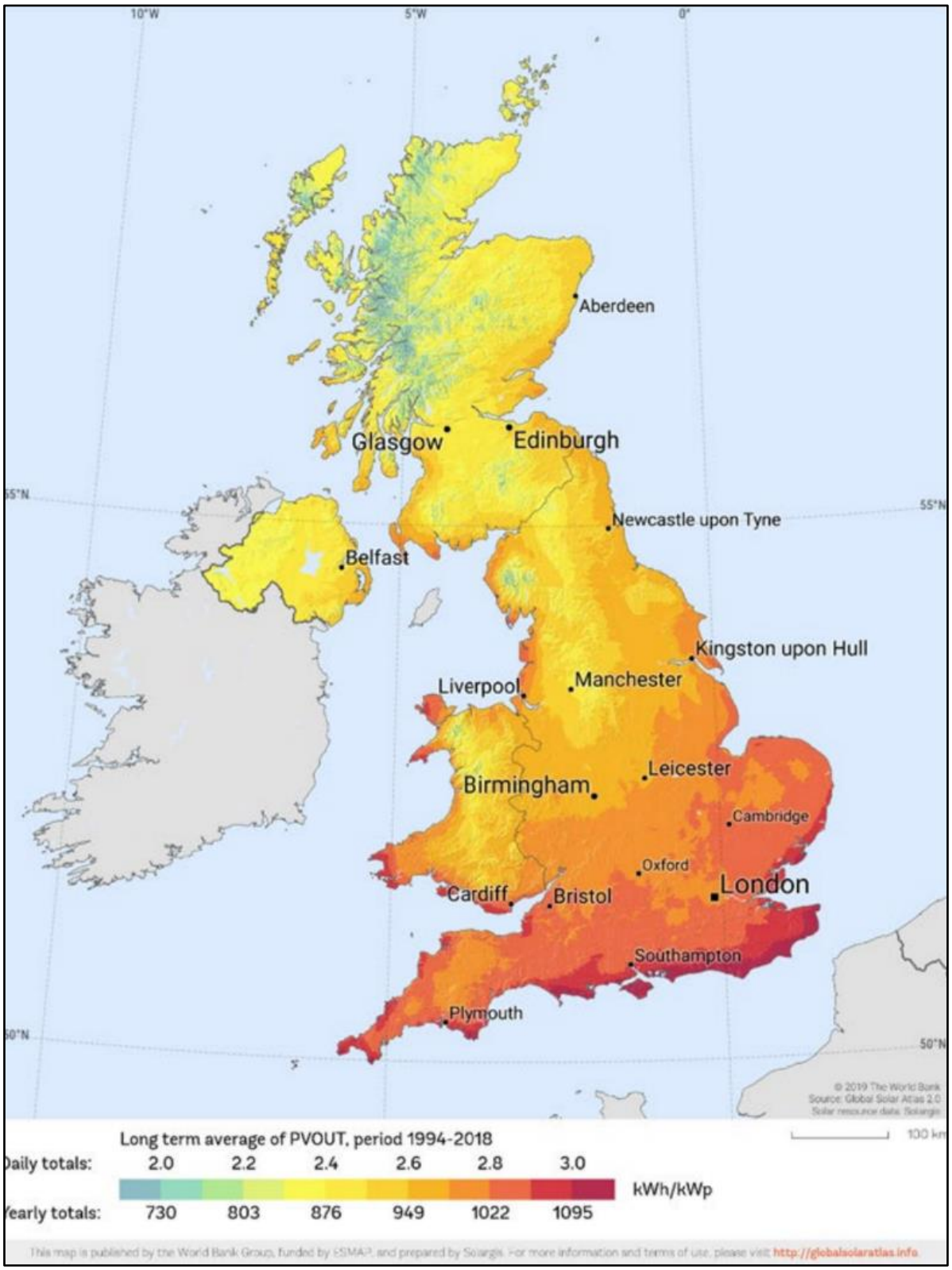
3.3.15. Against this background, the Applicant considered several important factors, as set out in the following section, before arriving at the preferred Site. As site selection considerations for solar are not set out in the current adopted suite of NPS, these are outlined below drawing on the factors influencing site selection as set out in the Draft NPS EN-3.

Irradiance and site topography

3.3.16. The Draft NPS EN-3 notes that site topography is a key input to the site selection process under paragraph 3.10.10 Irradiance and Site Topography, which states, *"Irradiance of a site will, in turn, be affected by surrounding topography, with an uncovered or exposed site of good elevation and favourable south-facing aspect more likely to increase year-round irradiance levels. This, in turn, affects the carbon emission savings and the site's commercial viability."*

3.3.17. Lincolnshire represents a good location within the UK to construct a solar farm as demonstrated below (bearing in mind the constraints in other locations). The area benefits from higher levels of photovoltaic power and irradiance compared to other parts of the UK, as show in **Plate 3.1**.

Plate 3.1 Average photovoltaic power



3.3.18. Flat or gently south-facing slopes are most suitable and beneficial for solar. Therefore, this influenced the focus on the East Midlands area as the preferred location of the Site. The general topography

of the area surrounding the Site is flat or with limited gradients, making it particularly suitable for solar. Fields with entirely north-facing slopes were excluded from the area considered suitable for solar panels.

3.3.19. Topography, which is generally flat or gently undulating, is most suitable for solar from both a constructability and operational perspective to ensure that the Site can produce a large amount of electricity.

3.3.20. In addition, Lincolnshire benefits from the existence of large areas of land which are characterised by a generally sparce settlement pattern. Such characteristics provide the opportunity for utility scale solar development which can contribute to delivering net zero.

Grid connection and capacity

3.3.21. As explained above, having identified that the wider geography was generally suitable for solar and that there was overall capacity on the two 400kV lines (West Burton to Bicker Fen line and Cottam to Eaton Socon line), the Applicant commenced discussions with NGESO about how best to connect into that capacity.

3.3.22. Early discussions with NGESO identified that a new substation would be required to connect into the available capacity in the overhead lines as the existing substations on the line are either full or located in unsuitable places for solar.

3.3.23. The Applicant therefore focused on identifying a site that was suitable for solar along one of the overhead lines, before starting discussions with landowners on what land would be potentially available for development. In undertaking this search, areas of land closer to the 400kV lines were preferred, to minimise the length of cable connection, which adds both to cost, time and complexity, in terms of negotiation with multiple additional landowners and any environmental constraints associated with the cable route, in addition to potential delay in the overall consenting and delivery timescale. A shorter cable route also reduces loss of energy in transporting power to the grid and presents a more efficient use of land particularly where routing can be delivered in proximity to the infrastructure to generate the power rather than crossing other land unrelated to a development.

3.3.24. This stage of the process is developer, not NGESO, driven and once the Applicant was able to identify suitable land with a reasonable prospect of it being brought forward, locational conversations with NGESO were undertaken with a connection request subsequently being made.

3.3.25. NGET is working in parallel with Springwell to identify the most appropriate location for their new substation, into which Springwell will connect. The Springwell DCO application will seek consent for

a connection into the future National Grid Navenby Substation. However, it is not proposed that the National Grid Navenby Substation itself will form part of the Springwell DCO application and consent is expected to be sought by NGET in due course through a Town and Country Planning Act 1990 application.

Land ownership

3.3.26. Following identifying capacity and a broad area of search as close as possible to the 400kV lines, the Applicant started initial discussions with landowners.

3.3.27. Blankney Estate is one of the largest single landowners within Lincolnshire and was willing to discuss the potential option for large solar development within their Estate. The willingness of the Estate to enter into discussions regarding the development of utility scale solar was key to the progression of the Site through the selection process and enabled the Applicant to have more detailed conversations with National Grid about appropriate connection points. Another renewable energy developer had already obtained planning consent for a smaller scale solar farm in the eastern part of the Site through a Town and Country Planning Act 1990 application, which was approved in September 2014 (reference 14/0397/FUL).

3.3.28. The initial discussions with Blankney Estate focussed on identifying a site with sufficient additional land for the Proposed Development, as well as mitigation and enhancement, as close as possible to the West Burton to Bicker Fen 400kV line. The Applicant initially sought to actively identify a single site of a particular size, led by landowner discussions to identify potentially available land suitable for a large solar development and whether any potential effects could be made acceptable. The ability to reach a voluntary agreement with landowners rather than rely on Compulsory Acquisition for the solar PV generating station was a key requirement, and therefore single, contiguous sites with as few landowners as possible were prioritised. The Site has two individual landowners who were agreeable in principle to leasing their land for solar. Other areas for the solar PV development around and further from the connection point were discounted due to reasons such as multiple land ownerships or unwilling landowners.

Proximity of the Site to dwellings

3.3.29. The Blankney Estate is a large estate with discrete settlements dispersed throughout the Estate; there are also groups of dwellings scattered within the surrounding area. The existence of large areas of land without built development and a generally sparse settlement pattern means that there is the opportunity to identify sites of sufficient scale to deliver an NSIP scale project.

3.3.30. Although the Site is located in relatively close proximity to the village of Scopwick and the smaller hamlet of RAF Digby, Ashby de la Launde, and Blankney, there are opportunities to provide mitigation and help assimilate the Proposed Development into the landscape and limit any potential visual impacts through a combination of setbacks, natural screening through topography and existing and proposed landscape improvements.

3.3.31. There are a small number of dwellings that could experience significant effects from the Proposed Development. This number has been reduced by the changes proposed after Phase One Consultation: *Early plans and proposals*, January 2023 consultation feedback and additional engagement with near neighbours. The design of the Proposed Development will continue to evolve as a result of feedback received during statutory consultation and ongoing assessment work. This evolution will continue to seek to minimise any potential impacts that the Proposed Development may have.

Environmental considerations

3.3.32. The Applicant had regard to several important environmental considerations when determining the most appropriate location for the Site. Key considerations are described below.

3.3.33. The area around the West Burton to Bicker Fen 400kV line is not subject to any protected landscape or spatial designations such as Areas of Outstanding Natural Beauty, National Parks or Green Belt. Whilst it is a countryside location, Draft NPS EN-3 recognises that schemes of this type and scale will often be located in rural locations given their physical requirements, provided that the planning and environmental effects are acceptable.

3.3.34. The area around the West Burton to Bicker Fen 400kV line is not subject to any ecological designations such as Site of Special Scientific Interest (SSSI), Ramsar, Special Protection Area (SPA) or Special Area of Conservation (SAC). The Site is not subject to cultural heritage designations such as Scheduled Monuments. However, cultural heritage assets, including listed buildings, in the vicinity were identified as requiring further consideration. Environmental features are shown in **Figure 3.1**.

Agricultural land

3.3.35. Whilst Draft NPS EN-3 indicates that Agricultural Land Classification (ALC) should not be a *"predominating factor in determining the suitability of the site location"* (paragraph 3.10.14), ALC was an important factor for the Applicant when selecting the Site. The wider context of potential use of agricultural land is important in this regard. Agricultural land across England represents between 69-70% of the total land within the country.

Natural England estimates that around 42% of agricultural land within England is of 'Best and Most Versatile' (BMV) quality (with a roughly even split of 21% as Grades 1 and 2 and 21% Grade 3a) with the proportion of BMV in Lincolnshire rising to 71.2%. In the context of the location of the Proposed Development and the surrounding land type characteristics, the provisional Defra mapping, as displayed in **Plate 3.2**, shows Grade 2 land is in general abundance in areas adjacent to the Site, notably a large swathe to the east within the River Witham's flood plain and either side of the A15, north of Metheringham and narrower stretch running south from adjacent Scopwick to Ruskington. Further south-east towards Boston and the east coast, the Defra mapping shows a predominance of Grade 1 land. It is notable that much of the West Burton to Bicker Fen 400kV, particularly, east of Springwell falls on predominantly higher grade land, with a mixture of Grade 2 and Grade 3 as the line moves north-west past Navenby.

3.3.36. The Site was considered favourable because it was identified as predominantly Grade 3 on the provisional Defra mapping, offering the potential for Grade 3b land subject to further survey, with areas of Grade 2. This was also supplemented by initial conversations with the landowners over the quality and viability of the Site for agriculture. While the Draft NPS EN-3 does not prohibit the use of BMV and recognises that utility scale solar is likely to include some agricultural land, the preference is that poorer quality land is prioritised. The Applicant has sought to identify available land of lower grade adjacent the West Burton to Bicker Fen 400kV line; however, as the provisional mapping demonstrates, there is an abundance of both Grade 3 and Grade 2 land in relative proximity to the Proposed Development and that in order to deliver the proposed capacity, not only is it likely that a significant percentage of BMV land would likely be required, but that the Site represents a better than characteristic snapshot of the predominating land mix, and certainly significantly less BMV than the county wide mix of ALC grades. ALC also needs to be balanced with the other site identification criteria, including the grid capacity. Draft NPS EN-3 states at paragraph 3.3.35, applicants should avoid the use of BMV "where possible", and that is what the Applicant has achieved in its site selection process.

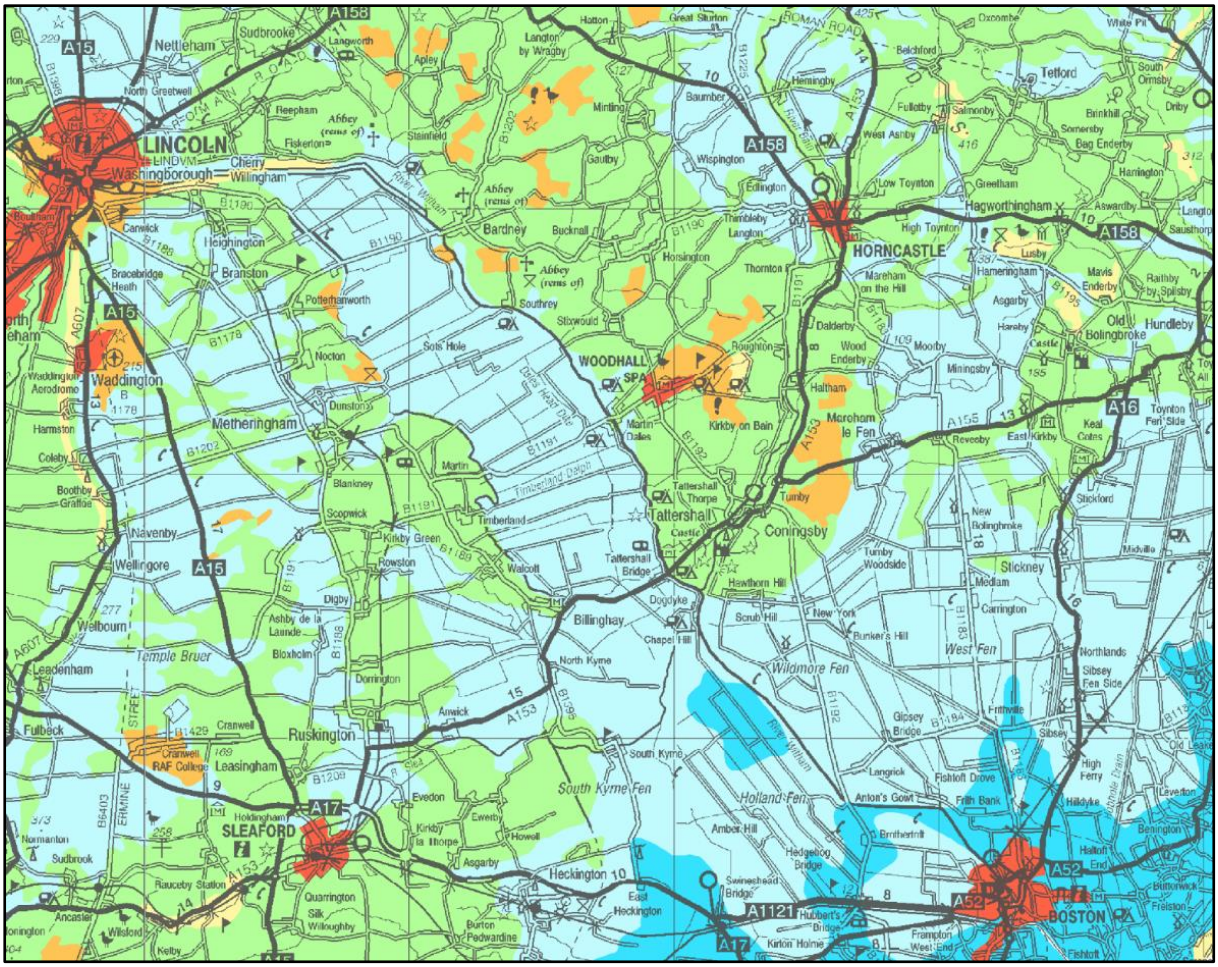
3.3.37. In addition, the Applicant sought to work with the landowners to understand relative productivity of the land alongside the provisional mapping to focus on areas of available land with poorer yield, noting that the provisional mapping and classification does not always go hand in hand with the reality of cultivating the land. As the Applicant's understanding of the Site has developed in terms of the land classification, the design development has built on the earlier desire to limit the use of the provisional higher grade land, and strong principles which focus on limiting the amount of BMV used

within the solar PV areas have been implemented. For example, where Grade 1 and 2 land was identified and, as noted below, where this was in single fields, this was removed from the fields proposed for Solar PV development. Further information on ALC is provided in **Chapter 10** of this PEIR.

3.3.38. The land adjacent the Cottam to Eaton Socon line also presents a mixture of Grade 2 and Grade 3 land types although the provisional mapping suggests a predominance of Grade 3 in immediate adjacency to the line. However, there was not sufficient land available to the Applicant to deliver similar capacity as with the Site.

3.3.39. It is important to recognise that ALC grading does not exist in isolation and is one of many important factors in site selection and consideration of alternatives and that the urgent national need for low carbon and renewable energy generation is considered to outweigh the temporary loss of BMV land for the duration of the Proposed Development's lifetime.

Plate 3.2 Provisional Land Classification Map



Accessibility

3.3.40. The Site is accessible by the rural road network and the strategic road network by the A15, a major dual carriageway which runs through the Springwell West Parcel. This is an important factor when considering possible effects during construction and the ability of the road network to accommodate HGVs and potential Abnormal Indivisible Loads (AILs). Further information on transport and access is provided in **Chapter 12** of this PEIR.

Brownfield sites

3.3.41. NPS EN-3 states: *"As most renewable energy resources can only be developed where the resource exists and where economically feasible, the IPC should not use a sequential approach in the consideration of renewable energy projects (for example, by giving priority to the re-use of previously developed land for renewable technology developments)."* Draft NPS EN-3, as noted above, also explains that *"land type should not be a predominating factor in determining the suitability of the site location"*.

3.3.42. Relatively little brownfield land is located within a sufficient distance of the West Burton to Bicker Fen 400kV line. The brownfield register (December 2022) maintained by North Kesteven District Council identifies five sites, all of which adjoin existing settlements and are under 8.3ha in size which would not be sufficient to deliver the capacity available within the grid connection offer. Furthermore, three of the five sites have obtained planning permission for residential development. Therefore, there is no suitable brownfield land within the district available to deliver renewable energy projects on the scale of the Proposed Development.

Summary

3.3.43. This section has provided a summary of the systematic process that the Applicant went through in determining suitable sites. Having identified the objective to deliver a large scale NSIP, to meet the pressing need for such projects in the UK and having regard to the general suitability of the Lincolnshire area for solar development, the Applicant identified two suitable overhead lines with spare capacity to deliver such a development and entered into discussions with NGESO about how to connect. Given the urgent need for renewable energy to address the climate crisis, this available capacity should be utilised (and made the most of) where it occurs.

3.3.44. The Applicant sought to identify willing landowners with large estates, capable of accommodating a large project on a site, within close proximity of existing overhead lines, which led to the identification of the Site. The Site is also suitable from a planning

and environmental perspective for solar, having regard to wider environmental constraints.

3.4. Alternative renewable technologies

3.4.1. Alternative types of renewable energy generation technologies such as wind and hydrogen were not considered by the Applicant. The Site is not considered to be suitable for onshore wind energy generation due to the low, flat typography of the Site which would likely give rise to significant landscape and visual effects, the high aviation use due to the proximity of RAF Waddington and RAF Cranwell which are both active RAF training bases which could potentially give rise to safety and aviation impacts, alongside the proximity to residential dwellings which may be subject to adverse effects associated with shadow flicker and wind turbine noise.

3.4.2. The Site was not considered suitable for hydrogen technology due to the construction and commercial viability for this type of energy generation in comparison to solar energy generation.

3.4.3. It is therefore considered that solar technology is the best renewable energy generating solution for the Site due to the low, flat typography.

3.5. Alternative solar technologies

3.5.1. The parameters of the DCO application will maintain a degree of flexibility to allow for the latest solar technology to be utilised at the time of construction. However, several alternative solar technologies and design options have been considered throughout the design process to date and several options have been discounted. The reasoning for discounting the solar technologies and design options is detailed in **Table 3.1** below.

Table 3.1 Solar PV configuration

Configuration type	Reason for rejection
Tracker panel	Tracker Panels have been discounted based on the landscape and visual impacts due to the increased height in comparison to fixed panels. Although small areas of the Site were considered suitable to support tracker panels, the majority of the Site was considered unsuitable due to anticipated visual effects. It was therefore considered that installing tracker panels solely within these small areas, in comparison to a complete fixed panel installation across the entire Site, would not be commercially viable and would lead to greater environmental effects, particularly from a landscape and visual and glint and glare perspective.

Configuration type	Reason for rejection
East – west fixed	East-west fixed panels have the benefit that they have a different energy production curve, with energy production higher in the evening and the morning. The benefit of east-west fixed panels would not be considered a benefit for this Site due to the inclusion of a Battery Energy Storage System (BESS) as part of the Proposed Development, which will help introduce a level of flexibility around the energy production and will allow the storage and distribution of energy when required throughout the day and during peak hours. East – west fixed panels have also been discounted as they reduce the potential for biodiversity net gain and enhancements due to the reduced space between the panels. The reduced space between the panels would significantly reduce the level of light reaching the ground and would limit any biodiversity planting beneath the panels. The increased coverage and decrease of spacing between the panels for east – west fixed panels in comparison to south facing fixed panels would also lead to an increase in water accumulation on a smaller area of the Site, which would increase run-off.

3.6. Alternative layouts

3.6.1. The design and layout of the Proposed Development has formed part of an iterative process which has been informed by the ongoing environmental assessment process, site selection assessment and taking into consideration the design principles and controls, non-statutory consultation feedback and engagement with stakeholders and consultees.

3.6.2. Engagement has included a series of collaborative design workshops, focused workshops with residents, technical meetings with statutory consultees and meetings with North Kesteven District Council and Lincolnshire County Council. The feedback from the engagement held to date has informed the ongoing design development.

3.6.3. The layout of the Proposed Development will continue to be developed as part of the environmental assessment process and will have regard to outputs from engagement with stakeholders and consultees and feedback from statutory consultation.

3.6.4. A Consultation Report will be submitted in support of the DCO application, which will provide a summary of consultation feedback and how the Applicant has had regard to the feedback in developing the design. A Design Statement will also be prepared and submitted in support of the DCO application which will set out the evolution of the Proposed Development design.

3.6.5. The layout and extent of the Proposed Development has been through two stages of design iterations to date. The first stage of design (Stage 1) was held prior to the public launch of the Proposed Development and informed the design of the Proposed Development for non-statutory consultation and EIA scoping. The second stage of design (Stage 2) relates to the design that has been presented within this PEIR to inform statutory consultation.

3.6.6. The two stages of the design development are discussed further below.

Stage 1 Design

Solar PV development

3.6.7. Following the identification of the Site as outlined above in this chapter, the available land within the Site boundary was subject to an initial assessment to identify suitability for Solar PV development and suitable locations for the BESS and Springwell Substation. The assessment focused on the suitability of land parcels based on environmental, social and economic factors. Minimum offsets to landscape and ecological features, as described in **Table 4.4** in **Chapter 4**, were agreed by the design team to inform the design process.

3.6.8. Following the initial assessment, which included desktop assessments and visits to the Site, the design team identified fields within the Site boundary that were considered unsuitable for accommodating Solar PV development and were therefore discounted. The reasoning for discounting these fields during Stage 1 of the design is detailed within **Table 3.2** below and should be read in conjunction with **Figure 3.2** as provided in **Volume 2** of this PEIR.

Table 3.2 Alternative layouts considered at Design Stage 1 and reasons for rejection

Field	Reason for rejection
C1, C2, C3	The extent of solar development in the north of Springwell East, adjacent to the B1188, was removed to reduce the potential impacts on the landscape character and visual setting of Blankney from the B1188 and due the proximity to the

Field	Reason for rejection
	Blankney Conservation Area and to set back development from the existing Spires and Steeples PRoW.
Md05, Md06	The fields directly to the north of Scopwick were removed due to the proximity to the residential settlement of Scopwick and the visibility to the Scopwick Cemetery and the adjacent children's playground and communal open space.
By01	The northernmost field that forms part of Springwell East was removed due to the presence of high quality grassland that is suitable for reptiles.
C10	The field to the south of Springwell East, directly north of Kirkby Green, was removed due to the visual proximity from residential dwellings and potential impacts on the landscape setting of the village.
Bk13, Bk17, Bk18	The fields immediately south of Scopwick were removed due to the topography of the land which rises to the south as well as the proximity to residential properties and the setting of Scopwick village and the Conservation Area.
Bk03	The field located directly south of Heath Road was removed due to direct views from Heath Road as part of the approach into Scopwick from the west and the proximity and foreground of views towards Scopwick Mill which is a key local landmark and heritage asset.
E1a, E2	The fields directly to the north of Brauncewell village were removed from the area of development to reduce the impacts on the setting of Brauncewell Medieval village scheduled monument and line of sight to the Grade II listed Brauncewell Church.

3.6.9. The areas that were removed for development were retained within the Site for potential mitigation, enhancement or retained agricultural use.

Battery Energy Storage System

3.6.10. During the Stage 1 initial appraisal, the design team also carried out an assessment to identify fields that would be suitable for the Collector Compounds and BESS based on the information available at the time of the assessment. The areas that were considered suitable for the BESS and Springwell Substation were areas that could accommodate infrastructure up to 6m in height. The following factors have informed the development of the design:

- Proximity and visual impact to the residential settlements of Blankney, Scopwick, Kirkby Green, RAF Digby, Rowston Top, Scopwick Low Field Farm and Slate House Farm and Cottages;
- Impact on the setting of Scopwick Conservation Area;
- Landscape setting and visibility from Heath Road;
- Views towards Blankney and Scopwick from the Steeples and Spires Trail;
- Impact on the setting of Grade II listed Scopwick Mill;
- Flood Zone 2 or 3; and
- Proximity and location of PRoW, particularly in Springwell East where several PRoW cross fields.

Springwell Substation

3.6.11. The Stage 1 initial appraisal also involved an assessment, based on site visits, surveys and desk-based studies available at the time, to identify areas that would be suitable for the location of the Springwell Substation. The areas that were identified as suitable were chosen due to the topography and screening from existing woodlands or tree belts that may help to reduce the landscape and visual impact of both structures.

Stage 2 design

3.6.12. Following the non-statutory consultation held in January - March 2023, the Stage 1 design was reviewed and revised to take account of the consultation feedback and the emerging results from various environmental surveys.

3.6.13. This process involved undertaking a detailed environmental appraisal, targeted engagement with statutory consultees and stakeholders, alongside several technical design workshops.

3.6.14. Following the Stage 2 design process, several fields were discounted from the area of Solar PV development. **Table 3.3** provides a summary of the fields that have been discounted and the reason for rejection. The majority of the fields were removed due to a combination of environmental factors.

3.6.15. Following the removal of the fields detailed below, the remaining area that was considered suitable to accommodate Solar PV development equates to approximately 816ha. The areas that were removed for development have been retained within the Site for potential mitigation, enhancement or retained agricultural use.

3.6.16. Opportunities to provide environmental enhancement and/or community benefits were also identified as part of the Stage 2

design process. Consequently, there was a minor amendment made to the Site boundary to account for a proposed new permissive path to connect Scopwick and RAF Digby.

3.6.17. As a result of the Stage 2 design process, a revised layout and initial green infrastructure plan for the Proposed Development was produced. These are provided in **Figure 2.3** and **Figure 2.5**, respectively. This design has formed the basis for this PEIR.

3.6.18. **Figure 3.2** details the areas of Solar PV development included at Stage 1 which informed the EIA Scoping Report in comparison to Stage 2 design for the PEIR.

3.6.19. The design will continue to be refined prior to submitting the DCO application in order to give regard to feedback from statutory consultation, stakeholder engagement and the findings of further environmental and technical assessments.

Table 3.3 Alternative layouts considered at Stage 2 design and reasons for rejection

Location	Reason for rejection
Lf09, Lf03, By27, By18	Fields that were identified as comprising solely of Grade 1 or 2 land were removed from the area of Solar PV Development to reduce the impact on BMV agricultural land.
Bcd141, W2, Bcd111, Bcd120, Bcd108, Bcd100, Bcd079, Rw10, Rw11, Rw12, Rw08, Rw07, Rw06, Rw05, Rw04, Rw02, Bk01, Bk07, Bk08, Bk09, Bk10, Bk11, Bk12, Lf10, By05, C4, Lf13, Lf16, Lf12, By13, By16, Md03, Lf10	Fields that comprised of majority BMV agricultural land were reviewed to identify whether those parts of the field that contained BMV could be removed, whilst retaining the non-BMV parts of the field. In some cases, part of the field was removed in combination with other environmental impacts as identified in this table.
Bcd141, Rw10, Rw11, Rw12, Rw06. Rw04, Bcd079, Bk07, northern section of Bk06, Bk15, Bk08, Md04, C7, Lf12, By12	Following the completion of the geophysical survey, fields that were identified as having high archaeological potential were removed in conjunction with other environmental impacts identified within this table.
C7, Md03, Md03	The fields located to the west of the Steeples and Spires PRoW, adjacent to the B1188, were removed during Stage 2 of the design to reduce the impact on the landscape character and visual settings towards Blankney and Scopwick from the PRoW, alongside views of Scopwick Church from the B1188.

Location	Reason for rejection
Lf12, Lf13, By16, C7, Md04, Md03	Following further survey work and site visits, several fields were removed from the area of Solar PV development due to the high landscape and visual impacts on PRoW, particularly the Steeples and Spires Trail and Trundle Lane, to reduce the cumulative impact of the Proposed Development, in conjunction with other impacts identified within this table.
Bcd088, Bcd079, Bcd118, Bcd108, Rw12, Rw11, Rw10, R108, Rw07, Rw05, Rw04, Rw02, Bk07, Bk10, Lf12, Lf13, Lf16, By05, By13	Following feedback from consultation and initial site visits to neighbouring properties, a residential visual amenity assessment was undertaken. This assessment identified areas of the Site to be removed due to a combination of particularly high residential amenity impacts and landscape and visual impacts for the property. The extent of the removal of Solar PV development was reviewed for each individual location to provide a suitable offset.
Bcd110, Bcd111, Bcd120, By05, By13	The fields located to the east of the B1191 in Springwell West that are located within an area of Flood Zone 2 and 3 were removed from the area of Solar PV development, in conjunction with other reasoning identified within this table.
Sections of particular fields were removed, including an area within the fields Bcd106, Bcd107, Bcd104, Bcd115, Bcd108, Bcd118, Bcd128	During the Stage 2 design, fields were removed from the area of Solar PV development to provide areas for mitigation and habitat connectivity across the Site.

Battery Energy Storage System

3.6.20. Following the Stage 2 design and further survey work, a further assessment was carried out to review and identify suitable locations for the BESS. The assessment discounted further locations across the Site due to the potential landscape and visual impacts and access requirements. The outputs of this assessment helped to inform the design decision to discount the option of distributed BESS across the Site, due to the fact that there were limited locations deemed suitable for distributed BESS in Springwell East and Central, particularly due to landscape and visual impacts and the proximity to the residential settlements of Blankney and Scopwick.

3.6.21. The two potential locations in the north and south of Springwell West for the consolidated BESS are provided in **Figure 2.3**.

3.6.22. It is anticipated the one location will be selected as the design progresses and will be presented and assessed within the ES.

Springwell Substation

3.6.23. Following the Stage 2 design development and outputs of the environmental surveys undertaken to date, the location of the Springwell Substation was refined. The options of locating this infrastructure to the south of Springwell West and in the centre of Springwell West, adjacent to the A15, were discounted.

Underground cabling

3.6.24. The siting zone for the Grid Connection Corridor is presented in **Figure 2.3**. Given the short connection length, this corridor has been chosen as it is the most direct route to minimise impact on the land, whilst avoiding key environmental constraints, including Gorse Hill covert. Any alternative route would unnecessarily increase the length of the Grid Connection cable route, involve further road crossings and associated environmental effects.

3.6.25. The Grid Connection Corridor forms the area that is being considered for the location of the Grid Connection cable route. The Grid Connection cable route is subject to an iterative design process informed by ongoing environmental and engineering surveys and engagement with landowner(s) and stakeholders. The location of the Grid Connection cable route will be refined following engagement and further survey work. The refined Grid Connection cable route will be presented in the ES.

3.6.26. The indicative location of the cabling routes between each parcel of land has been informed by the embedded mitigation measures (**Table 4.4** of **Chapter 4**) alongside a detailed review and assessment of known environmental features, including the location of trees, hedgerows and areas of high archaeological potential.

3.6.27. There are several cabling route options within the Site that connect each parcel, as displayed within **Figure 2.7**, which will be refined as the design progresses.

4. Approach to EIA

4.1. Introduction

4.1.1. This chapter sets out the overall approach taken to the EIA for the Proposed Development.

4.1.2. As part of the EIA process, this PEIR outlines the work undertaken to date and identifies preliminary likely significant environmental effects of the Proposed Development, based on the environmental baseline information currently available and the preliminary design parameters for the Proposed Development.

4.1.3. The preliminary design of the Proposed Development, as presented in this PEIR, has been informed by the ongoing EIA process and consultation responses. Further survey and design work is currently being undertaken to refine the design and to inform the final assessment of likely significant environment effects of the Proposed Development which will be reported within the ES.

4.1.4. The information presented in this PEIR is 'preliminary'; and the Applicant is therefore actively seeking consultees' comments so that it can have regard to feedback as it progresses the design of the Proposed Development and the EIA.

4.2. Overview of the EIA process

4.2.1. An EIA is a systematic process that examines the likely significant effects (beneficial or adverse) on the environment resulting from the construction, operation (including maintenance) and decommissioning of a proposed development. The findings of an EIA are presented in a document called the Environmental Statement (ES), which is used to report to decision makers, consultees and stakeholders on the likely significant environmental effects of a development and helps the decision maker (in the case of a Development Consent Order, the Secretary of State) determine the application for consent.

4.2.2. The main stages of the EIA process are as follows:

- EIA Screening: Screening is undertaken to determine whether a proposed development constitutes 'EIA Development', in cases where there is uncertainty if a project requires an EIA to be undertaken. However, as noted in **Section 1.2** of **Chapter 1**, the Applicant notified the Secretary of State under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an ES in respect of the Proposed Development and by virtue of Regulation

6(2)(a)[33], the Proposed Development is considered 'EIA development', thus requiring an EIA.

- EIA Scoping: EIA Scoping refers to the process of identifying the scope of the assessment for the development with the relevant decision maker (in the case of a DCO, PINS on behalf of the Secretary of State).
- PEIR: The Preliminary Environmental Information Report, as stated in Regulation 12(2) of the EIA Regulations, is to provide sufficient information to enable consultation bodies to develop an informed view of the likely significant environmental effects of the development being proposed. The Planning Inspectorate's Advice Note 7[34] (Section 8.4) states that there is no prescribed format as to what preliminary environmental information should comprise and it is not expected to replicate or be a draft of the ES. However, it also states that if the Applicant considers this to be appropriate (and more cost-effective) it can be presented in this way. A good PEIR is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the proposed development and helps to inform their consultation responses on the proposed development during the pre-application stage.
- ES: The ES presents the results of the EIA undertaken for the project and sets out the likely significant environmental effects that would result from the Proposed Development, alongside the proposed mitigation measures to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment. An ES is submitted as part of an application for development consent and is taken into account during the decision making process.

4.3. Scoping

4.3.1. EIA Scoping is the process of identifying the factors to be considered within the ES and establishing the receptors/matters that will comprise the scope of the assessment. The applicant submits a scoping report setting out a description of the proposed development and an explanation of the likely significant effects of the development on the environment and requests that the Secretary of State states in writing their opinion as to the scope and level of detail of the information to be provided in the ES. Although scoping is not a mandatory requirement under the EIA Regulations,

[33] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, Regulation 6(2)(a). Available online: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk).

it is recognised as a useful preliminary procedure which helps to identify the main effects that a development is likely to have on the environment, taking into account responses from prescribed consultees.

4.3.2. An EIA Scoping Report was prepared by the Applicant in respect of the Proposed Development and a Scoping Request was submitted to the Planning Inspectorate on 22nd March 2023 with a request for the Secretary of State to adopt a Scoping Opinion in relation to the Proposed Development. In considering the request for a scoping opinion, the Secretary of State consulted with the relevant prescribed consultees. The Scoping Opinion was issued by the Planning Inspectorate on 2nd May 2023. The EIA Scoping Report and Scoping Opinion are provided in **Volume 3**, **Appendix 4.1** and **Appendix 4.2**.

4.3.3. A table outlining the Scoping Opinion Response and how the PEIR, ES and other reports that will be submitted in support of the DCO application will address these points is provided in **Volume 3**, **Appendix 4.3**.

4.3.4. Following receipt of the Scoping Opinion and consultee responses, engagement has been undertaken with stakeholders to clarify and inform further EIA work to be undertaken to inform this PEIR and the ES. A summary of the scope which has been assessed in this PEIR having full regard to and reflecting the Scoping Opinion is presented in **Table 4.1**.

Table 4.1 Summary of the scope of this PEIR

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
Air quality	Yes – Scoped in	Chapter 5
Biodiversity	Yes – Scoped in	Chapter 6
Climate	Yes – Scoped in	Chapter 7
Cultural heritage	Yes – Scoped in	Chapter 8
Landscape and visual	Yes – Scoped in	Chapter 9
Land, soils and groundwater	Yes – Scoped in	Chapter 10
Noise and vibration	Yes – Scoped in	Chapter 11
Traffic and transport	Yes – Scoped in	Chapter 12

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
Water	Yes – Scoped in	Chapter 13
Cumulative effects	Yes – Scoped in	Chapter 15
Glint and glare	Yes – Scoped in	A preliminary assessment of glint and glare has been undertaken to inform the design of the Proposed Development, as reported within **Chapter 14** of this PEIR. A detailed glint and glare assessment will be appended to the ES and will inform the assessment of relevant topics.
Heat and radiation	No – Scoped out as a separate chapter	The Planning Inspectorate has agreed that heat and radiation can be scoped out of further assessment. However, the ES will include a brief outline and signposting to any known identified sources of heat (and radiation) and detail how this has been considered in the design of the Proposed Development presented in the ES.
Major accidents and disasters	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that major accidents and disasters can be scoped out of further assessment. However, the ES will clearly signpost where these impacts are assessed in other relevant chapters and where any relevant mitigation measures are secured, if required. A Battery Safety Commitments Plan will be submitted in support of the DCO application.
Utilities	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that utilities can be scoped out of further assessment. Additional mitigation measures to protect against interference with below ground utilities during construction will be documented within and secured by the Outline Construction Environmental Management Plan.

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
Human health	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that human health can be scoped out of further assessment. However, the ES will clearly cross reference to where human health impacts (dust, noise) are assessed in other relevant chapters (air quality, noise and vibration)
Material assets	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that material assets can be scoped out of further assessment. It is noted that borrow pits are no longer being considered as part of the Proposed Development. The ES will detail the proposed waste arisings and will confirm the cut and fill balance.
Waste	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that waste can be scoped out of further assessment. However, in accordance with the Scoping Opinion, the ES will include further detail on the waste impacts for the decommissioning phase and outline how any impacts will be mitigated and managed through measures documented within and secured by the Outline Decommissioning Environmental Management Plan and the Outline Site Waste Management Plan.
Socio-economics	No - Scoped out as a separate chapter	The Scoping Opinion considers that the ES should consider both the positive and negative socio-economic impacts of the Proposed Development, including the cumulative loss of agricultural operations within the region. The use of BMV agricultural land is addressed within **Chapter 10** of this PEIR. The Scoping Opinion considers that the ES should assess impacts to

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
		PRoW and on walkers, cyclists and horse riders from the Proposed Development such as the need for temporary closures or diversions, or reduction in amenity, where significant environmental effects are likely to occur. Impacts on users of PRoW are considered within **Chapter 9: Landscape and Visual** and **Chapter 12: Traffic and Transport** of this PEIR. A Socio-Economic Statement which highlights the positive socio-economics impacts of the Proposed Development on the local and regional area will be submitted in support of the DCO application.
Electric, Magnetic and Electromagnetic Fields (EMF)	No - Scoped out as a separate chapter	The Grid Connection cabling, which forms part of the Proposed Development, exceeds 132kV and therefore has the potential to cause electromagnetic fields with adverse effects on human health. The Grid Connection cabling will be buried underground at a suitable depth in accordance with the relevant guidance[35]. Therefore, electromagnetic fields are unlikely to have any adverse effects on residential receptors.

4.4. Consultation and engagement

4.4.1. Consultation and engagement 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.

[35] Department of Energy and Climate Change (2012). Demonstrating compliance with EMF public exposure guidelines: voluntary code of practice. Available online: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)

4.4.2. Consultation and engagement, as an ongoing process, enables design evolution and embedded and additional mitigation measures to be incorporated into the Proposed Development to limit adverse environmental effects and optimise environmental benefits.

4.4.3. Early engagement with consultees has been important in influencing the design process of the Proposed Development to date. There is ongoing engagement with consultees to seek an appropriate level of feedback, to ensure that comments are considered in the evolving design and this PEIR forms an important part of this process. The consultation responses will be recorded in a Consultation Report and design development detailed within the Design Statement which will be submitted in support of the DCO Application.

4.4.4. The Applicant has undertaken targeted engagement with statutory consultees and a variety of representative local groups to gather views to help develop the design of the Proposed Development at an early stage to enable the sharing and consideration of local knowledge. These stakeholders included Lincolnshire County Council, North Kesteven District Council, local parish councils, statutory environmental consultees and local interest groups.

4.4.5. Non-statutory consultation was held in January - March 2023. The Applicant has also held collaborative meetings with residents, which involved meeting with a small group of near-neighbours, which were held on 12th, 13th and 15th June 2023 to present and discuss the progress of the design. The outputs of the meetings were taken into account to inform the ongoing design of the Proposed Development.

4.4.6. Regard will also be had to feedback received through the statutory consultation and from ongoing engagement to inform the ongoing design and EIA process.

4.4.7. The Consultation Report will provide a summary of consultation feedback and how the feedback has been taken into account in development of the design and mitigation.

4.4.8. As part of the EIA process, consultation and engagement is ongoing with a range of statutory and non-statutory consultees to help inform the design of the Proposed Development.

4.4.9. Several meetings have been held with consultees to provide further information on the Proposed Development design and survey progress and to agree the approach to the methodology for environmental surveys and assessment. The following consultees that have been liaised with to date, include (but not limited to):

- Lincolnshire County Council;
- North Kesteven District Council;
- Parish Councils;

- The Planning Inspectorate;
- Historic England;
- Natural England;
- Environment Agency;
- National Highways;
- Lincolnshire Wildlife Trust;
- RAF Digby; and
- Lincolnshire Fire and Rescue.

4.4.10. The consultation and engagement undertaken for each of the environmental factor assessments is provided in further detail in **Chapters 5-14** of this PEIR.

4.5. Good design and Project Principles

4.5.1. Design should be considered as a process and an outcome and the importance of good design for NSIPs is championed in national policy, including Draft NPS EN-1 and Draft NPS EN-3 which set out criteria for achieving good design. Supporting consideration of good design for infrastructure projects, and referred to in the Draft NPS EN-1, the National Infrastructure Commission's (NIC) 'Design Principles for National Infrastructure' identifies the purposes of the design process is to bring together engineering, environmental and creative expertise to shape and deliver a development project. The document notes that "*design is as much about process as it is product. Imaginative thinking about design should be embedded at every step of planning and delivery. The principles ensure a good process leads to a good design outcomes.*"

4.5.2. The document sets out four thematic principles to shape the design of NSIPs. These are:

- Climate - Mitigate greenhouse gas emissions and adapt to climate change.
- People - Reflect what society wants and share benefits widely.
- Places - Provide a sense of identity and improve our environment.
- Value - Achieve multiple benefits and solve problems well.

4.5.3. These thematic principles have informed the wider Project Objectives for Springwell under which The Project Principles have been developed. These are:

- Climate - Make efficient use of our land to increase the supply of clean, secure and affordable energy in the UK.

- People - Be a good neighbour by respecting others, working considerately and recognising our place within the community.
- Place - Design a layout that responds to the distinctive character of the local environment and creates opportunities to deliver recreational, landscape and ecological enhancements.
- Value - To work closely with the communities in which the project is located to ensure that benefits are shared locally'.

4.5.4. Good design has been a fundamental consideration from the outset. The following Project Principles (**Table 4.2**) have been identified to ensure good design outcomes are embedded within the Proposed Development from the very start. These will be tested and refined as part of the EIA and DCO process. Engagement has been held with several statutory consultees including, North Kesteven District Council, Lincolnshire County Council, Natural England, Lincolnshire Wildlife Trust and the Environment Agency, whereby the project principles were discussed.

Table 4.2 Project Principles

Strategic Principles	Project Principles
1. Design places that support and enhance local communities	**1.1** Engage openly, transparently and meaningfully with stakeholders taking their feedback into account and making use of local knowledge to improve our project. **1.2** Provide appropriate offsets to local settlements and dwellings on a case-by-case basis, respecting their individual amenity. **1.3** Consider sequential views and the experience of people using Heath Road and other local roads. **1.4** Work with Blankney Estates and other landowners to secure the long-term management of both the agricultural landscape and benefits provided by the scheme. **1.5** Identify opportunities for wider community benefits in consultation with local stakeholders.
2. Lead with the landscape	**2.1** Retain existing vegetation wherever reasonably possible to retain the fabric of the site and aid assimilation of development into its context. **2.2** Design the development to respond to the distinctive and unique local character of the site, informed by relevant local studies such as North Kesteven landscape character assessment. **2.3** Maintain the rural separation between the villages of Ashby de la Launde, RAF Digby, Scopwick and Blankney. **2.4** Conserve the significance of heritage assets including Scopwick Mill and Ashby Walled Gardens.

Strategic Principles	Project Principles
	2.5 Protect the setting of the Scopwick and Blankney conservation area.
3. Increase biodiversity appropriate to the landscape character and connect nature	**3.1** Extend and enhance existing local wildlife sites and priority habitats, including the creation of calcareous grassland adjacent to the A15. **3.2** Create a mosaic of habitats, such as new grassland and arable margins, to support farmland birds such as skylark and grey partridge and species such as brown hare. **3.3** Use locally native species wherever possible to create new habitats, increase the number of pollinator species and create food sources for birds such as skylark and yellow hammer during winter months. **3.4** Use land under and between solar panels to deliver biodiversity benefit for pollinators and farmland birds. **3.5** Establish new planting and landforms at the earliest practicable opportunity. **3.6** Deliver a substantial biodiversity net gain beyond the minimum of 10%.
4. Make efficient use of the land, touch it lightly	**4.1** Optimise generation and export capacity of the solar farm within the constraints of the site to make the most efficient use of the land and available grid connection. **4.2** All internal access tracks and cable routes will use existing tracks, crossings and/or gaps in the hedgerows wherever practicable. **4.3** Cabling routes will run alongside access tracks as much as possible to avoid wider excavations. **4.4** Fences will be designed to integrate with the local environment, allow for the movement of wildlife and meet the functional requirements of the project. **4.5** Minimise the use of concrete and foundations where practicable.
5. Provide new ways to enjoy the countryside that go beyond the lifetime of the scheme	**5.1** Retain all existing PRoW where practically possible. **5.2** Protect the amenity of the Spires and Steeples trail, avoiding any solar development between the route and the B1188. **5.3** Consider sequential views and the experience of people using the Stepping Out Walks and other local footpaths. **5.4** Enhance the footpath and cycle network by providing new and improved routes to increase connectivity and link local settlements such as RAF Digby, Scopwick and Blankney.
6. Improve economic resilience through education	**6.1** Foster innovation and extend supply chain to leave a lasting legacy value for Lincolnshire and the UK.

Strategic Principles	Project Principles
and by boosting the UK supply chain	**6.2** Provide education and interpretation of the solar farm and the Site.
7. Manage water, improve quality, reduce pollution	**7.1** Slow the flow of water within the site to improve flood resilience. **7.2** Apart from Solar PV modules, no built structures (central inverters, substation and collector compounds) will be located within Flood zones 2 or 3. Solar PV modules will be above the maximum flood height level.
8. Support agricultural productivity	**8.1** All fields comprising solely of Grade 1 or 2 land within the site will remain in arable production. **8.2** Prioritise the use of BMV agricultural land for arable production where practicable. **8.3** Where not used for Solar PV development, BESS or Springwell Substation, prioritise the use on non-BMV agricultural land for the creation of legacy/permanent habitats where practicable.
9. Build resilience in a changing climate	**9.1** Design for resilience and adaptation to future climate change.
10. Ensure responsible construction, ongoing maintenance and decommissioning	**10.1** Behave as a considerate neighbour through both construction and operation. **10.2** Provide clear lines of communication between the developer and the local community. **10.3** Prioritise sustainable resource management and techniques and minimise carbon emissions throughout the project lifecycle.

4.6. Approach to the preliminary assessment

Design Principles, uncertainty and flexibility

4.6.1. The design of the Proposed Development is ongoing and the PEIR provides a preliminary environmental assessment of the design to date.

4.6.2. In order to maintain flexibility in the design, a 'Rochdale Envelope' approach within parameter ranges is being taken. The Planning Inspectorate's Advice Note Nine 'Rochdale Envelope'[36] provides specific guidance to applicants on the degree of flexibility that could be considered appropriate under the Planning Act 2008 regime.

4.6.3. 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 DCO application is submitted. The term is used to describe those elements of a scheme that have not yet been finalised, but can be accommodated

[36] Planning Inspectorate (July 2018) Advice Note Nine: Rochdale Envelope (Version 3). Available online: Advice Note Nine: Rochdale Envelope | National Infrastructure Planning (planninginspectorate.gov.uk)

within certain limits and parameters, allowing the likely significant environmental effects of a project to be presented as a reasonable 'worst case'.

4.6.4. The preliminary design parameters for the Proposed Development for the purpose of the preliminary assessment of likely significant environmental effects are as set out in **Chapter 2: Description of the Proposed Development**.

4.6.5. At this stage of the design of the Proposed Development, there is also various optionality within the design. **Table 4.3** below sets out those elements of the Proposed Development for which optionality is present within the current design. **Table 4.3** also sets out the scenario assessed for the purpose of this PEIR. This scenario has been adopted for the environmental factor assessments presented in **Chapters 5-14**, unless otherwise stated within the environmental factor chapter.

Table 4.3 Optionality of project elements at PEIR stage

Project Element	Optionality	Scenario assessed for PEIR
Solar PV modules	The indicative area for Solar PV Modules is shown in light blue on the Zonal MasterPlan (**Figure 2.3**). Some of these areas overlap with Indicative Siting Areas for the BESS, Collector Compounds and Springwell Substation hence there is optionality within these areas; Solar PV Modules may or may not occur within these areas depending on the preferred location of the BESS, Collector Compounds and Springwell Substation.	Assumes Solar PV modules would be located within all Solar PV fields marked in light blue on the Zonal MasterPlan (**Figure 2.3**) to assess the potential maximum extent of development. Height parameters for the Solar PV Modules would be up to 3m, 3.5m and 4m as shown in the Height Parameter Plan in **Figure 2.4**.
Balance of Solar System	The location of the BoSS has not yet been defined. Generally, the BoSS would comprise locating the inverter, transformer and switchgear equipment, independently outdoors, or within an enclosed ITS located throughout the fields shown in light blue on the Zonal MasterPlan (**Figure 2.3**). Some of these areas overlap with Indicative Siting Areas for the BESS, Collector Compounds and Springwell	Assumes that the BoSS equipment would be located in an ITS that would be located within each Solar PV field as marked in light blue on the Zonal MasterPlan (**Figure 2.3**). Assessment of BoSS height (up to 3.5m) has not been specifically addressed across the Solar PV fields. Height across the Solar PV fields has been addressed as per the Solar PV Modules (up to 3m,

Project Element	Optionality	Scenario assessed for PEIR
	Substation - hence there is optionality within these areas; BoSS may or may not occur within these areas depending on the preferred location of the BESS, Collector Compounds and Springwell Substation. The inverters required as part of the BoSS are expected to be either string inverters mounted underneath the Solar PV Modules or central inverters sited at regular intervals amongst the Solar PV Modules which would be located outdoors or within an enclosed ITS container.	3.5m and 4m) as shown in the Height Parameter Plan in **Figure 2.4**.
Collector Compounds	Four Collector Compounds, one located within each of the Indicative Collector Compound Siting Zones shown on the Zonal MasterPlan (**Figure 2.3**). Assumes one Collector Compound within Springwell East, one within Springwell Central and two in Springwell West. There is overlap between the Collector Compound in the southern extent of Springwell West and the BESS Indicative Siting Zone in the same location. Assumes Collector Compounds could be sited anywhere within Indicative Siting Zone.	Assumes one Collector Compound within each of the Indicative Siting Zones shown on the Zonal MasterPlan (**Figure 2.3**). Height parameters for the Collector compounds are up to 6m as shown in the Height Parameter Plan in **Figure 2.4**. Collector compound siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.
BESS	BESS located within any of the Indicative Siting Zones for BESS grid (zones located in close proximity to the Springwell Substation within the north of Springwell West, and zone located in the fields to the southern extent of Springwell West) shown on the Zonal MasterPlan (**Figure 2.3**). There is overlap between the BESS in the	Assumes BESS is either located within 1) Indicative Siting Zone in the north of Springwell West, OR 2) within the Indicative Siting Zone in the southern extent of Springwell West. Both options have been assessed. Height parameters for the BESS Indicative Siting Zone in the southern extent of Springwell West are up to 6m

Project Element	Optionality	Scenario assessed for PEIR
	southern extent of Springwell West and the Collector Compound Indicative Siting Zone in the same location. Assumes BESS could be sited anywhere within the Indicative Siting Zones for BESS.	as shown in the Height Parameter Plan in **Figure 2.4**. Height parameters for the BESS Indicative Siting Zone in the north of Springwell West reflect the higher Springwell Substation (up to 12m). BESS siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.
Springwell Substation	Springwell Substation located within any one of the Springwell Substation Indicative Siting Zones (marked as A) on the Zonal MasterPlan (**Figure 2-3**). Assumes Springwell Substation could be sited anywhere within Indicative Siting Zone (marked A).	Assumes Springwell Substation is located within the A Zone shown on the Zonal MasterPlan (**Figure 2.3**). Height parameters for Springwell Substation are up to 12m as shown in the Height Parameter Plan in **Figure 2.4**. Springwell Substation siting within Indicative Siting Zone A is assumed to be closest to the nearest sensitive receptor for that particular assessment.
Main construction compounds satellite Construction compounds	Assumes three main construction compounds will be indicatively located in 1) Bcd128 (West); 2) either Tb1, T2 or Bcd082 (for BESS and substation); 3) either Md03, Md04 or C7 (for central and east) as shown on **Figure 2.8**. Assumes 5 satellite compounds at various potential locations including: Tb3, Tb4, Tb5 Bcd139 Bcd093 or Bcd084	Assumes that one main construction compound and one satellite construction compound are located within each of the indicative siting zone locations displayed in **Figure 2.8**. Main construction and satellite construction compounds siting within an indicative siting zone location is assumed to be closest to the nearest sensitive receptor for that particular assessment. Access to the Site is assumed to be via the indicative access points as shown on **Figure 2.9**.

Project Element	Optionality	Scenario assessed for PEIR
	Bk04, bk06, bk07, bk11, bk12 By 18 or By27 as shown on **Figure 2.8**. There is overlap between these construction compound locations and various project elements as listed above within this table.	
Grid Connection cable route	The siting zone for the Grid Connection cable route is presented in **Figure 2.3**.	This preliminary assessment has been based on the siting zone presented in **Figure 2.3** and the cable route is assumed to be closest to the nearest sensitive receptor for that particular preliminary assessment.
Cable route to connect the Solar PV modules, BoSS, Collector Compounds, Springwell Substation and BESS	The indicative location of the main cable route between the parcels and the potential routing options is presented in **Figure 2.7**.	The preliminary assessment has been based on all the cable route options outlined in **Figure 2.7**.

4.6.6. As the design of the Proposed Development evolves, further information will become available and key elements of the design will be refined and further defined, and the optionality will be reduced. However, it is likely that flexibility will need to be maintained for some aspects of the Proposed Development for the DCO application. Where flexibility is to be retained in the DCO application, the parameters will form the likely worst case envelope for the Proposed Development to be reported within the ES.

Defining the study area

4.6.7. Study areas have been defined individually for each environmental factor assessment, taking into account the geographic scope of the potential impacts relevant to that factor and the information required to assess those impacts.

4.6.8. The proposed study areas are described within **Chapters 5-13** of this PEIR.

4.6.9. These study areas have also been used to inform the zone of influence for the purposes of assessing the cumulative effects, as detailed in **Chapter 15**.

Establishing baseline conditions

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

4.6.11. The establishment of the environmental baseline is essential to assist with the comparison against future changes as a result of the Proposed Development and to assess the likely significant environmental effects of the Proposed Development.

4.6.12. Specific details of the approach taken to establishing baseline conditions are provided within **Chapters 5-13** of this PEIR. Typically baseline conditions have been established by:

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

4.6.13. The PEIR provides an overview of the current baseline for the purposes of the preliminary assessment as set out within **Chapters 5-13**. Where further studies or survey work will be undertaken as part of the ongoing EIA this is also outlined in **Chapters 5-13**. The reports detailing the results of further baseline studies or surveys will be provided within the ES.

Establishing future baseline conditions

4.6.14. 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').

4.6.15. Each environmental factor chapter (**Chapters 5-13**) provides a description of the future baseline scenario and the data sources that have informed it where relevant.

Assessment Scenarios

4.6.16. The assessment scenarios considered for the Proposed Development 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. It should be noted that without the Proposed Development, the Site would continue to be occupied for agricultural use.
- Construction of the Proposed Development - As presented in **Chapter 2**, construction is scheduled to commence in 2026 and last for approximately 48 months. Where relevant, environmental factor chapters have assessed the relevant 'worst case' construction scenario and where necessary, the relevant period or 'peak' of activity within the construction programme.
- Operation (which includes maintenance) of the Proposed Development – As presented in **Chapter 2**, it is assumed that the Proposed Development will be operational and maintained for a duration of 40 years. However, it is acknowledged that this could be slightly longer depending on the maintenance regime deployed for the Proposed Development as is the case for existing generating assets.
- Decommissioning of the Proposed Development (where appropriate) - As presented in **Chapter 2**, decommissioning activities will begin following the cessation of the operational Proposed Development and will take approximately 12 – 24 months.

Assessment of likely significant environmental effects

4.6.17. The EIA process requires the identification of the likely significant environmental effects of the Proposed Development.

4.6.18. The PEIR reports on the preliminary likely significant environmental effects for the construction (including site preparation and earthworks), operational (i.e. once completed and open to use, and including maintenance) and (where relevant) decommissioning phases of the Proposed Development based on information available to date.

4.6.19. The following criteria have been taken into account when determining significance for the purposes of the PEIR:

- The receptors/resources (natural and human) that 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?

4.6.20. The method for assessing significance of effects varies between environmental factors and is derived from a variety of legislative requirements, technical guidance and the EIA Regulations, but in principle, this is based on the environmental sensitivity (or value/importance) of a receptor/resource and the magnitude of change from the baseline conditions.

4.6.21. The approach to assessing the significance of effects for each individual factor is summarised in **Chapters 5-14**. However, it is worth noting that for the preliminary assessment of likely significant environmental effects reported within this PEIR, the assessment is based on the current stage in the design process and the current understanding of baseline conditions. Further survey and design work is currently being undertaken to refine the design and to inform the final assessment of likely significant environment effects of the Proposed Development, which will be reported within the ES.

4.6.22. Summary of effect tables that summarise the preliminary likely significant environmental effects associated with each of the environmental factors are presented within **Chapters 5-13**. These tables outline sensitive receptors, the likely effects in the absence of additional mitigation measures, the likely additional mitigation measures, the likely residual effects (following the application of any additional mitigation measures proposed) and a preliminary assessment of whether the residual effect would likely be significant or not.

4.6.23. The approach taken to the preliminary assessment of cumulative effects is reported in **Chapter 15**.

Approach to mitigation

4.6.24. Mitigation can be relied on to reduce potential significant environmental 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.

4.6.25. The Institute of Environmental Management and Assessment's (IEMA) 'Environmental Impact Assessment Guide to Shaping Quality Development'[37] refers to three distinct forms of mitigation:

- **Primary:** An intrinsic part of the project design
- **Secondary:** Typically described within the environmental 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.

4.6.26. For the purposes of this PEIR and the ES, embedded 'primary' mitigation measures will form part of the Proposed Development that is the subject of the application for consent. **Table 4.4** describes the currently known embedded (primary) environmental mitigation measures that are considered to be an inherent part of the Proposed Development i.e. the technical requirements 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.

Table 4.4 Embedded (primary) mitigation measures

Receptor/factor	Embedded (primary) mitigation
Residential properties	There will be a minimum 250m offset from ITS, BESS, Project Substations and Collector Compounds to residential properties.

[37] Institute of Environmental Management and Assessment (2015). Environmental Impact Assessment Guide to Shaping Quality Development.

Receptor/factor	Embedded (primary) mitigation
Hedgerows	Boundary fencing will not be constructed through existing hedgerows or across ditches. There will be a minimum 10m offset from the Proposed Development to all existing hedgerows. Internal access tracks and cable routes will use existing tracks, hedgerow crossings and/or gaps in the hedgerows wherever practical. Proposed hedgerows will be planted with a variety of fruiting and nut bearing species providing foraging opportunities.
Woodlands	There will be a minimum 15m offset from built development to existing woodlands, whilst noting that it is possible that individual trees may need to be removed to facilitate construction. There will be a minimum 20m offset from the Proposed Development to ancient woodland.
Designation sites for nature conservation	There will be a minimum 20m offset from the Proposed Development to statutorily and non-statutorily designated sites for nature conservation.
Biodiversity	Exceed 10% Biodiversity Net Gain on Site. There will be a minimum 30m offset from the Proposed Development to main badger setts.
Land, soils and groundwater Cultural heritage	Grid Connection Corridor and cabling to connect the Solar PV development to the ITS, Collector Compound, BESS and Springwell Substation will comprise below ground cables. Cable routes to connect the Solar PV modules to the BoSS and Collector Compounds will run alongside access tracks as much as possible to avoid wider excavations. The use of use of trenches and foundations will be minimised. Utilise easily removable foundations.
Watercourses and ditches	Provide offsets of at least 10m either side from main rivers and 6m from ditches.
Public rights of way	All existing PRoW will be retained where practically possible in their existing alignment during the operation of the Proposed Development. There will be a minimum 50m offset of ITSs from PRoW. The Proposed Development (excluding new landscaping where appropriate) will be set back at least 15m either side from existing or proposed PRoW, except where crossings are necessary.
Climate	All members of the supply chain will provide a carbon reduction plan.

Receptor/factor	Embedded (primary) mitigation
	All suppliers will meet the Applicant's tendering, procurement and supply chain requirements. The Applicant's continued adherence to PV Cycle requirements. The use of concrete will be minimised.
Agricultural land	All fields comprising solely of Grade 1 or 2 land within the Site will remain in arable production.
Landscape	Structural planting is to consist of native and indigenous species and wherever possible from local provenance.

4.6.27. 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 Mitigation Measures' section within each environmental factor assessment chapter (**Chapters 5-13**).

4.6.28. Mitigation will be secured through the DCO process to ensure that all measures are delivered as part of the Proposed Development. Measures are expected to be secured through the setting of specified parameters and via DCO requirements.

Opportunities for enhancing the environment

4.6.29. 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*'. Therefore, any identified enhancement measures will not be taken into account when determining the significance of effects.

4.6.30. Environmental enhancement measures have been reported where known at this stage within this PEIR, and will continue to be considered as part of the ongoing design process and will be reported in full within the ES.

Monitoring

4.6.31. The need for and scope of any required monitoring is evolving as part of the iterative design process. In accordance with the EIA Regulations, the ES will identify the need for any monitoring required to monitor significant adverse environmental effects of the Proposed Development on the environment and/or to monitor the effectiveness of identified mitigation measures where considered appropriate. Any monitoring proposed at this PEIR stage with

respect to predicted likely significant adverse environmental effects is identified within the respective environmental factor chapters (**Chapters 5-13**). Monitoring measures will be secured through the DCO process to ensure that all measures are delivered as part of the Proposed Development.

Difficulties and uncertainties

4.6.32. Factor-specific difficulties and uncertainties are set out in **Chapters 5-13** of this PEIR. The following key general difficulties and uncertainties apply to a number of factor assessments:

- The detailed design of the Proposed Development is still developing, as are the environmental surveys and assessments required to support the planning and EIA process. This PEIR is prepared based on the preliminary information available at the time of writing. Each environmental factor chapter clearly sets out the additional work, including any surveys, that are required to inform the ES.
- The preliminary information presented in this PEIR is based on construction information available at the time of writing and based on reasonable worst case assumptions, where this data is not available.
- 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 PEIR details the maximum parameters of the Proposed Development components as they are currently known. The preliminary assessment within this PEIR is based on a reasonable 'worst case scenario' based on the maximum parameters presented. In addition, **Table 4.3** in this chapter sets out the scenarios assessed in terms of optionality. This is the scenario that has been assessed within this PEIR (unless otherwise stated within the environmental factor chapters) and therefore whichever location or footprint is decided and applied, this preliminary assessment will ensure that the maximum level of significant environmental effects is considered. Further detail is provided in **paragraphs 4.6.4 – 4.6.5** and in **Chapters 5-13**.
- 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 sourced and secured from reputable 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 will 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.


Springwell
Solar Farm