

# MERIDIAN SOLAR FARM PEIR VOLUME I CHAPTER 3: ALTERNATIVES AND DESIGN EVOLUTION

## 3. Alternatives and Design Evolution

### 3.1. Introduction

- 3.1.1. This chapter outlines the process and justification for site selection that was undertaken for the Meridian Project. It also provides commentary on how the elements of the Scheme have evolved over time, from the initial identification of the opportunity and Site, and updates since the non-statutory consultation undertaken in 2024.
- 3.1.2. This chapter is supported by PEIR Volume III Appendix 3-1: Commitments Register.
- 3.1.3. Regarding Site selection and the consideration of alternatives, whilst there is no standard methodology or guidance, it is important that a clear and transparent process is undertaken and documented. Overarching National Policy Statement for Energy (EN-1)<sup>1</sup> states that: *“as in any planning case, the relevant or otherwise to the decision-making process of the existence (or alleged existence) of alternatives to a proposed development is in the first instance a matter of law. This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option from a policy perspective. Although there are specific requirements in relation to compulsory acquisition and habitat sites, the NPS does not change requirements in relation to compulsory acquisition and habitat sites”* (paragraph 4.3.9).
- 3.1.4. EN-1 does, however, state that applicants should include detail on the reasonable alternatives considered and the primary reasons behind design choices, accounting for the environmental, social and economic effects of the Scheme, including where relevant, how factors in relation to technical and commercial feasibility have influenced the consideration of reasonable alternatives (paragraph 4.3.15). Where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements (paragraph 4.3.17). This consideration of alternatives should be carried out in a proportionate manner, with only those that meet the objectives of the Scheme needing to be considered (paragraph 4.3.22). Alternative proposals which mean a development could not proceed, for example because they are not commercially viable or the location would not be physically suitable, can be excluded from consideration on the basis that *“they are not important and relevant to the Secretary of State’s decision”* (paragraph 4.3.27). There should be a realistic prospect of the alternative option delivering the same infrastructure capacity in the same timescale of the Scheme (paragraph 4.3.23).

---

<sup>1</sup> Department for Energy Security and Net Zero (2024) *Overarching National Policy Statement for energy (EN-1)* (E03028327). London: HMSO Available at: <https://assets.publishing.service.gov.uk/media/65bbfbd709fe1000f637052/overarching-nps-for-energy-en1.pdf>

- 3.1.5. EN-1 further includes specific requirements to consider alternatives in relation to biodiversity and geological interests, flood risk and schemes within national designated landscapes (Sections 5.4, 5.8, and 5.10).
- 3.1.6. Schedule 4(2) of the EIA Regulations<sup>2</sup> outlines the need for an ES to include “*a description of the reasonable alternatives (for example in terms of the design, technology, location, size and scale of the Scheme) considered by the Applicant which are relevant to the Scheme and its specific characteristics, including an indication of the reasoning for selecting the chosen option, as well as a comparison of the environmental effects.*”
- 3.1.7. The Habitats Directive, transposed into UK law by the Conservation of Habitats and Species Regulations 2017 (the ‘Habitats Regulations’)<sup>3</sup>, requires the consideration of alternative solutions as part of Stage 3 of a Habitats Regulations Assessment (HRA) for Schemes where the Habitats Regulations apply.
- 3.1.8. As such, this chapter describes the evolution of the design as a result of the iterative process undertaken to-date, outlining how alternatives have been considered in relation to the following elements of the Scheme:
- Selection of the PV Area (Section 3.2);
  - Environmental design of the PV Area (Section 3.3);
  - Identification and selection of the Grid Connection Corridor (Section 3.4); and
  - Identification and selection of the Inter-Array Areas (Section 3.5).
- 3.1.9. Consideration has not been given to a ‘do nothing’ scenario as it is not considered a reasonable alternative to the Scheme and would not deliver the object of the Scheme to deliver substantial renewable energy generation.
- 3.1.10. The need for the Scheme is established under EN-1 and has been outlined separately within PEIR Volume I Chapter 2: The Scheme.
- 3.1.11. Further details as to how alternatives have been considered and how the Scheme design has evolved will be submitted with the DCO application and reported within the ES as appropriate.

## 3.2. Selection of the PV Area

- 3.2.1. There is no standard methodology for the selection of land for solar PV generation. The methodology used has been informed by the NPSs for energy, which outline the objectives and requirements for the assessment of DCO applications for energy NSIPs.

---

<sup>2</sup> *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017*. Available at: <https://www.legislation.gov.uk/uksi/2017/572/data.pdf>.

<sup>3</sup> *Conservation of Habitats and Species Regulations 2017*. Available at: <https://www.legislation.gov.uk/uksi/2017/1012/data.pdf>.

NPS for Renewable Energy Infrastructure (EN-3)<sup>4</sup> identifies the key factors that are likely to influence the location and layout of Sites for solar farms, including:

- Irradiance and land topography;
- Network connection;
- Proximity of land to dwellings;
- Agricultural land classification and land type;
- Accessibility;
- Public Rights of Way (PRoW); and
- Security and lighting.

3.2.2. Where these considerations have informed the Site selection process for the Scheme, this is set out in the following sections.

3.2.3. The Scheme has followed a three-stage iterative process for Site selection as outlined below.

## Stage 1 – Identification of the Opportunity Area

### Irradiance and Land Topography

3.2.4. Two of the key factors when determining the location of a solar development are topography and irradiance (sunlight). Solar PV generation development can be found across the UK at a wide variety of latitudes; however, their efficiency is driven by the levels of irradiance at their location. Topography helps to maximise these irradiance levels, with flat land being the most optimal as it reduces shading on the panels which allows for a better energy yield when compared to undulating land. Flat topography is also preferential for construction and is generally less visually intrusive to the landscape and wider communities.

3.2.5. The East of England (Lincolnshire, Norfolk and Cambridgeshire) benefits from high levels of irradiance and a broadly flat topography in comparison to other UK regions. This area was, therefore, a favourable region in which to complete a search for grid connection opportunities<sup>5</sup>.

---

<sup>4</sup> Department for Energy Security and Net Zero (2024) *National Policy Statement for Renewable Energy Infrastructure (EN-3)* (E03028327). London: HMSO Available at: <https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf>

<sup>5</sup> Existing mapping of irradiation levels across the UK enables estimates of Specific Photovoltaic Power Output per year. The maximum output in the UK is approximately 1160kWh/kWp per annum which can be found in the South of Kent. The lowest levels on the mainland can be found in the far North of Scotland at approximately 830kWh/kWp per annum. The estimated yearly output in the area of search is approximately 1040 kWh/kWp per annum, providing highly favourable conditions for a large-scale solar development.

### Network Connection

- 3.2.6. A key determining factor on the site selection process is the capacity of the electricity network to connect opportunities for new renewable energy generation. Due to the scale of the generation and opportunity that was sought, a connection to local distribution networks would be unsuitable as it would not provide the capacity required for the project.
- 3.2.7. At the commencement of the Scheme, and in line with paragraph 4.11.5 of EN-1, discussions were held with National Grid Electricity Transmission (NGET) regarding suitable connection opportunities to the National Transmission System (NTS) in the East of England. During this engagement, NGET advised that a new large scale NGET substation (subsequently called the Weston Marsh Substation) was proposed to be constructed to facilitate network reinforcement works in the area and to enable grid connections for offshore wind farms off the coast of Norfolk.
- 3.2.8. It was advised that a point of connection (PoC) would be developed and that it would provide capacity for a large-scale solar development. Following discussion with NGET, a grid connection application was made for connection to the proposed PoC, with an offer subsequently made for 750MW. Due to the confirmation of the availability and confirmed capacity at the PoC to be developed, this became the starting point for the area of search for the development of the Meridian Solar Farm.
- 3.2.9. At the time of securing the connection agreement, the potential location of the proposed Weston Marsh Substation was not yet identified. Accordingly, a broad search area for potential opportunities was identified on the basis that the substation could be located between Spalding in Lincolnshire and Walpole in Norfolk.
- 3.2.10. As the connection agreement was not site-specific, a search of land suitable for solar PV generation development was conducted based on the broad assumption of the potential substation location.

### Stage 2 – Consideration of Constraints and Opportunities

- 3.2.11. This section describes the process undertaken in Stage 2 of the selection process which included desktop mapping of identified planning and environmental spatial constraints and a review of planning policy. This stage also identified potentially suitable land holdings of a suitable size to accommodate the Scheme.

#### *Land Holdings and Site Characteristics*

- 3.2.12. A guiding principle for Site identification was the early consideration of deliverability and that land must be considered available for development. A search was undertaken with a preference for large land holdings (of at least approximately 300-400 acres) to mitigate commercial and deliverability risks associated with multiple party negotiations and to provide flexibility in Site design. Large blocks of land within holdings are considered beneficial for solar PV development as they can facilitate a large installation. Typically,

the developable area is smaller than the field size due to the requirement for buffers and the consideration of other design constraints.

- 3.2.13. To identify the potential for a consolidated site sufficient to deliver the required capacity, large landholdings within close proximity to each other were identified.

*Urban Areas and Proximity to Large Residential Zones*

- 3.2.14. Built up areas with a population of 10,000 or more residents were identified and excluded from the identification of opportunity sites. Land close to large settlements (within 2km) was also excluded to mitigate development within close proximity to urban areas. Consideration was given to section 2.10.27 of EN-3, which requires consideration of the impacts on visual amenity and glint and glare to existing residential communities.

*Access for Construction*

- 3.2.15. As outlined in paragraphs 2.10.35 to 2.10.39 of EN-3, appropriate access must be available to facilitate construction of a solar PV site. Whilst it would be possible, using traffic management, to access and construct a solar PV site via single track lanes, a two-way access road was preferred for a development of the proposed scale.
- 3.2.16. In addition, locations that were within a reasonable distance from the strategic road network would be preferred.

*Archaeological and Heritage Interest*

- 3.2.17. Considering the policy outlined in sections 5.9 of EN-1 and sections 2.10.107 to 2.10.119 of EN-3, it is preferable to site solar development on land with low levels of archaeological interest and without designated sites, such as scheduled monuments, listed buildings and conservation areas. Designated sites were mapped and factored into the consideration of the appropriateness of site options.
- 3.2.18. Sites that were absent of designations or were of sufficient size to provide opportunities to reduce potential impacts through appropriate on-Site design measures were considered further.

*Agricultural Land Classification*

- 3.2.19. Paragraph 2.10.29 of EN-3 states that land type should not be a predominating factor for determining the suitability of a site location. Despite this, EN-1 does direct applicants to minimise impacts of solar development on best and most versatile (BMV) agricultural land (defined as ALC grades 1, 2 and 3a), with a policy preference for development on land that is not classified as best and most versatile (grades 3b, 4 and 5).
- 3.2.20. As outlined in section 2.10.29 of EN-3, a desktop review of previously developed land, brownfield land, contaminated land and industrial land was undertaken to identify sites with the potential to accommodate a solar farm of the proposed scale. It was determined that there are no sites of a suitable size, location and characteristics to accommodate the proposed development without use of agricultural land.

3.2.21. As part of the consideration of opportunity areas, predictive ALC mapping was reviewed to determine the potential availability of options that could fall outside areas of BMV land. The predictive mapping showed that, outside urban areas, the vast majority of land between (and surrounding) Spalding and Walpole was likely to be either Grade 2 or Grade 1 agricultural land. The closest substantive areas of land that fall outside of these predicted grades would be to the south of Kings Lynn, approximately 16km (in a straight line) to the east of Walpole or in the vicinity of the A15, approximately 18km (in a straight line) to the east of Spalding. Following the identification of this constraint, the opportunity to avoid BMV land in its entirety was not considered feasible and would therefore not be a differentiator in the identification of options. Nevertheless, using the predictive mapping, opportunities to locate a Site that could reduce the impact on Grade 1 agricultural land was sought.

#### *Landscape Designations*

3.2.22. Considering the policy outlined in section 5.10 of EN-1, there was a preference to identify a Site which would avoid direct impacts on designated landscapes. A desktop review of landscape designations was undertaken within the search area to identify National Landscapes (Areas of Outstanding Natural Beauty) and National Parks to ensure that these would be excluded from the identification of opportunity areas.

3.2.23. In line with section 5.11.2 of EN-1 and Chapter 13 of the National Planning Policy Framework<sup>6</sup>, areas of Green Belt were identified and excluded from the identification of options to ensure their continued openness and permanence.

#### *Nature Conservation Designations*

3.2.24. Sites that did not contain designated international and national ecological and geological designations would be preferred in order to reduce the potential for significant effects. The following sites were therefore identified and excluded from the consideration of suitable options:

- SSSIs;
- SACs;
- SPAs;
- SPA protection buffers;
- Ramsar sites; and
- National Nature Reserves (NNRs).

---

<sup>6</sup> Ministry of Housing, Communities and Local Government (2024) *National Planning Policy Framework*. Available at: <https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf>

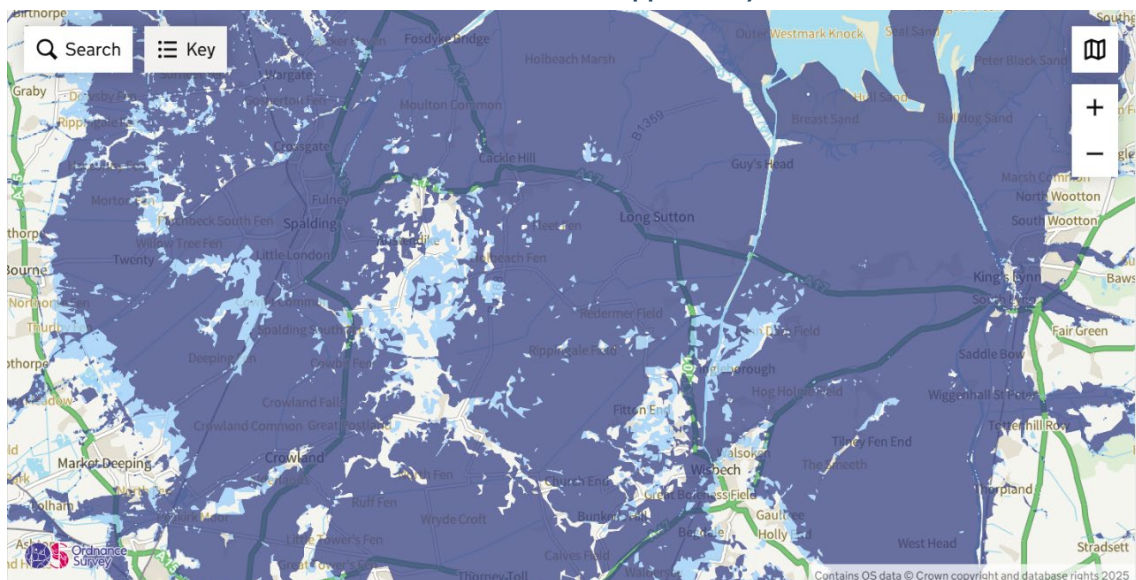
3.2.25. A review was also completed for proposed internationally and nationally designated ecological and geological sites, though none were identified within the search area.

*Flood Risk*

3.2.26. A substantial proportion of Lincolnshire and the search area to identify opportunity Sites is located within Flood Zone 3 as shown in Figure 1 below. NPS EN-1 requires the Sequential Test to be applied to the siting of infrastructure in flood risk areas outside of Flood Zone 1. If following the application of the Sequential Test, suitable sites at lower risk of flooding are not available, paragraph 5.8.9 of EN-1 allows for the Exception Test to be applied.

3.2.27. Consideration has been given to the identification of suitable land parcels that would fall outside areas at the highest risk of flooding in the first instance. The most substantive areas of land that fall outside Flood Zone 3 within the opportunity area are located in the vicinity of Moulton Chapel, to the south east of Spalding or near Gorefield to the south west of Walpole (Plate 3-1).

**Plate 3-1 Flood Risk Context within Site Selection Opportunity Area**



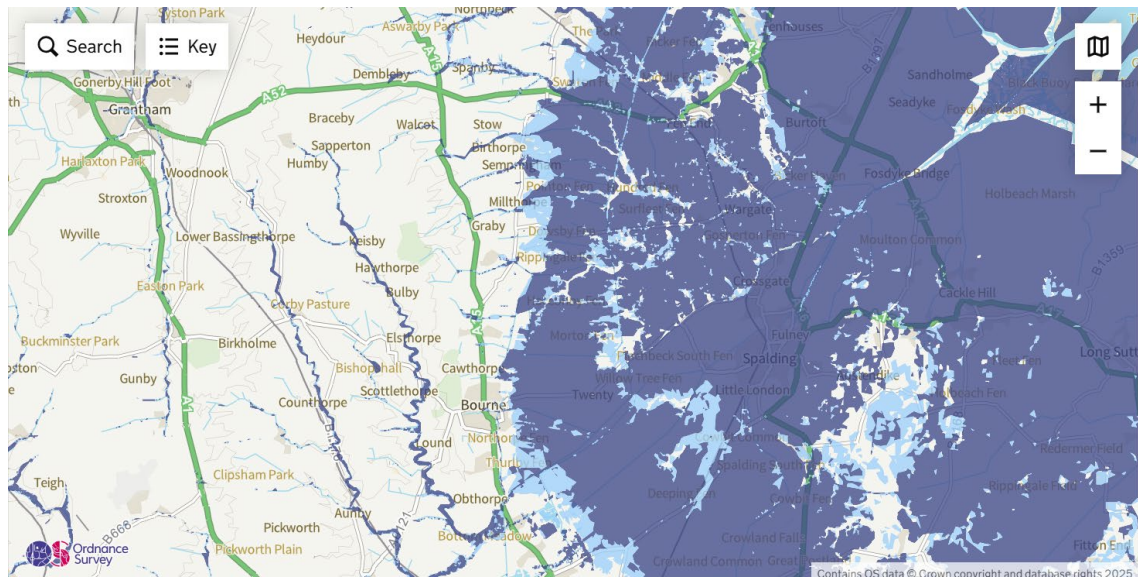
3.2.28. The area to the south west of Walpole was considered in terms of the potential land parcels that could be available in line with the characteristics outlined in paragraph 3.2.12 above. A desk-based search determined that there are no appropriately sized land parcels that fall outside of Crown ownership that could reasonably be considered available and deliverable for a Scheme of this scale.

3.2.29. Consideration was also given to the land in the vicinity of Moulton Chapel that would fall outside Flood Zone 3. Similarly, there are numerous pockets of Crown land in this area and there are limited land parcels that would fall wholly outside Flood Zone 3 that would provide a realistically available opportunity for the development of the Scheme. Nevertheless, parcels close to this area were identified that would provide sufficient

available land were present that fall partially outside Flood Zone 3. These land parcels (B and C) were considered further against other Site selection criteria and were considered appropriate for potential inclusion in the scheme.

- 3.2.30. The largest and closest area that falls wholly outside Flood Zone 3 is the area to the east of the A15, north of Bourne as shown in Plate 3-2. This area lies in the region of 18 to 20km (in a straight line) to the west and north west of Spalding. Multiple constraints are present in this area, including significant areas of protected woodland, a network of PRow and substantial areas of Crown Land which would restrict the availability and deliverability of a scheme and also presents additional constraints to routing a connection to the proposed PoC.

**Plate 3-2 Flood Risk Context within Wider Site Selection Area**



- 3.2.31. As set out in the preceding paragraphs, Flood Zone 3 is prevalent across the majority of the opportunity area considered for Site selection. There are small pockets of land that lie within lower flood risk areas however due to factors including the size of available land parcels and presence of Crown Land, the majority of these parcels do not satisfy the Site selection considerations for solar development set out in EN-3. Where suitable land parcels are available in areas of lower flood risk (parts of Parcels B and C), these have been incorporated into the Scheme. The application of the Sequential Test shows that there are no reasonably available lower risk Sites for the entire Scheme.
- 3.2.32. In applying the Exception Test, Annex 3 of the National Planning Policy Framework classifies solar farms and essential utility infrastructure (including for generation) as essential infrastructure. The Exception Test must be applied to essential infrastructure sited in Flood Zone 3a or 3b where the Sequential Test has demonstrated that there are no reasonably available, lower risk sites, appropriate for the Scheme.
- 3.2.33. There are two limbs to the Exception Test, it should be demonstrated that:

- Development that has to be in a flood risk area will provide wide sustainability benefits to the community that outweigh flood risk; and
- The development will be safe for its lifetime taking account the vulnerability of its users, without increasing flood risk elsewhere, and where possible, will reduce flood risk overall.

3.2.34. The ES will be supported by a Flood Risk Assessment and further detail on how the Sequential and Exception Tests have been applied.

#### *Watercourses*

3.2.35. During the consideration of constraints and opportunities, it was determined that the waterways near Spalding were a potential barrier to development and could pose issues where a grid connection was required to cross these waterways. Therefore, it was determined that land to the East of River Welland, Vernatt's Drain, Coronation Channel, and Blue Gowt Drain would be preferred for the location of the Scheme.

### **Stage 3 – PV Area Site Selection and Land Assembly**

3.2.36. Following the identification of Site selection considerations, Sites that provided reasonable opportunity to develop a Scheme of the proposed scale were identified. The initial scoping exercise focussed on identifying sufficient land to accommodate the scale of the proposed Scheme including adequate mitigation and enhancement, with the land being as close as reasonably practical to the potential PoC. Following this, corresponding landowners were identified.

3.2.37. As the Scheme progressed and the stages of Site identification were undertaken, continued engagement with NGET took place and the search area for the PoC was refined over time. The consideration of alternative Sites remained active and iterative to ensure no preferable alternatives to the Site proposed.

3.2.38. Potentially available land suitable for solar and with limited environmental effects was sought. Sites in close proximity to each other with as few landowners as possible, and ideally neighbouring landowners, were preferred to produce a PV Area on continuous blocks as this improves the potential for deliverability.

3.2.39. Application of the above criteria identified a selection of appropriate land parcels. Initial contact was made with the relevant landowners and progressed towards agreement of commercial terms.

3.2.40. Considering the constraints and opportunities referenced above, the PV Area was identified as having the following characteristics:

- The PV Area could be accessed via reasonable connections in close proximity to A16 which runs between Peterborough and Spalding;
- There are no listed buildings or conservation areas either on or immediately adjacent to the PV Area. There is a scheduled monument within land parcel C;

however, it was considered at the feasibility stage that development in the vicinity of this monument could be appropriately managed with Site-specific investigation and surveys, and by way of exclusion zones;

- A desk-based study identified that the likely area for the PoC was located within an area classed by national provisional ALC mapping<sup>7</sup> as predominantly Grade 1, with areas of Grade 2. It should be acknowledged this dataset is not intended for planning purposes and served as an indicator of areas of lower land quality within the area surrounding the PoC. Where the use of agricultural land is shown to be necessary, applicants should opt for poorer quality land and avoid the use of BMV agricultural land where possible. Following initial engagement with landowners, it was established that land in the surrounding area had been intensively farmed for long periods of time, with it reasonable to believe that the grade of land is below that of Grade 2 as identified on national-scale provisional ALC mapping, with surveys to be completed as part of the design process and avoidance of areas of the highest quality, notably in the siting of permanent infrastructure. Agricultural land surveys have now been undertaken within the PV Area to help refine the design;
- No National Landscapes (Areas of Outstanding Natural Beauty) or National Parks were identified in the area of search. No areas of Green Belt were located within the area considered for siting of the PV Area;
- No SSSIs, SACs, SPAs, SPA protection buffers, Ramsar sites or National Nature Reserves (NNRs) were present in, or in close proximity to, the PV Area. There are also no proposed internationally or nationally designated ecological and geological sites, within the PV Area;
- The PV Area is largely within Flood Zone 3 with some areas of Flood Zone 1 and 2. Flood defences are in place at Crowland and Cowbit Wash. Through design mitigation and incorporation of flood resistance and resilience into the Scheme design, the flood risk on-site could be mitigated. The Sequential Test has been applied and will be demonstrated as part of the DCO Application; and
- The locality of the PV Area comprises large areas of undeveloped land and a sparse settlement pattern, with few residential properties within or around the PV Area. The PV Area itself is made up of a handful of neighbouring landowners with significant acreage that can be used for the Scheme, therefore a contiguous area can be established with the opportunity to develop a viable NSIP-scale Scheme which can make meaningful contributions to the UK's net zero commitments.

---

<sup>7</sup> Natural England (2024) *Provisional Agricultural Land Classification (ALC) Mapping*. Available at: <https://www.data.gov.uk/dataset/952421ec-da63-4569-817d-4d6399df40a1/provisional-agricultural-land-classification-alc2>.

- 3.2.41. The potential of delivering a smaller Scheme with less generation capacity on a smaller scale was considered and discounted. The potential to maximise the potential for renewable energy generation in appropriate areas that have sufficient grid capacity is strongly supported in National Policy, particularly in section 4.2 of EN-1 which identifies the critical national priority of nationally significant renewable energy infrastructure. Delivering a Scheme at a smaller scale would not take sufficient advantage of the opportunity available on the identified Sites and would not take advantage of the available capacity at the PoC. This was therefore not considered a reasonable option to pursue.

### 3.3. Environmental Design of the PV Area

#### Scheme Design Principles

- 3.3.1. Paragraph 2.5.2 of EN-3 states the importance of demonstrating good design for renewable energy infrastructure schemes, particularly in respect of “*landscape and visual amenity, opportunities for co-existence/co-location with other marine and terrestrial uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage*”. A series of design principles have been developed to inform the design process, assist with mitigation and reduction of potential environmental effects and, where appropriate, inform wider ranging enhancements or improvements for local stakeholders.
- 3.3.2. The following key themes have been used as guiding principles. Opportunities to mitigate or reduce impacts or provide enhancements will be regularly reviewed throughout the design process.

#### Sustainability

- 3.3.3. The Scheme will be designed to support the transition to net zero and assist the UK in achieving net zero targets by 2050. The Scheme will be designed with flexibility to take advantage of new sustainable and efficient technologies that emerge throughout the development process and maximise the opportunity for renewable energy generation on the identified Site.

#### People

- 3.3.4. Meaningful engagement will be carried out with communities and stakeholders to understand how to appropriately protect and enhance the environment and the local area. This will include seeking feedback on the Scheme, community benefit packages and how best to protect and enhance the environment and the local area.

#### Environment

- 3.3.5. We will seek to protect and enhance the landscape, and the Scheme will be designed sensitively with consideration to complementing local character and culture, and supporting ecology, where reasonably practicable. Topic-based environmental studies will be used to inform design and suitable mitigation measures.

## Environmental Design and Commitments Register

- 3.3.6. Ongoing environmental surveys and studies have been key to the design of the Scheme, notably in identifying sensitive features and potential opportunities to deliver enhancements. Where they cannot be avoided, the Scheme has sought to reduce the potential significant impacts where practical, utilising mitigation embedded into the design in the first instance. Further consideration will be given to the residual effects identified as part of the preliminary assessment alongside feedback received during statutory consultation to inform the requirement for additional mitigation where appropriate.
- 3.3.7. The following sections outline the key stages where environment-led design has influenced the development of the Scheme. Further details as to where measures have been implemented to avoid or reduce adverse effects and/or support the achievement of good design, including in relation to the environment or other benefits, have been logged within the Scheme Commitments Register (CR) as outlined within PEIR Volume III Appendix 3-1: Commitments Register. The CR has been developed in accordance with the Planning Inspectorate 2024 guidance 'Nationally Significant Infrastructure Projects: Commitments Register'<sup>8</sup>, and is intended to be a live document. The CR will be updated at the ES stage.

### 3.4. Design Evolution of the PV Area Layout

- 3.4.1. The design of the PV Area has been refined iteratively, accounting for environmental and technical considerations while incorporating feedback from statutory and non-statutory consultees, including the local community and relevant authorities. Table 3-1 below outlines the key design iterations to the PV Area to date, as well as future anticipated stages.

---

<sup>8</sup> Planning Inspectorate (2024) *Nationally Significant Infrastructure Projects: Commitments Register*. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-commitments-register>.

**Table 3-1 PV Area Design Iterations**

Design Iteration	Consultation	Key Considerations
Indicative early design (January 2024)	Discussion with landowners, early engagement with statutory consultees and environmental surveys.	Broadly based on early engagement with landowners and need to understand technical capacity and feasibility per land parcel.
First design workshop (January 2024)	N/A	Consideration of environmental constraints and opportunities with respect to each EIA topic, including preliminary ecology surveys, early ALC survey findings and heritage desk study. Consideration of Design Principles with regard to avoidance and buffer zones around sensitive features.
EIA Scoping design freeze (May 2024)	Discussion with landowners, ongoing engagement with statutory consultees and environmental surveys.	Based on continued discussion with landowners, initial specification for Grid Connection, information from environmental surveys, first design workshop and early engagement with statutory and non-statutory consultees.
Non-statutory consultation design updates (June 2024)	Discussion with landowners, ongoing engagement with statutory and non-statutory consultees including at a series of public exhibitions, and environmental surveys.	Based on continued discussion with landowners, information from environmental surveys, technical considerations and ongoing engagement with statutory and non-statutory consultees.
Second design workshop (July 2024)	N/A	Consideration of layout based on more detailed environmental constraints and opportunities with respect to each topic including preliminary updated ecology surveys, ALC survey findings and heritage geo-physics and aerial photograph surveys.
PEIR design freeze (October 2024)	Scoping Opinion, discussion with landowners, ongoing engagement with statutory and non-statutory consultees, and environmental surveys.	Alterations to the PV Area design as appropriate, based on comments received during non-statutory consultation, discussion with landowners and continued engagement with statutory and non-statutory consultees.
<b>Future Iterations</b>		
ES design freeze, layout for DCO submission	Discussion with landowners, continued engagement with statutory and non-statutory consultees, and environmental surveys.	Alterations to the PV Area design as appropriate, based on public statutory consultation, environmental surveys and technical considerations.
Additional requirements post-DCO consent	Additional environmental surveys as required and statutory consultee consultation as part of discharge requirements.	Detailed design of PV Area prior to construction, accounting for statutory consultee comments provided as part of the discharge of requirements. Updates to design where there have been technological advances.

- 3.4.2. The Scoping process was conducted on a worst-case assumption that solar PV modules would be located on all land parcels of the PV Area with exception to B-3, B-5, and where scheduled monuments are located within the Site. This was similarly the case with the siting of solar PV supporting infrastructure, and the BESS and on-Site Substation Compounds. Each land parcel of the PV Area has been considered for its relative technical and environmental constraints with alterations made to the Scheme design as further information has become available.
- 3.4.3. Solar PV modules have been removed from parts of land parcel A to the west of Crowland Airfield following consultation with Peterborough and Spalding Gliding Club. PV modules have also been removed from areas where agricultural land surveys and heritage investigations indicated high concentrations of heritage features in areas likely to be classed as Grade 1 agricultural land. These have also informed the indicative siting of the BESS and On-Site Substation Compounds.
- 3.4.4. The layout of the PV Area to date has been subject to a series of key design parameters that have underpinned the technical approach across all land parcels to ensure consistency. The design parameters, as presented in Table 3-2 below, will continue to set the technical approach as the Scheme is further refined. Details will be updated accordingly within the ES.

Table 3-2 PV Area Design Parameters

Factor	PV Area Key Design Parameters
Planning applications and allocations	<ul style="list-style-type: none"> <li>Avoidance of land subject to pending planning applications and/or site allocations.</li> </ul>
Technical requirements	<ul style="list-style-type: none"> <li>Access by vehicle to land parcels for maintenance; and</li> <li>Access by vehicle to the BESS and on-Site Substation Compounds.</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>Avoidance of infrastructure within scheduled monuments.</li> </ul>
Ecology and Biodiversity	<ul style="list-style-type: none"> <li>Offset of infrastructure 20m from non-designated sites;</li> <li>Offset of infrastructure 30m from badger sets;</li> <li>Offset of infrastructure 50m from ponds, including where great crested newts have been identified;</li> <li>Offset of infrastructure 20m from major watercourses;</li> <li>Offset of infrastructure from Schedule 1 bird nests will be considered on a case-by-case basis;</li> <li>Offset of infrastructure 10m from agricultural drainage ditches of any kind; and</li> <li>Offsets of infrastructure 8m, 12m and 20m from trees with low, medium or high bat roost potential as identified.</li> </ul>
Hydrology, Flood Risk and WFD	<ul style="list-style-type: none"> <li>Offset of infrastructure 20m from major watercourses;</li> <li>Offset of infrastructure 9m from agricultural drainage ditches and flood risk management infrastructure, including beneath and above;</li> <li>Clearance of infrastructure 12m in height above agricultural drainage ditches; and</li> <li>Consider the results of Flood Risk Assessment inputs in determining floor levels and mounting structure heights of infrastructure as where appropriate.</li> </ul>
Agriculture and Soils	<ul style="list-style-type: none"> <li>Consider avoidance of infrastructure within best and most versatile land where practical; and</li> <li>Preference for lowest grade available for areas likely to host permanent hard standing infrastructure.</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>Exclusion of infrastructure 50m from residential properties; and</li> <li>Identification of key visual receptors and key views, including bordering PRoW to influence location of screening and location of tall infrastructure.</li> </ul>
Noise and Vibration	<ul style="list-style-type: none"> <li>Consider siting of BESS and on-site substations compounds, solar stations and other supporting infrastructure away from sensitive receptors, including residential properties.</li> </ul>
Socio-Economics, Human Health and Land Use	<ul style="list-style-type: none"> <li>Identification of key recreational receptors;</li> <li>Avoidance of land subject to planning applications or Site allocations;</li> <li>Preference for the use of land within the same ownership; and</li> <li>Seek to avoid Crown Estate owned land.</li> </ul>
Traffic and Access	<ul style="list-style-type: none"> <li>Preference for the use of existing access points and highway network where possible;</li> <li>Sensitivity of watercourse crossings to construction traffic;</li> <li>Accessibility by vehicle to all land parcels for maintenance during the operational phase;</li> <li>Accessibility by vehicle to all BESS and on-Site substation compounds for maintenance during the operational phase;</li> <li>Accessibility by vehicle to all land parcels for maintenance during the construction phase; and</li> </ul>

Factor	PV Area Key Design Parameters
	<ul style="list-style-type: none"> <li>Accessibility by vehicle to all BESS and on-Site substation compounds for maintenance during the construction phase.</li> </ul>
Glint and Glare	<ul style="list-style-type: none"> <li>Consideration of screening where high or medium impact of glint and glare is identified.</li> </ul>
Utilities	<ul style="list-style-type: none"> <li>Avoidance of underground utilities, offset subject to easement widths; and</li> <li>Minimum 15m offset to existing overhead lines.</li> </ul>

### 3.5. Identification and Selection of the Grid Connection Corridor

#### Technology Selection

- 3.5.1. The PV Area would connect to the National Grid's planned 400kV Weston Marsh Substation via a 400kV overhead line Grid Connection. A description of the infrastructure within the Grid Connection Corridor is outlined within PEIR Volume I Chapter 2: The Scheme.
- 3.5.2. The selection of an overhead line as the preferred technology for the Grid Connection is guided by national policy contained in the NPS for Electricity Networks, EN-5<sup>9</sup>. Paragraph 2.9.20 states that it is the Government's position that overhead lines should be the strong starting presumption for electricity networks in general. It is acknowledged that this presumption is reversed where an overhead line would cross a nationally designated landscape; however, the Scheme would neither directly or indirectly impact one of these sites and therefore the presumption of an overhead line for the connection is considered wholly appropriate.
- 3.5.3. The ES will contain additional detail in relation to a refined design of the Grid Connection, along with a proportionate comparison of the environmental effects and costs associated with reasonable and appropriate alternatives.
- 3.5.4. In order to inform the selection of a route for the Grid Connection, a Grid Connection Routeing Study has been undertaken. An overview of this process is presented below. The routeing study was completed based on the assumption that the Grid Connection would be via an overhead line supported by lattice-style towers in line with the starting presumption for overhead lines set out in EN-5.
- 3.5.5. Consideration was given to the various tower types available for a 400kV connection, including lattice towers, folded steel or composite monopoles and alternative designs such as the 'T Pylon'. Due to the availability, constructability and proven deliverability of the lattice tower design, this is the preference for the Scheme to take forward.

---

<sup>9</sup> Department for Energy Security and Net Zero (2024) *National Policy Statement for electricity networks infrastructure (EN-5)* (E03028327). London: HMSO Available at: <https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf>

3.5.6. The Grid Connection Routeing Study has embodied the principles of the Holford Rules in accordance with Section 2.9.16 of EN-5. The Holford Rules provide design criteria guidelines to seek to avoid adverse impact through careful routeing of overhead lines as part of the selection and assessment of potential route options. In principle, routeing of overhead line transmission lines should, where practicable:

- Avoid altogether major areas of the highest amenity value;
- Avoid smaller areas of high amenity value or scientific interest by deviation, provided this can be done without using too many angle towers;
- Choose the most direct line with no sharp changes in direction and thus with fewer angle towers;
- Be positioned against tree and hill backgrounds as far as possible;
- Prefer moderately open valleys with medium or moderate levels of tree cover;
- Be kept as far as possible independent from smaller lines, converging routes and other poles, masts, wires, and cables to avoid a concentration of lines or 'wirescape' unless specifically preferred otherwise by relevant stakeholders; and
- Approach urban areas through industrial zones, where they exist; and when residential and recreational land intervenes between the approach line and the substations, carefully assess the comparative costs of undergrounding.

3.5.7. A broad range of environmental topics have been considered as part of the Grid Connection Routeing Study. For each environment topic, a review was completed to identify the key qualitative indicators within the study area as outlined within Table 3-3 below. Only those indicators identified within the study area that could be considered a determining factor formed part of the environmental scope of the Grid Connection Corridor selection process.

**Table 3-3 Grid Connection Routeing Study Environmental Scope**

Topic	Key Qualitative Indicators within Study Area
Cultural Heritage	<ul style="list-style-type: none"> <li>• Listed buildings;</li> <li>• Conservation areas;</li> <li>• Scheduled monuments; and</li> <li>• Historic Environmental Records (HER) data.</li> </ul>
Ecology and Biodiversity	<ul style="list-style-type: none"> <li>• Priority Habitat;</li> <li>• Sites of Special Scientific Interest;</li> <li>• Natural woodland.</li> </ul>
Water Environment	<ul style="list-style-type: none"> <li>• Main rivers and other watercourses;</li> <li>• EA Flood zones;</li> <li>• Groundwater flood risk;</li> <li>• Surface water flood risk;</li> <li>• Aquifer designation and groundwater vulnerability;</li> <li>• Reservoir inundation mapping; and</li> <li>• Nitrate vulnerable zones.</li> </ul>

Topic	Key Qualitative Indicators within Study Area
Contaminated Land	<ul style="list-style-type: none"> <li>• Surface water abstractions;</li> <li>• Borehole records;</li> <li>• Historic landfill sites;</li> <li>• Recorded pollution incidents to controlled waters; and</li> <li>• Historical industry</li> </ul>
Agriculture and Soils	<ul style="list-style-type: none"> <li>• Provisional ALC 1:250,000 data;</li> <li>• Borehole records;</li> <li>• Soilscales;</li> <li>• Superficial deposits; and</li> <li>• Peatland.</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>• Residential properties and businesses;</li> <li>• Topography; and</li> <li>• Natural woodland.</li> </ul>
Socio-Economics, Human Health and Land Use	<ul style="list-style-type: none"> <li>• Land subject to planning application;</li> <li>• Land subject to site allocation; and</li> <li>• Crown land.</li> </ul>
Traffic and Access	<ul style="list-style-type: none"> <li>• Strategic road network;</li> <li>• Local road network;</li> <li>• National cycle routes; and</li> <li>• PRow.</li> </ul>

3.5.8. The Grid Connection Routeing Study comprised three stages. The Grid Connection Corridor presented within PEIR Volume II Figure 1-2: Scheme, has been identified as a result of this Study. The latest stage of this process has refined the Grid Connection Corridors presented at EIA Scoping to a single preferred corridor. The Grid Connection Corridor is indicative and will be further refined following feedback received from statutory consultation, wider ongoing stakeholder engagement and the results of ongoing environmental and technical surveys.

### Stage 1 – Defining Initial Corridor Options

3.5.9. The first stage of Grid Connection Corridor identification established the study area from which data would be gathered to inform corridor options. The study area, presented in PEIR Volume II Figure 3-1: Grid Connection Initial Study Area, was established from the easternmost and westernmost corners of the PV Area, meeting to form a triangular shape with the provisional location of the Weston Marsh Substation provided by National Grid. This was established using straight lines to form the most direct route, requiring the minimum amount of new development that could give rise to environmental effects.

3.5.10. Land through which it would be unfeasible, for technical reasons, to route the Grid Connection was removed. This largely correlated with the land considered to be of the highest amenity value around built-up areas including Moulton Chapel, Cowbit, Moulton and Weston.

3.5.11. The remaining area was then divided into the seven corridor options presented in PEIR Volume II Figure 3-2: Grid Connection Routeing Study Initial Corridors. Five corridor options were considered within the south section of the study area, and two corridor options considered within the north section.

## Stage 2 – Assessment of Initial Corridor Options

3.5.12. The second stage assessed each corridor option within an options appraisal matrix. This assigned, for each corridor option, an appraisal process was undertaken against a list of key environmental constraints and corresponding qualitative indicators as outlined in Table 3-3. The following section provides a summary of the key results of the options appraisal matrix per corridor option presented in PEIR Volume II Figure 3-2: Grid Connection Routeing Study Initial Corridors, where environmental constraints identified were a determining factor.

3.5.13. The two northern corridor options achieved the appraisal rating in all categories, apart from the number of listed buildings identified within them. This is because both corridors share many of the same constraints. Both options were therefore taken forward for a more detailed round of consideration. This round included further refinement of the corridor, reducing its width to bring them further still from residential areas.

3.5.14. Of the five southern corridor options:

- B-2 and B-3 were excluded from further consideration, having been determined to be unsuitable on the basis of cultural heritage because of the presence of Scheduled Monuments within their boundaries;
- On the completion of reconnaissance-scale ALC surveys and a desk-based aerial photography and a LiDAR study within the PV Area, it was established that the on-Site substation that would form the start of the Grid Connection would either need to be located in land parcel B or land parcel D due to the potential impact of locating a substation in land parcel C on cultural heritage. This led to the exclusion of corridor option B-5; and
- Corridor options B-1 and B-4 were progressed to the next stage.

## Stage 3 – Selection and Refinement of Preferred Corridor

3.5.15. Following the receipt of feedback in the EIA Scoping Opinion and non-statutory engagement, a preferred Grid Connection Corridor was selected from the options consulted on. North east, north west, south east, and south west corridor options meant that the following four configurations were available as outlined in PEIR Volume II Figure 3-3: Grid Connection Corridors:

- North East Corridor and South East Corridor;
- North East Corridor and South West Corridor;
- North West Corridor and South East Corridor; and

- North West Corridor and South West Corridor.

- 3.5.16. At this stage, the corridors were further refined to make them narrower and more specific.
- 3.5.17. Consideration was given to the relative environmental, social and technical constraints of each of the four corridor options. For the south corridors, the potential suitability of the corresponding land parcel that would need to host an on-Site substation to support the Grid Connection was considered. For the south-east corridor, an on-Site substation would need to be constructed within land parcel D-1. For the south-west corridor, an on-Site substation would need to be constructed within land parcel B-5. These were the only technically feasible parcels that were not within or adjacent to the Scheduled Monuments.
- 3.5.18. When considering the selection of the north corridor, the impact on ecology and the water environment was considered neutral for the north-east option, while there were a series of priority habitat areas identified within north-west corridor. However, it was considered that careful micro-siting should enable these habitats to be avoided. For both north corridors, there were no determining factors in relation to access due to its close proximity to the strategic road network and availability of two-way roads. Numerous listed buildings were identified in proximity to each of the north corridors where they pass either side of Weston. The north-east corridor was recognised as being closer to Moulton Conservation Area, while the north west corridor was shown to border a Scheduled Monument. In relation to impact on landscape and visual amenity, the north-east corridor was identified as potentially requiring a longer route, and would be closer to the residential receptors at the village of Moulton. It would likely have greater visual amenity impacts than the shorter north-west corridor. The north-west corridor would also overlap with the current National Grid Grimsby to Walpole proposed overhead line corridor, so a preference was taken to following a similar route to that rather than needing to cross it and create a further visual intrusion to the north east. With these items considered a preference emerged for the north-west corridor option.
- 3.5.19. No clear preference in relation to ecology and the water environment was established between the south corridor options. Both options were considered to present a relatively equal challenge in relation to access and the transportation of an accompanying Substation during construction to each of the aforementioned associated land parcels. This was also the case with heritage where both options were identified as having a similar potential impact based on the information available to date. The south-west corridor was preferred in relation to the relative impact on landscape and visual amenity due to a smaller number of residential properties having been identified within or near to the corridor. The south-east corridor performed relatively poorly in this respect coming in close proximity to the villages of Holbeach St Johns and Whaplode St Catherine. As a result, a preference for the south-west corridor was identified.
- 3.5.20. As a result of the options appraisal, the north-west corridor and south-west corridor were combined to form a single preferred corridor. To ensure a focused indicative search area

was produced for consideration within the PEIR, a review of the preferred corridor was conducted to remove any remaining residential properties and associated curtilage. The outcome of this for the Grid Connection Corridor is presented within PEIR Volume II Figure 1-2: Scheme. The extent and configuration of infrastructure within the preferred Grid Connection Corridor will be subject to further refinement following statutory consultation.

### **3.6. Identification and Selection of Inter-Array Areas**

- 3.6.1. Land parcels of the PV Areas would connect via either overhead lines or underground cable across the Inter-Array Areas. Due to the requirement for the parcels to be connected, there is limited geographic scope to consider alternative options for the Inter Array Areas.
- 3.6.2. A description of the physical proposal within the Inter-Array Areas is described within PEIR Volume I Chapter 2: The Scheme. Flexibility is included in the assessment at this time to account for the potential design to be an overhead line solution (up to 132kV), underground cables, or a combination of both. The design will be refined for the DCO Application following the confirmation of the most appropriate voltages at the internal substations, continued stakeholder engagement, environmental surveys, and feedback received from statutory and non-statutory consultees.
- 3.6.3. Since the Scoping process was undertaken, the Inter-Array Areas have been refined. This has primarily been to ensure residential properties and associated curtilage are excluded from the indicative area from which the Inter-Array Connection will be selected. The Inter-Array Area between land parcel C and land parcel D has been refined along its south border where it crosses from Green Bank along Farrow Road, Parsons Lane and Barr's Lane to the B1168 (Holbeach Drove Gate) as only an underground cable configuration would be considered along this section should it be selected as the preferred option following consultation.

