Dean Moor
Solar Farm

Design Approach Document

on behalf of **FVS Dean Moor Limited**

March 2025
Prepared by: Stantec UK Ltd
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DEAN MOOR SOLAR FARM
DESIGN APPROACH DOCUMENT
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PREPARED ON BEHALF OF FVS DEAN MOOR LIMITED

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Executive Summary

E.1. The Design Approach Document (DAD) **[REF: 5.8]** has been prepared to set out the framework of vision and design principles which have guided the approach to the design of the Proposed Development, explain how the design has evolved iteratively to respond to environmental constraints and opportunities, and describe the role that stakeholder consultation has played in this evolution. The DAD reflects conformity with National Policy Statement (NPS) EN-1, which requires the consideration of good design for energy infrastructure and that encourages the delivery of sustainable infrastructure which is sensitive to place. It has also been prepared in consideration of the Planning Inspectorate's 'Nationally Significant Infrastructure Projects Advice on Good Design' and policies S4 and DM14 of the Allerdale Local Plan Part 1 (2014).

E.2. The DAD provides an overview of the Site and describes the key components of the Proposed Development. The DAD goes on to explain how the concept of 'good design' has informed the Proposed Development's design approach, and describes the vision, Project Design Principles which were developed by the Applicant. It then explains how the design has evolved in response to these Project Design Principles, and the environmental and technical constraints and opportunities identified during the pre-application stage. The DAD demonstrates how positive engagement with key stakeholders has been a golden thread running through the pre-application process.

E.3. The DAD concludes with a consideration of how the Project Design Principles have been applied during the design process, demonstrating compliance with EN-1 and responding positively to local policy.

1 Introduction

1.1 Purpose of this Document

1.1.1 This Design Approach Document ('DAD') has been prepared for FVS Dean Moor Limited (the 'Applicant') to support the DCO application for Dean Moor Solar Farm ('the Proposed Development') on approximately 276.5ha of land, located between the villages of Gilgarran and Branthwaite in West Cumbria (the 'Site'), which is situated within the administrative area of Cumberland Council ('the Council'). The Proposed Development will be within the 'Order Limits' (the land shown on the Works Plans **[REF: 2.3]** within which the Proposed Development can be carried out). For the purposes of this DAD the terms 'Order Limits' and 'Site' are used interchangeably.

1.1.2 The DAD has been prepared to set out the framework of vision and design principles which have guided the approach to the design of the Proposed Development, explain how the design has evolved iteratively to respond to environmental constraints and opportunities, and describe the role that stakeholder consultation has played in this evolution. The DAD reflects conformity with Section 4.7 of National Policy Statement EN-1 (EN-1), which requires the consideration of good design for energy infrastructure and that encourages the delivery of sustainable infrastructure which is sensitive to place. It has also been prepared in consideration of the Planning Inspectorate's '*Nationally Significant Infrastructure Projects Advice on Good Design'* and policies S4 and DM14 of the Allerdale Local Plan Part 1 (2014) (LPP1).

1.2 Interaction with Other Documents

1.2.1 This DAD is intended to be read alongside and supplemented by the following documents:

- Schedule 1 of the draft Development Consent Order ('DCO') **[REF: 3.1]** describes the Works which comprise the Proposed Development;
- Schedule 2 of the DCO sets out requirements relating to construction, operation, and decommissioning of the Proposed Development;

- The Works Plans identifies the limits of deviation for the Works;
- Environmental Statement ('ES') Chapter 3 **[REF: 6.1]** describes the Site and Proposed Development for the purposes of the Environmental Impact Assessment (EIA);
- The Design Parameters Document ('DPD') **[REF: 5.7]** lists the Design Parameters for the Proposed Development;
- The Planning Statement ('PS') **[REF: 5.5]** appraises the Proposed Development's compliance with national and local policy;
- The Consultation Report **[REF: 5.1]** summarises how the Applicant has consulted and considered the feedback from stakeholders on the proposals; and
- The ES Non-Technical Summary ('NTS') **[REF: 6.4]** summarises the conclusions of the ES in non-technical language.

1.3 Overview and Structure

1.3.1 This DAD is divided into the following chapters:

- **Introduction** – describes the purpose of the DAD within the DCO application document suite;
- **The Site and Context** – an overview of the Site as context to the design approach;
- **The Proposed Development** – an overview of the Proposed Development, summarising the key components as context to the design approach;
- **Good Design** – an overview of policy related to the concept of 'good design' that has informed the Proposed Development's design approach;
- **Design Approach** – sets out the hierarchy of vision and Project Design Principles established to ensure good design in the Proposed Development;
- **Design Evolution** – a summary of how the design of the Proposed Development has evolved via an iterative process informed by constraints and opportunities arising from ES assessment and stakeholder consultation;
- **Design Review –** a summary of the project design principles and how the design has evolved in response to these; and
- **Summary** – a summary of the approach to securing good design.

1.4 The Site and Context

1.4.1 This section provides a brief overview of the Site as context to the design approach described in this DAD. A more detailed overview of the existing

Site is provided in the relevant ES topic chapters, with a more complete summary of the Site and its surroundings in ES Chapter 3.

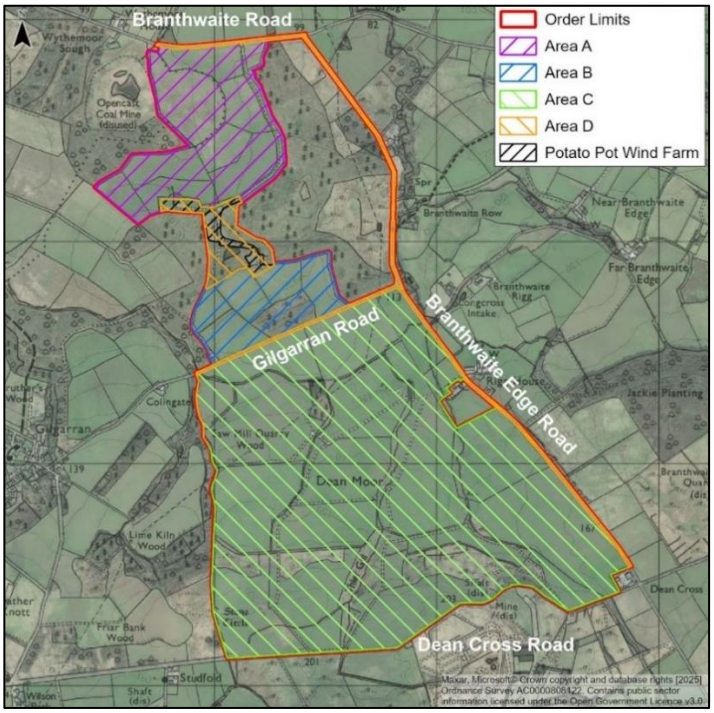
1.4.2 The Site is located approximately 1.1km east/southeast of the Lillyhall Industrial Estate, and 2.6km east of the village of Distington. The small village of Gilgarran is approximately 600m west, Branthwaite is approximately 900m west, and the small hamlet of Branthwaite Edge is directly adjacent to the east of the Site. The Site is approximately 5km southeast of Workington town centre on the west Cumbrian coast and approximately 3.2km west of the Lake District National Park (LDNP).

1.4.3 The Site is located in a relatively sparsely populated rural area, with 20 dwellings and four commercial buildings within 500m of the Site, and no dwellings within the Order Limits. Although rural in character the Site is influenced by the presence of the Potato Pot Wind Farm (the Wind Farm) and Electricity North West Limited (ENW) (as Distribution Network Operator) (DNO) infrastructure including 132kV overhead lines (OHL) and pylons as well as 11kV OHL between wooden poles.

1.4.4 The Order Limits extend to approximately 276.5ha. For ease of reference, the Site is divided into four areas referred to as Areas ‘A’, ‘B’, ‘C’, and ‘D’ as shown in Figure 1.1.

- **Area A**: Land south of Branthwaite Road (approximately 40.2ha);
- **Area B**: Land south of Branthwaite Road and north of Gilgarran Road (approximately 19.9ha)
- **Area C**: Land south of Gilgarran Road and north of Dean Cross Road (approximately 203ha); and
- **Area D**: Land connecting Areas A and B, including Potato Pot Wind Farm (the ‘Wind Farm’), Gilgarran Road between Areas B and C, and Branthwaite Edge Road (approximately 13.4ha).

Figure 1.1: Site Area Plan



1.4.5 The following section provides an overview of key environmental topics assessed to inform an understanding the Site and enable a design that is responsive to its constraints and opportunities. An overview of these topics and their relationship with planning policy is provided by the PS, with further detail in the ES chapter for each topic.

Landscape

1.4.6 There are no designated landscapes within the Site, although the internationally recognised LDNP and English Lake District World Heritage Site (WHS) is located approximately 3.2km east.

1.4.7 Land within the Site is typical of the surrounding area; it is predominantly farmland which at times curtails views from the wider area, providing a feeling of containment. Land within the Site tends to fall south to north, with an elevated plateau of land along the Site's southern boundary lying at approximately 200m Above Ordnance Datum ('AOD').

1.4.8 The variable topography and features within the Site, proximity to sensitive receptors (e.g. dwellings), and the proximity to the LDNP pose constraints for design and have been influential in shaping the embedded and

additional mitigation secured by the draft DCO and discussed further in Section 6.2. Detailed information on the Site and its landscape is available from ES Chapter 7 – Landscape and Visual Impact **[REF: 6.1]**.

Agricultural Land and Soils

1.4.9 The majority of the Site is in intensive pastoral agricultural use, although the Order Limits also include the public highway between areas, blocks or bands of plantation woodland (for biomass) and scrubland vegetation, a number of watercourses, an established internal access track network, and the Wind Farm in Area D. Further information is provided in the Agricultural Land Classification (ALC) Report (ES Ch.2, Appendix 2.8) **[REF: 6.3]**. This confirms that all the agricultural land within the Site is poorer quality and there is no 'Best and Most Versatile' (BMV) land. The lack of BMV land is considered a strength for the Site as a location for a renewable energy generating station.

Historic Environment

1.4.10 Detailed information on the Site in relation to the historic environment is set out in ES Chapter 6 – Cultural Heritage **[REF: 6.1]** which discusses both designated and undesignated assets and their settings. Particularly relevant heritage asset influences have been:

- A Scheduled Monument (SM) described as '*Large Irregular Stone Circle and a Round Cairn on Dean Moor'* (NHLE: 1014588) ('the Stone Circle and Cairn', is partly within the Site on the western boundary of Area C. The SM is not visible above ground level, and the SM is fenced off and inaccessible.
- The Grade II listed '*Wythemoor Sough and Adjoining Barn and Stable'* (NHLE: 1327185) is located approximately 160m to the north west in a prominent location, with views across parts of the Site.
- The English Lake District WHS is approximately 3.2km east of the Site. There are views into the Site from the fells within the LDNP, particularly of the southern part of the Site in Area C, which is most elevated.

1.4.11 Heritage assets in proximity to the Site and consideration of impacts on their setting have informed the placement of development within the Site, and the embedded and secondary mitigation to be provided.

Biodiversity

1.4.12 The Site largely comprises modified grassland in line with its function as sheep grazing pasture. Notable habitats present on the Site include lowland dry acid grassland, watercourses and waterbody habitats, areas of woodland. Ecology surveys provided in ES Chapter 8 – Biodiversity **[REF: 6.1]** identify the habitats and species present across the Site.

1.4.13 The Site is not located within any statutory designated site however it is hydrologically linked to the River Derwent and Bassenthwaite Lake Special Area of Conservation ('SAC') and the River Derwent and Tributaries Site of Site of Special Scientific Interest ('SSSI') which are approximately 1.2km east of the Site. There is also a stand of replanted ancient woodland present adjoining the Site to the west of Area C.

1.4.14 A non-statutory designated site, Dean Moor County Wildlife Site ('CWS'), is partially located within the southern part of the Site and a Special Roadside Verge (SRV) is present along the eastern boundary of Area C. The habitats and species on Site, and designations such as the CWS have informed the form and manner of the Proposed Development as secured by the Works Plans and control documents.

Geological Conservation

1.4.15 A peat survey in Area C has identified the presence of peat in discrete parts of the Site. A Peat Survey Report (PSR) (ES Ch.10, Appendix 10.3) **[REF: 6.3]** confirms the locations of peat, which are mapped in PSR Figure 1.4. Peat is a constraint on generating station equipment, with a 10m buffer for this resource secured by Works Plans and further mitigation provided by the Outline Construction Environmental Management Plan (OCEMP) (ES Ch.5, Appendix 5.1) **[REF: 6.3]** and Outline Soil Management Plan (OSMP) (ES Ch.5, Appendix 5.3) **[REF: 6.3]**.

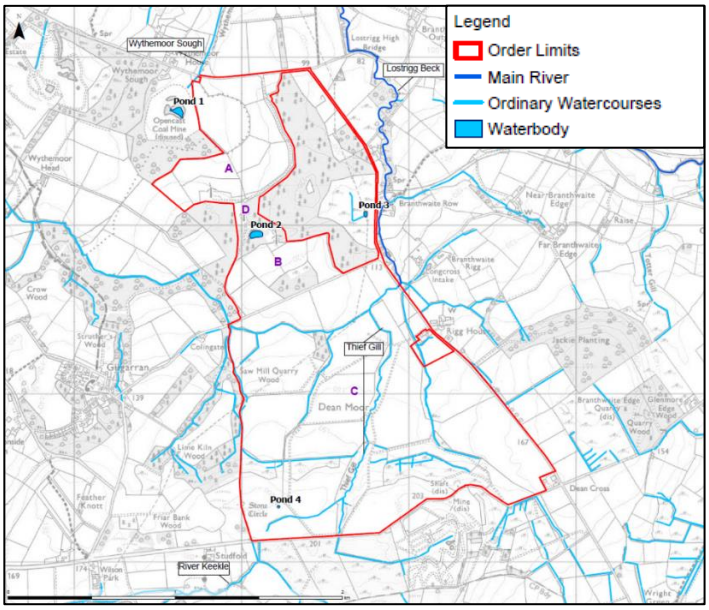
Flood Risk and Water Management

1.4.16 Details on the water environment are provided by the Flood Risk Assessment (FRA) and Outline Drainage Strategy (ODS) (ES Ch.2, Appendix 2.4) **[REF: 6.3]**.

1.4.17 Several ordinary watercourses provide land drainage and flow across the southern part of the Site (Area C). These flow from the south and west, combining and flowing towards the north-east corner of Area C. After passing beyond the Site and under Branthwaite Edge Road the combined channel becomes a designated 'main river', the Lostrigg Beck, which outfalls into the River Marron, approximately 6.5km northeast.

1.4.18 There are no ordinary watercourses within Areas A or B, but the land falls towards the north-west corner of the Site where a land drainage channel, the 'Wythemoor Sough' is formed flowing north beyond the Site boundary. Area D includes a waterbody (pond).

Figure 1.2: Hydrological Context of Site (extract from Appendix A of the FRA (ES Appendix 2.4))



1.4.19 The watercourses within the Site pose constraints, with buffers being applied to meet Environment Agency (EA) and Lead Local Flood Authority (LLFA) requirements, although watercourses also present an opportunity for water quality betterment and blue infrastructure habitat enhancement.

Transport and Access

1.4.20 Matters relating to transport and access are primarily discussed within the Transport Statement (TS) (ES Appendix 2.5) **[REF: 6.3]** and to public access also within ES Chapter 7 – Landscape and Visual.

1.4.21 The Site benefits from good access to/from the Strategic Road Network (SRN) via a Local Road Network (LRN) route that avoids villages and sensitive local areas. The Proposed Development's operational phase will have negligible traffic impacts, while construction and decommissioning phases will benefit from additional management as established by the Outline Construction Traffic Management Plan (OCTMP) (ES Ch.5, Appendix 5.2) **[REF: 6.3].**

1.4.22 The Site is not crossed by any Public Rights of Way (PRoW). There is a limited network of PRoW within the surrounding countryside. The presence of nearby PRoW are potential visual constraints to be considered in the landscaping strategy. The lack of PRoW within the Site, and public appetite for improved accessibility creates an opportunity for contributing to the accessibility of the local area.

Ground Conditions

1.4.23 With respect to historic land use, the Site has extensive non-agricultural history. In particular, the entirety of Areas A, B, and parts of D were used by a colliery of opencast coal mining which was operational between 1986 and early 1994 until relatively recent restoration to agriculture. In addition, there are historic mine entries and areas of potential ground instability associated with historic mine workings located across the central and southern areas of the Site (Area B and C).

1.4.24 Further information on historic land use as a matter that has been influential for design is provided by ES Chapter 10 – Ground Conditions **[REF: 6.1]** and its associated appendices.

1.4.25 The historic land use of the Site poses constraints in terms of evaluating the stability and contamination issues but is an opportunity to continue the Site's evolution from a previously extractive use which contributed to climate change into one that can support decarbonisation.

2 The Proposed Development

2.1 Introduction

2.1.1 The Proposed Development is described in Schedule 1 of the draft DCO (dDCO) **[REF: 3.1]** where the different elements of the Proposed Development are divided into Works which correspond with the Work Number areas shown on the Work Plans. The ES has assessed the spatial extents of each Work Number shown on the Work Plans, which align with the Parameter Plan (ES Figure 3.4) **[REF: 6.2]**, adopting the principle of the 'Rochdale Envelope' which ensures that the maximum parameters and realistic worst case have been assessed.

2.1.2 The Proposed Development comprises the construction, operation, and decommissioning of a solar photovoltaic (PV) energy generating station. The generating station would export electricity via an on-Site connection to the ENW grid network. The purpose of the Proposed Development is to generate clean renewable energy to contribute to the urgent need to decarbonise the UK's energy supply.

2.1.3 The principal components of the Proposed Development include:

- Solar PV panels;
- Solar PV array mounting structures;
- Power Conversion System ('PCS') in the form of inverters and transformers;
- Grid Connection Infrastructure comprising Customer and DNO Substation buildings and external electrical equipment and ancillary infrastructure within a security fence;
- Perimeter fencing, gates, CCTV cameras, electrical cabling, and other associated infrastructure;
- Access from the highway and internal access tracks; and
- Green Infrastructure including landscape planting and ecological enhancements.

2.1.4 The sections to follow summarise the principal components listed above along with an overview of the Proposed Development's construction, operation, and decommissioning phases.

2.2 Proposed Development Components

Solar Arrays

2.2.1 Solar PV Arrays are the primary generating component and will feature anywhere within Work No. 1. Solar PV Arrays comprise solar panels placed on a mounting structure framework and arranged in rows, with grassland gaps (aisles) between. Solar arrays feature solar panels with a matte metal frame and a blue/grey façade mounted on a matt metal framework. The highest part of any solar array on the Site would be up to 3.3m and the lowest part would be no lower than 700mm. The mounting structure is secured by posts that are typically pile-driven into the ground, with alternative mounting types available for different ground sensitivities.

Power Conversion System Units

2.2.2 Power Conversion System ('PCS') units are solar inverter-transformers which convert the power generated by PV panels to electricity that can be exported to the grid network. Two PCS configurations are available; these are a Central Inverter or String Inverter solution. Central inverters include inverters and transformers in joint containers dispersed across the Site. A String Inverter solution would entail small inverters mounted on the back of the solar array framework which would connect into dispersed Standalone Transformer Unit containers. For both options, the PCS buildings are pre-fabricated metal containers built off-Site with no permanent foundations.

Grid Connection Infrastructure

2.2.3 Work No. 2 comprises the infrastructure which supports the Point of Connection ('POC') to the grid, which is the existing ENW pylon in Area C. This area has been identified for Work No. 2 due to the proximity to the POC, suitable ground conditions, and suitability with respect to effects on sensitive receptors. Grid Connection Infrastructure includes:

- Up to two substation buildings (a Customer Substation and DNO Substation);
- A Control Building;

- POC compound comprising external electrical equipment including transformers, relays, circuit breakers and harmonic filters, and ancillary infrastructure;
- Communication Mast;
- Security fencing; and
- Electrical cables.

2.2.4 Infrastructure within Work No. 2 will include buildings that are likely of brick, metal, or glass reinforced plastic (GRP) construction, some of which may have in-ground foundations depending on ENW specifications. These will sit outside of a 'POC Compound' enclosed by a metal Security Fence. Within the compound will be external electrical equipment such as circuit breakers and transformers, most likely mounted on a concrete base and surrounded by gravel ground cover. Two POC Masts, up to 30m tall and positioned adjacent to the existing pylon, and a Communication Mast up to 15m tall could also be included.

Electrical Cables

2.2.5 A network of electrical cables is included in Work No. 3 – Associated Works. Cables will primarily be implemented via trenching and in doing so will follow methodology requirements set out in documents like the OSMP to mitigate environmental effects associated with excavation.

Access

2.2.6 Nine indicative Site access points from the LRN are established by Work No. 5, all of which are existing accesses. It is not expected that all nine will be required, but they have been chosen for flexibility in construction and operations. Where required, accesses to the Site will be widened to provide safe access and egress which is appropriate to the vehicles which are needed during construction and/or operation.

2.2.7 Internal access tracks will be required to facilitate construction and the movement of operations and maintenance vehicles around the Site. Where possible, these will follow existing farm tracks within the Site. All tracks, whether only temporary for construction, or for the operational lifetime, will be of a fully permeable construction.

Site Security Measures

2.2.8 The Site needs to be secured to prevent theft and criminal damage and ensure health and safety. Perimeter fencing will be 'deer fencing' with wooden fence poles and galvanised high tensile steel wire (up to 2.4m high). This will enclose the generating station equipment and allow sheep to graze securely. Gates will be installed to allow for movement from the access points into the Site for ongoing maintenance and mammal gaps will be provided at ground level to allow continued access for wildlife across the Site. The internal perimeter of the Site will be protected by a system of CCTV and/or infra-red cameras to provide remote surveillance.

2.2.9 The Proposed Development will not be permanently lit although there will be permanently available lighting. Details of the sensitive lighting strategy for construction is set out in the OCEMP and for operation detail is provided within the Outline Operational Management Plan (OOMP) and Outline Landscape Ecological Management Plan (OLEMP) **[REF: 6.3]**

Landscape and Ecological Enhancements

2.2.10 The Proposed Development aims to represent multifunctional green infrastructure that will tackle the climate and biodiversity crisis in a joined-up way. New and improved planting and other habitat enhancement measures are proposed across the Site either alongside/with the generating station equipment (Work No. 3) or in areas that are set aside for a biodiversity focus with no generating station infrastructure (Work No. 6). This will be achieved primarily through a combination of new planting as well as reinforcement/improvement for existing features.

2.2.11 Potential measures are visualised in the Landscape Strategy Plan (LSP) (ES Figure 7.6) **[REF: 6.2]**, to be finalised within a Landscape Ecology Plan ('LEP') which will be implemented via a LEMP substantially in accordance with the OLEMP.

2.2.12 An initial assessment of the LSP outcomes with respect to biodiversity net gain (BNG) is provided in the BNG Report (ES Appendix 8.8) **[REF: 6.3]** which demonstrates that the Proposed Development is capable of

delivering BNG significantly in excess of the 10% target. This will be delivered via the management and monitoring provided by the LEMP.

2.3 Proposed Development Phases

Construction Phase

2.3.1 The Proposed Development is expected to take around 18 months to construct although this may be extended in response to environmental conditions. The nature of activities, details of temporary development such as construction compounds, and management arrangements to minimise effects associated with these activities are described in ES Chapter 5 – Construction and Decommissioning Methodology and Phasing **[REF: 6.1]**.

2.3.2 Temporary construction compounds will be the main hubs of Site activity, and their locations are identified by Work No. 4. Measures to control environmental effects during construction are primarily provided via the OCEMP, OCTMP, and OSMP which are secured by DCO Requirements.

Operational Phase

2.3.3 The Proposed Development will have an operational lifespan of up to 40 years. Solar farms provide passive energy generation with no regular site activity or personnel presence required. Visits are expected to be required an average of two times per week for general landscape or other maintenance activities. The operational phase will be governed by the OLEMP for ecological interests, and by the OOMP for other topics.

Decommissioning

2.3.4 At the end of the 40-year operational lifespan, the Proposed Development including solar PV modules, mounting structures, cabling and ancillary buildings will be decommissioned, dismantled, and removed, and the Site and would be returned to its current use. Decommissioning is discussed in ES Chapter 5, with a framework for a future Decommissioning Management Plan (DMP) document suite set out in the Framework Decommissioning Management Plan (FDMP) (ES Appendix 5.4) **[REF: 6.3]** which is secured by a DCO Requirement.

3 Good Design

3.1 Introduction

3.1.1 This section summarises the key national and local policies relevant to good design and the guidance produced by the National Infrastructure Commission (NIC) and the Planning Inspectorate on this topic. A fuller appraisal of the Proposed Development in relation to the National Policy Statements (NPS) and local policies is provided by the Planning Statement and Policy Compliance Document **[REF: 5.6]**.

3.2 National Policy Context

Overarching National Policy Statement for Energy (EN-1)

3.2.1 The NPS for Energy (EN-1) sets out policy for the delivery of energy infrastructure. EN-1 Section 4.7 establishes criteria for good design to produce *'sustainable infrastructure sensitive to place'* (4.7.2). Paragraph 4.7.5 states that design principles should guide development from conception to operation and account for national guidance and local policies. 4.7.6 recognises that design choices may be limited but highlights opportunities for sensitive siting relative to landscape character and features, sensitive use of materials, and embedding '*nature inclusive design'*. 4.7.7 goes on to advise applications to demonstrate *'how the design process was conducted and how the proposed design evolved'* and how choices were made when a number of options were considered.

National Policy Statement for Renewable Energy Infrastructure (EN-3)

3.2.2 The NPS for Renewable Energy Infrastructure (EN-3) sets expectations of good design for solar farms. Section 2.5 reiterates good design criteria, particularly with respect to landscape and visual amenity, opportunities for co-location, and mitigation of noise, ecology, and heritage effects. Section 2.10 sets out factors which influence site selection and design (including technical considerations). Paragraphs 2.10.127-144 set out recommended mitigation that may be incorporated into design to limit adverse effects.

3.3 Local Policy Context

3.3.1 The Allerdale Local Plan Part 1 (2014) (LPP1)[1] sets out several polices relevant to 'good design'. Particularly relevant policies include:

- S4: Design Principles requires standards of design broadly defined as being: functional; integrated with its surroundings including with local character and the natural and historic environment; safe and accessible; and employing sustainable construction methods.
- DM14: Design and Layout of New Development expects development to create areas with a '*sense of place'* that is *'well integrated with existing development.*' It expects landscaping to form an *'integral part of the layout'* to mitigate visual impact and integrate development into the surroundings by retaining existing features and maximising landscaping and biodiversity value.

3.3.2 The design of the Proposed Development has also been developed in consideration of the policies relevant to design within the LDNP Local Plan[2], including Policy 06 – Design and Development, and of the Copeland Borough Local Plan[3], notably policies N1 – Conserving and Enhancing Biodiversity and Geodiversity, and N9 – Green Infrastructure.

3.4 Guidance

Climate, People, Places, Value: Design Principles for National Infrastructure

3.4.1 The NIC's 'Climate, People, Places, Value: Design Principles for National Infrastructure' report[4] advises 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'.*' NIC principles are incorporated into the Proposed Development's and are referenced throughout this DAD.

[1] Allerdale Borough Council. 2014. Allerdale Local Plan Part 1 Strategic and Development Management Policies..
[2] Lake District National Park. 2021. Local Plan.
[3] Copeland Borough Council (CBC) (2024). Copeland Local Plan 2021-2039. CBC.
[4] National Infrastructure Commission. Design Principles for National Infrastructure.

NIC Design Group Guidance – Project Level Design Principles

3.4.2 The '*Project Level Design Principles*'[5] document sets out a process for applying the design principles at every stage of the project and provides further detail on the four principles to guide the planning of NSIPs:

- *'Climate – seek opportunities to enable the decarbonisation of society through the mitigation of emissions, and allow the project to adapt over time to build resilience;*
- *People – design infrastructure for people, not architects or engineers; make it human scale, easy to navigate and instinctive to use, helping to improve quality of life;*
- *Places – provide a strong sense of identity and improve the natural and built environment; make a positive contribution to landscapes within and beyond the project boundary; and*
- *Value – achieve multiple benefits and solve problems well; add value by defining issues clearly from the outset and providing overall direction for everyone working on the project.'*

3.4.3 The NIC state that projects should address the above with a logical hierarchy of design principles, and that: '*Design is the iterative process within clearly defined parameters, which will help ensure:*

- *Project objectives are defined clearly;*
- *Delivery is efficient; and*
- *Benefits are shared across multiple partners'.*

Nationally Significant Infrastructure Projects: Advice on Good Design[6]

3.4.4 This 'Guidance Note' explains that good design requires an '*holistic approach'*, with a transparent process; multi-disciplinary collaboration; a clear statement of design principles; a succinct vision; a narrative that explains how the design has evolved; and design leadership.

3.4.5 The Guidance Note highlights the importance of EIA to the design process as a '*decision-making tool'* which can identify ways to improve the environment through collaboration between technical experts. The EIA's influence on the design process is set out in ES Chapter 4 – Alternatives and Design Evolution **[REF: 6.1]**.

[5] National Infrastructure Commission. 2024. Project Level Design Principles..
[6] The Planning Inspectorate. October 2024. Nationally Significant Infrastructure Projects: Advice on Good Design.

3.4.6 The Guidance Note describes the stages of a good design process as:

- Assemble – comprising setting out the project's purpose, budget, multi-disciplinary team, and vision;
- Research – iterative analysis of constraints and opportunities including engagement with statutory parties, affected persons, and local communities;
- Co-ordinate – further refinement of design choices and parameters; and
- Secure – defining how the design will be secured and providing clarity over elements of the design.

4 Design Approach

4.1 Introduction

4.1.1 This section sets out the hierarchy of vision and design principles which have shaped the Proposed Development. This section also describes how the Applicant has embedded good design within the design process, including through governance established at the outset, and how these governance arrangements embed good practice throughout the design lifecycle, including into those aspects which will occur post consent.

4.2 Design Principles

Establishing a clear vision

4.2.1 The Applicant's vision has shaped the Project Design Principles (DPs) which this DAD sets out as being in alignment with the NIC design principles. A member of the Applicant's team has provided design leadership to ensure the vision is embedded into the work of the environmental specialists and in formal and informal consultation.

4.2.2 The Applicant's vision for the Proposed Development is of a renewable energy generating station that contributes to net-zero commitments and energy security, and which embodies the concept of Green Infrastructure ('GI') by providing multi-functional benefits to address the joint climate and biodiversity emergency. Underpinning this is an ambition to maximise the environmental, economic, and social 'good' that is viable for the Proposed Development to bring about through good design choices within the Site.

Establishing Design Principles

4.2.3 The vision has driven the establishment of the Project DPs that have evolved and become more fully realised through the process of establishing the baseline of the Site, the EIA, and consultation and each advancement in the iterative design process. These DPs have informed the commitments which are secured by the application's works areas, parameters, and management plans and are intended to avoid or minimise

potential adverse environmental effects, and to maximise the benefits associated with opportunities for enhancement.

4.2.4 The Project DPs applied in the process of developing the design for the Proposed Development are set out within Table 4.1 below. The compliance of the Proposed Development with the DPs is considered more fully in Section 6 of this DAD. Section 7 then provides a summary table which reviews how the DPs have been applied across all topics.

Table 4.1: Project Design Principles

NIC DP	Ref	Project Design Principles
Climate	C.1	Generate clean renewable energy for export to the grid to support the transition to a 'net zero' energy supply.
	C.2	Provide multifunctional green infrastructure to ensure green energy infrastructure is complemented by ecological betterment for a joined-up approach to the climate and biodiversity crisis.
	C.3	Support sustainable development through good design that makes efficient use of land and ensures the Proposed Development is adaptable and resilient in the face of a changing climate.
People	PE.1	Deliver the Proposed Development in a way which is considerate and avoids or minimises potential impacts on the health and amenity of the local community.
	PE.2	Deliver public benefit through improved access and enable public enjoyment of the Site's natural environment and cultural heritage assets through new opportunities for outdoor recreation.
	PE.3	Embed principles of meaningful consultation (including accessibility and inclusivity) across all aspects of the Proposed Development so as to positively influence design, delivery (construction), and operations.
Places	PL.1	Improve the GI value of the Site so that it can be a positive hub for ecological betterment, with improvements to include BNG in excess of 10%.
	PL.2	Have regard for the existing land use and ensure the Proposed Development provides opportunities for continued co-located agriculture, with benefits from retaining aspects of landscape character and supporting the rural economy.
	PL.3	Respect the setting of heritage assets and take a landscape-led approach to design which avoids or minimises potential impacts on sensitive receptors.
Value	V.1	Embed circular economy and nature-based-solutions principles into the design (including management plans) so that choices for the Proposed Development reflect its temporary nature and support sustainable decommissioning.
	V.2	Smart engagement with stakeholders that sets reasonable expectations of the Proposed Development grounded in what can be tangibly delivered.

NIC DP	Ref	Project Design Principles
	V.3	Ensure the Proposed Development can be delivered in a manner that adds value to the local economy and provides diversification and not displacement of rural economic activity.

4.3 Embedding Good Design

4.3.1 The four stages of good design set out in the Guidance Note have been integrated into the project approach. These are not wholly linear and have informed and reinforced one another across the pre-application phase.

Stage 1 – Assembling a multi-disciplinary team

4.3.2 The design of the Proposed Development has been informed by the combination of the Applicant's experience in delivering UK solar farms and the project's technical/environmental team (see ES Appendix 1.1 – Statement of Expertise) assembled at an early stage following the receipt of the ENW grid connection offer.

4.3.3 The Applicant's expertise in design, construction, and operation of solar farms has been combined with the wider project team's expertise in land use and environmental planning, with particularly important input coming from core topic areas such as landscape, ecology, heritage, and agricultural land/soils. The project team has operated as such from an early stage and has been added-to as the Proposed Development evolved from a concept into a participant in a defined application process.

Stage 2 – Research

4.3.4 Research is the process of systematically gathering information, and the process of the assessment of likely environmental effects. Research for the Proposed Development has primarily been derived from desk-based work, fieldwork, and stakeholder engagement. The way in which research and engagement has underpinned the project is demonstrated within the ES chapter for each topic, and the Consultation Report. Where relevant, these documents detail the methodologies behind their content and provide research outputs and consideration of feedback that have supported their conclusions.

4.3.5 The main stages of research for the Proposed Development are:

- **Pre-Concept Fundamental Research:** This is Applicant research before applying for a grid connection, with key questions being: whether a grid connection is possible; if a solar farm is likely to be viable in areas of potential grid connectivity; and if conditions appear to be such that the site/area is a suitable location to host a solar farm.
- **Project Concept Research**: This phase follows the grid connection being secured and a more multidisciplinary approach is initiated. Baseline information gathering and technical expertise turn a location into a Site for which an application can be made and provides an initial assessment of environmental effects for EIA Scoping.
- **Application Research:** The longest phase, initialised by the outcomes of EIA Scoping, including the EIA Scoping Opinion **[REF: 6.3]**. It involves multiple periods of work based around the stages of EIA, which result in defined outputs such as the Preliminary Environmental Information Report (PEIR) and eventual ES. This phase benefits from formal (statutory) and informal stakeholder consultation.

4.3.6 During all phases research has been driven by the Applicant's values as represented by Project DPs and has been directed to deliver a design which minimises adverse effects (constraints) and maximises the environmental benefits that can be achieved (opportunities), recognising that there is a difference between a project that aims to meets minimum requirements, and one that embodies a commitment to good design.

4.3.7 An example of this is that during the Concept Research phase, research did not solely focus on investigating the potential Order Limits for a 150MW generating station. Instead, it aimed to define Order Limits to accommodate environmental mitigation measures for a solar farm (e.g. screening) and opportunities for green infrastructure enhancements that would exceed 10% BNG so that, from the start, a selected site would have the potential to deliver environmental good beyond the generating station's significant intrinsic benefits in relation to climate change mitigation.

Stage 3 – Co-ordination

4.3.8 Co-ordination is defined by the Guidance Note as the refinement of design choices and parameters driven by the vision. Effective co-ordination combines the strengths of a multi-disciplinary team with research output,

turning distinct specialisms into a collaborative whole and integrating different strands of the project into a coherent design narrative.

4.3.9 Oversight and co-ordination of the EIA process is also crucial in ensuring that the outcomes of surveys and assessments, feedback received on the PEIR, and engagement with stakeholders, is reflected and incorporated within the Design Parameters. In turn, the oversight of the Applicant, supported by the Planning/Legal/EIA-oriented project team, has ensured that decisions made about the design and the project vision have informed the finer details of the parameters and approach to assessment.

Stage 4 – Securing good design

4.3.10 The Guidance Note states that projects must set out how good design will be secured and delivered, including post-consent.

4.3.11 The Project DPs set out in Table 4.1 are the framework for the establishment of the Design Parameters within the DPD which control the appearance of the Proposed Development.

4.3.12 The management plans included within the ES include commitments to monitoring the Proposed Development and regularly engaging with local communities to ensure that the proposed infrastructure is functioning well and continues to have minimal adverse impacts on its surrounds.

4.3.13 As per DP V.2, the Applicant has aimed to set realistic expectations with stakeholders for what this project can assuredly deliver. An example of this is committing to BNG delivery in accordance with DP PL.1, but with figures below what is predicted by the statutory metric. This approach has been taken to reliably secure BNG without putting deliverability at risk and reflects being environmentally ambitious but also being realistic about commitments that can be assuredly secured absent a final design.

4.3.14 The detailed design and procurement of infrastructure of the Proposed Development must be in accordance with the Design Parameters as set out in the DPD thereby securing the delivery of embedded good design elements.

5 Design Evolution

5.1 Introduction

5.1.1 The design of the Proposed Development iteratively evolved from the early site and concept layout to this application's Order Limits (ES Figure 1.1) and Parameter Plan (ES Figure 3.4).

5.1.2 This has been informed by technical expertise and the input of the Council, local residents, and other stakeholders through consultation associated with EIA Scoping, statutory consultation on the PEIR, and ongoing engagement thereafter. An overview of how consultation has influenced the scheme is found in the Consultation Report.

5.1.3 This section summarises how the scheme has changed since the initial consideration of a site, to the boundary presented in the EIA Scoping Report (ES Appendix 2.1) **[REF: 6.3]**, to the Order Limits proposed by this application. It further sets out how the parameters of the Proposed Development have been established as a response to environmental considerations and consultation at each key stage of the project.

5.2 Site Selection

5.2.1 The Applicant has undertaken a robust and effective site selection exercise to identify suitable areas for solar development. The site selection story is told here as it relates to design, and not in terms of policy requirement, which is included in Section 6.3 and 6.4 of the PS, or explicitly in the relation to environmental effects (see ES Chapter 4 – Alternatives and Design Evolution). General requirements for identifying land which is suitable for solar farm are as follows:

- **Grid connection capacity:** Identify a suitable POC with capacity to accept additional generation and secure a grid connection offer. This is essential to an energy infrastructure project;
- **Land availability and productivity:** Approach landowners within a search area from a potential POC to identify available land of a sufficient size to host a solar farm;

- **Environmental suitability:** Review of environmental and planning constraints as well as technical viability for solar generation through desk-based sources, and with awareness of planning policy.

Grid Connection Capacity

5.2.2 The process for selecting a site suitable for solar PV generation is led by the need to secure a grid connection. Without a viable grid connection, there can be no solar farm. This process is increasingly challenging and important for a project's success, given the constraints within the grid.

5.2.3 A site must also be located reasonably close to a POC to avoid transmission losses; the greater the distance, the more energy is lost along the way. Locating a site far from a POC is not an efficient use of land because it means there is less clean energy getting to the grid from the same land use area. Or, the construction costs and environmental effects of a long cable run, in conjunction with the energy losses, fails the test of 'value' (viability) for investment and a solar farm is not possible.

5.2.4 A viable POC was identified on available land which is now Area C of the Site, with a connection into existing 132kV OHL infrastructure. The location of the OHL within the Site had a strong bearing on where Work No. 2 could be most efficiently located within the Site. The on-site POC also means there are no avoidable energy losses and what is generated on Site goes directly into the ENW distribution network for local update (as opposed to the transmission network where there is less certainty of where the renewable energy consumption may occur).

Land Availability and Productivity

5.2.5 The process of identifying a site suitable for solar is significantly constrained by land availability and finding a willing landowner. Given the scale of solar required for the UK to meet net zero objectives, and the location of viable POCs, appropriate sites require the use of agricultural land. As established by Project DP V.3, it is important to identify a landholding that is large enough to incorporate a solar farm without compromising the viability of the primary agricultural enterprise, in

combination with supporting continued agricultural use and the multifunctional benefits it provides as per DP PL.2.

5.2.6 The Applicant has a Project DP C.3 to support sustainable development through efficient land use. The Proposed Development avoids the use of BMV agricultural land, uses only a small proportion of the two landowners' holdings so that the scheme is diversification without displacement, is designed to support co-located agricultural use, and is designed with decommissioning in mind so that it can be removed with minimal disturbance to the rested soils and new/improved habitats.

Environmental Suitability and Technical Viability

5.2.7 Exploring the environmental suitability and technical viability becomes more predominant once a POC and land availability is at least partly resolved. Throughout this process the Applicant was supported by the advice of specialists who provided expertise relating to environmental constraints. This was particularly prominent for landscape, which the Applicant knew would be a sensitive topic given the proximity of the LDNP.

5.2.8 Area C was identified as environmentally suitable for reasons related to design including, but not limited to:

- **Suitability for solar:** Considered to have capacity and topographically suitable for a solar farm based on size and irradiance levels;
- **Accessibility:** Benefits from easy access to the SRN and existing accesses and internal access tracks used by farm vehicles;
- **Flood risk:** Area C is at low risk of flooding from all sources;
- **Heritage setting:** The Stone Circle and Carin is located on a plateau to the southwest and there are no other assets in close proximity; and
- **Landscape setting:** Much of the Area C is self-enclosed, and low lying, with few properties or PRoW in close proximity. The Wind Farm and OHL infrastructure mean the setting is not exclusively agricultural.

5.2.9 As the process of Concept Research went on it became clear that the ability to develop only Area C and provide sufficient capacity for the 150MW generating station would be limited by a number of environmental constraints leading to the evolution of the Order Limits.

5.3 Evolution of the Order Limits

5.3.1 The Order Limits as per the Location Plan **[REF: 2.1]** have undergone a series of amendments at various stages of the design process.

5.3.2 As set out in Section 5.2, this process began after a POC was secured in Area C. With Area C as a strong starting point, work was undertaken to determine whether a 150MW solar farm could be accommodated and enough land would be available to provide flexibility and responsiveness to constraints likely to arise through further research and assessment; it was quickly apparent that the possibility of additional land should be explored.

5.3.3 As per Table 5.1, consideration of landscape and visual impacts was an important aspect of determining the boundary used for EIA Scoping. The Applicant worked closely with landscape specialists who utilised Zone of Theoretical Visibility (ZTV) mapping for a review of land in the vicinity of Area C, with particular regard for potential visual effects on the LDNP and other sensitive receptors. Once a site took a shape akin to its current form (as per PEIR), the final phase of this process considered the extent to which land was genuinely necessary to deliver the Applicant's vision for the Proposed Development before fixing the Order Limits.

Table 5.1: Evolution of the Order Limits

Stage	Summary of events	Explanation of change
Pre EIA Scoping	Area C was secured to host the POC for a 150MW solar farm.	Initial site selection identified Area C as suitable to host a solar farm based on a consideration of technical and environmental factors and the presence of a POC to the grid.
	Areas A, B, and D added to the draft Order Limits.	Appraisal of Area C concluded its capacity as a host would be limited by constraints including topography, ground conditions, and watercourses. A further site selection exercise was undertaken to identify additional suitable land close to the POC. This led to the inclusion of Areas A, B, and D (formerly known as A and B).
	Highways Land added to the draft Order Limits	The adjoining Local Highway Authority (LHA) estate was included within the Order Limits to allow for the provision of cabling across Gilgarran Road and to support the possibility for potential upgrades or repairs if required by the LHA
Post EIA Scoping	Minor changes to the publicised EIA Scoping draft Order Limits	There were minor refinements to the boundary following the Scoping Opinion and non-statutory consultation. Changes comprised unnoticeable refinements of the mapping and the

Stage	Summary of events	Explanation of change
		removal of a small area to the northwest of Area A that research revealed to be public open access land.
Post PEIR	Minor adjustments to the adjoining LRN	The Order Limits were reduced to be consistent with the Land Registry's record of LHA estate, rather than what is implied by the OS map boundary.
	A small area of land in the northwest corner of Area A was removed.	A further area of unregistered land was removed from Area A was as it was also not required for the DCO.
	Rigg House Farm buildings and curtilage removed from Area C.	This land was removed as it was not required for the DCO.

5.4 Design Evolution

5.4.1 The design of the Proposed Development has been developed iteratively at various key stages, and in response to the EIA, land and other technical engineering and design considerations. The evolution has been driven by the need to take account of environmental constraints and opportunities and to respond to issues identified by stakeholders consulted during non-statutory and statutory consultation.

Phase 1 – Preliminary Design (feasibility to EIA Scoping submission)

5.4.2 The preliminary design phase comprised the initial period of defining a 'Concept Layout' for EIA Scoping (Figure 5.1). The Concept Layout was based on desktop research and preliminary fieldwork surveys. Scoping and the surveys which were proposed were to respond to a 'worst-case scenario' of the spatial extent of solar arrays across the Site and an early formulation of the maximum parameters for assessment.

Generating Station Developable Areas

5.4.3 A key consideration has been what parts of the available land are suitable for generating station equipment. It was concern for this in relation to Area C that led to the inclusion of A and B ahead of EIA Scoping, and it has remained a critical issue as ongoing research informed optioneering.

5.4.4 Of the three main parts of the Site for development, Area C is the largest, though also the most environmentally constrained. It is topographically variable and has several north facing slopes less suited to the photovoltaic

process. The southern part of Area C has a distinctive character and includes features like the Thief Gill escarpment and a plateau with wide ranging visibility, including from the LDNP. Some of these aspects became apparent early in the design process and informed the eventual inclusion of Areas A and B as additional locations for generation equipment.

5.4.5 Within Area C, other matters that have been particularly determinative for the design include:

- The presence of OHL including 132kv pylons and 11kv wooden poles.
- Watercourses present topographic challenges and are habitats that require protection.
- The potential for archaeological receptors due to lack of mining history.

5.4.6 Other factors that have informed the Order Limits and have been broadly applicable to the Site as a whole include:

- Residential receptors – avoiding / minimising environmental health and amenity effects through sensitive siting and screening of infrastructure.
- Cultural heritage – avoiding / minimising impact on setting of heritage assets including the WHS, Scheduled Monument, and listed buildings.
- Landscape structure features like woodland and hedgerows which are beneficial for screening but have shading effects on solar PV.
- Ground conditions – this relates to the Site's mining history and affects potential stability, contamination risk, and remediation requirements.

5.4.7 Consideration of the Site's environmental constraints also influenced the choice of solar PV technology. Tracking PV arrays were discounted as they require a larger land take and in an undulating landscape like the Site, and the benefits of tracker solar would not represent design value.

5.4.8 At this stage it was intended to include a Battery Energy Storage System (BESS). Initial optioneering considered where this could be located given the concentrated nature of a BESS facility and associated noise. The design assessed for EIA Scoping was informed by a noise impact assessment (NIA) to define a location where POC and BESS equipment could be located in relation to nearby noise sensitive receptors (NSR) without leading to effects at the Significant Observable Adverse Effects Level' (SOAEL). This was also extended to provide recommendations for

areas in which other noise emitting technology (e.g. PCS Units) could be located to avoid such effects.

Access

5.4.9 A consideration for selecting Area C was that it is well served by a good LRN route, and good connection to the SRN. The route avoids small rural communities or sensitive locations. Similar positive characteristics apply to Areas A and B, with Area A having a formal access for the Wind Farm.

5.4.10 Good access is an important aspect of good design. It is ideal to have access to a site via a physically suitable route and one that avoids settlements. Being able to make use of existing access points is also an advantage to minimise construction and character effects. At EIA Scoping five likely potential access points were identified.

Landscaping and ecological constraints and opportunities

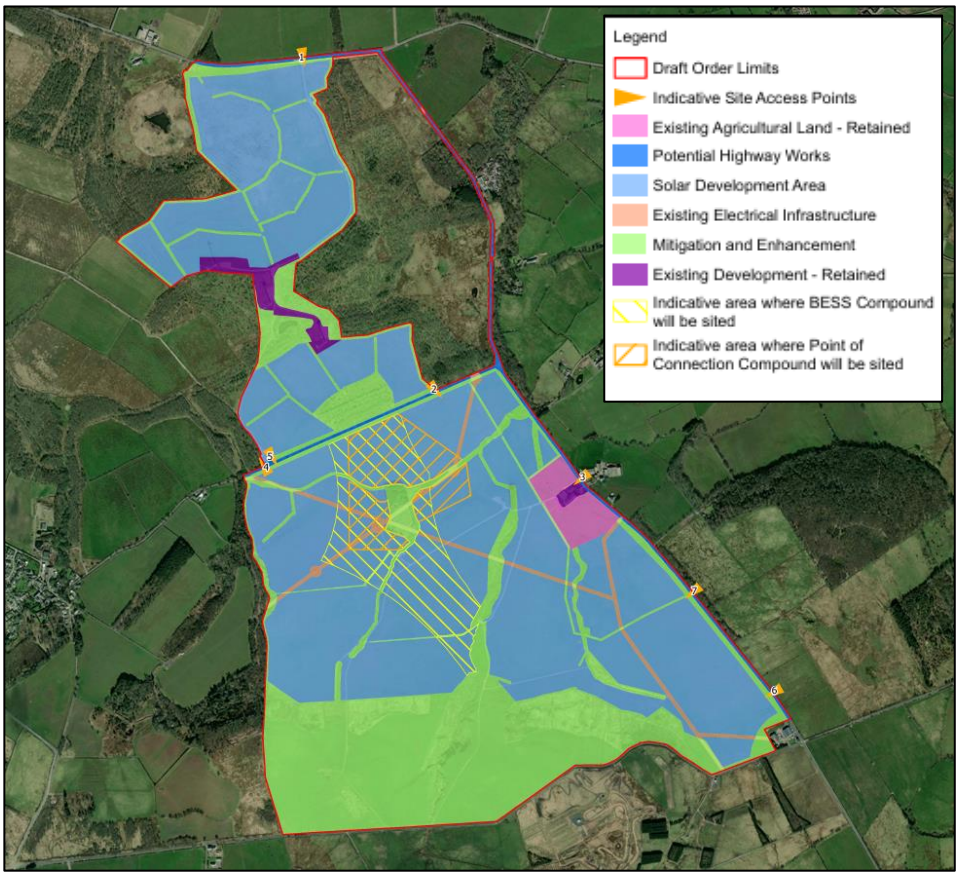
5.4.11 While achieving BNG is not a statutory requirement for an NSIP, doing so is at the heart of the Applicant's vision and is central to the Applicant's concept of solar farm good design. Based on previous experience there was concern for achieving strong BNG outcomes; it is typically much lower for sites in pastoral use than in arable use. It was concluded early that a future site would need enough land to accommodate generating station equipment along with additional land for habitat enhancement beyond that which could be co-located with infrastructure.

5.4.12 During the preliminary design stage, the Applicant also became aware that the south of the Site falls under a non-statutory designation as a CWS. Much of the CWS area was also being discounted for other reasons (landscape and visual and heritage in particular) so this presented an excellent opportunity for this part of Area C to be retained for ecological betterment with an aim to support a poorly performing designated area into one that makes a more positive contribution.

Phase 2 – Concept Design (EIA Scoping Opinion – PEIR submission)

5.4.13 The EIA Scoping Opinion (ES Ch.2, Appendix 2.2) and non-statutory consultation helped to inform the next phase of research and the next design milestone which was the Concept Layout presented within Figure 5.2 of the PEIR which is provided as an extract below.

Figure 5.2: Adapted from Figure 3.1 in the PEIR



5.4.14 The way in which EIA Scoping and stakeholder engagement influenced the design presented at PEIR is set out within ES chapters where relevant. Recommendations for further research and assessment and requests for additional information were anticipated in the EIA Scoping Opinion (ES Ch.2, Appendix 2.2), and nothing was raised that suggested a need for a major re-conception or overhaul, as opposed to continual improvement and refinement. As this background is reported across this application suite where relevant, the detail will not be summarised fully by this DAD. Instead, this section will focus on takeaways from the EIA Scoping Opinion

and non-statutory consultation that have been particularly influential in relation to achieving good design.

Public Accessibility

5.4.15 A frequent theme of discussions during non-statutory consultation was the desire for improved accessibility. The emergence of this topic is an excellent example of the value of local knowledge in the planning process.

5.4.16 In the research that informed the Scoping Report including a review of the Council's online version of the Definitive Map[7] it was noted that despite a strong PRoW network west of Gilgarran and east of Dean, there is a gap in provision in the vicinity of the Site, with no off-road PRoW across the Site or immediately adjoining land. The few PRoW present terminate at the LRN in the vicinity with no off-road linkages between these routes. Existing PRoW are identified in Figure 7.7b of Ch.7 and Figure 6.2 herein.

5.4.17 The lack of PRoW within the Site is an advantage as the potential for visual effects or disturbance to PRoW users during construction are minimal. At the same time, and in response to the Project DPs, this absence of PRoW has provided an opportunity for enhancement.

5.4.18 Background to the lack of PRoW within the Site was not available through desk-based research which only provides insight into established routes. Through discussions with residents at consultation events it was revealed that there was historically a network of routes associated with the colliery. Residents provided mapping produced by the former County Council indicating routes to be added to the Definitive Map; but the Council has confirmed the routes were not subsequently added to the Definitive Map. The design of the Proposed Development would not preclude these routes being added to the Definitive Map in the future.

5.4.19 The Applicant is supportive of creating opportunities for access to nature within the Order Limits. While the Applicant cannot offer paths beyond the Order Limits, the local passion for better countryside accessibility has

[7] Cumberland Council. Public Rights of Way Map. Available from: Public rights of way map | Cumberland Council. Accessed February 2025.

inspired the introduction of two Permissive Paths for the Site. This includes a recreational route along the boundary of Area B and into D which aligns with where an anecdotal informal route is located, and a new north/south connection along the western boundary of Area C.

Landscaping

5.4.20 For the Scoping Report and non-statutory consultation, no landscape mitigation or enhancement measures were included. This is an intentional part of the process so that feedback on the worst case (which would be filling the entire area with solar development but with no new planting) can inform where development either requires exclusion or additional planting to make its inclusion acceptable. The outcomes of the EIA Scoping and non-statutory consultation informed this topic and allowed for an early visual concept of environmental measures to be produced for PEIR. This included some enhancements to boundary vegetation and pulling back development some way from the residential properties in proximity. Although starting to take shape, the illustrative Environmental Measures Plan which informed the PEIR design and assessments was also intentionally less comprehensive, again for the benefit of worst-case assessment for the next design phase.

Phase 3 – Application Design (from PEIR submission – Application submission)

5.4.21 As with the previous phase, the way in which the PEIR response and statutory consultation have informed further assessment and design decisions is well reported across the ES chapters where relevant and therefore detail will not be summarised fully by this DAD. Instead, this section will focus on takeaways from external sources and the project team's refinement work that have advanced the design since that phase and to its current form for this application.

Removal of BESS

5.4.22 The two previous scheme iterations included a BESS facility, but this has been removed from the Proposed Development. This decision was driven

by grid connection challenges but influenced by a combination of factors including consultation and assessment outcomes.

5.4.23 The main reason for the removal of the BESS is the lack of compatibility with the grid connection offer from ENW. Further assessment concluded that BESS would not represent design value.

5.4.24 This decision was reinforced by outcomes of the statutory consultation and ongoing Site assessments:

- Public concerns about safety were taken on board. While the Applicant knew this could be addressed it was also accepted that the local community were more inclined to support a project without BESS.
- Areas where BESS could be located without unacceptable effects (noise) were limited by the NIA and landscape advice The best location for BESS was on sloping ground that could have entailed significant earthworks to safely accommodate the facility, and that without extensive ground investigation it was uncertain whether such a concentrated form of development could be accommodated.

5.4.25 It was determined that such extensive upheaval involving a change to the landform should not be pursued without a compelling reason in relation to the vision for the project. As there is no secure import connection and a BESS facility might only be delivered via a second construction phase 10+ years after the start of operations, it was removed as an aspect that is not in the best interest of the Site and local community.

Grid Connection Infrastructure

5.4.26 Confirming the design of the Grid Connection Infrastructure (Work No. 2) is one of the more challenging aspects of the design because so much of this equipment is not in the Applicant's sole control to design and deliver. The grid connection will be facilitated by a new 132kv substation facility that connects into an existing pylon on the Site and becomes a grid asset that strengthens the distribution network. More than half the equipment will be an adopted ENW asset that is implemented by an Independent Connections Provider (ICP) on the DNO's behalf, but as the Applicant's contractor. It must be built to the ENW specifications and will be operated and maintained in accordance with their standards.

5.4.27 Work No. 2 will be the subject of a detailed design between ENW and the ICP which will only commence post-consent. This means for the purpose of this application's Rochdale Envelope (see the DPD) the Applicant has specified the largest possible size (area) and elements (heights/mass) that could be specified based on generic DNO guidance and the ICP advisor experience.

5.4.28 The process of defining the Works Numbers and consideration of the likely potential layouts of the infrastructure led to a change to the area for Work No. 2. Compared to PEIR it has moved slightly east to incorporate an existing watercourse crossing. The reason for this is that the land south of the watercourse is better served by the existing access network and is relatively flat compared to land north of the watercourse. It is considered highly likely that the DNO will prefer the location adjoining the pylon south of the watercourse, but because detailed DNO design is not possible at this stage the Proposed Development had to include enough land to accommodate a substation facility south of the watercourse and/or north, which meant including an existing crossing between these areas.

5.4.29 It should be noted that, in accordance with EIA methodology, Chapter 7 – Landscape and Visual) has assessed the Grid Connection Infrastructure as being located at the highest most visible point of the Work No. 2 area, despite this being a least likely location from a technical perspective. The Applicant made the decision to not avoid these worse effect outcomes by removing land north of the watercourse to provide the statutory undertaker with maximum design flexibility.

5.4.30 Following advice from an ICP, other changes have arisen to parameters relating to the maximum size (area and heights) of substation buildings and electrical equipment. It is known that actual heights and sizes are likely to be lower/smaller, but the parameters were extended to allow for possibilities based on a variety of manufacturers the DNO could specify.

5.4.31 Consideration of everything that a DNO could specify also led to the introduction of two 'POC Masts' which may be located within Work No. 2A.

These are tall structures located adjacent to pylons as an alternative way to connect to the pylon as a POC (the typical method is via a cable underground). The POC masts could be as tall as the existing pylons (up to 30m), with a similar style but of a slimmer construction. They are considered to be less likely, however the lack of detailed DNO design means it would not be responsible to exclude them from assessment. Should they come forward the POC Masts would be the Proposed Development's tallest element. However, the project's landscape architect assessment concluded that due to their limited location in proximity to the existing pylon in a relative low point of the Site, the masts would not lead to new significant effects arising compared to those already assessed, and these could be accommodated on the Site subject to the parameters as proposed.

Layout and Specification of Solar PV Arrays

5.4.32 Following statutory consultation, the area for the solar PV arrays (Work No.1) has been refined to reflect a more comprehensive understanding of environmental constraints. This includes improving the extent of Work No.1 in relation to any features requiring buffers/exclusion. For example, the outcome of the Peat Survey Report (ES Appendix 10.3), enabled the Applicant to exclude these sensitive locations from Work No. 1.

5.4.33 The extent of Work No. 1 was also honed through the process of incorporating an improved level of detail on locations for ecological and landscape mitigation requirements and enhancement opportunities. Revision also took on board a request from the residents to the southeast.

5.4.34 For the elements of Work No. 1 there was a change to parameters for solar arrays. Both the maximum height (from ground to highest point) and minimum height (from the ground to the lowest point) were adjusted. The minimum height of the arrays has been lowered from the 800mm assessed at PEIR to 700mm. The typical heights (800mm at the lower end and 3m at the higher end) remain, with the additional allowances intended to support the inclusion of arrays on north-facing slopes which can be appropriate for solar arrays with minor adjustments. It also supports array

continuity where there is a sharp topographic change (a dip) in the ground levels, reflecting consideration of the NIC ‘place’ principle.

Access

5.4.35 A further two potential access points are included compared to the PEIR design, with Accesses 8 and 9 identified along Gilgarran Road added. These were included to allow existing accesses to be considered as available for the final design for either construction and/or operations.

5.4.36 There are nine accesses assessed as potential Site accesses. Only two of these (Accesses 1 and 3) are certain to be required for both construction and operations. Beyond this are a further 5 potential access points off the Gilgarran Road (No. 2, 4, 5, 8, 9) and two off the Branthwaite Edge Road (No. 6 and 7). The accesses off Gilgarran Road will certainly not all be used for construction but are provided for flexibility depending on the final layout of construction compounds within Work No. 4. Of the Accesses 6 and 7 south of No 3 on Branthwaite Edge Road, the most southern point is proposed to be available for ad hoc operational use and not construction.

5.4.37 Where accesses are not required for construction, which will require a degree of formalisation to make them suitable for construction vehicles, they may be made available for operational use, particularly for landscaping management and to support co-located grazing. All accesses will only be made as formal as needed to accommodate safe use in accordance with LHA standards, with accesses that will be only used for grazing and land management likely to be retained in their present informal style as agricultural access points.

Temporary Construction Compounds

5.4.38 Following statutory consultation further consideration was given to the potential locations of temporary construction compounds, which were set out as necessary in Scoping and PEIR documents but without defined locations. The limit of areas in which such facilities could be located has now been defined by Work No. 4 although what has changed since PEIR is not the fact of these compounds, but of the detail provided for them.

5.4.39 Work No. 4 locations have been selected based on proximity to existing accesses and with regard for other environmental sensitivities. Work No. 4 defines only the locations in which temporary compounds may be sited but does not define a total area to be given over to compounds as Work No. 4 is larger than the compounds could be (as per the DPD) to support flexibility within those areas. The DPD confirms that the Site may have up to five compounds, of which up to two may be Primary Compounds, and sets a limit on the total area associated with temporary compounds.

Watercourse Crossings

5.4.40 The Parameter Plan includes sections of Work No. 3 (associated works) across watercourses which are otherwise in Work No. 6 (green infrastructure). This approach has been to highlight existing crossings which could be utilised as crossings and could therefore need either replacement or reinforcement works.

5.4.41 Identifying these locations provides certainty for consultees as to where crossings for accesses and/or cables could be located. It is known that not all these crossing points will be required, but they are all included to provide design flexibility. Existing crossings that may not be used for solar farm access tracks or cables may also be maintained to support co-located agriculture and the Site's future return to its current use.

5.4.42 All existing access points identified by Work No. 3 have been given a 10m buffer either side to accommodate works/activities for upgrade works or maintenance, with any exact locations within these bands to be specified in the plans and method statements required for future Ordinary Watercourse Consent (OWC). This approach has been agreed through consultation with the Council as Lead Local Flood Authority (LLFA).

Additional considerations arising from proximity with the Wind Farm

5.4.43 Another way in which consultation has influenced design is through feedback of on the operational requirements of the Wind Farm which entailed a 5m constraint on heights for new vegetation within 500m. This constraint has been incorporated into what is proposed by the LSP.

Removal of land from the Order Limits around Rigg House Farm

5.4.44 A final change from the PEIR design is the removal of areas from the Order Limits not strictly necessary for the delivery of the Proposed Development. This includes land around the existing Rigg House Farm buildings in Area C so that these farm assets remain available for use by the wider enterprise on land opposite the Site. This is not a change from PEIR as development had already been excluded from those areas without a corresponding reduction to the Order Limits. The removal is intended to support the continued viability of the farm business.

5.5 Detailed Design

5.5.1 This DAD explains some of the influences and design rationale behind the Works Plans and DPD secured by the dDCO. These, along with other aspects of the ES such as outline management plans, provide the envelope for the future detailed design of the Proposed Development in terms of appearance and the manner of its implementation and operation. Should development consent be granted, the design (layout and governance) will need to be in accordance with the DPD and approved by the Council under the detailed design DCO Requirement.

5.5.2 A main reason for this approach is that there can be a significant passage of time between an application design being submitted and the pre-construction phase in which detailed engineering design is conducted and materials are procured. Renewable energy technology is rapidly evolving, and current options may be superseded before construction can start. During this time, the Site environment will also evolve (the conditions of vegetation in particular) and more in-depth technical studies (e.g. geotechnical surveys, or manufacturer-specific ‘pull tests’ for mounting frameworks) are critically informative for design but cannot be undertaken years before a project would commence.

5.5.3 As a development with a primary purpose of meeting current energy demands in a way that enables a more sustainable future it is important to allow a design to be based on best available technology and responsive to

up to date Site conditions and engineering studies. Along with this, a critical aspect of the scheme is Work No.2 infrastructure. The design of the Grid Connection Infrastructure cannot be initiated with the DNO until after development consent is granted and this will influence the remainder of the Work No. beyond appearance of elements within Work No.2 (e.g. access locations, drainage design, screening for that infrastructure).

5.5.4 This detailed design and procurement stage will specify technical requirements to optimise solar output in the context of existing topography and constraints while also responding to the requirements for new landscape/biodiversity mitigation and enhancement that will also become more highly detailed in the pre-commencement period. This means a degree of design flexibility is required with respect to layout, elevations, sizing, and appearance of on-Site elements. Along with this, management plans like the LEMP, CEMP, and CTMP must be fit for purpose which means being responsive to the final design and based on an accurate construction programme. Each outline management plan sets out how it will be updated and agreed with the Council and other relevant consultees.

6 Proposed Development Design Review

6.1 Introduction

6.1.1 A process of iterative design and assessment has refined the Proposed Development to one that is defined by the Order Limits, Works Plans, DPD, and ES commitments of the outline management plans and associated DCO Requirements. This section provides a review of the Proposed Development and sets out key topics for the design, the 'design response' to these topics, and how these relate to Project DPs.

6.1.2 The foundation of the approach to design described in each of the following sections is to maximise renewable energy output and respond sensitively to existing environmental and technical constraints and opportunities within and surrounding the Site as informed by the ES.

6.2 Transport and Access

6.2.1 In its urban fringe countryside location, the Site is well served by the LRN which allows routing from the SRN. This topic considers access to/from the Site via the SRN and LRN, access into and out of the Site from the LRN, and internal access around the Site. Further information on the transport network surrounding the Site and access points is found in the Transport Statement (TS) (ES Appendix 2.5).

Application of Design Principles

6.2.2 The Proposed Development aims to deliver safe access and to manage transport to/from the Site in a manner that minimises impacts on the road network and ensures the safety of road users. This responds to Project DP PE.1 which aims to deliver the Proposed Development in a considerate manner that minimises impacts to human and environmental wellbeing.

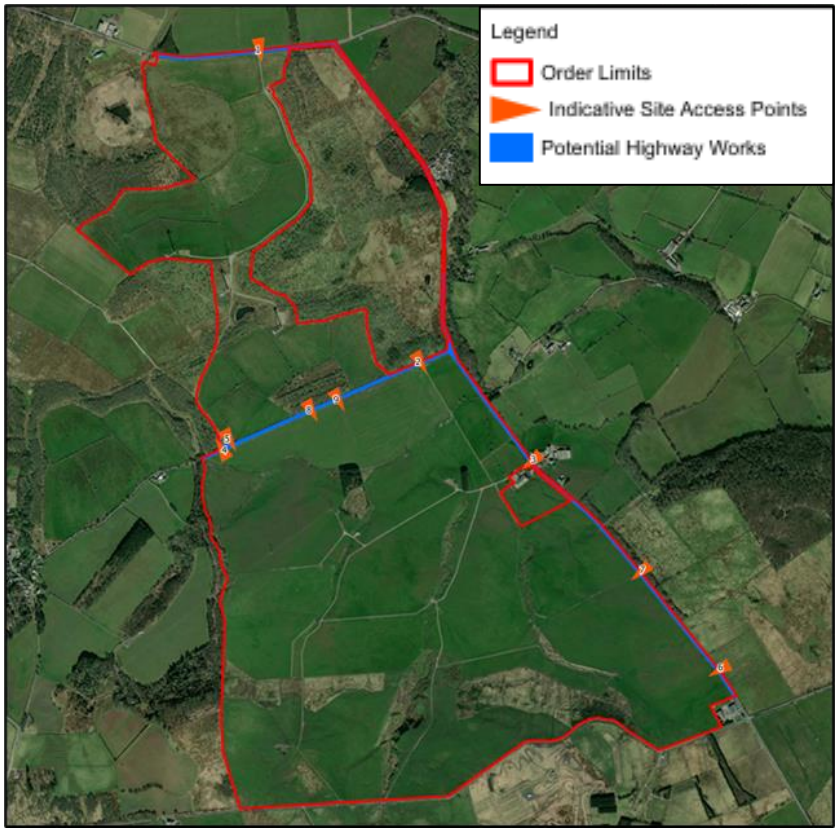
Design Response

Access in/out of the Site

6.2.3 As shown on Figure 6.1 the Proposed Development includes nine access points, each of which is an existing access that is defined by Work No. 5.

The proposed accesses may be utilised for construction, operations, or both. The number of accesses is for flexibility, but it is not necessarily the case that all will be required or used with more intensity than at present.

Figure 6.1: Site Access Map (adapted from TS Figure 7.1)



6.2.4 Existing accesses would be upgraded as necessary to provide safe access / egress for construction and/or operational activities, with final plans for each access to be provided as part of the detailed design. The details will depend on the nature of vehicles and scheme phase.

6.2.5 Access improvements would generally consist of widening and the provision of visibility splays for safety. Indicative swept path and visibility splay plans for each access are in the OCTMP (ES Appendix 5.2). Visibility splay requirements have been adjusted to account for LRN conditions, including vehicle speed and flow. Upgrades to the surfacing of the access apron would also be undertaken where necessary; where the existing surfacing is unsuitable this would be upgraded to a bound surface, potentially continuing into the Site up to 5-20m as per Work No. 5. Where

necessary, any secondary consents will be sought from the LHA in accordance with the Highways Act 1980[8].

6.2.6 Removal of vegetation will be limited to what is required for safe access. Where possible, vegetation will be trimmed but not removed so that permanent loss is minimised if the loss would only be needed for construction phase.

Internal Access and Construction Compounds

6.2.7 In as much as possible, the Proposed Development will rely on an existing network of farm tracks during construction and operation. New access tracks will be designed to minimise the impact on the soil through compaction, and on drainage through use of permeable surfacing. Where tracks are only needed for construction, temporary matting would be used as surfacing, and affected land would be reinstated once tracks are no longer required.

6.2.8 The approach to use of the internal network is set out within the OCTMP and OCEMP, which in general, aim to minimise demands on the track network in terms of volumes and types of traffic by using Work No. 4 compounds for HGV traffic, and then distributing internally via smaller vehicles. The OSMP also provides control for any type of vehicle that may need to travel across the Site by a means other than the track network.

6.2.9 The temporary construction compounds will be the main hubs for traffic and access matters during construction phase and access/egress will be facilitated by bankspersons to ensure vehicles manoeuvre safely. In addition, wheel wash facilities would be provided to prevent mud or debris from within the Site being trafficked onto the public highway. These and other such measures are set out in the OCTMP.

Construction Routing and Management

6.2.10 The need for a good routing is an important aspect of site selection. The Site benefits from LRN roads which are sufficiently wide to require no

[8] Highways Act 1980.

improvement works and has a straightforward connection onto the A595 and the wider SRN with no major interventions or upgrades required (e.g. S278 works). An especially positive aspect of the route is that it avoids passing through settlements or by sensitive sites.

6.2.11 The routing is assessed as suitable by the TS and conformity to the required route will be delivered by the CTMP as outlined in the OCTMP. The OCTMP also includes further measures arising from community engagement (per DP PE.3) like restrictions on when the booking system can arrange deliveries to avoid peak periods when local demand is higher.

Transport and Access Design Review Conclusions

6.2.12 The principles of good design for this topic relate to the design of Site access points, the design and use of internal access routes, and the design of management measures to avoid or minimise environmental effects arising from transport and access.

6.2.13 This application demonstrates that the Site can be accessed safely and that effects from construction and operational traffic and access would not be significant and can be managed via controls that secure best practice. The TS and dDCO commitments for this topic reflect multidisciplinary collaboration between the project's technical experts and input from relevant consultees, including the LHA and local community. The outcomes for this topic relate well to NIC principles for people and place.

6.3 Public Accessibility

6.3.1 Natural England guidance[9] is that GI is not limited to features of or for nature but includes human connectivity like paths. Opportunity to engage with and experience nature via public access is associated with health and wellbeing benefits. Improvements to public accessibility in the vicinity of the Site was raised by the local community (individual residents and parish councils) across informal and statutory consultation. Section 5.4 herein

[9] Natural England. 2025. Available from: [redacted] Accessed February 2025.

provides the background of the introduction of permissive paths in the Proposed Development's design evolution.

Application of Design Principles

6.3.2 The Proposed Development aims to improve the green infrastructure contribution of the Site by supporting public access options and making a positive contribution to the network of local routes. The design response supports the delivery of Project DPs PE.1-3.

Design Response

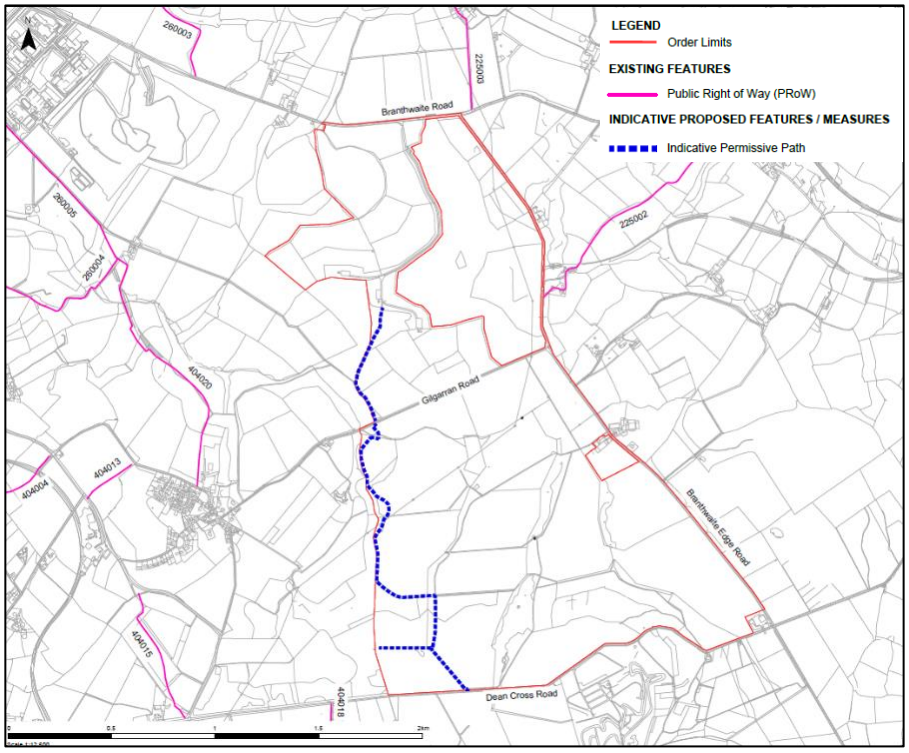
6.3.3 The design response has been to include two permissive paths. These routes have been designed with consideration of maximising benefits to users by travelling to key features of public interest, including the Stone Circle and Cairn SM, ancient woodland, and the pond in Area D, as well as consideration to entrance/exit locations in relation to the wider PRoW and public open access land options. Security and safety have also been a consideration when selecting the routes, with the paths outside the Perimeter Fence in areas targeted for ecological enhancement.

6.3.4 Indicative permissive path routes are shown in blue on Figure 6.2 and are:

- A permissive path would be established along the eastern edge of Area C to link Gilgarran Road and Dean Cross Road, both of which have good connections onto the wider PRoW network in the vicinity.
- The second will be a recreational loop, responding to requests by local residents, and will follow the northwest boundary of Area B to the Area D Pond, which will be enhanced in accordance with the OLEMP.

6.3.5 The OLEMP sets out the arrangements for the management and implementation of the proposed permissive paths. It also outlines further features to benefit the route users such as information boards. As the route through Area C also passes closely by the Stone Circle and Cairn SM, the access to this heritage asset and information board(s) can help to better reveal the significance of the asset of which there are only ground-level visual remnants, and to which there is no public access at present.

Figure 6.2: Indicative Permissive Paths and PRoW (from ES Figure 7.7b)



Public Accessibility Design Review Conclusions

6.3.6 The Proposed Development's commitment to good design principles is secured by the inclusion of measures in the OLEMP directed at green infrastructure through public accessibility. This reflects the Project DPs PE.1-3 and alignment with the NIC on the topics of people and place.

6.4 Landscape and Visual

6.4.1 The design of the Proposed Development, including the Order Limits, siting of equipment, and parameters, has been landscape-led. Background to the influence of this topic on site selection and design evolution is found across Section 5 of this DAD, with a landscape and visual impact assessment (LVIA) provided by ES Chapter 7 – Landscape.

6.4.2 This section focuses on two themes arising from this topic: how landscape constraints have informed the Work Numbers for the Proposed Development, and the Proposed Development as an opportunity for landscape enhancement. These themes have enabled a development that

is appropriate for its location and delivers multifunctional landscape enhancements.

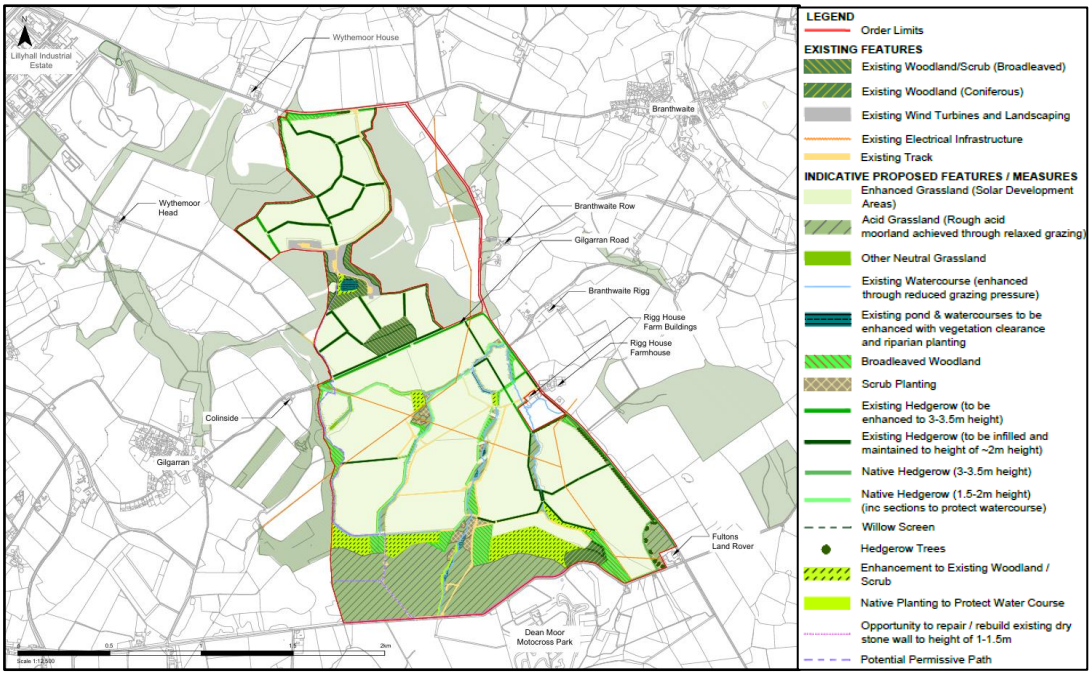
Application of Design Principles

6.4.3 The Proposed Development has been designed to respond to the character of the Site and to be sensitive to the surrounding landscape, particularly the need to avoid impacts on sensitive receptors. The design has aimed to ensure visual impacts are mitigated in a way that complements the existing landscape structure, while also contributing positively to the vision for the Proposed Development as multifunctional green infrastructure. In doing so it delivers alignment with a number of Project DPs and touches on each NIC design category.

Design Response

6.4.4 The design response relies largely on proposals as outlined by the Landscape Strategy Plan (LSP) (ES Figure 7.6) **[REF:6.2]** and OLEMP.

Figure 6.3: Landscape Strategy Plan (extract from ES Figure 7.6.1)



Site Features

6.4.5 Establishing the locations for infrastructure within the Site landscape has been a continually improving process. As described in Section 1.7, the

Site contains blue and green infrastructure features and topographic characteristics which constrain options and provide building blocks for the mitigation strategy. Features of particular relevance include:

- The elevated open moorland plateau to the south of Area C which also hosts the Stone Circle and Cairn and a part of the Dean Moor CWS.
- Watercourses through the Site in Area C are important habitat corridors protected by a minimum 8m buffer, and many are in steep gullies that would be topographically unsuitable for development.
- Existing woodland in and around the Site provide visual screening and constrain design due to shading effects and need to avoid impacts on tree retention. Woodland design influences include:
- A stand of replanted ancient woodland adjoins the western boundary of Area C and is protected by a minimum 15m buffer to development.
- There are two blocks of woodland within the north of Area C, and a linear section of woodland which runs the length of the escarpment to the south of Area C which are predominantly Sitka spruce and been established for commercial forestry (biomass).
- A buffer of recent but maturing broadleaf woodland east and west of Areas A and B are included within the Order Limits on the Council's recommendation to secure the retention of woodland screening.
- The Wind Farm presents as a constraint on any vegetation over 5m high within 500m of the turbines to ensure wind flow is unimpeded and there would be no vegetation that inhibits their future decommissioning.
- Boundary features like dry stone walls or hedgerows on external Site boundaries and field parcel boundaries, some of which are gappy, define areas in which development may occur without loss of existing GI corridors or features that reflect landscape character.

6.4.6 The LVIA notes the Site is well contained, with significant impact potential being confined to receptors in close proximity to the Site. For receptors at a greater distance landscape and visual effects will be limited by the containing effects of Site topography in conjunction with the retention and enhancement of boundary features along with new linear features and blocks of woodland which will break up longer distance views. In designing a landscaping strategy which is sensitive to existing features, the Applicant will ensure that solar arrays are placed in a way to prevent adverse effects of renewable energy output from shading, while taking advantage of current or enhanced versions of these features as mitigation (screening).

Arboriculture

6.4.7 An Arboricultural Impact Assessment ('AIA') (ES Appendix 7.8) **[REF: 6.3]** reports on the outcomes of a tree survey and provides management recommendations. It includes a Tree Constraints Plan (TCP) of trees and woody vegetation relevant to the Site, both within and outside the Order Limits, where the Proposed Development has the potential to effect or be affected by these features. The TCP has informed the design by helping to avoid impact through Works Numbers that exclude development from areas with woody vegetation wherever possible, including measures such as the 15m buffer to ancient woodland west of Area C. The findings of the survey have been carried over into an outline Tree Protection Plan (TPP) based on the Parameter Plan (ES Appendix 3.4). This identifies locations with potential for impacts where works are not excluded from Root Protection Areas (RPA) and mitigation may be required.

6.4.8 Best practice for tree protection is secured by the OCEMP. This establishes a commitment for an updated tree survey to accurately inform the detailed design and CEMP measures and sets out mitigation such as the use of protective barriers and no-dig methodologies to be include in a TPP based on the detailed design. These measures will support the retention of trees, tree groups, and hedgerows as important landscape structural elements which provide visual mitigation and habitat value.

Nearby Dwellings

6.4.9 Although the undulating landscape and relative containment of the Site reduces wider ranging visual effects, and the Site benefits from relatively few residential and commercial properties in the immediate vicinity, the need to minimise impact on the limited proximate dwellings has been an aim of the landscaping design. The most relevant dwellings are:

- Wythemoor Sough, a Grade II listed building northwest of Area A. A setback of Work No. 1 and the inclusion of a new belt of broadleaved woodland is secured by the Works Plans and LSP to minimise effects;
- Commercial garage and dwelling at the southeast corner of Area C: A setback informed by topographic contours and consultation with the owners is secured by Works Plans, along with targeted planting

secured by the LSP locates infrastructure in a sensitive manner with additional screening along ridges to prevent views of arrays behind;

- Hamlet of Branthwaite Edge east of Area C: Works Plans secure setback from the eastern boundary along with landscape screening (hedgerows and woodland belt) to minimise impacts.

Lake District National Park and English Lake District World Heritage Site

6.4.10 LDNP/WHS is located 3.2km west of the Site at its closest and its fells have extensive views across West Cumbria, including the Site. Given the value of the LDNP/WHS, this has been an important topic and the design response has been informed by consultation with the LDNP Authority. The need for additional screening and consideration of long-distance views have been discussed throughout this consultation and has informed the strategy as secured by the Works Plans, OLEMP, and LSP.

6.4.11 All infrastructure development is excluded from the elevated moorland plateau which would have significant landscape and heritage impacts and is confined to more well-contained areas of the Site. The majority of the Proposed Development is low profile with long distance views broken up by a combination of topography and vegetation belts. The exception is Work No. 2 which has worst-case parameters that include a cluster of buildings and structures, some of which are taller elements such as 30m tall POC masts. When identifying a suitable location for Work No. 2, consideration was given to how topography and existing features provide screening, and Work No. 2A to limit POC masts to an area adjacent to an existing pylon minimises the landscape effect of the tallest structures.

6.4.12 The LVIA acknowledges that even with the screening provided by topography and existing trees and vegetation, without mitigation from new planting and a management regime for existing planting, the area covered by solar arrays would be visible in long distance views. In response, the Works Plans secure the retention of existing features and the LSP and OLEMP include improvements to existing linear vegetation and new linear blocks of vegetation to ‘break up’ long distance views.

Landscape as Opportunity

6.4.13 For this DAD, in relation to the topic of good design, the concept of GI enhancement encompasses measures which are defined by EIA/LVIA methodology as embedded and additional mitigation, along with measures that EIA terms as enhancements, so is not confined to merely the latter.

6.4.14 The vision for the Proposed Development as delivered by Project DPs (e.g. C.2 and PL.1) places great importance on maximising opportunities for green infrastructure within the limits of what is possible for a solar PV development which has a primary purpose of generating 'green' energy.

6.4.15 Some existing GI within the Site performs well or has the potential to do so, but in-general features are poorer quality and/or fragmented. This includes boundaries which are defined by gappy, partially managed species-poor hedgerows with sections of dry-stone wall in various states of repair or loosely defined by scrub vegetation. This provides an opportunity for infill planting of hedgerow and hedgerow trees which delivers multifunctional benefits for visual impact screening alongside more effective habitat connectivity for species across the Site. In response to this opportunity, the design as secured by Works Plans, the LSP, and the OLEMP has sought to create cohesive, connected GI.

6.4.16 The design as outlined by the OLEMP has been shaped by, and responds to, the multidisciplinary nature of GI. It reflects a combination of mitigation and enhancements proposed by ecology and landscape specialists for an implementation and management regime which protects and enhances existing landscape features and ecological habitats. The maintenance arrangements described within the OLEMP will ensure that the GI measures are delivered, maintained, and monitored across the Proposed Development's operational lifespan. This will secure the multifunctional benefits of mitigation screening, landscape character enhancement, and ecological betterment while benefitting other technical topics like flood risk.

6.4.17 Connectivity as a GI theme is also reflected in the integration of the permissive paths set out in Section 6.3 which responds to Project DP PE.2, which aims to enable public enjoyment of the natural environment.

Landscape Design Review Conclusions

6.4.18 Good design, as it relates to landscape and views, has been the role of landscape in shaping the design (order limits and siting) and then creating a landscaping strategy which is sensitive to existing Site features, the local landscape, and visual receptors, and uses these as a platform for a GI network that can mitigate impacts and deliver enhancements that align with the Applicant's vision. The design response supports all four NIC DPs, and multiple Project DPs, reflecting the consideration of 'Places' through the provision of GI which can be a positive hub for environmental betterment in the local area (PL.1), 'Climate' by taking a landscape-led approach with biodiversity benefits (C.2), 'People' through enhanced access to nature (PE.2) and consideration of amenity (PE.1), and 'Value' in the nature-based-solutions (NBS) approach to issues on the Site (V.1).

6.5 Biodiversity

6.5.1 Alongside landscape, consideration of biodiversity protection and enhancement has been a principal consideration for the Proposed Development's approach to good design. Section 5 of this DAD sets out how biodiversity has factored into the iterative design process for a design that is responsive to constraints such as the watercourses, woodland, and the CWS. This section will not duplicate information about the biodiversity baseline which can be found in ES Chapter 8 – Biodiversity.

6.5.2 This part of the DAD focuses on two themes arising from this topic: ecological interests as a source of constraint on design with respect to layout and management commitments, and the Proposed Development as an opportunity for biodiversity benefit. These themes have been central to DP's aiming to advance a development that is appropriate for its location that delivers multifunctional GI for nature recovery and BNG.

Application of Design Principles

6.5.3 The need for the design of the Proposed Development to be responsive to the Site's ecological interest and reflect the protection of ecological value in its design and management is embedded within Project DPs, including multifunctional GI to help tackle the biodiversity crisis (C.2), sustainable development that is resilient to climate change (C.3), improvements to the habitat value of the Site and BNG in excess of 10% (PL.1), enabling co-located agriculture (PL.2), and an NBS approach to issues (V.1).

Design Response

Habitats

6.5.4 Sensitive Site habitats include CWS grassland, hedgerows, woodland, watercourses, and small areas of scrub and mire, with a hierarchical approach taken to the addressing potential effects on effects on habitats within the Site. The approach to habitats is to conserve and enhance them through additional planting and/or improved management. In areas other than Work No. 6, which is reserved for GI, development is avoided or mitigated where sensitive receptors/features are present, while measures are included within all works areas (not only Works No. 6) to optimise the biodiversity value of boundary features, field margins, and to improve grassland species diversity. This is secured by Works Plans and control documents such as the OCEMP and OLEMP. Further background information to commitments by the OLEMP are set out within the BNG Report (ES Appendix 8.8).

6.5.5 The CWS in the south of Area C has been a particular constraint and opportunity for design. The majority of the CWS is excluded from hosting co-located infrastructure, which was driven first by landscape and heritage considerations and reinforced by the ecological designation. Where these other impacts are not a factor, a balanced approach was taken to avoid exclusions of limited benefit to the designated CWS at the expense of the function of the generating station as envisaged by EN-1 at 5.10.26.

6.5.6 As described in ES Chapter 8 – Biodiversity much of the CWS is poorly functioning and does not include areas of purple moor grass for which it is designated. In these areas where other factors do not already require exclusion, the cessation of intensive grazing and promotion of species diversity will promote biodiversity within the CWS, including in areas co-located with Work No. 1 which will benefit from additional controls for construction and operation than areas of Work. No. 1 not in the CWS. This approach has been agreed with the Cumbria Wildlife Trust (CWT) during the pre-application process, reflecting the ethos of PE.3 in being responsive to consultation.

6.5.7 As agreed with the CWT, the Proposed Development aims to improve and restore lowland acid grassland habitats in parts of the CWS where this is most likely to be achievable, though is not currently proposed to deliver this habitat across wider parts of the CWS given uncertainties around soil chemistry and the difficulties of creating this habitat (as per DP V.2).

6.5.8 A commitment of the OLEMP which is also related to good design for the CWT and the Site's biodiversity value as-a-whole is that the LEMP will be updated every five years based on the monitoring done over the previous LEMP period. This aligns with the importance of committing to proposals and targets that are assuredly deliverable, while building-in the flexibility to aim for further improvement based on additional research (DP V.2).

Species

6.5.9 The Proposed Development has been designed to respond to species established as present within the Site as per ES Chapter 8 (Appendices 8.1-8.6). The presence of small terrestrial species is an important consideration in terms of ensuring their movement is not overly restricted across the Site, their habitat is retained, and infrastructure has minimal impact on access to breeding grounds and foraging. This has led to things like the commitment to include mammal gaps within perimeter fencing.

6.5.10 Surveys have established the presence of bats within the Site, which are notably sensitive to light pollution and benefit from linear vegetation. The

Proposed Development will retain and enhance linear features and would operate under a sensitive lighting strategy as secured by the OCEMP, OLEMP, and OOMP. Under this strategy the Proposed Development would generally not be lit at night, and if lighting is used it would be for a specific time-limited purpose, cowled, and directed towards the ground away from features like hedgerows and watercourses.

6.5.11 A suite of breeding and wintering bird surveys have been conducted to build up a reliable picture of the Site's importance as a habitat for these species. The protection and creation of habitats, enhancements to grassland diversity, and planting along watercourses, as well as the management prescriptions to allow for taller swards during key seasonal periods reflect the consideration of benefits to bird species, providing suitable shelter and enhanced food availability.

Biodiversity Net Gain

6.5.12 As per DPs PL.1 and C.2, delivering significant BNG is part of the Applicant's vision, despite this not being a statutory obligation for NSIPs. The BNG Report sets out the outcomes of the statutory metric for BNG that could be achieved should the LSP be implemented in full based on habitat conditions and assumptions based on current knowledge.

6.5.13 The BNG metric outcome reflects an aspirational-but-grounded (conservative) approach to considering the habitats which will be retained, enhanced and/or created on the Site, and the target conditions to be achieved. It does not include measures such as providing bird and bat boxes or all watercourse enhancements, as not all betterment is captured by the statutory metric, even though these also form commitments secured by the OLEMP which will benefit habitats and species.

6.5.14 The statutory metric provides outcomes that are based on the LSP design and management via the OLEMP. The BNG Report sets out gains that are higher than the minimum BNG commitment secured by the OLEMP. This is intended to support flexibility in detailed design and reflects an awareness that baseline conditions may change with final outcomes to be

based on the updating surveys secured by the OCEMP and OLEMP. It is expected that the Proposed Development will deliver BNG that is more akin to the aspirational outcomes of the BNG Report than the minimum commitments, which are still significant despite the conservative approach. This reflects DP PL.1's commitment to BNG >10% and also V.2 in setting reasonable expectations for what can be delivered.

Biodiversity Design Review Conclusions

6.5.15 Good design, as it relates to biodiversity, applies to retaining existing habitats and maximising the value to species using the Site through enhancement, reinforcement, and complementary habitat creation. This approach is not limited to that which can be quantified through the BNG metric, although the metric has been used to establish aspirational delivery figures and minimum commitments beyond what is required for NSIP projects. This aligns with the vision for the Proposed Development to jointly tackle the climate and biodiversity crisis and of Project DPs aimed at delivering multifunctional green infrastructure benefits. The Project DPs go beyond the delivery of renewable energy and aim to deliver the integrated, holistic approach advocated by the Guidance Note, which encourages a positive response to the climate and biodiversity crisis.

6.6 Cultural Heritage

6.6.1 Ensuring good design with regards to cultural heritage has meant aiming to avoid impacts through works areas and parameters that are sensitive to heritage assets, and where possible seeking opportunities to make a positive contribution. This section describes how consideration of above ground assets (e.g. listed buildings) and potential below-ground assets (archaeology) have shaped the design. Further detail is provided by ES Chapter 6 – Cultural Heritage.

6.6.2 A need to avoid effects on heritage assets has influenced site selection and the siting of works therein (as described in the Design Evolution). Particular constraints for the design were the Stone Circle and Cairn in the south-west of Area C, Wythemoor Sough, a Grade II listed building

approximately 160m north-west of Area A, and the English Lake District WHS as discussed in Section 6.4 – Landscape and Visual. Consideration has also been given to below ground heritage receptors through research and engagement with the Council's Archaeological Advisor.

Application of Design Principles

6.6.3 The design of the Proposed Development aims to minimise impacts on the setting of nearby heritage assets and to make a positive contribution to cultural heritage accessibility. This primarily responds to Project DPs PE.2 in aiming to enable public enjoyment of the Site's cultural heritage assets through improved access and PL.3 in adopting a landscape-led approach to respect the setting of heritage assets and avoid/minimise effects.

Design Response

6.6.4 The design approach has been hierarchical; to avoid unacceptable impacts and then to mitigate any impacts that cannot be avoided. A design response is reflected in the Applicant's approach to designated heritage assets and potential below-ground archaeology.

Designated Heritage Assets

6.6.5 The Proposed Development has no physical impact on designated heritage assets, but there are potential effects on the setting of heritage assets. Early cultural heritage influence led to exclusion of development other than GI from the south of Area C, as secured by the Works Plans. This plateau at the south of Area C forms the immediate setting of the Stone Circle and Cairn and is more prominent in long distance views from the WHS. A subsequent setback was provided for Wythemoor Slough with a band of intervening woodland introduced by the LSP.

6.6.6 The application has taken a balanced approach to mitigation for designated heritage assets as it is acknowledged that the only way to avoid effects would be a 'do-nothing scenario'. This is considered a disproportionate response to the assessed *'less than substantial harm'* in the face of the climate crisis and critical national priority for renewable energy infrastructure. As recommended by EN-1, exclusion was provided

wherever the loss of function was outweighed by the benefit of the mitigation measures to heritage (and landscape) interests. Beyond this, effects on the WHS and the Stone Circle and Cairn are minimised though mitigation planting to reduce the effects on landscape character and include linear blocks of vegetation to break up the impact associated with the solar arrays which otherwise would appear to extend uninterrupted across a large area.

6.6.7 A further design response is provided by the permissive path along the western boundary of Area C. The visible parts of the SM are at ground level and therefore while the SM's relationship to the landscape is intrinsic to its significance, this is not a part of Cumbrian cultural heritage that can be readily experienced and appreciated by the public. As secured by the OLEMP, access would be provided close to the SM and signage would be provided to explain its significance and relationship between the SM in the historic landscape as well as the association between stone circles and calendrical (e.g. solar) activity, as noted by the List Entry[10].

Undesignated Heritage Assets

6.6.8 The potential for undesignated heritage assets (archaeology) for the Site as-a-whole is considered to be low, largely due to historic mining activity in Areas A, B, and D. An iterative process of research and consultation has informed the design response to potential archaeology focused on Area C. For this part of the Site a geophysical survey was undertaken, with results provided in the Archaeological Geophysical Survey Report (ES Appendix 6.2) **[REF: 6.3]**. Following this fieldwork an Archaeology Mitigation Strategy (AMS) (ES Appendix 6.3) **[REF 6.3]** has been agreed with the Council's Archaeological Advisor setting out a staged approach to additional investigation and mitigation pathways, reflecting the DP V.2, which aims for a design that is informed by positive engagement with stakeholders.

[10] Historic England. 1996. Large irregular stone circle and a round cairn on Dean Moor. Available from: [redacted] Accessed March 2025.

6.6.9 The first stage of this is to agree a Written Scheme of Investigation (WSI) that will be in accordance with the trenching plan in the AMS unless the detailed design excludes works from locations where prior investigation is required. Undertaking intrusive ground works that would disrupt agricultural operations on the Site only after consent is granted, and only where the detailed design would place equipment, is considered a proportionate response to the limited areas of archaeological potential and the known compatibility of solar farms with areas of archaeological interest. This approach aligns with the NIC principle of 'value'.

6.6.10 The parameters in the DPD also proactively provide design alternatives which enable the avoidance of archaeological effects which accords with Historic England advice[11] for solar farms being co-located on sites with underground heritage assets.

Cultural Heritage Design Review Conclusions

6.6.11 Good design as it relates to heritage has meant avoiding unacceptable impacts and minimising residual effects on heritage assets through exclusion and new and enhanced landscape structure elements. This is complemented by the permissive path and signage aimed at supporting public access to, and knowledge of, the Stone Circle and Cairn SM. With respect to archaeology, good design is achieved through the AMS and by ensuring the flexibility for alternative equipment options within the DPD.

6.7 Ground Conditions

6.7.1 Land within the north of the Site (Areas A, B, and D) was historically part of an opencast coal mine and limited areas of Area C have also been used for quarrying and mining. Baseline research also indicated a potential for peat which is confirmed as present in Area C as per the Peat Survey Report (PSR) (ES Appendix 10.3). The ALC Report (ES Appendix 2.8) outcomes provide the foundation for the management of soil which is set out for the construction phase within the OSMP (ES Appendix 5.3).

[11] Historic England (2021) Historic England Advice Note 15: Commercial Renewable Energy Development and the Historic Environment.

6.7.2 ES Chapter 10 – Ground Conditions provides assessment of potential effects and establishes mitigation requirements which are secured by Works Plans, the DPD, and control documents. For the Proposed Development, the approach to good design has had to account for the Site's mining history, the presence of peat, and an overarching need to conserve the soil resource, particularly in construction.

Application of Design Principles

6.7.3 The Proposed Development makes positive use of a Site with a history of coal mining; as a use that directly contributed to the climate crisis and ecological degradation the Applicant considers it fitting for a former coal mine to host a clean energy generating station.

6.7.4 Ensuring good design in relation to managing the risks posed by ground conditions is embedded within the Project DPs. Crucially, this means effective engagement with the Mining Remediation Authority (MRA) (formerly the Coal Authority), the Council's Environmental Health Officer (EHO), and other relevant consultees to determine what is required for the detailed design and control documents to be responsive to ground conditions constraints, which reflects Project DPs PE.2 and PL.2. At detailed design, a fuller picture of the ground conditions constraints will be considered to make efficient use of the available Site, reflecting Project DP V.2 and C.3. In mitigating these risks, the Applicant has had regard for the possible impacts on environmental health and the health of on-site workers (DP PE.1).

Design Response

Geo-Environmental Constraints

6.7.5 The Site's mining history primarily effects Areas A, B, and D as the discrete parts of Area C that are affected are already excluded. The design response is informed by the Phase 1 Ground Conditions Assessment (GCA) and Coal Mine Hazard Assessment (CMHA) (ES Appendices 10.1 and 10.2) **[REF: 6.3]**, which identify historic mine entries, contamination risk, and instability hazards within the Site. The design

response to the environmental and safety considerations associated with these features has been to apply a hierarchy of mitigation for avoiding these constraints where possible, and applying additional mitigation where risks are not excluded via the Works Plans.

6.7.6 Mitigation is secured by the OCEMP which sets out requirements for ground investigations to be undertaken post-consent to investigate and characterise the near-surface soils and provide information on former coal mine entries, areas of potential shallow mine workings, and the former opencast pit highwall as identified in the CMHA. The ground investigation will locate and delineate, as far as is reasonably practicable, the extent of these hazards, with the results of the investigation used to inform the detailed design and CEMP. Depending on outcomes a Foundation Works Risk Assessment (FWRA) may also be provided to ensure that the proposed foundation method will not have an adverse impact by creating new pathways for the migration of contamination.

6.7.7 Anticipated mitigation includes exclusion, prior remediation where exclusion would otherwise be required, or sensitive siting of equipment which would be suitable, coupled with design alternatives such as ballasted or anchored arrays where needed. These options would be complemented by CEMP methodologies for working practices, including the use of protective barriers, RAMS, and a Discovery Strategy to be followed in the event of unexpected contamination.

6.7.8 An example is the 50m buffer from identified former mine entries. Ground investigations in accordance with an MRA Permit will determine the need for full exclusion, or whether some forms of infrastructure may be sited within this buffer subject to satisfying the MRA that some equipment is appropriate. (e.g. Work No. 1 solar PV arrays, but not PCS units).

6.7.9 The approach to investigation and mitigation pathways is set out in section 11 of the OCEMP (ES Ch.5, Appendix 5.1). Assessments for the application have been informed by engagement with relevant consultees, and the measures secured by the OCEMP have been established by

agreement with the MRA and Council's EHO. This includes commitments to secure further permits ahead of investigations, to undertake works in accordance with permits, and for the outcomes of investigation to form the evidence base for detailed design and construction methodologies which will be agreed with the relevant authorities prior to a submission to discharge associated DCO Requirements. Therefore, the design reflects the extent of research that is possible at this pre-application stage and secures further assessment, consultation, and working methods so that geo-environmental risks are appropriately mitigated.

Peat Resource Conservation

6.7.10 The design response to the presence of peat is informed by research and recognises the need to protect this resource in accordance with the England Peat Action Plan 2021[12]. Impacts to peat have been managed through good design which excludes all intrusive works from the peat deposit locations (along with a 10m buffer to these deposits) via the Works Plans, This does not apply to Work No. 3 and 6 subject to the OCEMP and OSMP controls which confirm that these areas will generally be avoided by construction activities, particularly those which would entail excavation or affect compaction or drainage, but that there may be protection measures (barriers) used or specific landscape and ecological enhancements within Work No. 3 or 6 in areas of identified peat deposits.

Soil Resource Conservation

6.7.11 Safeguarding the soil resource during construction is secured by the Outline Soil Management Plan (OSMP) (ES Appendix 5.3). Alongside broader environmental protections secured by the OCEMP, the OSMP will protect the quantity and quality of soil resources. Doing so will also prevent knock-on environmental risks (e.g. surface water flooding and water quality), will ensure suitable conditions to support implementation of the LEP and LEMP, and will provide a foundation for a successful return to

[12] HM Government (2021). DEFRA. England Peat Action Plan

the existing use after decommissioning, with protection for the benefits to soil quality that can be achieved from resting the land.

6.7.12 During operation the cessation of intensive grazing and chemical-free land management along with improved vegetation (cover and species diversity) will benefit soil health, i.e. through increase in soil organic matter, increase in the diversity of soil, flora, fauna, and microbes, and improved soil structure resulting from the implementation of the OLEMP and OOMP (ES Ch.3, Appendix 3.1).

Ground Conditions Design Review Conclusions

6.7.13 Good design for ground conditions relates to ensuring contamination risk, stability hazards, areas of peat, and soils as a resource are accounted for. This supports the design to make efficient use of the available land (see DP C.3) and for management plans to minimise impacts on environmental health and amenity (PE.1). This application demonstrates that a proactive and pragmatic approach has been taken to design in this respect (see DP V.2) which is informed by consultation and agreed with the key consultees with an interest in this topic (as per DP V.3).

6.8 The Water Environment and Flood Risk

6.8.1 Good design, as it relates to the water environment and flood risk, is arrived at through consideration of how the designed can minimise effects on flood risk and water quality and to deliver betterment to these where possible. This topic area has been largely informed by the Flood Risk Assessment (‘FRA’) (ES Appendix 2.4) which provides an evaluation of the risk of flooding within the Site and includes an Outline Drainage Strategy (‘ODS’) which is secured by a DCO Requirement.

Application of Design Principles

6.8.2 Influential Project DPs for this topic are evident in measures to avoid or mitigate adverse environmental effects (PE.1) and to retain and enhance blue and green infrastructure features (PL.1). DP V.3 which recognises the temporary nature of the project and promotes an NBS approach to

environmental issues has been highly influential. This is most applicable to drainage, where the proposed SuDS strategy is landscape-led and relies on multifunctional GI benefits to avoid over development (C.2 and PL.1).

Design Response

The Water Environment

6.8.3 The Site's water environment includes linear blue infrastructure features (watercourses), waterbodies (pond), and the land from which rainwater flows into these features or infiltrates into groundwater. For the Proposed Development this topic is relevant to flood risk, water quality, and biodiversity and has been a strong influence on design.

6.8.4 The principal design response has been the application of minimum 8m buffer from the top of the bank of a watercourse as secured by the Works Plans and in accordance with requirements of the EA and LLFA. It is also known that due to the topography of most of the Site's watercourses, the actual buffer is likely to be more than the 8m minimum.

6.8.5 An exception to the 8m buffer allows Work No.3 to provide crossing points. Mitigation remains embedded in the design by defining crossing locations only where there are already existing crossings. The detailed design will select from these locations, and it is known that not all potential crossings will be required. The design also takes a conservative approach by including 10m either side of existing crossings in Work No. 3 to enable upgrade activities (e.g. replacement or reinforcement of existing culverts) although it is also known that such an extent is improbable. This allows the application to assess the worst case and design mitigation on this basis.

6.8.6 The OCEMP sets out how the Applicant will engage with the LLFA to secure 'Ordinary Watercourse Consent' (OWC), with all crossing works to be in accordance with the OWC method statement which will set out how environmental effects will be minimised. This approach is secured via the OCEMP and is agreed with the LLFA as a suitable way to enable design flexibility without posing an uncontrollable risk to the water environment.

6.8.7 A second design response directed at the water environment is the protection of watercourses from Site activities via control documents (e.g. OCEMP, OLEMP, OOMP) which go beyond only a requirement for a buffer (e.g. the use of silt fencing during construction and the use of barriers during operations to prevent sheep grazing along banks).

6.8.8 These will sit alongside the enhancement of watercourses as habitats as per the LSP and OLEMP. The BNG Report takes a cautious approach to watercourse units with a 12.56% uplift based on assuming only 1.029km of the 4.84km of linear watercourses on the Site can be improved, which is at least partly due to the allowance made for Work No. 3 crossings. However, the OLEMP only secures a lower 5% minimum commitment. This largely reflects uncertainties of what the baseline could be in advance of detailed design, and the BNG Report's outcome is a minimum aspiration for what should be achievable based on the following good design deliverables:

- All watercourses are classified as 'poor' or 'moderate' but with reduced nitrate input from a cessation of grazing; riparian planting; reducing run-off from better land management; and stopping siltation from poaching and tracks, it should be possible to achieve "moderate" and "good".
- All watercourses will have a fringe of aquatic marginal vegetation along more than 75% of the ditch to be delivered via the LEMP.
- There will be no damage to watercourses caused by poaching; tracks; management or from machinery or storage via control documents such as the CEMP, SMP, and OMP.

6.8.9 The above design measures, combined with the management of grazing, the 8m buffer to watercourses, and pollution management measures outlined in the OCEMP and OSMP, are anticipated to provide mitigation and deliver a positive impact on the watercourses as habitats and on the water quality of watercourses within the Site, and downstream.

Flood Risk and Drainage

6.8.10 As confirmed by the FRA most of the Site is at low flood risk other than isolated areas of higher risk along linear watercourse features and other topographic depressions. Although solar farms can be compatible with

flood risk conditions, the ODS commits to a sequential approach to the detailed design in which more sensitive infrastructure such as PCS units and Work No. 2 will be located only in low-risk areas.

6.8.11 The ODS approach to SuDS is grounded in research by Cook and McCuen[13] which found that, providing full vegetation cover beneath solar arrays is maintained, *'the change in runoff characteristics from solar farm sites is likely to be insignificant and that ground cover has a highly significant control over runoff.'* This has led to a NBS approach that relies on ecosystem services provided by ground cover and boundary vegetation to avoid over-engineering. This will help to maintain soil hydrological conditions for existing and new boundary vegetation and to avoid the development of off-Site dependencies on engineered features that would be removed when the Proposed Development is decommissioned.

6.8.12 The ODS relies on the retention and enhancement of grass coverage and avoiding bare ground to prevent erosion and change to existing greenfield characteristics. Impacts are also minimised through parameters such as the requirement that internal access tracks be of a permeable construction and for gaps between solar arrays to provide natural filter strips that slow overland flows. The majority of the DS will therefore be delivered by via the LEMP, with planting relied on to reduce runoff, encourage interception, infiltration and evapotranspiration, and provide water quality treatment before surface water enters any watercourses in and surrounding the Site.

6.8.13 This will be complemented by targeted SuDS (such as gravel subbases) for those elements that could otherwise increase runoff by introducing new impermeable areas. It also recognises that Work No. 2 may require engineered drainage with discharge to a watercourse subject to OWC. Other measures such as swales or filter drains will also be considered. The ODS secures a DS that is supported by evidence from microdrainage calculations that account for worst case climate change scenarios and will

[13] Cook, L. M., & McCuen, R. H. (2013). Hydrologic Response of Solar Farms. Journal of Hydrologic Engineering, 18(5).

set out a strategy that is agreed in advance with the LLFA based on the detailed design's layout and equipment specifications.

The Water Environment and Flood Risk Design Review Conclusions

6.8.14 Good design has been secured by the Works Plans which include buffer distances to watercourses, by management plans for working practices that prevent adverse effects, measures to improve watercourses as habitats and for the benefit of water quality and adopting a nature-based solutions approach to drainage which is informed by research and agreed in consultation with the LLFA.

6.9 Use of Agricultural Land

6.9.1 The majority of the Site is in agricultural use and is intensively grazed by sheep. Although the ALC Report (ES Ch.2, Appendix 2.8) confirms no land in the Site is BMV land, the topic has remained important to good design efforts. This has been sought through measures to support soils and for continued co-located agricultural use. As soil resource conservation is discussed in section 6.7 above, this section of the DAD focuses on the multifunctional benefits of co-located grazing.

Application of Design Principles

6.9.2 Natural England recognise that achieving net zero depends on changing land use and management, and that around one-fifth of agricultural land will need to be released before 2050[14]. This is supported by research that confirms grazed grassland leads to better soil carbon sequestration (SOC) than mown grassland due to the greater return of organic matter and nutrients. Grazing also alters the soil microbial community which enhances the availability of substrate which favours SOC[15].

6.9.3 By providing opportunity for co-located grazing the Proposed Development incorporates the aims of DPs by making efficient use of land (C.2), creating multiple forms of 'value' through enabling the diversification of the

[14] Natural England. 2021. Carbon Storage and Sequestration by Habitat 2021 (NERR094).

[15] Gilmullina, A. and others. 2020. Management of grasslands by mowing versus grazing – impacts on soil organic matter quality and microbial functioning. Applied Soil Ecology. 156: 103701.

rural economy (V.5), and having regard for existing use and the contribution of continued grazing to landscape character. (PL.3).

Design Response

6.9.4 The design response to the Site's potential for co-located grazing use balances several considerations. There are clear benefits to the rural economy, and to maintaining a use that reflects the landscape character. There are also benefits to the Applicant as the grazing minimise O&M activities for mowing and removal of arisings. However, these have had to be weighed against the potential disbenefits of grazing, particularly for green and blue infrastructure outcomes (e.g. ground cover quality and species diversity, boundary vegetation as landscape screening, and water quality) which rely on the cessation of intensive agricultural use.

6.9.5 The design response has been to provide a OLEMP which includes an Outline Grazing Management Plan (OGMP) for grazing to be managed in a way that reinforce the ambition to create habitats and functional GI and avoid environmental impacts during the Site's operational lifetime. This approach was informed by the advice of the project ecologist and landscape consultant, with inputs from water quality specialists, while being sensitive of the interests of the farm as a business.

6.9.6 The OGMP facilitates continued co-located conservation grazing[16] at a reduced intensity for land management. It reflects consideration of measures such as prevention of agricultural runoff into watercourses and so the benefits of planting such as wildflower grassland isn't undermined by grazing activity. The OGMP is therefore intended to maintain and manage grassland habitat creation in a way in which contributes to the BNG objectives and prevents overgrazing.

Use of Agricultural Land Design Review Conclusions

6.9.7 Good design, as it relates to the use of agricultural land, applies to designing a strategy to facilitate sheep grazing which is sensitive to the

[16] Department for Environment, Food & Rural Affairs. Blog: Farming. Available from: https://defrafarming.blog.gov.uk/graze-with-livestock-to-maintain-and-improve-habitats/. Accessed February 2025.

current use of the Site (PL.2), makes efficient use of land through co-location (C.3) and creates multiple forms of value through: enabling continued agricultural activity and economic contribution to the rural economy (V.3), using an NBS approach to managing GI to establish species diverse grassland in line with ecological objectives, and improving water quality (V.1, PL.1).

6.10 Environmental Health

6.10.1 While most topics already discussed relate to environmental health and amenity outcomes, this section focuses on the effects arising from noise, light pollution, and air quality. As per ES Chapter 2 – EIA Methodology **[REF: 6.1]** Table 2.7, these are 'scoped out' of the ES as individual chapter topics but remain relevant to assessment of effects associated with 'scoped-in' chapters and are important for achieving good design in Works Plans and control documents such as the OCEMP and OOMP.

Application of Design Principles

6.10.2 The objective with respect to environmental health is to ensure that the detailed design for the location of infrastructure, materials / equipment types selected, and landscape mitigation, as well as the design of the implementation and monitoring measures in control documents have regard for sensitive receptors and can provide appropriate adaptability for changing conditions without undermining the effectiveness of the controls. Project DPs that are most relevant include PE.1, PE.3, C.3, PL.3, and V.1.

Design Response

Noise Effects

6.10.3 Noise effects which require design consideration include noise arising from activities during construction and decommissioning (e.g. vehicles, plant and machinery) and from the operational generating station equipment. The Proposed Development's potential for noise effects has been considered for all phases, with good design delivered by the Works Plans and control documents such as the OCTMP, OCEMP, and OOMP.

6.10.4 With respect to activity related noise, no activities are expected to be of a nature that cannot be sufficiently mitigated by targeted and general best practice measures for solar farm construction and operations. Control documents secure working hours restrictions, requirements to make considerate choices about equipment and working practices and provide commitments relating to community engagement and responsiveness.

6.10.5 Solar PV is a passive generation technology and noise emitting sources are limited to the PCS Units (which only operate in daylight hours when background noise levels are higher) and parts of Work No. 2. A Noise and Vibration Impact Assessment (NIA) (ES Ch.2, Appendix 2.6) **[REF: 6.3]** has informed the design of where Work No. 2 could be sited without noise exceeding the SOAEL for nearby NSR and is secured by the Works Plans. A similar location constraint for PCS Units was identified at Scoping but was removed for the PEIR (Figure 5.2) and is not included in the Works Plans or DPD.

6.10.6 A design restriction on the location of PCS Units via Works Plans is not considered necessary because such a restriction would not be the only means by which to secure an outcome of noise effects not exceeding the SOAEL when, at this stage, a model to inform the constraint is not based on the exact technology and layout specified in pre-construction.

6.10.7 An alternative form of mitigation to avoid undue restraint on optimal engineering configuration is provided by the DCO Noise Requirement. This commits to an operational generating station informed by an updated noise model so that PCS Units are not designed in a way that could have significant adverse noise effects (either due to their locations and/or lack of attenuation in the unit itself). This represents an approach to good design that ensures that best performance in respect of Project DP C.1 (renewable energy output) can be delivered alongside DP PE.1 (environmental health and amenity).

Light Pollution Effects

6.10.8 Light pollution which requires design consideration include effects arising from the presence of lighting for activities/operations (e.g. security lighting) and the potential for adverse glint and glare (G&G) effects on nearby sensitive receptors (road users, dwellings, and aviation).

6.10.9 A sensitive lighting strategy for the construction and operation of the Site is secured by the OCEMP and OOMP/OLEMP. This ensures any use of lighting would be strictly controlled; no permanently-on lighting will be required, and any lighting use would be time-limited for a specific requirement and would be cowled 'down-lighting' that is not directed at sensitive receptors such as ecological corridors.

6.10.10 The potential for G&G effects is set out in the Glint and Glare Assessment (ES Ch.7, Appendix 7.9) **[REF: 6.3]** which uses a definition of glint and glare aligned with NPS EN-3 at paragraph 2.10.102.

6.10.11 Mitigation is embedded in the technology itself as the photovoltaic process depends on light absorption. The anti-reflective coating of the panels minimises effects and the metal materials on the Site are matte and do not glint or gleam in the light. These properties are secured via the DPD.

6.10.12 The G&G Assessment considers potential glint and glare impacts on road users, dwellings, and a seasonal aerodrome (Gilgarran airfield) which is in use for a maximum of 28 days of the year. The was revealed in non-statutory consultation by local residents, demonstrating the value of consultation to the design process (PE.3). The inclusion of all possible receptors in the assessment, such as road users despite the local roads not being of a nature where such assessment is required by minimum standards, demonstrates a proactive approach to ensure all possible effects are understood and minimised (PE.1 and 3).

6.10.13 Much of the screening of this effect will be from existing topography and off-Site vegetation, reflecting the strengths of the landscape-led site selection process and design. The G&G Assessment confirms no residual

adverse effects on sensitive receptors due to mitigation secured via the LSP and OLEMP.

6.10.14 A proactive approach is further reflected in the commitment to re-model glint and glare based on the detailed design and updated assessments such as the tree survey, as well as securing in the management plans temporary measures such as mesh barriers to ensure that screening is provided before any planting has matured. This reflects DPs PE.1, PE.3, and V.2 in ensuring that the application is not just prepared to secure consent, but mitigation is timed and managed in a way that secures the effectiveness of good design throughout multiple phases.

Air Quality Effects

6.10.15 The Site itself is not under any air quality designations such as Air Quality Management Area (AQMA) and there are limited sensitive receptors as residential dwellings and public footpaths. Additionally, solar farms are not associated with operational air quality effects. Where emissions are possible is in the construction and decommissioning phases, which is where the good design efforts have focused (DP PE.1).

6.10.16 The Proposed Development's response is delivered via management plans, particularly the OCEMP, OCTMP, and OSMP (with the FDMP establishing a commitment to their equivalents for decommissioning). The approach secured by these documents has been agreed with the EHO, who will be consulted further as part of the detailed design and discharge of Requirements process (DP PE.3).

6.10.17 The Proposed Development is not a form of energy generation associated with adverse air pollution effects from dust and emissions. There is a potential for adverse air quality impacts, but these are readily mitigated via standard construction best practice including adherence to the Construction, Design and Management (CDM) Regulations[17] regime and compliance with measures in place as mitigation for other effects. This

[17] The Construction (Design and Management) Regulations 2015. SI 2015/51.

includes things such as wheel washing to prevent safety risk to the public highway, and the soil resource management measures in the OSMP.

6.10.18 The inclusion of a minimum of two Electric Vehicle charging points on-Site will support the transition to electric O&M vehicle fleets further reflects the Applicant's commitment to environmental health (DPs C.1, C.3, and PE.1).

7 Summary

7.4.7 The design of the Proposed Development has been informed by relevant local and national policies with respect to Section 4.7 of National Policy Statement EN-1 (EN-1), and the NIC's principles for 'good design'. This is reflected in the Proposed Development's approach to design as represented by the Project Design Principles.

7.4.8 Table 7.1 sets out the Project DPs and provides a summary of each of these are addressed within the DCO application under headings provided by the NIC guidance.

Table 7.1: Review of Project Design Principles

Project DPs	Compliance
NIC Design Principle - Climate	
C.1 - *Generate clean renewable energy for export to the grid to support the transition to a 'net zero' energy supply.*	The Proposed Development will export 150MW of renewable energy. During the operation of the Proposed Development, there will be a potential carbon saving resulting from the export of renewable electricity to the local distribution network, in lieu of the current energy mix, which include fossil fuels and renewable sources. This is anticipated to be a carbon saving of approximately 8,986.03 tCO2e per annum. This is a saving of approximately 359,441.2 tCO2e over the 40-year operational lifespan of the Proposed Development.
C.2 - *Provide multifunctional green infrastructure to ensure green energy infrastructure is complemented by ecological betterment for a joined-up approach to the climate and biodiversity crisis.*	The ecological and landscape enhancements described within the LSP and OLEMP demonstrate how a holistic, nature-based solutions approach has been applied to the design of mitigation, so that it contributes to the GI value of the Site. In combination, the multifunctional benefits provided by proposed GI will contribute to the fight against climate change and biodiversity loss. This is discussed further within Sections 6.4, 6.5, and 6.8 of this DAD.
C.3 - *Support sustainable development through good design that makes efficient use of land and ensures the Proposed Development is adaptable and resilient in the face of a changing climate.*	The Site is used efficiently, with an on-Site POC which avoids transmission losses associated with extensive cable routing (Section 5.2), supporting co-located agricultural use and continued sheep grazing (Section 6.9), and providing a positive use for land with an extensive history of coal mining (Section 6.7). The Proposed Development has been designed to be responsive and resilient to future climate change, evidenced in the choice of a Site with a low flood risk, and enhancement of watercourses to improve their function which will benefit watercourses downstream. It is further integrated in management plans such as the OLEMP, which considers the susceptibility of vegetation and wildlife to periods of climate extremes, and how new and retained vegetation can provide thermal shading and be managed to ensure resilience for biodiversity.
NIC Design Principle - People	
PE.1 - *Deliver the Proposed Development in a way which is considerate and avoids or minimises potential impacts on the health and amenity of the local community.*	The outline management plans set out measures to control air quality, pollution, waste, and noise which will minimise potential impacts on health and amenity and include protocols for ongoing engagement and addressing complaints. The Applicant has sought to contribute to the health and wellbeing of the local community through proposing two permissive paths which will improve the

Project DPs	Compliance
	accessibility of enhanced green infrastructure, which is known to have mental as well as physical health benefits.
PE.2 - *Deliver public benefit through improved access and enable public enjoyment of the Site's natural environment and cultural heritage assets through new opportunities for outdoor recreation.*	As above, two permissive paths are proposed which will be of positive local recreational value and will enable access and appreciation of the Stone Circle and Cairn on Dean Moor, and of the proposed new and enhanced GI on-site.
PE.3 - *Embed principles of meaningful consultation (including accessibility and inclusivity) across all aspects of the Proposed Development so as to positively influence design, delivery (construction), and operations.*	Engagement with local communities and stakeholders has been embedded through all stages of the pre-application process and the evidence of how this has shaped the Proposed Development is discussed within Section 5.4. The principle of meaningful consultation is embedded within the outline management plans, which provide mechanisms for updates and liaising with the community and will continue forward into construction and operation.
NIC Design Principle - Places	
PL.1 - *Improve the GI value of the Site so that it can be a positive hub for ecological betterment, with improvements to include BNG in excess of 10%.*	The GI proposed within the Site has been designed to connect to off-site habitats to create corridors and local networks of GI. The Applicant has committed to delivering BNG in exceedance of 10%. The proposals for GI, habitat retention and enhancement, and managed sheep grazing, and the benefits this has to species using the Site, water quality, and recreational users of the permissive paths are discussed within Sections 6.4 and 6.5 of this DAD.
PL.2 - *Have regard for the existing land use and ensure the Proposed Development provides opportunities for continued co-located agriculture, with benefits from retaining aspects of landscape character and supporting the rural economy.*	Continued sheep grazing will be supported during the operational phase at a reduced intensity for land management. This co-located agricultural use will be managed to the benefit of grassland habitat creation and contribute to the BNG objectives and preventing overgrazing. There are clear benefits to the rural economy, and to maintaining a use that reflects the landscape character.
PL.3 - *Respect the setting of heritage assets and take a landscape-led approach to design*	The need to avoid effects on the setting of the Stone Circle and Cairn Scheduled Monument, Grade II Listed Wythemoor Sough, and LDNP and WHS has been a key consideration throughout the site selection, and design process. The general approach, as set out in Section 6.6 has been to avoid

Project DPs	Compliance
which avoids or minimises potential impacts on sensitive receptors.	sensitive areas where possible and break up impacts through landscaping. The landscape-led approach has contributed to a design which is sensitive to existing landscape features within the Site and the landscape character and minimises visual impacts on local dwellings and potential glint and glare impacts through appropriate screening and siting of infrastructure.
NIC Design Principle - Value	
V.1 - *Embed circular economy and nature-based-solutions principles into the design (including management plans) so that choices for the Proposed Development reflect its temporary nature and support sustainable decommissioning*.	As a temporary development, the circular economy principle of 'Designing for Disassembly' has been considered in the design decisions. This is reflected in the commitments made within the FDMP, including to a Site Restoration Scheme to ensure that appropriate GI features are retained, and vegetation is protected without loss, and an expectation that the DMP will demonstrate that no materials which can be re-used or recycled are disposed of in any other way without compelling justification. This is complemented by adopting a nature-based solutions approach, wherever possible, minimising the 'built' elements, for example in the use of natural drainage features which mimics greenfield runoff (see Section 6.8).
V.2 - *Smart engagement with stakeholders that sets reasonable expectations of the Proposed Development grounded in what can be tangibly delivered.*	The Applicant's extensive experience with the construction and operation of solar farms has informed the development of a design that is viable and can be delivered as proposed. This experience has ensured that the efforts to achieve good design are based on realistic assessments of the works and activities throughout all phases of the Proposed Development, and that the appropriate mitigation and enhancement measures that can be delivered are communicated through and informed by stakeholder engagement. Examples of this are in the approach to securing BNG which is environmentally ambitious, but is realistic about commitments that can be assuredly secured absent a final design, agreeing a staged approach to archaeological investigation and mitigation,
V.3 - *Ensure the Proposed Development can be delivered in a manner that adds value to the local economy and provides diversification and not displacement of rural economic activity.*	Renewable energy is an important form of farm diversification. The Proposed Development will support co-location with agricultural use and continued sheep grazing which would maintain agricultural activity and provide an economic contribution to the rural economy.