Dean Moor
Solar Farm

EIA Scoping Report

on behalf of **FVS Dean Moor Limited**

August 2023

Prepared by: **Stantec UK Limited**
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Revision: **0**
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations

Firma Energy

ib vogt

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1. Introduction

1.1. Purpose of this Report

1.1.1. The Dean Moor Solar Farm comprises the construction, operation and maintenance, and decommissioning of a renewable energy generating project (the 'Proposed Development') on approximately 279.50 hectares ('ha') 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').

1.1.2. The Proposed Development has an expected energy generating capacity in excess of the 50 mega-watt ('MW') threshold for onshore generating stations in England and therefore constitutes a 'nationality significant infrastructure project' ('NSIP') under sections 14(1)(a) and 15(1) and (2) of the Planning Act 2008 ('2008 Act'). Accordingly, FVS Dean Moor Limited (the 'Applicant') intends to make an application for a Development Consent Order ('DCO') to authorise the Proposed Development. The DCO will include a description of the Proposed Development and will be accompanied by an Environmental Statement ('ES') prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations'), the development falling under Schedule 2 of the EIA Regulations.

1.1.3. As the first stage in the DCO process, the Applicant has prepared this Environmental Impact Assessment ('EIA') Scoping Report, which presents an initial review of the potential impacts associated with the construction, operation and maintenance, and eventual decommissioning of the Proposed Development. The purpose of the Scoping Report is to request a formal Scoping Opinion from the Secretary of State for Energy Security and Net Zero ('SoS') in accordance with Regulation 10 of the EIA Regulations and to ensure a proportionate EIA. The benefits of delivering a proportionate EIA, as defined

by the Institute of Environmental Management and Assessment ('IEMA') (2017)[1], are to:

i. Drive collaborative action and understanding across the EIA community;
ii. Focus assessments so their findings are accessible to all stakeholders;
iii. Reduce uncertainty and risk within project consenting;
iv. Save time and costs for developers, consenting authorities and consultees; and
v. Allow more time to be spent exploring the delivery of environmental improvements.

1.1.4. An integral element of this Scoping Report is to consider the aspects which are not considered likely to be 'significant' and can therefore be scoped out of the ES in the interests of proportionality. The ES, which reports the proportionate EIA, will be based on the Scoping Opinion, informed by the recommendations of the consultees and the information contained within this Scoping Report.

1.2. Introduction to the Applicant

1.2.1. FVS Dean Moor Limited (the 'Applicant') is a joint-venture partnership between two renewable energy development specialists, comprising Firma Energy and Ib vogt ('IBV').

1.2.2. Firma Energy, founded in 2021, is an independent management-owned business based in Leeds. Firma Energy focuses on creating and delivering renewable energy developments with environmental and social benefits.

1.2.3. Across the UK, Firma Energy currently has over 260MW of solar farms and 347MW of Battery Energy Storage Systems ('BESS') in development.

1.2.4. IBV is a leading renewable energy developer specialising in utility-scale solar photovoltaic ('PV') farms and BESS infrastructure. With a long-standing history and depth of international talent, IBV was the second-largest developer in the UK from 2012-2017, successfully built and operated over 490MW of solar

[1] Available at: https://www.iema.net/resources/reading-room/2017/07/18/delivering-proportionate-eia Accessed May 2023

projects, and is currently constructing the UK's largest hybrid portfolio comprising 350MW of solar and 250MW of BESS. Active on every continent, IBV has over 40GW of development projects in the pipeline globally.

1.2.5. IBV's success is based on more than technical expertise; the company is driven by strong values that prioritise sustainability and high-quality local development. This commitment is underscored by participation in the United Nations Global Compact, further solidifying a dedication to responsible and ethical practices. IBV projects are designed and delivered with consideration for communities at their core. Through positive engagement and local investment, IBV strives to empower local resilience while addressing the global challenges of climate change. A core of development and engineering excellence is at the heart of a mission to create a greener future through renewable energy solutions.

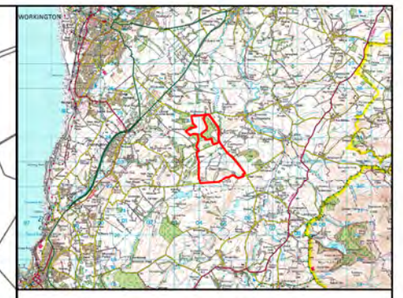
1.3. The Scoping Boundary

1.3.1. Figure 1.1 illustrates the scoping boundary that has been used to inform this Scoping Report. The scoping boundary is defined as the area within which the Proposed Development and electrical infrastructure will be located, including the temporary work areas.

Figure 1.1: Site Location Plan

N

0 0.5 1 1.5 2 km



Legend

Draft Order Limits

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Site Location Plan

Scale: 1:12,500 @ A3	Date: 31/07/2023
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Figure: 1.1 Sheet 1 of 1	Rev: A

Stantec

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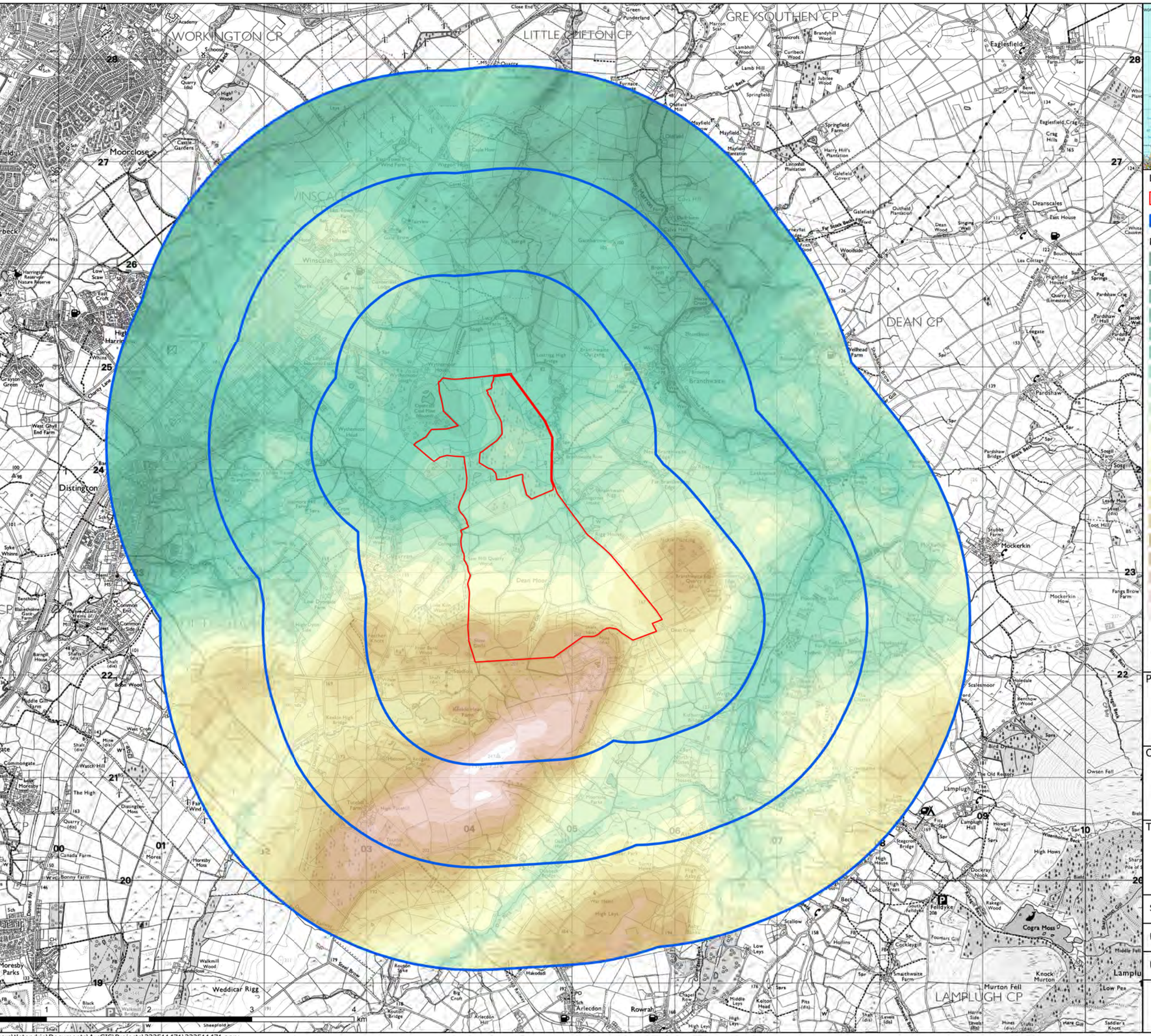
1.4. Site Location and Description

1.4.1. The Site area extends to 279.50ha and is located approximately 1.1km east of the Lillyhall Industrial Estate, 6.5km east of the small village of Gilgarran, 1.3km west of Branthwaite, and 6km southeast of Workington town centre on the west Cumbrian coast as shown on Figure 1.1. The hamlet of Branthwaite Edge is directly adjacent to the east of the Site.

1.4.2. The northern part of the Site boundary adjoins an unclassified road, hereafter referred to as “Branthwaite Road”. The southern part of the Site boundary abuts Dean Cross Road. The unnamed north/south road between Branthwaite Road and Dean Cross Road, forming the eastern boundary of much of the Site, is “Branthwaite Edge Road”. The Site is bisected by an unclassified road between Gilgarran and Branthwaite Edge, hereafter referred to as the “Gilgarran Road”.

1.4.3. Land within the Site is typical of the surrounding area; comprising undulating predominantly pastoral land which at times curtails views from the surrounding area, providing a feeling of containment. Land within the Site tends to fall south to north, with a plateau of land along the Site’s southern boundary lying at approximately 200m Above Ordnance Datum (‘AOD’), falling relatively sharply initially by around 60m over a span of some 350m before taking on a more undulating form, falling to around 100m AOD at the northern boundary of Area A. The topography of the Site and the surrounding area is shown on Figure 1.2.

Figure 1.2: Topography of the Site and Surroundings



Legend

🟥 Draft Order Limits

🟦 Distance from Draft Order Limits (1, 2, and 3km)

Elevation

- ▨ 40.0m - 50.0m AOD
- ▨ 50.0m - 60.0m AOD
- ▨ 60.0m - 70.0m AOD
- ▨ 70.0m - 80.0m AOD
- ▨ 80.0m - 90.0m AOD
- ▨ 90.0m - 100.0m AOD
- ▨ 100.0m - 110.0m AOD
- ▨ 110.0m - 120.0m AOD
- ▨ 120.0m - 130.0m AOD
- ▨ 130.0m - 140.0m AOD
- ▨ 140.0m - 150.0m AOD
- ▨ 150.0m - 160.0m AOD
- ▨ 160.0m - 170.0m AOD
- ▨ 170.0m - 180.0m AOD
- ▨ 180.0m - 190.0m AOD
- ▨ 190.0m - 200.0m AOD
- ▨ 200.0m - 210.0m AOD
- ▨ 210.0m - 220.0m AOD
- ▨ 220.0m - 230.0m AOD
- ▨ 230.0m - 240.0m AOD
- ▨ 240.0m - 250.0m AOD

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Topography of Site and Surroundings

Scale: 1:35,000 @ A3	Date: 31/07/2023
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Figure: 1.2	Rev: A

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1.4.4. Notable landscape features within the Site include woodland blocks of varying maturity and minor watercourses within Area C (see below) which mainly run from the high plateau at its southern boundary northeast towards Branthwaite Edge. Aside from the woodland blocks vegetation is broadly limited to field boundary hedgerows, often supported by legacy dry-stone walls or timber post and wire fencing.

1.4.5. For ease of reference, the Site is divided primarily into three areas referred to as Areas ‘A’, ‘B’, and ‘C’ as shown on Figure 1.3.

i. Area A – Land south of Branthwaite Road (approximately 44ha);
ii. Area B – Land south of Branthwaite Road and north of Gilgarran Road (approximately 19.6ha); and
iii. Area C – Land south of Gilgarran Road and north of Dean Cross Road (approximately 208ha).

1.4.6. The areas identified do not total the Site area of 279.50ha, as the Draft Order Limits also include land between these three areas, such as land associated with existing highways or wind turbines, where access improvements or buried cabling may be located.

Figure 1.3: Solar Farm Area Plan

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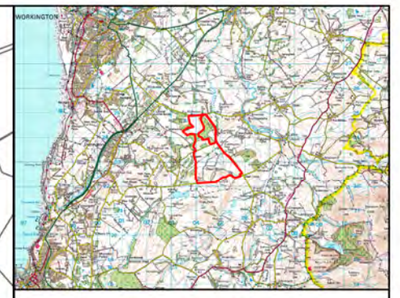
Field Area A - Land south of Branthwaite Road (approx. 44ha)

Field Area B - Land south of Branthwaite Road and north of Gilgarran Road (approx. 19.6ha)

Field Area C - Land south of Gilgarran Road and north of Dean Cross Road (approx. 208ha)

0 0.5 1 1.5 2 km



Legend

- Draft Order Limits
- Field Areas

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Solar Farm Area Plan

Scale: 1:12,500 @ A3	Date: 31/07/2023
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1.4.7. The existing land can be divided approximately into the following land use types:

i. Grazing Land – 238.70ha;
ii. Existing Farm Buildings and Curtilage – 0.6ha;
iii. Woodland – 11.84ha;
iv. Highways land – 5.52ha;
v. Wind Farm and Curtilage – 3.43ha; and
vi. Scrubland Vegetation – 19.41ha.

Figure 1.4: Land Use Area Plan

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AVS Cumbria Metals Salvage Yard

Branthwaite

Potato Pot Wind Farm

Branthwaite Edge

Gilgarran

Dean Moor Farm

Fulton's Landrovers

Dean Moor Motocross Park

0 0.5 1 1.5 2 km

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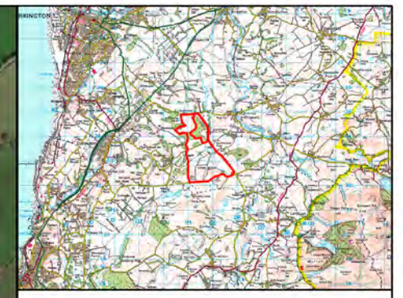

Legend

- Draft Order Limits
- Wind Farm and Curtilage (3.43ha)
- Highways and Verges (5.52ha)
- Existing Woodland (11.84ha)
- Grazing Land (238.70ha)
- Existing Farm Buildings and Curtilage (0.60ha)
- Existing Scrubland Vegetation (19.41ha)

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Indicative Land Use

Scale: 1:12,500 @ A3	Date: 04/08/2023
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Figure: 1.4	Rev: A

Stantec

1.4.8. The Site is rural in character and is predominantly used for sheep grazing, although is not an unspoilt landscape as the Site is affected by the presence of pylons, overhead lines ('OHL') and wind turbines. The northern portion of the Site (Areas A and B) is identified on Ordnance Survey ('OS') maps as Wythemoor and the southern part of the Site (Area C) as Dean Moor.

1.4.9. There are areas of recently planted woodland adjacent to Area A of the Site, and outside the Site.

1.4.10. The land in Areas A and B were used by a colliery of opencast coal mining which was operational between the late 1980s and early 1990s. These areas of the Site have since been restored to agricultural use.

1.4.11. Area C of the Site is predominantly in pastoral agricultural use but has limited historic uses of quarrying and mining. The quarries recorded on the historical maps remain visible on contemporary aerial imagery, and therefore are not considered to present an environmental hazard to the Site.

1.4.12. The Site is in a sparsely populated location, and there are no dwellings within the Site. There are three isolated dwellings in proximity to Area C, including a bungalow and farmhouse west of the Site at Dean Moor Farm, and a dwelling at Fulton's Land Rover Garage, adjacent to the southeast corner of the Site. To the north (east of Area A) is the AVS Cumbria Metals salvage yard and the Dean Moor Motocross Park is located immediately south of Area C.

Grazing Land

1.4.13. The Site primarily consists of agricultural land, which is in intensive pastoral grazing use. Area C benefits from a historic Agricultural Land Classification ('ALC') survey recorded by Defra (Department for Farming and Rural Affairs).

Existing Wind Farm

1.4.14. There is an existing operational wind farm, known as 'Potato Pot Wind Farm' ('the Wind Farm') (planning ref. 2/2012/0594), which consists of three wind turbines and a control and services building located within Areas A and B.

Existing Overhead Power Lines

1.4.15. The Proposed Development would include a new substation to connect to the existing 132 kilovolt ('kV') OHL which runs across Area C of the Site. There are various sections of 11kV OHL within the southern and northern parts of the Site, as shown on Figure 1.4 above.

1.5. Notification that DCO Application will be accompanied by an ES

1.5.1. The Applicant hereby gives notice, pursuant to Regulation 8(1)(b) of the EIA Regulations, that the application for a DCO will be accompanied by an ES. The ES will include at least the information set out in Regulation 14(a) – (e) and any additional information specified in Schedule 4 relevant to the specific characteristics of the Proposed Development and to the environmental features likely to be significantly affected. It will include the information reasonably required for reaching a reasoned conclusion on the significant effects of the Proposed Development.

1.6. Request for Scoping Opinion

1.6.1. This Scoping Report has been prepared by Stantec, IEMA qualified assessors, on behalf of the Applicant with regard to land at Dean Moor, Gilgarran, Cumbria for the Proposed Development. The Proposed Development will be able to generate over 50MW of electricity.

1.6.2. The EIA requirement for NSIPs is transposed into law through the EIA Regulations. The EIA Regulations specify which developments are required to undergo EIA and schemes relevant to the NSIP planning process are listed under either 'Schedule 1' or 'Schedule 2'. Those developments listed in Schedule 1 must be subject to EIA, while developments listed in 'Schedule 2'

must only be subject to EIA if they are considered 'likely to have significant effects on the environment by virtue of factors such as its nature, size or location' (Regulation 3(1) of the EIA Regulations). The selection criteria for Schedule 2 development are set out in Schedule 3.

1.6.3. The Proposed Development is a 'Schedule 2' development under paragraph 3(a) of Schedule 2 of the EIA Regulations as it constitutes *'industrial installations for the production of electricity, steam and hot water'* and is not a project listed in Schedule 1.

1.6.4. Following the completion of the surveys, assessments and consultation processes outlined in this Scoping Report, an application for a DCO will be made to the Planning Inspectorate on behalf of the SoS for determination in accordance with the 2008 Act.

1.6.5. This Scoping Report is submitted in support of a request pursuant to Regulation 10 of the EIA Regulations for a Scoping Opinion from the SoS on the scope, and level of detail, of the information to be provided in the ES. It includes the information required by Regulation 10(3) as follows:

i. A plan sufficient to identify the land (see Figure 1.1);
ii. A description of the Proposed Development, including its location and technical capacity (see this Section 2);
iii. An explanation of the likely significant effects of the Proposed Development on the environment (see Sections 6 to 10); and
iv. Such other information or representations as the person making the request may wish to provide or make (see Figures 1.1 to 10.1 and Appendices 4.1 to 8.1).

1.7. Dean Moor Solar Team

1.7.1. The preparation of the EIA is being led by Stantec working with Kernon Countryside Consultants Limited ('Kernon'), and Pager Power Limited ('Pager Power').

1.7.2. Pursuant to Regulation 14(4) of the EIA Regulations, the ES will be prepared by competent experts and the ES will outline the relevant expertise or

qualifications of the experts. In addition, a number of specialist consultancies are providing expert input into the EIA topic chapters, as indicated in Table 1.1 below.

1.7.3. BDB Pitmans LLP is the legal adviser to the project team for the DCO.

Table 1.1: Dean Moor Solar Farm Project Team

Topic	Author
Planning	Stantec
Agricultural Land and Soils	Kernon
Glint and Glare	Pager Power
Water Resources and Flood Risk	Stantec
Major Accidents & Disasters, Electric, Magnetic and Electromagnetic Fields, Telecommunications Television Reception & Utilities, Wind Microclimate, Daylight, Sunlight and Overshadowing, Waste, Minerals	Stantec
Traffic and Access	Stantec
Ground Conditions	Stantec
Noise and Vibration	Stantec
Cultural Heritage	Stantec
Landscape and Views	Stantec
Biodiversity	Stantec
Climate Change	Stantec
Socio-Economics	Stantec

1.8. General Approach to Scoping Matters In and Out

1.8.1. This Scoping Report has been produced in accordance with the EIA Regulations and appropriate guidance documents. The Inspectorate's *Advice Note 7; Environmental Impact Assessment: Preliminary Environmental*

Information and Environmental Statements[2] (2020), observes that, although not a statutory requirement, the Scoping Opinion is an important document, and the EIA Regulations require the ES to be based on the most recent one adopted. The note identifies that the scoping process allows for early identification of the likely significant effects applicable to the EIA Regulations and provides an opportunity to agree where aspects and matters can be scoped out from further assessment.

1.8.2. Section 4.10 of Planning Inspectorate Advice Note 7 ('AN7') highlights the need to ensure that ESs are appropriately focused on aspects and matters where a likely significant effect may occur, thereby ensuring that the EIA process is proportionate. In accordance with AN7, the Applicant has set out within Section 4 of this Scoping Report justification for scoping matters out and the evidence base for these conclusions.

1.8.3. Further information and justification for those topics intended to be scoped out of the ES are set out in Section 6 of this Scoping Report.

1.9. The Consenting Process

1.9.1. This section outlines the legislative requirements required for the Proposed Development.

1.10. The Development Consent Process Order

1.10.1. In accordance with Section 31 of the 2008 Act, the DCO application process is split into six stages. This Scoping Report addresses the first stage (pre-application).

1.10.2. During pre-application, Part 5 of the 2008 Act requires promoters of a DCO application to engage in pre-application consultation with statutory consultees under Section 42 of the 2008 Act and the local community under Section 47 of

[2] Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/#1 . Accessed May 2023

the 2008 Act. The proposed application must also be publicised under Section 48 of the 2008 Act.

1.10.3. The EIA Regulations make provision for various matters in connection with making a DCO application, including in respect of the pre-application consultation described above. Details of the pre-application consultation with the local community that the Applicant is intending to carry out for the Proposed Development will be published in a Statement of Community Consultation ('SoCC'). Following the completion of pre-application consultation, the DCO application for the Proposed Development will be prepared and submitted to the SoS via the Planning Inspectorate. In line with the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations'), the application will be accompanied by '*the environmental statement required pursuant to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and any scoping or screening opinions or directions'*.

1.11. The Environmental Impact Assessment (EIA) Process

1.11.1. The EIA Regulations set out the statutory process and minimum requirements for the provision of adequate environmental information to enable the EIA process. The EIA, activities, surveys, and studies will be reported in the ES.

1.11.2. The EIA process can be broadly summarised as consisting of three main elements that the Applicant will undertake prior to the submission of the DCO and ES:

i. **Scoping:** The Applicant will submit this Scoping Report in support of a request for a Scoping Opinion from the SoS, who must consult defined consultation bodies before issuing the Scoping Opinion. This report comprises the Scoping Report for the Proposed Development on behalf of the Applicant.

ii. **Consultation:** The Applicant is required to conduct pre-application consultation in accordance with the 2008 Act and associated guidance and Regulations, which includes the EIA Regulations. For EIA

development, the applicant must consult on preliminary environmental information listed in Regulation 14(2) of the EIA Regulations. This information should be reasonably sufficient for the consultation bodies to develop an informed view of the likely significant environmental effects of the development and any associated development. A Preliminary Environmental Information Report ('PEIR') will be produced for the Proposed Development which will build upon findings from this Scoping Report. It will incorporate the findings of the surveys and initial assessments and will enable consultees to develop an informed view of any likely significant environmental effects of the Proposed Development. Feedback will be sought from the local communities and other stakeholders on the PEIR.

iii. **ES Preparation:** The ES will be prepared taking into account the responses to the consultation process. The first five chapters of the ES will be introductory and provide essential information for the subsequent technical chapters. The ES for the Proposed Development will advance the content of the PEIR and incorporate the responses from the consultation and results of the surveys undertaken. It will also describe any changes made to the project and any mitigation measures that need to be implemented. The ES will form part of the DCO application.

1.12. National Policy Statements

1.12.1. Under Section 104 of the 2008 Act, the SoS must have regard to any National Policy Statement ('NPS') which has effect in relation to development of the description to which the application relates (a 'relevant national policy statement') and the application must be determined in accordance with the relevant NPS. Other matters which the SoS must have regard to under Section 104 include any local impact report, any matters prescribed in relation to development of the description to which the application relates, and any other matters which the SoS thinks are both important and relevant to decision.

1.12.2. NPSs set out the Government's objectives for the development of nationally significant infrastructure, and each NPS covers a different sector of nationally

significant infrastructure. There is no current NPS that explicitly deals with solar or energy storage of the nature of the Proposed Development. Therefore, the DCO application for the Proposed Development would need to be determined by the SoS under Section 105 of the 2008 Act. Section 105 provides that the SoS must, in cases where no NPS has effect, have regard to any local impact report, any matters prescribed in relation to development of the description to which the application relates, and any other matters which the SoS thinks are both important and relevant to the decision.

1.12.3. The topic chapters of this Scoping Report make reference to the national policy contained within the emerging NPSs where relevant. The ES will be drafted during 2023 and 2024 and will make reference to the revised NPSs (if designated) or, if it appears that the new NPSs will not have been designated by the time the DCO application is submitted, then the ES will make appropriate references to the existing relevant NPSs and the emerging drafts.

1.13. Approach to Planning Policy

1.13.1. In the event that the revised NPSs are not in place by the time the application is submitted, there are three current NPSs that are important and relevant to the determination of the DCO application for the Proposed Development:

i. **Overarching NPS for Energy (EN-1) (July 2011)**[3] ('NPS EN-1'): Sets out a commitment for the UK to transition to a low carbon economy and establishes the national need for energy infrastructure. It also includes a series of Assessment Principles against which DCO applications for energy infrastructure should be determined.

ii. **NPS for Electricity Networks Infrastructure (EN-5) (July 2011)**[4]: Should be read in conjunction with NPS EN-1. This NPS sets out required assessments and technology-specific matters for consideration.

[3] Available at : https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf. Accessed May 2023

[4] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf. Accessed May 2023

It covers above ground electricity lines where nominal voltage is expected to be 132kV or above. However, paragraph 3.3.2 states that any other kind of electricity infrastructure (including underground cables at any voltage and associated infrastructure such as substations) will be covered by this NPS if it constitutes associated development for which consent is sought along with an NSIP such as a generating station.

iii. **NPS for Renewable Energy Infrastructure (EN-3) (July 2011)**[5] ('NPS EN-3'): Should be read in conjunction with NPS EN-1. NPS EN-3 provides the primary basis for decisions by the Secretary of State for Energy Security and Net Zero on applications for renewable energy NSIPs. Although NPS EN-3 (July 2011) does not specifically mention solar, as it is the adopted version, it is still deemed relevant to the Proposed Development. The draft iteration is set out below.

1.13.2. The UK government published for consultation a suite of draft revised energy NPSs (EN-1 to EN-5) in September 2021. A further round of consultation on the revised drafts commenced in March 2023 and closed in June 2023.

1.13.3. The following provisions of the revised draft NPSs are relevant to the Proposed Development:

i. **Revised (Draft) Overarching NPS for Energy (EN-1) (March 2023)**[6] ('Revised (Draft) EN-1'): This Overarching National Policy Statement for Energy (EN-1) is part of a suite of NPSs issued by the Secretary of State of Department for Energy Security and Net Zero. It sets out the Government's policy for delivery of major energy infrastructure to reach the legally binding net zero target by 2050, as set out in the Climate Change Act 2008 (2050 Target Amendment) Order 2019. Revised (Draft) NPS EN-1 specifically addresses the role of solar, stating solar is one of the lowest cost ways of generating electricity, helping reduce costs and

[5] Available at:https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/37048/1940-nps-renewable-energy-en3.pdf. Accessed May 2023

[6] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf. Accessed May 2023

providing a clean and secure source of electricity supply. UK government analysis demonstrates that a secure, reliable, affordable, and net zero consistent system in 2050 is likely to be composed predominantly of wind and solar. It is also recognised that ensuring an affordable and reliable energy system today, and in the future, requires these technologies to be complemented by a means to supply electricity, or reduce demand, when the wind is not blowing or the sun does not shine.

ii. **Revised (Draft) NPS for Renewable Energy Infrastructure (EN-3) (March 2023)**[7] ('Revised (Draft) EN-3'): Covers renewable energy infrastructure including solar PV above 50MW in England. Revised (Draft) NPS EN-3 recognises solar farms as one of the most established renewable electricity technologies in the UK and the cheapest form of electricity generation worldwide. It provides clear support for large scale solar development, stating that: *'the government has committed to sustained growth in solar capacity to ensure that we are on a pathway that allows us to meet net zero emissions. As such solar is a key part of the government's strategy for low cost decarbonization of the energy sector'.* Furthermore, revised (Draft) NPS EN-3 recognises the important role solar will have in delivering the UK' energy goals for greater energy independence. The British Energy Security Strategy[8] states that government expects a five-fold increase in solar deployment by 2035 (up to 70GW).

1.13.4. Revised energy NPSs are expected to be in place by the time the Applicant's DCO application is submitted. These will replace existing NPSs EN-1 to EN-5.

1.13.5. The SoS has decided that for any application accepted for examination before designation of the 2023 amendments, the 2011 suite of NPSs should have effect in accordance with the terms of those NPSs.

[7] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147382/NPS_EN-3.pdf. Accessed May 2023

[8] Policy paper British energy security strategy (2022). Available at: https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy. Accessed July 2023

1.13.6. The 2023 amendments will therefore have effect only in relation to those applications for development consent accepted for examination after the designation of those amendments. However, any emerging draft NPSs (or those designated but not yet having effect) are potentially capable of being important and relevant considerations in the decision-making process. The extent to which they are relevant is a matter for the relevant SoS to consider within the framework of the 2008 Act and with regard to the specific circumstances of each development consent order application.

1.14. Local Planning Policy

1.14.1. As of 1 April 2023, Allerdale Borough Council ('ABC') merged with Copeland Borough Council and Carlisle City Council to become Cumberland Council, which is now the administrative authority where the Site is located. The Site is located within the former administrative boundary of ABC.

1.14.2. The Local Plan for ABC is considered to be relevant to the Proposed Development, as there are no new planning policies that have been adopted following the formation of the Council in April 2023.

1.14.3. In March 2020, ABC agreed an action plan[9] for tackling climate change. The motion adopted by ABC to address climate change set targets to ensure emissions from its estate and activities are carbon neutral by 2030. At the same time ABC ratified commitment to the Zero Carbon Cumbria Partnership and its net zero target for the whole county by 2037. In doing so, it committed to putting in place policies for ABC to support the Government's statutory obligation to achieve net zero by 2050.

1.14.4. The Allerdale Local Plan (Part 1) - Strategic and Development Management Policies was adopted in July 2014 and sets out a vision for ABC until 2029. The following policies are considered relevant to the Proposed Development:

[9] Allerdale Borough Council, The Council's action plan to address climate change Available at: **https://www.allerdale.gov.uk/en/your-environment/climate-change/climate-change-action-plan/** Accessed July 2023

Strategic Policy S2: Sustainable Development Principles:

'The Local Plan will promote sustainable development as a core principle running through the entire plan. All development within the Plan Area, regardless of scale or nature, will be assessed against this policy.

Economic:

The Council will: … Encourage the development of renewable or low carbon energy resources in appropriate locations given the potential wider environmental, community and economic benefits; …'

Strategic Policy S19: Renewable Energy and Low Carbon Technologies:

'The Council will seek to promote and encourage the development of renewable and low carbon energy resources given the significant wider environmental, community and economic benefits. Proposals where impacts (either in isolation or cumulatively) are, or can be made acceptable will be permitted.

The Council will take a positive view where:

a) Proposals (either in isolation or cumulatively):

i. Do not have an unacceptably adverse impact on the amenity of local residents (such as air quality/emissions, noise, odour, water pollution, shadow flicker);

ii. Do not have significant adverse impact on the location, in relation to visual impact and impact on the character and sensitivity of the surrounding landscape;

iii. Do not have an adverse effect on any European/International protected nature conservation site (including SACs, SPAs and Ramsar sites, candidate SACs, potential SPAs and proposed Ramsar sites) including its qualifying habitats and species, either alone or in-combination with other plans or projects.

iv. Do not have a significant adverse effect on any National nature conservation site (Site of Special Scientific Interest; National Nature Reserve), except where the benefits of the development clearly outweigh both the impact on the site and any broader impacts on the wider network of National sites.

v. Do not result in loss or harm to a Local nature conservation site, including habitats or species supported by Local Sites, unless it can be demonstrated that there is a need for the development in that location and that the benefit of development outweighs the harm or loss.

vi. Do not have unacceptably adverse impact on heritage assets and their settings; …

c. *Appropriate operational requirements are addressed (including accessibility and suitability of road network, ability to connect to the grid, proximity of any relevant feedstock);*

d. *Appropriate measures are included for the removal of structures and the restoration of sites, should sites become non-operational;*

e. *Potential benefits to the local economy and the local community, including agriculture and other land based industries are considered'.*

1.14.5. Other topic specific local planning policies that are considered relevant to the Proposed Development will be set out in respective disciplines throughout the PEIR and the ES.

2. The Proposed Development

2.1. Introduction

2.1.1. The Proposed Development will comprise ground-mounted solar PV arrays, together with battery energy storage, associated infrastructure, and an on-Site grid connection. The Proposed Development will have the capability to export over 50MW of electricity at any time.

2.2. Project Overview

2.2.1. The Proposed Development will include the following key elements of infrastructure:

i. Solar PV modules;
ii. PV module mounting structures;
iii. Solar Inverters-Transformers;
iv. BESS equipment comprising Battery Units, Power Conversion Systems ('PCS'), and associated infrastructure;
v. Point of Connection ('POC') Compound comprising Customer and District Network Operator ('DNO') Substation buildings and external electrical equipment, and on-Site cabling;
vi. Perimeter Fencing (deer fence), Gates, CCTV cameras, and other ancillary infrastructure;
vii. Access tracks; and
viii. Landscape planting and ecological enhancements.

2.2.2. Additionally, during the construction and decommissioning phases, at least two temporary construction compounds will be required, along with temporary access tracks that may be required to facilitate construction, but they are not needed for the operational phase. The compounds will be located within the Site, adjacent to Site entrances, to minimise heavy goods vehicle (‘HGV’) traffic within the Site. Internal access tracks will be required to facilitate the movement of operations and maintenance vehicles around the Site. Where possible, these will follow existing farm tracks around the Site and all tracks,

whether only temporary for construction, or for the operational lifetime, will be of a fully permeable construction.

2.2.3. The design is expected to evolve throughout the EIA process, with infrastructure positioned to avoid or reduce significant effects on any specific designations or assets and, where appropriate, to respond to feedback from consultees and the public. The technologies proposed as part of the Proposed Development (solar PV and BESS) are rapidly evolving, and the application will propose that an appropriate degree of flexibility is maintained to ensure best available technology can be utilised at the point of construction to maximise the benefits and implementability of the Proposed Development.

2.3. Development Components

Solar PV Arrays

2.3.1. Solar PV arrays comprise solar panels placed on a mounting structure framework and arranged in rows (known as arrays), with gaps of approximately 4-6m between each row depending on field topography. Arrays would be oriented east-west across the Site, with the panel facades facing south, maximising the amount of solar radiation absorbed as the sun moves across the sky. The layout of the arrays would allow for landscaping, fencing and access tracks within the Site.

2.3.2. Framework posts would be pile-driven into the ground to a depth of up to 2-2.5m below ground level ('BGL'), depending on pre-construction geotechnical surveys. This means no concrete is needed to secure the system and posts can be easily removed with no permanent impact after decommissioning. Alternatively, non-intrusive 'no-dig' mounting is available where required by ground conditions or below ground sensitivities.

2.3.3. At their lower edge, panels would be approximately 0.8m from the ground and up to approximately 3m at their higher edge. The positioning of arrays responds to existing physical features such as ditches, trees and hedgerows, with panels set back appropriate buffer distances as informed by technical guidance. No earth-moving or ground levelling is required.

Solar Inverter – Transformer

2.3.4. Inverters convert direct current ('DC') generated by the solar PV panels into alternating current ('AC'). Transformers then convert low voltage output from the inverters to high voltage suitable for feeding into the local electric distribution network.

2.3.5. Two options for inverters and transformers are being considered for the Proposed Development and these are described below. For the purposes of this Scoping Report, the Proposed Development has been assessed as using central inverter-transformers because these are slightly larger units with greater potential noise impacts.

Central Inverter-Transformer Units

2.3.6. Central inverter-transformer units would be located throughout the Site. Central inverters would be housed within prefabricated metal containers that are typically finished in a grey or green colour. The modular container solution means no permanent building is required which makes their removal at end of the Proposed Development's operational life easier. The total number of central inverter-transformer units required would be determined through the iterative design process.

String Inverters and Standalone Transformer Units

2.3.7. Alternatively, the Proposed Development could use smaller string inverters which can be fixed to the rear of the array framework or positioned on a frame at the end of an array. If string inverters are utilised, then standalone transformer units would be required. A standalone transformer unit is typically smaller than combined central inverter-transformer units but otherwise have the same characteristics as a containerised solution.

Battery Energy Storage Systems (BESS) Equipment

2.3.8. The Proposed Development would include associated BESS infrastructure facilities. The BESS would be utilised to reinforce the power generated by the solar farm, storing energy at times of low demand, and releasing to the grid in

periods of higher demand or when solar irradiance is lower. The energy stored will also provide balancing services to reinforce grid stability.

2.3.9. The BESS equipment comprises multiple battery containers coupled with a PCS unit. Additional battery interface cabinets may be needed if the functionality cannot be integrated within the battery container. Battery and PCS units are typically finished in an off-white or pale grey colour to discourage heat retention.

2.3.10. The arrangement of the BESS facilities within the Site has not been confirmed for this Scoping Report. BESS facilities can be dispersed throughout a site but are more typically grouped in a dedicated BESS compound located close to the POC infrastructure that facilitates the grid connection.

POC Compound

2.3.11. The POC infrastructure hereafter referred to as the 'POC Compound' includes:

i. The customer substation building and control house;
ii. DNO substation building; and
iii. Customer and DNO external electrical equipment within a security fence.

2.3.12. The customer substation building includes the switchgear that receives electricity from the inverters-transformers before transferring it to the DNO substation via underground electrical cables. This would most likely be a prefabricated glass-reinforced plastic ('GRP') kiosk, typically finished in a grey or green colour.

2.3.13. There will be one control house situated adjacent to the customer substation. This includes monitoring equipment and metering for the solar farm. A weather station, featuring an anemometer, would be situated adjacent to, or if not possible, close to the control house. The structure would primarily comprise a mast, and would be less than 1m wide, and approximately 4m tall.

2.3.14. A DNO substation building is required to facilitate the connection to the grid. The substation would be an Electricity Northwest ('ENW') asset, most likely

constructed in brick or of GRP, depending on DNO specifications in the detailed design process which will occur in the pre-construction phase.

2.3.15. Adjoining the DNO and customer substation buildings will be a fenced area with external electrical equipment including DNO and customer side High Voltage ('HV') and Low Voltage '(LV') transformers. Final electrical specifications will be determined by ENW requirements in advance of construction in accordance with ENW standards in place at the time of construction. The POC Compound infrastructure will connect into the existing 132kV OHL via the existing pylons that run east-west across the north of Area C. No new OHL or pylons are required for the grid connection and no off-Site cable route is required.

Fencing, Security, and other Ancillary Development

2.3.16. The Proposed Development would be secured to prevent theft and criminal damage during both the construction and operational phases of the Proposed Development and to ensure health and safety. Perimeter fencing (approximately 2m high) would be installed around the perimeter of the Site. It is proposed that 'Deer Fencing' with wooden fence poles and galvanised high tensile steel wire between would be used. No industrial metal palisade fencing, wire mesh, or barbed wire fencing is proposed other than for the POC and BESS compounds internal to the Site for safety and additional security. There will be access wing gates at entrances to the Site.

2.3.17. The perimeter deer fencing would enclose the solar panels and allow sheep to graze securely amongst the arrays. Gates will be installed to allow for movement from the access points off into the Site for ongoing maintenance. Provision of mammal gaps at ground level in the fencing will allow continued access for foraging of wildlife across the Site. Exact positions of these gaps can be identified in a post-determination detailed Landscape and Ecological Management Plan ('LEMP').

2.3.18. The perimeter of the Site would be protected by a system of CCTV and/or infra-red cameras to provide full 24-hour surveillance around the internal perimeter. Cameras would be inward facing on poles of up to approximately

3m high, spaced at intervals along the fence line. Cameras would only monitor inside the Site and not record any public or private land outside the perimeter. An intelligent sensor management system would manage the cameras.

2.3.19. No structures on-Site would be permanently lit. However, lighting may be attached to the substation and other structures for access and safety reasons (not for security). No lighting would be attached to the perimeter fencing or for site access purposes. In the limited circumstances where lighting is needed for safety at building or structure access points, this would be shielded, motion sensor activated low intensity down-lighting.

2.4. Construction Phase

2.4.1. It is anticipated that the construction phase will last for 18 months. It is expected that there would be an average of approximately 20 HGV trips to Site per day, or 40 two-way movements over the 18-month construction period. Details will be set out in a Transport Statement to be submitted with the DCO application of the Proposed Development.

2.4.2. Construction activities and deliveries will be carried out Monday to Friday 07:00-19:00 and between 07:00 and 13:00 on Saturdays. No construction activities or deliveries will occur on Sundays or on Public Holidays. A Construction Traffic Management Plan ('CTMP') will set out measures to manage deliveries in a way that seeks to reduce local impacts.

2.4.3. Approximately up to 150 workers are anticipated to be required on-site during the peak construction period. The location where staff will travel from is unknown at this stage as it will depend on the appointed contractor. However, it is envisaged that the majority of the non-local workforce will stay at local accommodation and be transported to the Site by minibuses to minimise the impact on the strategic and local highway network.

2.4.4. Secure temporary construction compounds will be used to store materials and provide welfare facilities during the construction period. The Site will have two primary construction compounds. There are also expected to be up to three

secondary compounds providing a materials hub and welfare and waste management facilities across the Site.

2.4.5. The temporary compound will be formed of a temporary permeable hardcore/gravel base atop a mesh membrane to facilitate ease of removal when construction is complete. Primary compounds will likely include:

i. Temporary gated security fencing (e.g., Heras Fencing), security officer kiosk, and temporary CCTV cameras;
ii. Temporary portable buildings to be used for offices, welfare and toilet facilities;
iii. Materials and equipment storage areas;
iv. Parking and turning areas for delivery vehicles and workers' vehicles; and
v. Wheel washing facilities.

Construction Access

2.4.6. There are expected to be five potential primary construction access points for the Site from the local road network, as indicated on Figure 4.9:

i. Access 1 is to the north along the Branthwaite Road via an existing access for the Wind Farm leading into Area A. Existing internal tracks associated with the Wind Farm lead south providing connectivity into the north of Area B.
ii. Access 2 is along the Gilgarran Road making use of an existing field access into the eastern area of Area C.
iii. Access 3 is further west along the Gilgarran Road making use of an existing field access into the western area of Area C.
iv. Access 4 is opposite Access 3, proving access from Gilgarran Road to the north into Area B.
v. Access 5 is the existing access into the farmyard to the central eastern edge of Area C via the Branthwaite Edge Road.

2.4.7. The access proposals ensure that no vehicles would have to wait on the surrounding highway network. There would be sufficient space within the temporary construction compounds to ensure that all vehicles will be able to enter and leave the Site in a forward gear. All construction worker and delivery vehicles will park or offload in a temporary construction compound close to the

access. On exiting the Site, vehicles will have to exit via the wheel wash area and a supplementary street sweeper will be available to avoid impacts on the local road network.

Construction Programme

2.4.8. The construction of the Proposed Development is anticipated to commence in 2026 and span a period of approximately 18 months. On this basis, it is expected that the Proposed Development would be completed in 2027. The activities on-Site during the construction phase are expected to include the following:

i. Site establishment and enabling works for construction, including the erection of perimeter fencing and implementing any required ecological/environmental protection measures;
ii. Implementation of temporary construction facilities, temporary security measures, and internal access tracks;
iii. Deliveries and construction of the solar farm including the installation of mounting framework, solar panels, and ancillary units;
iv. Deliveries and construction of the BESS infrastructure and POC compound;
v. Cable trenching, ducting and backfilling to connect solar generating equipment to the POC equipment and from the POC equipment to the existing 132kV OHL;
vi. Testing Commissioning of the generating station equipment and grid connection equipment; and
vii. Landscaping and biodiversity enhancements.

2.4.9. As a minimum, the ES will include detail on the following:

i. Location and indicative layout of the temporary construction compounds and access tracks;
ii. An outline CTMP (‘oCTMP’) will set out measures for safe access and traffic management to avoid or mitigate impact on the local road network; and
iii. An outline Construction Environmental Management Plan (‘oCEMP’) will detail the holistic site and environmental management of matters beyond construction traffic (e.g., ecology, arboriculture, drainage, noise, lighting, waste management, etc.).

2.4.10. An outline Landscape Strategy Plan ('oLSP') will provide details of planting and enhancements while an outline LEMP ('oLEMP') will set out how these measures will be implemented and maintained.

2.5. Operational Phase

2.5.1. The Proposed Development is reversible and will have a modelled operational lifespan of up to 40 years for the purposes of the ES assessments.

2.5.2. During the operational phase, the activities on-Site are expected to amount to maintenance activities, including servicing of plant and equipment and vegetation management.

2.5.3. It is expected that once operational, the Proposed Development would require up to two technical maintenance visits per month in transit van or 4x4 type vehicles. Several visits a year will be required to clean the solar PV panels (using only distilled water). Attendance will also be required in association with the implementation monitoring, and maintenance of landscape and habitat enhancements, to maintain any sustainable drainage ('SuDS') measures, and to secure any other mitigation to be delivered alongside the solar farm.

2.5.4. The oLEMP, will set out how the land would be managed and monitored throughout the Proposed Development's operational lifetime to deliver on biodiversity net gain and other environmental enhancement commitments. It is anticipated that the existing agricultural use (sheep grazing) would continue, albeit at a reduced intensity, as part of the maintenance regime. The final LEMP will therefore include a grazing management plan to provide for co-located pastoral activity.

2.6. Decommissioning Phase

2.6.1. Following termination of energy generation and exportation at the Site, the Proposed Development including solar PV modules, mounting structures, cabling, ancillary buildings, and BESS will be decommissioned, dismantled

and removed and the Site and would be fully reinstated and could be returned to solely agricultural use.

2.6.2. Where possible, all equipment would be removed and recycled or disposed of in accordance with good practice at the time of decommissioning. Where this is not possible, any waste generated during decommissioning will be removed and transported by a certified and licensed contractor.

2.6.3. The decommissioning of the Proposed Development is anticipated to take up to 12 months. During the decommissioning phase, one or more temporary compounds will be required, along with other temporary access tracks. The compounds will be located within the Site. All compounds and access tracks will be removed once decommissioning is complete except for those tracks which are aligned with existing agricultural use where the farmer intends to utilise the tracks on the re-commencement of solely agricultural activity.

2.6.4. The traffic management and reinstatement work element of the decommissioning phase will be addressed in an appropriately timed Decommissioning Plan as required by DCO requirement, in the event development consent is granted.

2.6.5. The ES will provide details of an Outline Decommissioning Environmental Management Plan ('oDEMP'). A detailed DEMP will be agreed with relevant authority prior to the commencement of decommissioning.

3. EIA Methodology

3.1. Introduction

3.1.1. This chapter will provide background to the EIA, including the principles of the methodology that will be adopted in the ES, the project team, describe the structure of the ES and confirm where the ES is available for viewing.

3.2. EIA Methodology

3.2.1. This chapter will set out the methodology used in the EIA, state the assumptions applicable to all disciplines, summarise the EIA scoping process undertaken and summarise the public consultation process. Bespoke methodologies, limitations and assumptions will be contained in the technical chapters of the ES where required.

3.2.2. The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the effects can be positive or negative. Generic criteria to be used in carrying out this process are detailed below. Some technical chapters will use discipline-specific criteria with their own terms for magnitude, sensitivity, and significance. This will be explained in the relevant chapter.

3.2.3. An environmental effect can be categorised as either permanent or temporary. The duration of temporary effects comprises:

i. Short-term (a period of up to 1 year);
ii. Medium-term (a period of between 1 year and up to 5 years); and
iii. Long-term (a period of more than 5 years).

Prediction of Impact Magnitude

3.2.4. The methodology for determining the scale or magnitude of impact is set out Table 3.1 below.

Table 3.1: Methodology for Assessing Magnitude

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

3.2.5. The sensitivity of a receptor is based on the relative importance of the receptor using the scale set out in Table 3.2 below.

Table 3.2: Methodology for Determining Sensitivity

Sensitivity	Examples of Receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Medium	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.
Very Low	The receptor/resource is tolerant of change without detriment to its character, or does not make a significant contribution to local character or distinctiveness and is not designated.

Assessment of Significant Effects

3.2.6. Effect significance will be calculated using the matrix in Table 3.3. This illustrates the interaction between impact magnitude and receptor sensitivity.

Table 3.3: Effect Significance Matrix

Magnitude	Sensitivity			
	High	**Medium**	**Low**	**Very Low**
High	Major Adverse / Beneficial	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial
Medium	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Negligible
Low	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Negligible	Negligible
Very Low	Minor Adverse / Beneficial	Negligible	Negligible	Negligible

Effects Definitions

3.2.7. Table 3.4 below provides generic definitions of the terminology used to categorise effects.

Table 3.4: Significance of Effect Definitions

Effect	Description
Major	An effect that is likely to be an important consideration at a national to regional level because it will contribute to achieving national/regional objectives or is likely to result in exceedance of statutory objectives or breaches of legislation.
Moderate	An effect that is likely to be an important consideration at a regional level.
Minor	An effect that is likely to be an important consideration at a local level.
Negligible	An effect that is likely to have a negligible or neutral influence, irrespective of other effects.

Significance

3.2.8. Significance of effect will be clearly identified in the ES. As a general rule, major and moderate effects will be considered to be significant whilst minor and negligible effects will be considered to be not significant.

3.2.9. However, professional judgment will also be applied and may moderate the significance of an effect where necessary, taking into account the professional's understanding of the balance between the magnitude of an impact and the sensitivity of the receptor/resource and whether the effect is permanent or temporary, its frequency, whether it is reversible, and likelihood of occurrence.

3.2.10. Furthermore, some topic disciplines may have a methodology and significance criteria that differs from what has been outlined above. If this is the case, this will be outlined in the respective chapter.

3.3. Alternatives and Design Evolution

3.3.1. This chapter will describe the evolution of the Proposed Development based on environmental constraints and reasonable alternatives studied by the Applicant.

3.4. Construction and Decommissioning Methodology and Phasing

3.4.1. This chapter will outline the anticipated construction and decommissioning programme, phasing and methodology and explain the assumptions made. This chapter will form the basis of the construction and decommissioning phase assumptions documented in each of the technical chapters of the ES.

3.5. Technical Assessments

3.5.1. Each ES chapter will follow the headings set out below to ensure the final document is transparent, consistent, and accessible.

i. Introduction;
ii. Planning Policy Context;
iii. Assessment Methodology;

iv. Baseline Conditions;

v. Likely Significant Effects;

vi. Mitigation Measures;

vii. Residual Effects;

viii. Cumulative Effects; and

ix. Summary.

3.5.2. Each chapter sub-heading is explained in further detail in Table 3.5 below.

Table 3.5: Technical Chapter Format and Content

Sub-Heading	Context
Introduction	This section will introduce the assessment discipline and the purpose for which it is being undertaken.
Planning Policy Context	This section will include a summary of national, regional, and local policies of relevance to the environmental discipline and assessment. Where applicable, relevant legislation will also be summarised.
Assessment Methodology	This section will provide an explanation of methods used in undertaking the technical study with reference to published standards, guidelines and best practice. The application of significance criteria will also be discussed. It will also outline any difficulties encountered in compiling the required information.
Baseline Conditions	This section will include a description of the environment as it is currently (at the time of writing the ES or at another appropriate point in time) and as it is expected to change if the Proposed Development were not to proceed (i.e. 'do-nothing' scenario). The method used to obtain baseline information will be clearly identified. Baseline data will be collected in such a way that the importance of the particular subject area to be affected can be placed in its context and surroundings so that the effects of the proposed changes can be predicted.
Likely Significant Effects	This section will identify the likely significant effects on the environment resulting from the construction, operational and decommissioning phases of the Proposed Development.

Sub-Heading	Context
Mitigation Measures	Adverse effects will be considered for mitigation and specific mitigation measures put forward, where practicable. Mitigation measures considered may be: • Primary (embedded): modifications to the location or design of the Proposed Development made during the pre-application phase that are an inherent part of the Proposed Development, with no further actions required, such as ensuring that a key habitat or archaeological feature will be unaffected by the Proposed Development layout and operation. The first assessment of magnitude, sensitivity and significance of effect takes all embedded mitigation measures into account as an integral part of the Proposed Development; • Secondary: actions that require further activity to achieve a particular outcome, secured for example through development consent requirements or section 106 obligations, such as lighting limits that will be subject to the submission of a detailed lighting layout for approval; or • Tertiary: actions that would occur regardless of the EIA, including those undertaken to meet other existing legislative requirements, or actions that are standard practice to manage commonly occurring environmental effects. The extent of the mitigation measures and how these will be effective will be discussed. Where the effectiveness is uncertain or depends upon assumptions about operating procedures, data will be provided to justify these assumptions and monitoring programmes will be proposed to enable subsequent adjustment of mitigation measures, as necessary.
Residual Effects	The residual effects, i.e., the effects of the Proposed Development assuming implementation of proposed secondary and tertiary mitigation, will be determined. The residual effects represent the overall likely significant effect of the Proposed Development on the environment having taken account of practicable/available mitigation measures.
Cumulative Effects	The inter-project cumulative effects of the Proposed Development and the identified committed developments will be assessed, as well as the intra-project cumulative effects of the Proposed Development i.e. the cumulative effects expected to arise solely from the Proposed Development. .
Summary	A summary of the assessment and conclusions will be provided at the end of each technical chapter.

3.6. Cumulative Effects

3.6.1. The approach to the assessment of the likely significant cumulative effects of the Proposed Development is set out in Section 11 of this Scoping Report.

3.7. Summary and Residual Effects

3.7.1. The residual effects of the Proposed Development will be summarised in a single table at the end of the ES setting out the overall beneficial and adverse likely significant effects of the Proposed Development.

4. Topics to be Scoped Out

4.1. Introduction

4.1.1. This section presents the technical topics to be 'scoped out' from the ES whereby the Proposed Development is not anticipated to result in likely significant effects in respect of these topics during its construction, operational and decommissioning phases. The following discussion of the technical topics to be scoped out of the ES have been informed by professional judgement, initial on-Site surveys, correspondence with the Council and statutory bodies, and desk-based research.

4.2. Agricultural Land and Soils

4.2.1. An Agricultural Land and Soils Scoping Analysis is provided as Appendix 4.1 to this EIA Scoping Report.

4.2.2. The Site is shown on the 'provisional' ALC maps from the 1970s[10] as falling into Grade 4 'poor' quality and Grade 5 'very poor' quality. These maps were based on a limited amount of field survey and cannot be used for site specific purposes[11], but they provide a good indication of likely land quality.

4.2.3. The Site is shown on the 'Likelihood of Best and Most Versatile' ('BMV') land maps (2017)[12] as falling into the low likelihood category (<20% area Best and Most Versatile). BMV land is agricultural land that is graded from Grade 1 'excellent' quality to Grade 3a 'good'[13]. Land of sub-grade 3b and land in Grades 4 and 5 is poorer quality agricultural land and does not constitute BMV agricultural quality.

[10] North West Region 1:250,000 Series Agricultural Land Classification, reprinted by Natural England (2010).

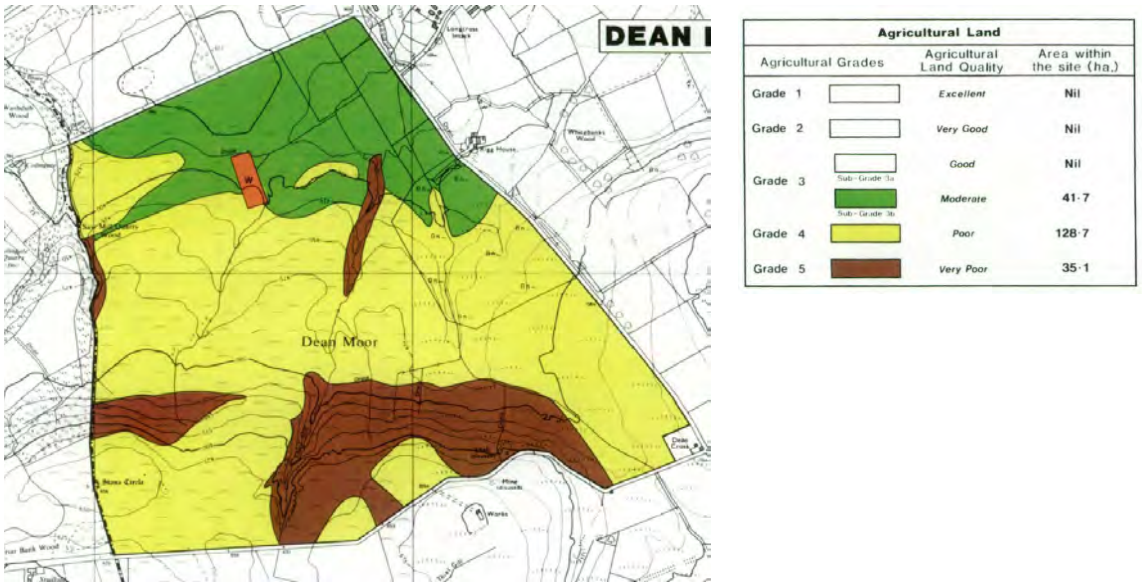
[11] As advised in 'Agricultural Land Classification: protecting the best and most versatile agricultural land, Natural England Technical Information Note 049', Natural England (December 2012).

[12] North West Region Likelihood of 'Best and Most Versatile' (BMV) Agricultural Land, Natural England (2017).

[13] National Planning Policy Framework Annex 2, Glossary, MHCLG (July 2021).

4.2.4. As shown on the plan reproduced in Appendix 4.1, the majority of the Site has been the subject of a detailed ALC survey, carried out by the Ministry of Agriculture, Fisheries and Food ('MAFF') in 1990. This detailed ALC survey identified a mix of agricultural land of Grades 4 and 5 across the majority of the Site (Area C), with some sub-grade 3b agricultural land (as reproduced in Appendix 4.1 and shown on Figure 4.1).

Figure 4.1: Extract from MAFF ALC



4.2.5. Areas A and B of the Site have not been surveyed. However, as identified in the MAFF detailed ALC (reproduced in Appendix 4.1), land over 110m AOD is limited by climatic conditions to no higher than a sub-grade 3b agricultural land classification. All of Area B is 110mAOD or higher and is limited by climate to no higher than sub-grade 3b.

4.2.6. The ALC grade of Area A (approximately 44ha) will depend upon the soils and their interaction with the Site and climatic factors. The soils are identified on published plans as consistent with the soils in the southern part of the Site, which was subject to the detailed ALC survey undertaken by MAFF. These were found to be in Wetness Classes IV or V. On this basis, with the Field Capacity Days in excess of 225[14], the clayey soils in

[14] Field Capacity Days is the number of days in the year when soils are replete with water (saturated).

the un-surveyed areas in Area A below 110mAOD would be no higher than sub-grade 3b under the ALC Methodology (1988)[15]. Part of this area is non-agricultural and is affected by the wind turbine bases and tracks.

4.2.7. Notwithstanding the ALC grading of land within the Site, as discussed in the Agricultural Land and Soils Scoping Analysis at Appendix 4.1, the installation of solar development is recognised as not adversely affecting agricultural land quality, with minimal on-ground impacts other than in the relatively minor areas where infrastructure and tracks are placed. These areas are usually on 2% - 3% of a solar development site and are reversible on decommissioning. Therefore, the quantum of agricultural land affected by the Proposed Development will be limited irrespective of agricultural land quality within the Site and it is therefore not likely to result in significant adverse effects on soils and agricultural land.

4.2.8. On this basis, it is proposed to scope out an assessment of likely significant effects from the Proposed Development on agricultural land and soils from the ES.

4.2.9. A farm impact questionnaire will be undertaken to establish current agricultural management practices and land ownerships at the Site, which will inform the assessment of likely significant socio-economic effects in the Socio-economics chapter of the ES.

4.3. Water Resources and Flood Risk

Introduction

4.3.1. Given the nature of the Proposed Development and baseline conditions at the Site, likely significant effects from the Proposed Development on the water environment (including flood risk) are not anticipated. Therefore, it is proposed to scope out chapter on water resources, hydrology, and flood

[15] Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land, MAFF (October 1988).

risk from the ES. However, a Water Framework Directive[16] ('WFD') Assessment and a combined Site-specific Flood Risk Assessment ('FRA') and Outline Surface Water Drainage Strategy would be appended to the ES.

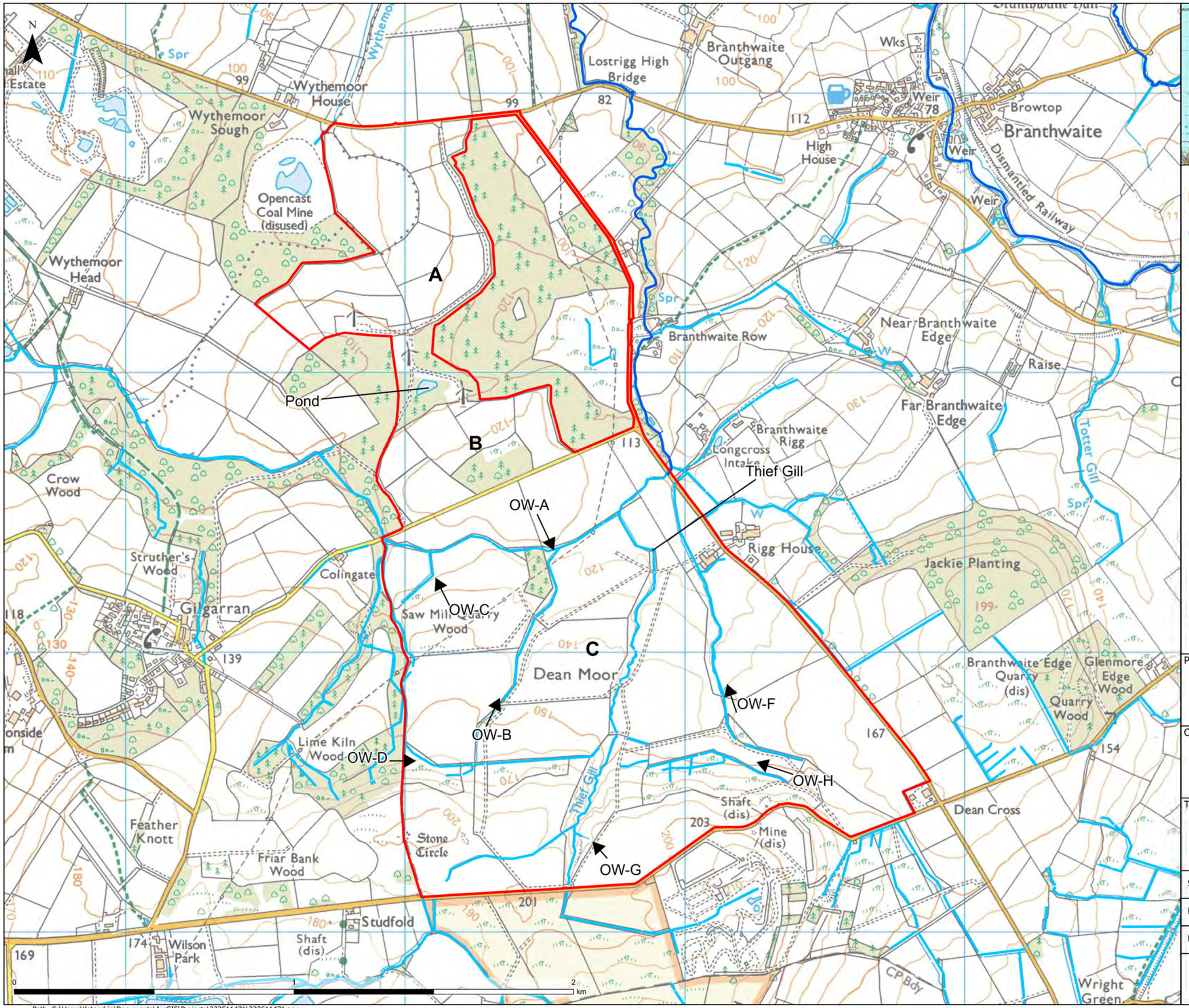
4.3.2. This section sets out the proposed approach to the WFD Assessment, Site-specific FRA, and Outline Surface Water Drainage Strategy for the Proposed Development to be prepared in support of the DCO application and appended to the ES. This includes the consideration of the vulnerability of the Site to flooding and the potential impacts of the Proposed Development on surface water. Given the nature of the Proposed Development, it constitutes an essential infrastructure land use which is appropriate within all Environment Agency ('EA') Flood Zones categories.

4.3.3. The Site is split into three areas, denoted as A, B and C (as shown in Figure 1.3).

4.3.4. As shown in Figure 4.2, an ordinary watercourse named the Thief Gill, as well as several other unnamed ordinary watercourses labelled (OW-A to OW-H), flow through the Site from the south and west towards the north-east corner of Area C. Beyond the Site boundary, these watercourses combine to flow in an EA designated main-river named Lostrigg Beck, which continues in a north-east direction before joining the River Marron, approximately 6.5km to the north east of the Site. As shown in Figure 4.2, there is a pond located centrally within the Area B which discharges into an ordinary watercourse.

[16] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Legislation.gov.uk, 2017, www.legislation.gov.uk/uksi/2017/407/regulation/1/made . Accessed June 2023

Figure 4.2: Hydrological Setting



Legend

- Draft Order Limits
- Main River
- Ordinary Watercourses

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Hydrological Setting

Scale: 1:12,500 @ A3	Date: 31/07/2023
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Figure: 4.2	Sheet 1 of 1 | Rev: A

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4.3.5. As shown in Figure 4.3, the EA Flood Zone mapping confirms that the Site is located within Flood Zone 1 'Low Probability', which is defined in the NPPF's supporting Planning Practice Guidance ('PPG'), Flood Risk and Coastal Change[17] as *'land having less than a 1 in 1,000 (0.1%) annual probability of flooding from rivers or the sea'.*

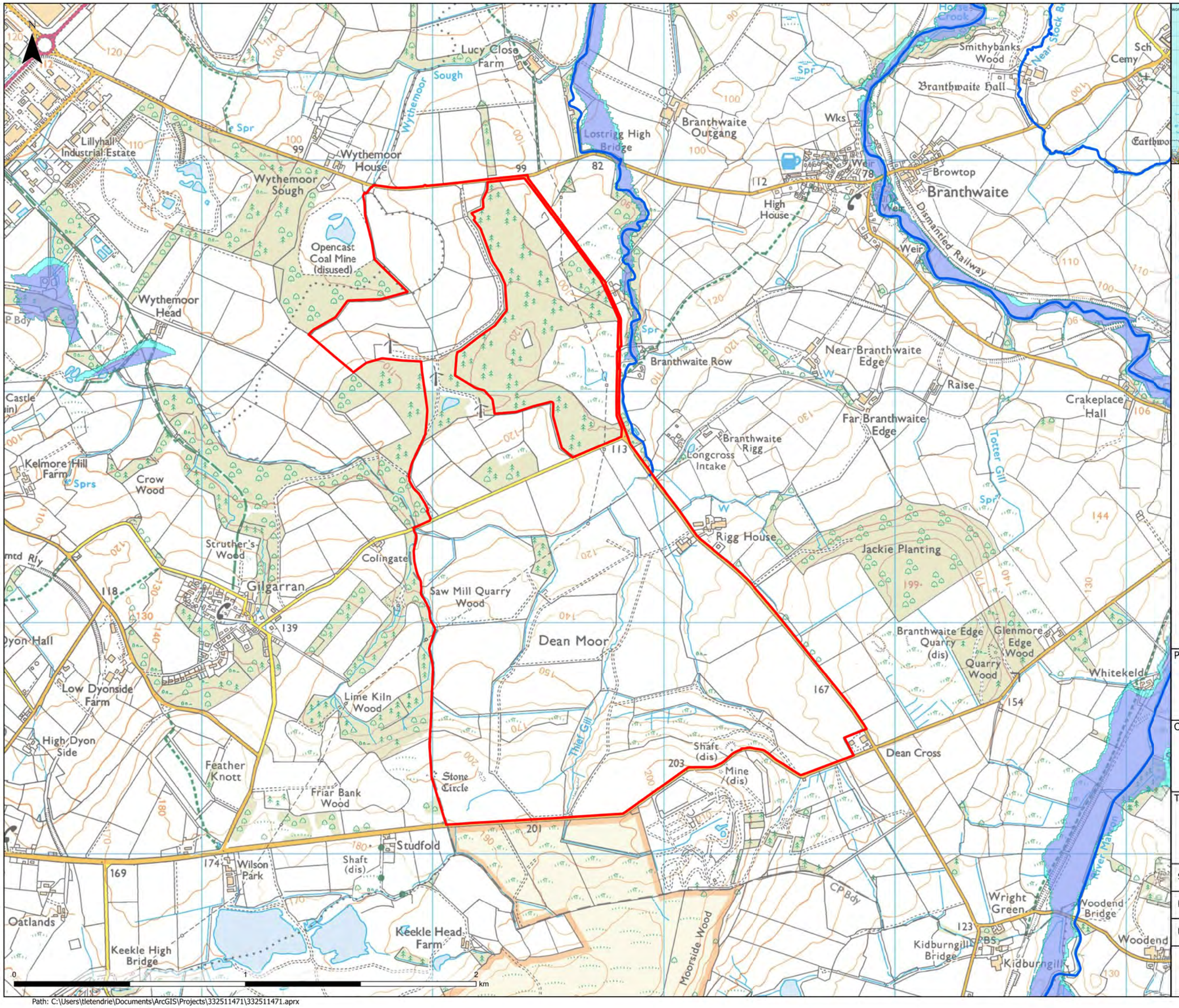
4.3.6. The nearest areas of Flood Zone 2 'Medium Probability' and Flood Zone 3 'High Probability' to the Site are associated with the Lostrigg Beck. These are located adjacent to the main river channel approximately 330m to the north-east of Area C.

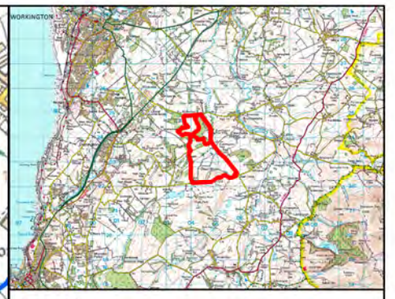
4.3.7. There is no historical record of flooding at the Site, and information available from the EA Opendata data sets and the local Strategic FRA relevant to the Council indicates a low likelihood of flooding from other sources.

4.3.8. The Site is located a significant distance from areas of the fluvial floodplain and therefore it is considered that the Site will not be impacted by, or have any impact on, fluvial flood risk, including accounting for climate change.

[17] Ministry of Housing, Communities & Local Government. National Planning Policy Framework GOV.UK, 20 July 2021, **www.gov.uk/government/publications/national-planning-policy-framework--2**. Accessed March 2023

Figure 4.3: Flood Zone Map





Legend

- Draft Order Limits
- Main River
- Reduction in Risk of Flooding from Rivers and Sea
- Flood Zone 3
- Flood Zone 2
- Area outside Flood Zone 2 and 3 is defined as Flood Zone 1 'Low Probability'

Project Title

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Client

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Title

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Flood Zone Map

Scale: 1:15,000 @ A3	Date: 31/07/2023	
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Figure: 4.3	Sheet 1 of 1	Rev: A

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4.3.9. EA surface water flood mapping shown in Figure 4.4[18] indicates that most of the Site has a 'Very Low' risk of surface water flooding, with areas of 'Low' to 'High' surface water flood risk present along the Thief Gill, other ordinary watercourses, and the pond within the Site, consistent with the depressions in the local topography.

4.3.10. The Site is not served by any existing artificial surface water drainage system, with rainfall currently draining naturally via runoff into the several land drainage channels on the Site or infiltrating into the ground where geological and hydrogeological conditions allow.

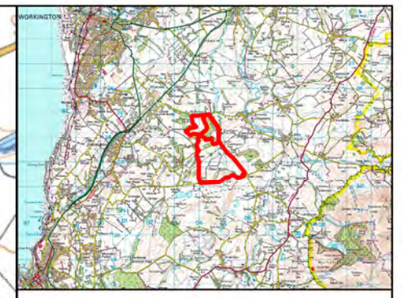
[18] GOV.UK. "Flood Map for Planning - GOV.UK. Available at: Flood-Map-For-Planning.service.gov.uk, 2023, **https://flood-map-for-planning.service.gov.uk/** Accessed June 2023

Figure 4.4: Surface Water (Pluvial Flood Risk)

Field Area A - Land south of Branthwaite Road (approx. 44ha)

Field Area B - Land south of Branthwaite Road and north of Gilgarran Road (approx. 19.6ha)

Field Area C - Land south of Gilgarran Road and north of Dean Cross Road (approx. 208ha)



Legend

- Draft Order Limits
- Field Areas

Risk of Flooding from Surface Water

- High (3.3%) - 1 in 30 Annual Probability
- Medium (1%) - 1 in 100 Annual Probability
- Low (0.1%) - 1 in 1000 Annual Probability
- Very Low (<0.1%) - Less than 1 in 1000 Annual Probability

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Surface Water (Pluvial Flood Risk)

Scale: 1:12,500 @ A3	Date: 31/07/2023
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Figure: 4.4	Sheet 1 of 1 / Rev: A

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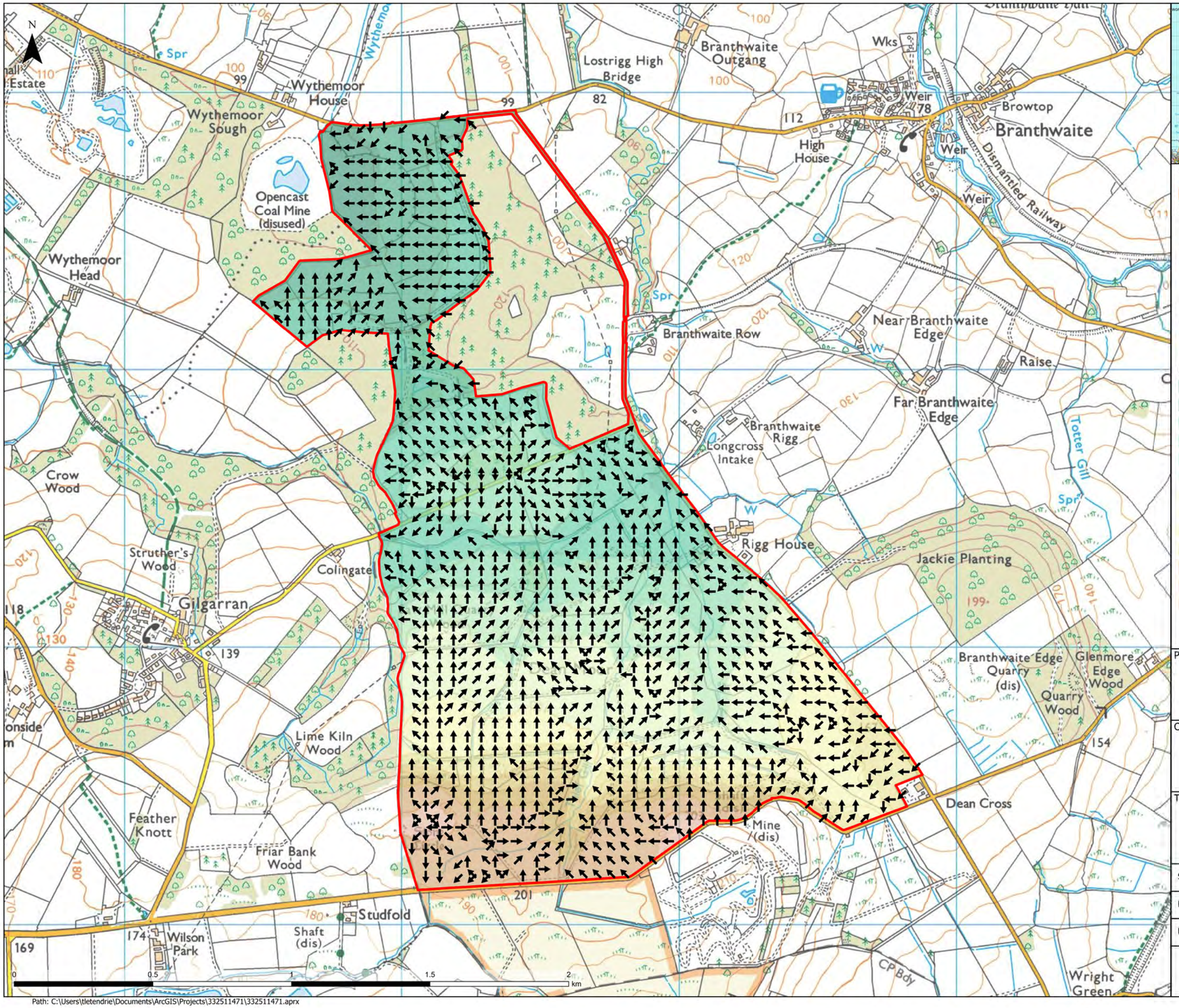
4.3.11. In addition to the EA surface water mapping, a high-level flow route assessment has been carried out. The results shown in Figure 4.5 below indicates that the flow routes are also consistent with the depressions in the local topography as flows are directed towards watercourses.

Figure 4.5: Surface Water Overland Flow Risk



Legend

Draft Order Limits

Direction of Overland Flow

- North Flow Direction
- North East Flow Direction
- East Flow Direction
- South East Flow Direction
- South Flow Direction
- South West Flow Direction
- West Flow Direction
- North West Flow Direction

Elevation (m)

- 80.0m - 90.0m AOD
- 90.0m - 100.0m AOD
- 100.0m - 110.0m AOD
- 110.0m - 120.0m AOD
- 120.0m - 130.0m AOD
- 130.0m - 140.0m AOD
- 140.0m - 150.0m AOD
- 150.0m - 160.0m AOD
- 160.0m - 170.0m AOD
- 170.0m - 180.0m AOD
- 180.0m - 190.0m AOD
- 190.0m - 200.0m AOD
- 200.0m - 210.0m AOD

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Overland Flow Route

Scale: 1:12,500 @ A3	Date: 31/07/2023
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Figure: 4.5	Rev: A

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Groundwater

4.3.12. The Site is not located within any groundwater Source Protection Zones, Drinking Water Protected Areas (surface water) or Drinking Water Safeguard Zones (both surface and groundwaters)[19].

4.3.13. A superficial aquifer classified as 'Secondary (undifferentiated)' extends across approximately half of the Site. Area A and Area C are partially covered whereas Area B is fully classified as Unproductive.

4.3.14. Groundwater is classified as 'Medium – Low' and 'Low' vulnerability within Areas A and B, north of the Gilgarran Road, and 'Medium – High' and 'High' for Area C south of the Gilgarran Road.

4.3.15. Within the Site, the bedrock aquifer is classified as 'Secondary A'. Secondary A aquifers comprise permeable layers which have the potential to support local water supplies and may form an important source of baseflows to rivers. Principal aquifers are designated by the EA as strategically important rock units which have high permeability and storage and may also support rivers and wetland environments. Aquifer designations are put in place to help protect groundwater as the type of aquifer on a site will affect how vulnerable it is to pollution and how much is available to abstract.

4.3.16. The Site boundary fully sits within the 'Secondary A' with a few areas designated as a 'Principal Aquifer' surrounding the south-west boundary.

Water Quality

4.3.17. The aim of the WFD is to ensure all surface water and groundwater bodies are of good chemical and ecological status. This considers the ecological and chemical status of surface waters, and the chemical and quantitative status of groundwaters.

[19] DEFRA (2023). Magic Map Application.Defra.gov.uk. Available at: https://magic.defra.gov.uk/MagicMap.aspx. Accessed June 2023

4.3.18. The ecological and chemical status of surface waters are assessed according to the following:

- Biological quality (fish, benthic invertebrates, aquatic flora);
- Hydromorphological quality such as river bank structure, river continuity or substrate of the river bed;
- Physical-chemical quality such as temperature, oxygenation and nutrient conditions; and
- Chemical quality that refers to environmental quality standards for river basin specific pollutants. These standards specify maximum concentrations for specific water pollutants. If even one such concentration is exceeded, the water body will not be classed as having a *'good ecological status'*.

4.3.19. The WFD stipulates that groundwater must achieve *'good quantitative status'* and *'good chemical status'* (i.e. not polluted) by 2027. Groundwater bodies are classified as either *'good'* or *'poor'*. To meet the aim of good chemical status, hazardous substances should be prevented from entering groundwater, and the entry of all other pollutants (e.g., nitrates) should be limited. Ecological Quality Ratio is used to determine the ecological water quality status.

4.3.20. Water quality data available from the EA's online 'Catchment Data Explorer' has been reviewed. The Site lies entirely within the River Basin Management Plan ('RBMP') 2 – 'Surface Waterbody: Lostrigg Beck – GB112075070550', which is part of the Derwent River Basin District.

4.3.21. This resource identifies that the Lostrigg Beck hydromorphological designation is not identified as *'artificial'* or *'heavily modified'*. The EA designates water bodies as '*artificial'* or '*heavily modified'* when achieving *'good'* status would require changes to the water body's hydromorphology that would have major negative effects on social or economic activity. The WFD recognises that some water bodies have been significantly physically modified to support various uses which provide valuable social and economic benefits. In many cases, these modifications cannot be

removed without having a major negative effect on the social and economic benefits that these uses bring.

4.3.22. The ecological classification of the Site (which is located within the Lostrigg Beck catchment), based on 2019 testing results, is *'moderate'*. It has been this classification since 2009 (a *'good'* standard was achieved in 2009 only).

4.3.23. The chemical classification for the catchment based on the 2019 testing results, is identified as *'fail'*. This followed a period of *'no testing required'* and *'good'* quality chemical classifications from 2009 to 2016 and was classified as such due to an associated *'fail'* in the measurement of 'priority hazardous substances' ('PHS'), including benzo(a)pyrene, polybrominated diphenyl ethers ('PBDE') and mercury. The WFD designates PHS as substances that are considered to be of particular concern to the aquatic environment because of their persistence, bioaccumulation, and toxicity. Therefore, it is an EA requirement that PHS are reduced so that the chemical classification can improve to '*good'.*

4.3.24. It was identified that *'measures* [have been] *delivered to address issues, awaiting recovery'*, although the projected timescale to achieve the targeted 'good' classification for problematic chemical substances is identified as up to 40 years, due to natural conditions and chemical status recovery time.

4.3.25. The receiving River Marron catchment has an ecological classification of *'good'* and a chemical classification of *'fail'*. It is also noted that measures have been delivered to address chemical quality issues.

4.3.26. In conclusion, the available information from the RBMP indicates that surface water quality over the Site is considered to be 'moderate', while the water quality of the receiving River Marron is also considered to be 'moderate'.

Consultation

4.3.27. Engagement will be undertaken with the EA, the Council (as the Lead Local Flood Authority ('LLFA')), and United Utilities (as the relevant water undertaker) to assist with the data already assessed above. This collaboration will determine the scope of the necessary investigations to inform the Site-specific FRA. It will also inform assessment methodologies and design principles that need to be adhered to for compliance with relevant national and local planning policies, legal requirements, and best practice guidelines in relation to flood risk and surface water management.

Assessment Methodology

4.3.28. The assessment of the Proposed Development on the hydrological setting, impact, and required mitigation is based on the baseline conditions of the Site, research conducted on similar sites, and engagement with relevant stakeholders.

4.3.29. A Site-specific FRA will be prepared which will set out the existing baseline conditions (as above), summarise the potential direct and indirect impacts of the Proposed Development, and the mitigation measures required to prevent, reduce or offset its residual effects. This will also set out the details of the existing surface water drainage regime at the Site, and the proposed surface water management for the Proposed Development, based on the principles of sustainable drainage systems.

4.3.30. This Scoping Report and the FRA consider the findings and recommendations of a research report published in the Journal of Hydrologic Engineering on the impacts of Solar Farms on peak flows, runoff intensity and volumes titled "Hydrologic Response of Solar Farms"[20] as discussed below.

[20] Laurne M.Cook and Richard H.McCuen, Hydrologic Response of Solar Farms (American Society of Civil Engineers, 2013) Available at: **https://ascelibrary.org/doi/10.1061/ASCEHE.1943-5584.0000530**. Accessed July 2023

4.3.31. The majority of the Proposed Development's built development area will be occupied by solar PV modules. The impact of these arrays is negligible with the only intrusion being the pile-driven posts. These posts can be delivered by different manufacturers but generally have an area intake between the range of 0.0012m^2 and 0.0014m^2. There will be one post for about 6-7 panels, so likely to be 6-7m between each post. Given the maximum area of the Site, which is grazing land, and could be developed for solar PV arrays, which is approximately 240ha, there could be up to 130,000 posts. Based on a worst-case assumption of 0.0014m^2 per post, the total area taken by the posts would be of 182m^2 on a 279ha Site (0.00652% impact). Therefore, the actual ground-impact is expected to be negligible.

4.3.32. Rainwater falling on the solar PV array façade will fall between the gaps of each solar PV panel, allowing water to fall off the arrays in many locations and avoiding concentrated runoff. The panel tilt (typically 15-20 degrees) helps water to run down at low velocities and reduces the likelihood rainfall runoff will "jump" the gaps between panels. There is therefore no risk of the water sheeting down in one area at the lower edge of the arrays and creating runoff channels and soil erosion that alters existing greenfield characteristics.

4.3.33. The solar PV modules will intercept some rainfall before it reaches the ground. The intercepted rainfall will either run down the face of the panels and drip onto the ground below or will be lost due to evaporation from the face of the panels. Without mitigation, there is a risk of erosion of the ground on which rainwater drips. However, as stated above, the potential for erosion to occur as a result of the 'drip effect' is appropriately mitigated by features of the solar PV modules themselves.

4.3.34. Cook and McCuen (2013) found that *'the addition of solar panels over a grassy field does not have much of an effect on the volume of runoff, the peak discharge, nor the time to peak'* if grass cover is located underneath panels and between rows. The study concludes that this is true for a range of return periods and storm durations. The report also notes that

although the solar PV panels could concentrate runoff onto the ground, this only has the potential to cause erosion if it falls directly onto bare ground or a gravel surface.

4.3.35. In summary, the available data for the Site and the evidence from comparable developments indicates that the Proposed Development will maintain the current hydrological response of the Site and will not increase flood risk elsewhere.

4.3.36. Whilst an FRA is necessary in support of the DCO application, the Site has been identified as low risk of flooding. Given the baseline conditions of the Site, research conclusions from Cook and McCuen (2013), and nature of the Proposed Development, there is no requirement for mitigation for most of the Site covered by solar PV modules beyond standard measures, comprising the management of surface water runoff during the construction and decommissioning phases of the Proposed Development. Targeted SuDS will be provided for ancillary buildings.

4.3.37. The Site-specific FRA will also include an assessment of future flooding from potential impacts of climate change upon surface water run-off for the modelled operational lifespan of up to 40 years for the Proposed Development, in accordance with the EA's '*Flood Risk Assessments Climate Change Allowances'* guidance, updated in May 2022[21].

4.3.38. Available existing studies/ documents, including evidence-based studies undertaken in support of the preparation of local planning policy (e.g., Strategic Flood Risk Assessment and Preliminary Flood Risk Assessment), will be reviewed to identify the best available data to inform the Site-specific FRA.

[21] *Flood Risk Assessments: Climate Change Allowances." GOV.UK* Available at: **www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#full-publication-update-history**. Accessed June 2023

Potential Effects

4.3.39. Although likely significant effects on the water environment are not anticipated, without mitigation, the Proposed Development has the potential to have impacts on surface water and flood risk receptors, as set out below, which will be considered in the Site-specific FRA, which will include a drainage strategy for the Proposed Development.

4.3.40. Potential likely significant effects on the environment for all stages of the Proposed Development are considered and adequate mitigation measures have been set out to limit and in some cases eliminate these impacts. As such, it is proposed to scope out the Proposed Development's hydrological impacts from the ES.

Construction Phase

4.3.41. There are potential consequences of soil compaction resulting from the operation of machinery and equipment during the installation of solar PV modules. The main consideration is that this compaction is likely to occur along the access tracks, which are heavily used on the Site. Soil compaction can lead to reduced permeability which can lead to a temporary decrease of the Site permeability. The presence of impermeable areas, such as on-site hard-standing for shipping containers, along with other infrastructure, can further hinder the natural absorption of water into the soil. Consequently, during periods of heavy rainfall, the catchment area may experience a more rapid and intense flow of water, commonly referred to as "flashiness." This can result in a temporary reduction in groundwater recharge, meaning that less water is able to replenish the underground water sources.

4.3.42. Excavation of the topsoil may be necessary for some construction activities such as laying underground cables. If not mitigated appropriately, this can have a direct impact on the exposed subsoil or rock due to an increased risk of erosion. This poses a risk during high rainfall events due to increased siltation of runoff, which has the potential

to pollute surrounding watercourses. Construction activities across the Site that could expose surface soils, such as soil stockpiles, could occur adjacent to the natural land drainage ditches or watercourses that are located within various parts of the Site. Therefore, there is potential for sediment-laden run-off to enter these watercourses directly.

4.3.43. Solar PV modules and batteries contain potentially harmful materials such as lead, lithium, and other heavy metals. If not handled properly during construction, these could contaminate local water resources. Additionally, construction activities or vehicles could pose a low risk of chemical spillages/ leakages. If these were to occur, it could potentially soak through the subsoil and into the groundwater leading to changes in the in-stream hydrochemistry resulting in a decrease in water quality. This could potentially result in adverse impact to sensitive biodiversity, as the Site drains overland through the Lostrigg Beck and passes through River Marron.

4.3.44. For laying utilities, the Horizontal Directional Drilling ('HDD') method may be used. Drilling fluid, also known as drilling mud, plays a crucial role in the drilling process. It helps cool and lubricate the drill bit, carries the drill cuttings to the surface, and stabilises the borehole. Drilling fluid can sometimes break out of the bore due to ground conditions, gravels or where there are large, interconnected fissures in the ground. Breakouts may also occur where artificial features are present (e.g., old Site Investigation boreholes). In the event of egress of drilling fluid from the bore hole it is only likely to reach ground level where there is a continuous path available to the surface which would have an impact on the water quality at, and downstream of, the Site.

4.3.45. If required, any modifications or crossings to the existing drainage channels and watercourses at the Site during the Proposed Development's construction phase have the potential to affect the hydrological conditions of various water resources near the Site. This has the potential to modify the local water flow and runoff.

Mitigation

4.3.46. An oCEMP will be produced as part of the DCO application which will outline the environmental mitigation measures to be implemented during the construction phase. The measures outlined in the oCEMP will be carried forward to the detailed CEMP, which will be produced by the appointed construction contractor and agreed with the relevant local planning authorities prior to construction. The oCEMP will include supplementary outline management plans which would later be included in full within the CEMP and CTMP.

4.3.47. The CTMP will put in place measures to limit the impact of soil compaction during the construction phase. Such mitigation measures will include the judicious use of machinery, managing and regulating parking areas, transport route management to avoid heavy utilisation of tracks to allow for quick rehabilitation during and post-construction.

4.3.48. In addition to the CEMP, a Site-specific FRA will be prepared for the Proposed Development and will be appended to the ES. The Site-specific FRA will provide more detail to the existing flood risk and any necessary mitigation. This would include strategically locating critical infrastructure, such as the solar PV modules and the substation within areas that will limit their impact on existing flow routes, Although the Site lies completely within Flood Zone 1, additional robust measures such as incorporating a minimum 8-metre buffer zone around all watercourses will be implemented. This buffer zone will serve to protect the watercourses from potential construction-related impacts and ensure that they remain undisturbed. Measures which will be proposed within the Site-specific FRA will be discussed and agreed with the LLFA during engagement with statutory bodies.

4.3.49. There is no EA designated main river watercourse within the Site and it is not proposed to undertake any detailed watercourse modelling given the general low risk of the proposals and location outside the fluvial floodplain. Existing EA data obtained via a data request will be used to

define the flood extent within the Site-specific FRA. In addition to this, the supports to the solar PV modules will be designed to minimise any potential impact on overland flood flow regimes, whist at the same time having the structural integrity to prevent a failure in an event of high rainfall intensity.

4.3.50. An Outline Surface Water Drainage Strategy will be included as part of the Site-Specific FRA which will be appended to the ES to manage any increase in surface water runoff which will likely consist of targeted limited interventions such as the use of temporary SuDS to intercept runoff and store any excess runoff predicted from construction activities. The LLFA will be consulted on standards and requirements, as well as to present and confirm the approach taken for the Proposed Development.

4.3.51. To reduce the potential impacts in relation to pollution from construction activities and vehicles, best practice mitigation measures would be implemented. These measures include locating refuelling designated compound areas, disposal of solid and liquid waste in line with an environmentally friendly waste disposal strategy outlined in the CEMP and providing a substantial buffer zone between construction activities and any nearby watercourse protecting against the potential runoff pollution, preserving the quality of the water bodies. The potential sources of pollution do not include substances such as herbicides and pesticides, which are typically associated with agricultural practices and due to the previous land use, are not within the Proposed Development.

4.3.52. The construction activities would make use of existing established access routes around the Site as much as possible. Where new access tracks are to be constructed, the ground would be rolled/ compressed to up to approximately 150mm and then a mesh membrane would be set down to help avoid aggregate sinking and to provide stability. Aggregate material (MOT Type 3 or similar) will be used as opposed to tarmac to allow a level of infiltration through the tracks, better representing the baseline soil conditions. If scour or siltation could occur on steeper sections of the Site, silt traps and grass filter strips would be used to capture any sediment,

preventing polluted runoff from entering any watercourses draining the Proposed Development.

4.3.53. Underground cable routes would be designed and installed to ensure a low risk of pollution from this activity. As outlined previously, it is anticipated that a cable plough would be used to install the cables, but some HDD may be required in more constrained locations. Based on the Site use and the limited depth of drilling required to cross the watercourses within the Site, the risk of fluid break out during drilling at the Site is small to negligible/ minor when determined in accordance with a high-level risk register for the directional drills, as required in the Construction (Design and Management) Regulations 2015[22] (the 'CDM Regulations'). Furthermore, a fluid breakout plan will be adopted and implemented, and drilling site monitoring will be carried out by dedicated, competent and suitably experienced personnel. Excavations required for cable installation will be undertaken in a manner as to minimise time which subsoil layers are exposed. Soil stockpiles would be managed to contain sediment to that locality, preventing pollution of watercourses. In addition, the ground would be restored as quickly as possible following construction and existing vegetation reinstated.

4.3.54. In addition to the measure taken above, to further mitigate the potential environmental impact, stringent pollution control measures will be put in place. These protective measures will be integral components of the CEMP strategy to minimise the environmental impact throughout the construction process.

4.3.55. These protective measures may include the implementation of temporary surface water drainage arrangements. Such systems are designed to capture and safely manage any spills, thereby preventing these substances from permeating the soil or infiltrating water resources. By integrating these pollution control measures into the CEMP, the

[22] Construction (Design and Management) Regulations Statutory Instrument 2015 No 51

construction project aims to effectively mitigate the risk of environmental contamination from oils and fuels used during the construction process.

4.3.56. The mitigation measures outlined in this section would reduce the potential effects in relation to hydrology and flood risk. Aforementioned mitigation measures for soils are relevant for ensuring minimal impacts upon water quality from increased siltation or pollutants. Pollution risk will be reduced through best management practices and siltation levels reduced using vegetation cover and silt traps. This will improve the water quality running off- site and therefore the risk posed to the health of the surrounding WFD water bodies, surrounding sites of special scientific interest ('SSSI'), lakes and Ramsar site will be reduced. These measures, which will be identified in the oCEMP, would be carried forward to the detailed CEMP for the Proposed Development. Meanwhile, vegetation and SuDS design will increase on-site attenuation, infiltration and reduce the rates of overland flow, reducing the flood risk posed downstream of the Proposed Development. These measures will be presented within the Surface Water Drainage Strategy which will be appended to the ES.

Operational Phase

4.3.57. The Proposed Development would result in a small increase of impermeable areas through the construction of a substation and supporting infrastructure. Additionally, the regular use of maintenance tracks may cause soil compaction over time, decreasing soak away potential leading to increased runoff. An expansion in the Site's existing impervious zone corresponds with a decrease in water seepage and an escalation in overland water flow. This could result in precipitation finding its way to river systems more rapidly and transporting a greater volume of water, thereby potentially exacerbating downstream flooding risks. However, given that the planned impervious zone is relatively minuscule compared to the scale of the Proposed Development, it is not likely to trigger a notable increase in flooding risks.

4.3.58. During the operational phase of the Proposed Development, the risk of pollution is small. This can come from siltation coming off the Site due to soil erosion, chemical spills arising from on-site maintenance or from faults from the solar PV modules.

4.3.59. EA data categorically confirms that the entirety of the Site resides within the 'Low Probability' confines of Flood Zone 1. A review of the EA surface water flood risk map indicates that the majority of the Proposed Development is also at low risk of surface water flooding, with a chance of flooding of less than 0.1% across almost the entire Site area. However, it should be noted that there exist some isolated pockets classified as ‘medium’ to 'high' risk for surface water flooding.

Mitigation

4.3.60. As stated in paragraph 4.3.34, Cook and McCuen (2013) found that solar PV modules do not have a significant effect on runoff volumes, peaks, or time to peak if vegetated ground cover is located underneath panels and between rows. The proposed impermeable area increases as a result of the substation and supporting infrastructure is very small relative to the scale of the Proposed Development, and it is unlikely to lead to a significant increase in flood risk. The proposed solar PV modules themselves have a limited impact on the surface water runoff regime of the Site area as, due to the tilt of the solar PV modules that are raised above ground, rainwater can still reach the existing vegetation underneath.

4.3.61. If deemed necessary, the design of the substation and supportive infrastructure would retain SuDS implemented during the construction phase of the development to allow for the nominal increase in impermeable area over the Site. These systems mimic natural drainage, encouraging infiltration and slowing the flow of runoff, thereby reducing the risk of downstream flooding. Such systems are likely to include targeted permeable gravel sub-bases and filter drains.

4.3.62. The use of access tracks would be carefully managed to prevent excessive soil compaction. This might involve rotating the use of different tracks, controlling the weight of vehicles, and aerating the soil regularly to maintain its permeability.

4.3.63. These strategies should be included in a comprehensive LEMP, which will also establish monitoring and response mechanisms to quickly identify and address any issues that may arise. This approach will help to mitigate potential environmental impacts, ensure compliance with environmental regulations, and contribute to the overall sustainability of the project.

4.3.64. Based on EA Opendata for fluvial flood risk, the majority of the Proposed Development is at ‘Low’ flood risk and therefore no mitigation measures are required for these areas. The isolated pockets classified as ‘medium’ to 'high' risk for surface water flooding are confined to the land drainage corridors on-site and topographic depressions such as the existing pond. The proposed building infrastructure, where surface water flow would be impeded, would be located outside of the areas indicated to be at risk of surface water flooding to ensure existing surface water drainage routes are not impeded.

4.3.65. To prevent on-site pollution, regular maintenance will be carried out to ensure the continued functionality of the solar PV modules are maintained and that the on-site vegetation is continuing to protect the soil layer. Best practice mitigation methods will be in place such as disposal of solid and liquid waste off-Site, the cleaning of vehicles to be carried out off-Site and the use of spill kits and absorbent mats to ensure any pollution from maintenance vehicles is minimised.

4.3.66. In addition, the Proposed Development would result in the reduction of intensive pastoral agricultural practices on-site. Any reduction in agriculture would help reduce the amount of diffuse pollution from entering the watercourses.

4.3.67. The mitigation measures outlined in this section would reduce any potential effects in relation to hydrology and flood risk. Aforementioned mitigation measures for soils are relevant for ensuring minimal impacts upon water quality from increased siltation or pollutants. Pollution risk would be reduced through best practice measures and siltation levels reduced using vegetation cover and silt traps. This would improve the water quality coming off-Site and therefore the risk posed to the health of the surrounding WFD areas, surrounding SSSIs, lakes and Ramsar sites will be reduced. Meanwhile vegetation and SuDS design will increase onsite attenuation, infiltration and reduce the rates of overland flow, reducing the flood risk posed downstream of the Site.

4.3.68. With the implementation of the mitigation measures presented above, it is not likely that significant effects would occur in relation to hydrology and flood risk during the operational phase. Therefore, is it proposed that a separate chapter on hydrology and flood risk within the ES is not required, and a combined FRA and Outline Surface Water Drainage Strategy and a WFD Assessment will accompany the ES.

Decommissioning Phase

4.3.69. Management and mitigation measures will be incorporated into the oDEMP, which will set out the general principles to be followed in the decommissioning of the Proposed Development. These measures, commitments and actions will be carried forward to a detailed DEMP, which would be prepared and agreed with relevant authorities in advance of the commencement of decommissioning.

4.3.70. The decommissioning phase of the Proposed Development will comprise activities similar to the construction phase and are not expected to result in any greater effects. Best practice measures will be in place to prevent pollution with the aim of mitigating effects in relation to water quality. The future baseline environment is likely to result in more frequent and intense rainfall and flooding events. This is not considered to result in greater effects during the decommissioning phase compared with the construction

phase. All other effects are considered to be no worse than during construction and therefore a separate assessment of the decommissioning phase is proposed to be scoped out.

Summary

4.3.71. Table 4.1 summarises each of the hydrology and flood risk aspects and assesses whether they should be scoped in or scoped out of the assessment in relation to both the construction, operation and decommissioning of the Proposed Development.

4.3.72. A WFD Assessment and a combined Site-specific FRA and Outline Surface Water Drainage Strategy will be provided as documents appended to the ES.

Table 4.1: Summary of Hydrology and Flood Risk

Aspect	Construction	Operation	Decommissioning	Rationale for Scoping Out
Water quality from siltation of runoff and pollution events (spillages)	Scoped Out			Mitigation measures outlined above would be implemented during the construction and operational phases of the Proposed Development as part of the oLEMP, and CEMP, to reduce the likelihood of pollution of watercourses/groundwater and the Applicant considers it likely that effects would not be significant. The oDEMP will set out the general principles to be followed during decommissioning of the Proposed Development and these measures, commitments and actions will be carried forward to a detailed DEMP, to prevent pollution which will mitigate effects in relation to water quality.
Designated Sites	Scoped Out			No increase in chemical pollutants, siltation events or downstream flooding is expected to occur. Therefore, no impacts on designated sites are predicted.
Surface water runoff from soil compaction	Scoped Out			As outlined above, the Site is not likely to have any significant detrimental impact on surface water runoff. Additionally, mitigation measures outlined above would be implemented during the construction and operational phases of the Proposed Development as part of the oLEMP, and CEMP, to reduce the likelihood of surface water runoff. The oDEMP will set out the general principles to be followed during decommissioning of the Proposed Development and these measures, commitments and actions will be carried forward to a detailed DEMP.

Aspect	Construction	Operation	Decommissioning	Rationale for Scoping Out
Pluvial Flooding	Scoped Out			If deemed necessary, targeted SuDS will be implemented during the construction, operational and decommissioning phases of the Proposed Development. A Site-specific FRA will be prepared which will outline details of surface water management for the Proposed Development, based on the principles of sustainable drainage systems.
Fluvial Flooding	Scoped Out			The entire Site area is located in a low flood risk area and as such, mitigation measures are not required.

4.4. Air Quality

4.4.1. The Air Quality Annual Status Report 2022[23] ('ASR') for ABC states that the former administrative authority for Allerdale Borough did not have any declared Air Quality Management Areas ('AQMA'). The ABC ASR has been reviewed due to the new Council not having any Air Quality ASRs.

4.4.2. ABC had no automatic (continuous) monitoring sites during 2021. However, ABC undertook non-automatic (i.e. passive) monitoring of NO_2 at 18 sites during 2021. The closest monitoring sites are located in Workington, approximately 6km west of the Site.

4.4.3. The ABC ASR shows that for 2021, there were no exceedances of the nitrogen dioxide ('NO_2') annual mean objective of 40µg/m^3 at any of the monitoring sites. Moreover, there have been no exceedances of the NO_2 annual mean objective between 2017 and 2021.

[23] Allerdale District Council Air Quality Annual Status Report (2022) Available at: https://www-cloudfront.allerdale.gov.uk/media/filer_public/ff/1e/ff1e7bcc-a6b4-4d2b-b7c7-d10ad7807746/abc_asr_2022_1.pdf Accessed July 2023

4.4.4. Given the nature of the Proposed Development, significant effects on air quality are not considered likely, as detailed below, and are therefore proposed to be scoped out of the ES.

i. **Construction and decommissioning dust:** during construction and decommissioning, the operation of construction plant and construction and decommissioning activities could lead to a risk of dust generation affecting local receptors. The risk of dust generation will be managed through the implementation of standard best practice and mitigation measures, as required. Mitigation measures could include, wheel washing before construction vehicles leave the Site and ensuring dust generating activities take place away from sensitive receptors. The measures will be incorporated into the oCEMP, as defined in Section 2 (The Proposed Development), which is an established method of managing environmental effects resulting from construction works. The oCEMP will be provided as an Appendix to the ES and secured by requirement in the DCO. Its implementation will ensure that dust impacts on existing sensitive receptors resulting from construction activities will not result in significant effects on these sensitive receptors.

ii. **Construction vehicle emissions**: changes to existing vehicle flows on the road network due to the Proposed Development's construction vehicles will be temporary. The proposed routing of these vehicles is shown on Figure 4.8. As outlined in section 4.5 Traffic and Access section below, due to the size, scale and nature of the Proposed Development, construction vehicle movements are not anticipated to exceed the threshold within guidance (100 average annual daily traffic ('AADT') trips for HGVs). An initial appraisal of the likely impacts of the Proposed Development has shown an anticipated level of traffic during the construction phase with a potential average of around 20 HGV trips (40 movements) and 8 light goods vehicle ('LGV') trips (16 movements) per day during the 18-month construction period. Therefore, the potential for a significant effect on local air quality due to the Proposed

Development is not anticipated. Mitigation measures set in the oCTMP will also be implemented to mitigate the effects of traffic during construction. The oCTMP will ensure that the appropriate vehicle routing for the construction phase is implemented.

iii. **Operational vehicle emissions**: as outlined in section 4.5 Traffic and Access below, there are anticipated to be a limited number of visits per week for maintenance (comprising 1-2 visits per week consisting of 2-4 vehicular movements). These would typically be made by car, van, or other LGV. The Proposed Development will comprise a minimum of two Electric Vehicle ('EV') charging points, which will support the transition of operational vehicle movements to be zero emissions. Therefore, air quality effects arising from vehicular use during the operational phase of the Proposed Development will be negligible. The components of the operational Proposed Development would not produce emissions to air.

iv. **Decommissioning dust and vehicle emissions:** emissions during the decommissioning phase are anticipated to be similar to, or less than, the construction phase and would be similarly managed, via the implementation of the detailed DEMP, to ensure impacts on air quality are minimal and not significant. An oDEMP will be submitted in support of the DCO application, which will be secured by DCO requirement.

4.5. Traffic and Access

Introduction

4.5.1. This section describes the baseline conditions for the Proposed Development relating to traffic and access. It sets out the potential impacts that could occur during the construction, operation and decommissioning of the Proposed Development. It also gives a description of the measures that will be embedded in the design and management of the Proposed Development to mitigate or minimise these impacts.

4.5.2. During construction and decommissioning impacts could arise from vehicles travelling to and from the Proposed Development to deliver or collect

construction materials, in addition to workforce trips. During the operation of the Proposed Development, there will be occasional operational traffic, including LGVs[24] for maintenance purposes and ad-hoc deliveries using HGVs[25].

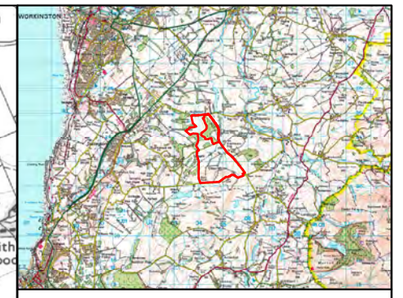
4.5.3. After consultation with the Council and National Highways ('NH'), both stakeholders agreed that it is appropriate to scope traffic and access out of the ES. Correspondence with the Council and NH confirming their agreement is included in Appendix 4.2. The meeting minutes from these consultations are additionally included in Appendix 4.3.

Traffic and Access Study Area

4.5.4. The road network in the study area, as outlined in Figure 4.6 below, consists of three un-named roads (referred to as Branthwaite Road, Branthwaite Edge Road and Gilgarran Road) and A595 on the Strategic Road Network ('SRN').

[24] Light Goods Vehicles are defined as goods vehicles with a Gross Vehicle Weight not exceeding 3.50 tonnes.
[25] Heavy Goods Vehicles are defined as goods vehicles with a Gross Vehicle Weight exceeding 3.50 tonnes.

Figure 4.6: Traffic and Access Study Area



Legend

- Draft Order Limits
- Study area
- ATC locations

Lilyhall Roundabout/A595

C2054 103: Branthwaite Road

U2186 101: Gilgarran Road

C2054 102: Branthwaite Edge Road

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Traffic and Access Study Area

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4.5.5. The road network adjacent to the Proposed Development consists of rural single carriageway roads with intermittent road markings. The speed limit on the local roads within the study area is 60mph. These roads do not feature pedestrian footways along the vast majority of the routes, although due to the rural setting pedestrian movement is expected to be low.

4.5.6. A595 north of Lilyhall Roundabout is a single carriageway road with lane markings and a speed limit of 60mph. A595 meets the A66 further north at Bridgefoot Roundabout.

4.5.7. No specific height, weight or width restrictions were identified on the study area road network. This has been confirmed through consultation with the Council and NH. The Council noted that the Gilgarran Road was not wide enough for two vehicles to pass each other. However, the road was noted for very low levels of traffic as shown in Table 4.2 and that construction vehicle movements could be effectively managed through the control mechanisms that will be set out in the oCTMP to be submitted as part of the DCO application.

4.5.8. It was also confirmed during consultation with the Council and NH that there are no sensitive receptors of note along the study area road network. The villages of Gilgarran and Branthwaite are not on the proposed vehicle routes (see Figure 4.7) and there are no education or medical facilities in the vicinity of the Site. This helps minimise the potential impact of the Proposed Development on sensitive locations.

4.5.9. Personal Injury Crash (‘PIC’) records from the past five years have been obtained from the Council. The data shows there have been a total of three recorded accidents on the local road network of the study area within the past five years. Two of these were recorded as ‘slight’, and one was recorded as ‘serious’. The serious incident was noted to involve one vehicle and driver and the cause was noted as driver error.

Public Transport Access

4.5.10. The nearest railway station to the Site is Harrington, located approximately 6.5km to the west. From here, Northern Trains operates an hourly service to Carlisle and Barrow-in-Furness. The services from this stop also serve nearby Workington and Whitehaven.

4.5.11. The nearest bus stops with frequent services are Lilyhall, located approximately 3.5km north-west of the Site. From here, Stagecoach operates route 29, a twice-hourly service between Workington and Whitehaven. Route 29 operates from approximately 05:30 to 19:30 Monday to Saturday with no service on Sunday. The next nearest bus stops are Distington, located approximately 4.2km west of the Site. From here, Stagecoach operates route 30, a thrice-hourly service between Thornhill and Maryport. Route 30 operates from approximately 05:30 to 23:30 Monday to Saturday with a reduced service on Sunday.

Cycle and Pedestrian Network

4.5.12. There are marked cycle lanes surrounding Lilyhall Roundabout, and a segregated pedestrian/cycle route runs adjacent to A595 towards A66. Approximately 2.4km north along A595, the cycle route separates and joins a rural road, crossing A595 again shortly north of the intersection with Moor Road. There are no other nearby dedicated or marked pedestrian/ cycle paths within close proximity of the traffic and access study area.

4.5.13. There are no Public Rights of Way ('PRoWs') within the Site, although there are multiple routes in the surrounding area, including:

i. PRoW 225002 – is a footpath located on the eastern part of the Site boundary running north of Rigg House Farm towards Branthwaite;

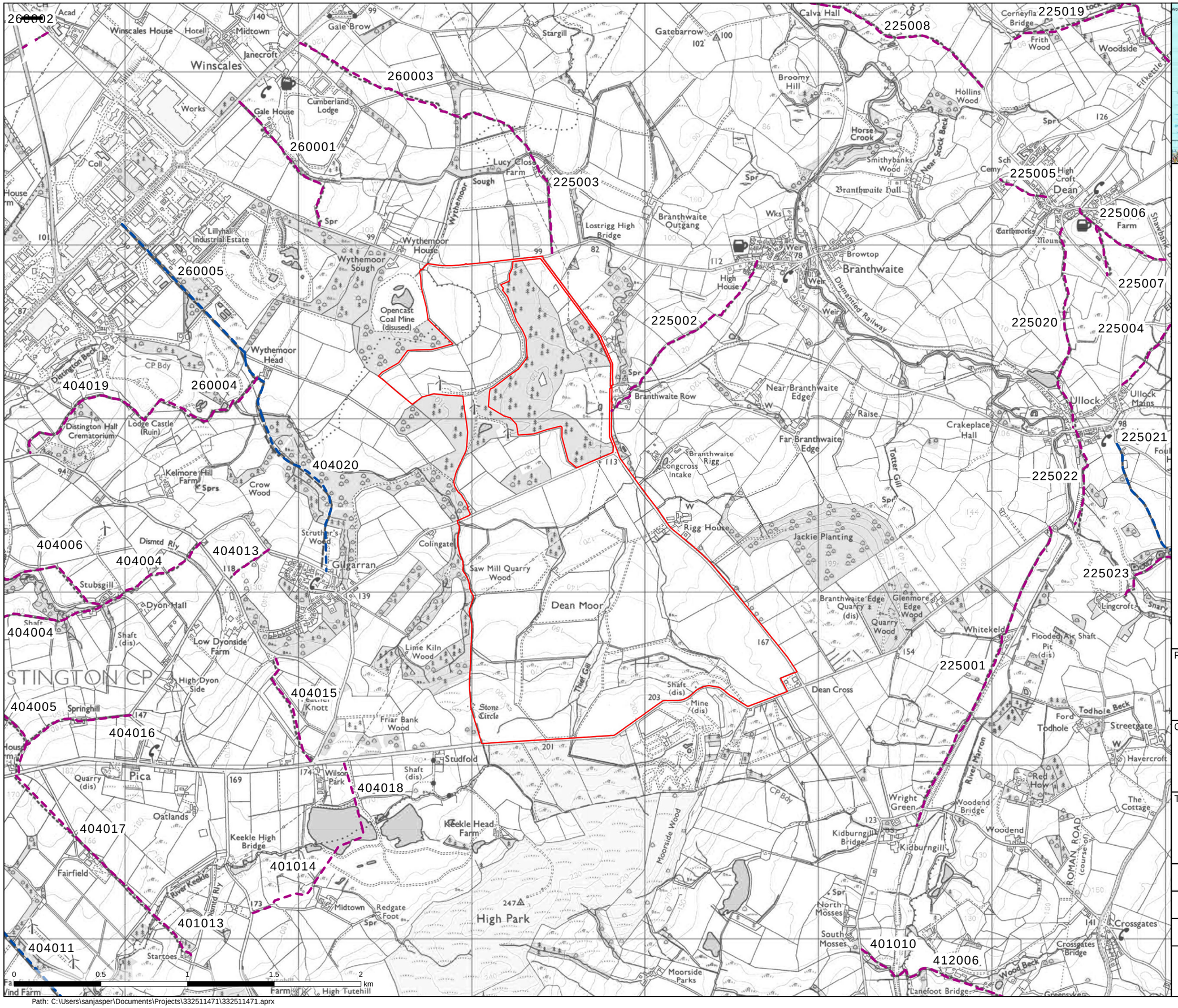
ii. PRoW 404020 – is a bridleway located approximately 800m from the western part of the Site, running north from Gilgarran to Lilyhall;

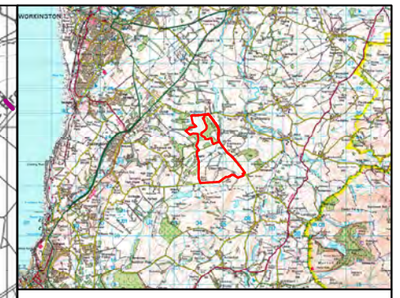
iii. Other minor PRoWs within the vicinity of the Site include PRoW 225003 and 260001 to the north.

4.5.14. Given that no PRoWs directly intersect the Site or the construction and decommissioning vehicle routeing on the local road network, significant effects on the PRoW network as a result of the Proposed Development are not anticipated.

4.5.15. Figure 4.7 below outlines the PRoW network surrounding the Site.

Figure 4.7: Public Rights of Way





Legend

- Draft Order Limits
- Bridleway
- Footpath

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Public Rights of Way in the Vicinity of the Site

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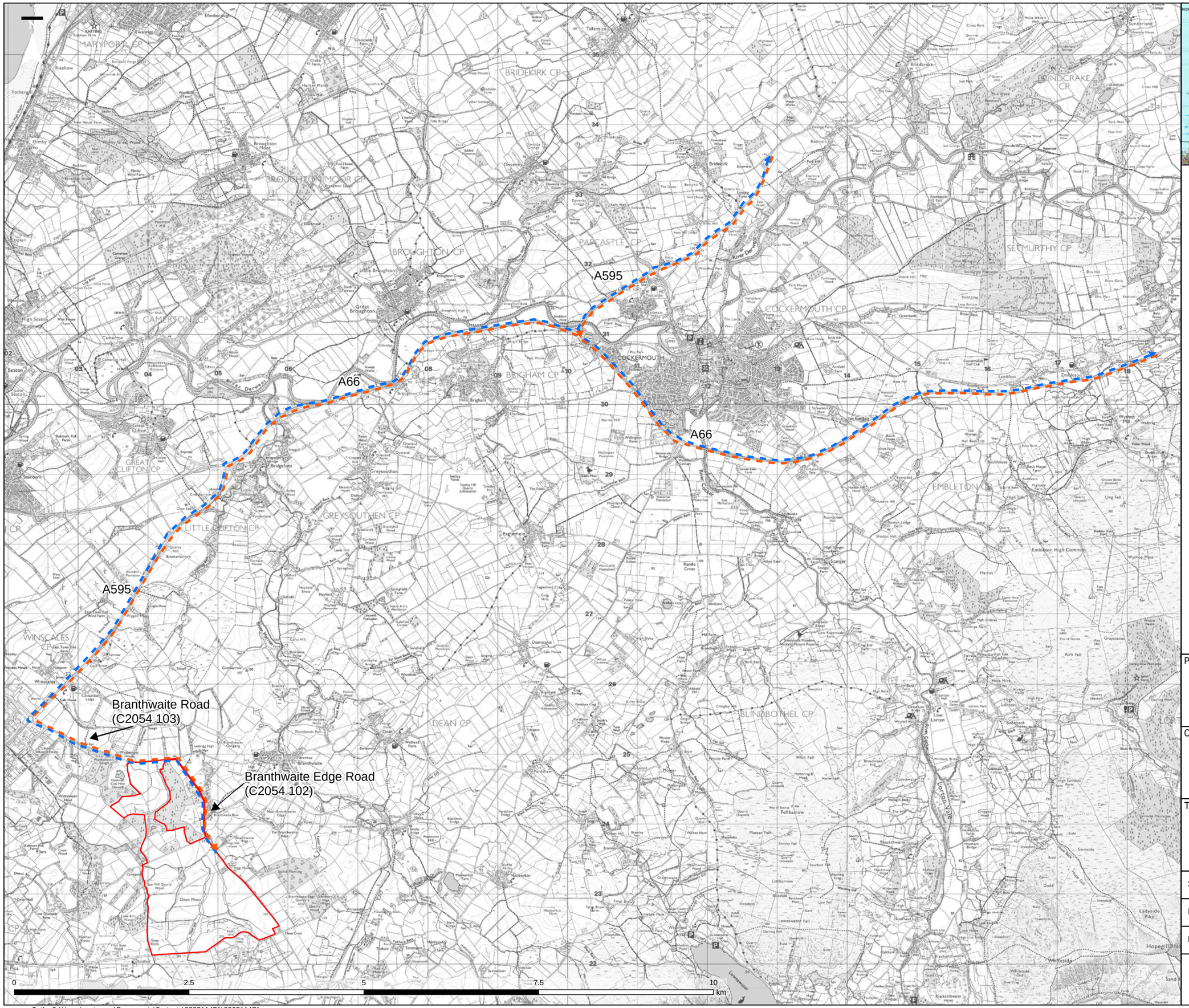
Vehicle Routes and Site Access

4.5.16. To access the Proposed Development from the SRN, vehicles will travel either south along A595 (if travelling from M6 J44 at Carlisle) or west along A66 (if travelling from M6 J40 from Penrith). Inbound vehicles from Penrith will subsequently travel west along A66 after passing through the Fitz Roundabout and Bridgefoot Roundabout and travelling south along A595. After reaching Lilyhall Roundabout, vehicles will leave the SRN, travelling east along Branthwaite Road. From here, vehicles can access the Proposed Development's entrances located along Branthwaite Road, Branthwaite Edge Road and Gilgarran Road. For vehicles departing the Proposed Development towards the SRN, the opposite routeing will be applicable. Figure 4.8 below presents the vehicle routeing.

Figure 4.8: Access from SRN to the Site



Legend

- Draft Order Limits
- Vehicle Route (Inbound)
- Vehicle Route (Outbound)

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Access from the Strategic Road Network

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4.5.17. The final access strategy is still under consideration. However, it will likely comprise 4-5 Site accesses as set out below:

i. The existing access point along Branthwaite Road, into Area A, previously used for the construction of the Wind Farm. This access point has a very wide bellmouth associated with the previous movement of wind turbine blades. As such, it is a suitable access for construction vehicles;

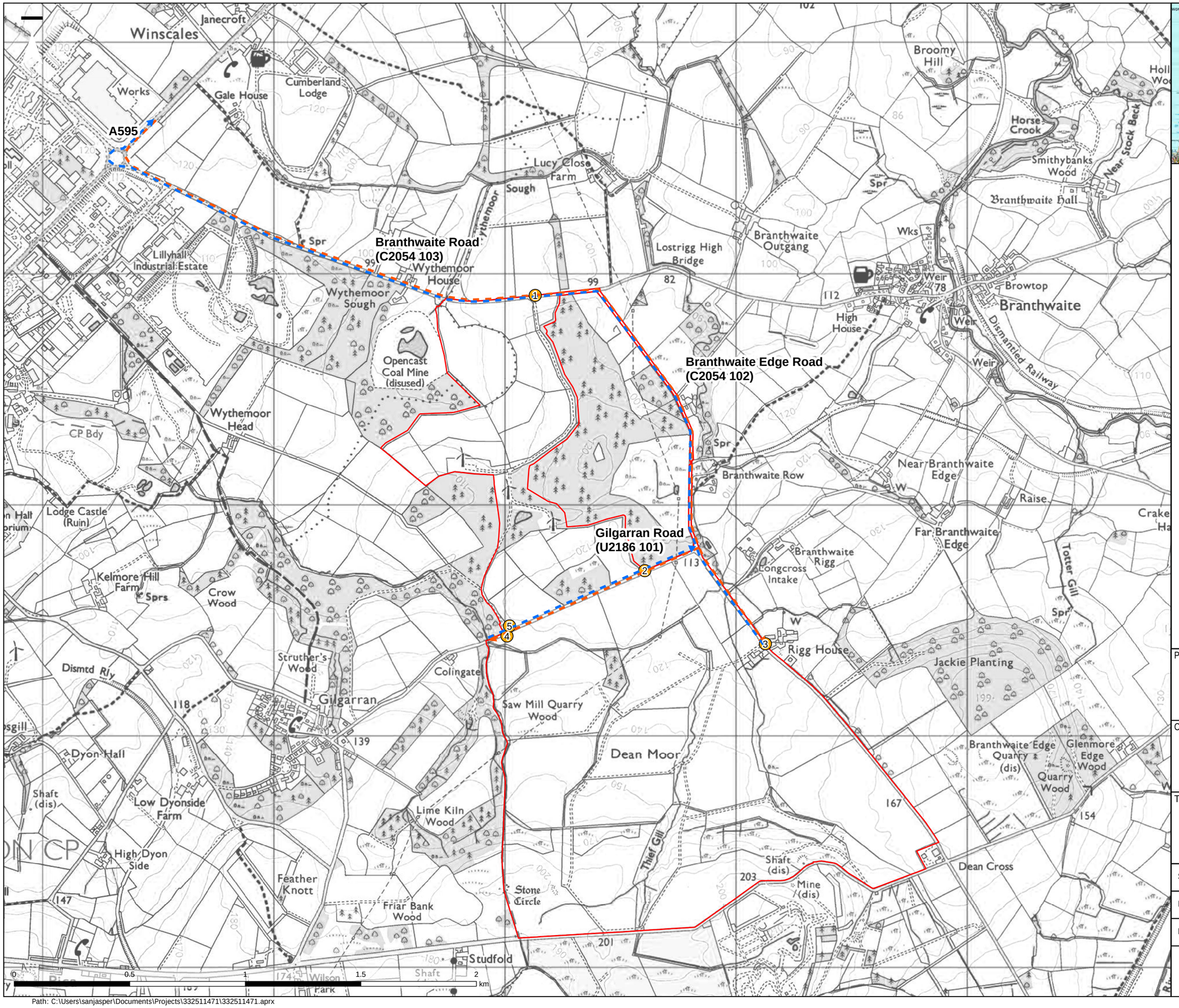
ii. The existing access point along Branthwaite Edge Road, into Area C, currently used as the primary agricultural land and farmyard access; and

iii. Two existing accesses along Gilgarran Road. These accesses will utilise existing entrances to the agricultural land to the west of Area B and the east and west of Area C.

4.5.18. During the consultation with the Council, none of the identified Site accesses raised concern in terms of accessibility or visibility. It was recognised that some (minimal) vegetation removal may be required, to provide sufficient width and visibility for vehicle manoeuvring.

4.5.19. Figure 4.9 below outlines the Site accesses.

Figure 4.9: Site Accesses



Legend

- Draft Order Limits
- Indicative Site Access
- Vehicle Route (Inbound)
- Vehicle Route (Outbound)

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Access from the Strategic Road Network

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ATC Surveys

4.5.20. Automatic Traffic Count ('ATC') surveys have been undertaken for roads within the study area of the Proposed Development and potential access junctions. The surveys were undertaken between 17 April 2023 and 23 April 2023. The three ATC survey locations were as follows:

i. ATC Location 1: 'Branthwaite Road' (Road Section C2054 103);
ii. ATC Location 2: 'Branthwaite Edge Road' (Road Section C2054 102); and
iii. ATC Location 3: 'Gilgarran Road' (Road Section U2186 101).

4.5.21. A map of the study area for the impacts from the Proposed Development's traffic and the ATC survey locations are shown in Figure 4.6.

4.5.22. In addition to ATC surveys, WebTRIS data[26] has been reviewed for the SRN within the study area, including A595 and A66. The average weekday two-way traffic flows are set out in Table 4.2 below.

Table 4.2: Baseline Traffic Flows - Average Weekday (24hr), Two-Way

ATC Survey Location	Road Section	Total Vehicles	% HGV
1	'Branthwaite Road' (C2054 103)	2,761	6%
2	'Branthwaite Edge Road' (C2054 102)	1,757	6%
3	'Gilgarran Road' (U2186 101)	145	5%
WebTRIS Data*	A595 (Lillyhall Roundabout to Bridgefoot Roundabout)	16,061	8%
WebTRIS Data*	A66 (West of Fitz Roundabout)	24,925	10%

** WebTRIS Data was extracted from the same week as ATC Survey (17th April to 23rd April 2023)*

[26] National Highways WebTRIS Available at: **https://webtris.highwaysengland.co.uk/** Accessed July 2023

4.5.23. As shown in Table 4.2, the baseline data shows the strategic and local road flows are relatively low and the network is operating within effective capacity. This was confirmed through informal consultation with the Council and NH who stated the baseline conditions were as expected and the road network in the study area did not present any specific operational challenges.

Proposed Development Traffic Movements; Construction and Decommissioning

4.5.24. It is expected that a range of vehicles would access the Site to enable construction, which would comprise the following (but not limited to):

i. LGVs i.e., vans and small flatbeds – movements for plant maintenance, PPE, fixings/small components, sundry items, canteen supplies, couriers, post/parcels (note LGVs do not include staff minibuses); and

ii. HGVs i.e., 2-6 axle rigid or articulated lorries – movements of materials/component deliveries, PV tables, mounts and panels, plant deliveries, piling rigs, spoil removal, aggregate supplies, cabling, containerised equipment, fencing etc.

4.5.25. An initial appraisal of the likely impacts of the Proposed Development has shown an anticipated level of traffic during the construction phase with around 20 HGV trips (40 movements) and 8 LGV trips (16 movements) per day. The peak period of construction is expected to occur when multiple teams are on-site undertaking piling, constructing the framework and mounting solar PV modules.

4.5.26. It is estimated that construction staff numbers may peak at up to 150 per day. However, the average number of workers on-site is expected to be between 50-80 per day. This includes both labourers and technical/office staff. Staff are expected to be staying in locally based accommodation (rather than travelling long distances on a daily basis) and minibuses will be used to transport workers to Site to minimise vehicle trips. A framework Construction Worker Travel Plan (‘CWTP’) will be submitted as part of the DCO application.

4.5.27. Based on the analysis of the ATC survey data and WebTRIS data, the impact from the construction phase on local roads and the SRN is expected to be minimal.

4.5.28. The Proposed Development has a modelled operational lifespan of up to 40 years. At the end of this period, the Proposed Development will be decommissioned. The number of vehicle movements associated with the decommissioning phase is not anticipated to exceed that set out for the construction phase.

Operational Phase

4.5.29. During the Proposed Development's operational phase there are anticipated to be a limited number of visits per week for maintenance (comprising 1-2 visits per week consisting of 2-4 vehicular movements). These would typically be made by LGVs or four-wheel drive vehicles with operatives to perform checks and maintenance of plant and equipment. There could also be an occasional ad-hoc visit by HGV for operations such as equipment replacement. The permanent Site accesses will be designed to accommodate HGVs allowing them to enter and exit in forward gear. As such, the impacts of the operational phase on traffic and access are expected to be minimal.

Supporting Documentation

4.5.30. A Transport Statement and oCTMP will be prepared to support the DCO application of the Proposed Development. The oCTMP will follow best practice and will identify a series of measures to mitigate or minimise the impacts of the construction and decommissioning phase of the Proposed Development. The measures include but are not limited to:

i. Adherence to designated vehicle routes;
ii. Use of a Delivery Management System;
iii. Vehicle Site entry and exit in forward gear;
iv. Wheel washing facilities; creation of vehicle passing bays (if necessary);
v. Component prefabrication where possible;
vi. Re-use of material on-site where practicable;
vii. Adherence to best practice schemes; and
viii. Implementation of the framework CWTP.

Likely Traffic and Access Effects from the Proposed Development

4.5.31. The Proposed Development's impacts on the environmental impact criteria set out in the Guidelines for the Environmental Assessment of Traffic and Movement[27] published by the IEMA ('the IEMA Guidelines') have been considered. These criteria comprise:

i. Accidents and Safety;
ii. Severance;
iii. Driver Delay;
iv. Pedestrian Delay (incorporating delay to all non-motorised users);
v. Pedestrian Amenity (including Fear and Intimidation); and
vi. Hazardous/Large Loads.

Accidents and Safety

4.5.32. The IEMA Guidelines do not include any definition in relation to the assessment of effects on accidents and safety, advising that professional judgement should be used to assess the implications of local circumstance, or factors which may increase or decrease the risk of accidents. Having carried out an initial review of PIC records (see paragraph 4.5.9) for the local roads and given the assessment of the baseline conditions on local roads, the SRN, feedback from the Council and NH during informal consultation and the estimated vehicle trips throughout the construction, operational and decommissioning phase, significant effects are not anticipated for accidents and safety as a result of the Proposed Development.

Severance

4.5.33. The IEMA Guidelines define severance as '*the perceived division that can occur within a community when it becomes separated by major traffic infrastructure* (paragraph 3.13) that '*separates people from places and other*

[27] Guidelines for the Environmental Assessment of Traffic and Movement (2023) Institute of Environmental Management and Assessment. Digital Copy. Available at: **https://www.iema.net/resources/blog/2023/07/12/new-iema-guidance-environmental-assessment-of-traffic-and-movement** Accessed July 2023

people', for example, difficulty crossing a heavily trafficked road, or the physical barrier created by infrastructure.

4.5.34. There are a range of indicators for determining the significance of effects resulting from changes in severance. The IEMA Guidelines suggest that '*changes in traffic flow of 30%, 60% and 90% are regarded as producing slight, moderate and substantial changes in severance respectively*' (paragraph 3.16). The guidance also notes that '*Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic'* (paragraph 3.16).

4.5.35. The forecast movements associated with the peak period of construction of would represent a 0.3% increase in Annual Average Weekday Traffic ('AAWT') on A595 at Lilyhall Roundabout. The forecast HGV traffic would represent a 3% change in HGV traffic at that junction.

4.5.36. The guidelines also note that *'At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact'* (paragraph 2.18). Subsequently, proportionate changes in traffic flow from a low base flow are not in themselves justification for significance. For roads with existing low traffic flows, a marginal change in the volume of traffic flow on the road due to a proposed development can derive a greater percentage change than for roads with higher existing traffic flows. Due to the absence of sensitive receptors along the access route, the change in vehicle traffic would not be judged to derive a significant impact within an ES.

4.5.37. The road network within the study area has low existing traffic flows. However, the estimated number of vehicle trips associated with the construction, operation, and decommissioning of the Proposed Development will have a negligible severance impact on the existing road network. As such, significant effects on severance are not anticipated as a result of the Proposed Development.

Driver Delay

4.5.38. The IEMA Guidelines state that '*delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system*' (paragraph 3.20). As such, the impact of a proposed development on driver delay is typically considered in relation to background traffic. The Council and NH confirmed through consultation that junction assessment modelling for the Proposed Development in support of the DCO application is not required as the surrounding road network is not at, or near, capacity. The change in traffic flow as a result of the construction, operation and decommissioning of the Proposed development is low. Correspondence details from the Council and NH are included in Appendix 4.2.

4.5.39. Consultation with the Council and NH has confirmed that the traffic and access impacts associated with the Proposed Development are considered to be minimal. Correspondence details from the Council and NH are included in Appendix 4.2. The Proposed Development would be judged to have a negligible impact on driver delay and the existing capacity of the SRN and local road network and therefore significant effects on driver delay are not anticipated.

Pedestrian Delay (incorporating delay to all non-motorised users)

4.5.40. The IEMA Guidelines states that *'the assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads'* (paragraph 3.23). The IEMA Guidelines subsequently state *'it is not considered wise to set down definitive thresholds. Instead, it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect'* (paragraph 3.26).

4.5.41. The estimated number of vehicle trips associated with the construction, operational and decommissioning phase will have a negligible impact on the SRN and local road network. As previously identified, there are minimal pedestrian routes within the study area, no PRoWs will be impacted by the

proposed development and vehicle routes to/from the worksites will not pass through the villages of Gilgarran and Branthwaite. Furthermore, any impacts on pedestrian delay associated with construction and decommissioning vehicles will be temporary. As such, significant effects from the Proposed Development on pedestrian delay are not anticipated.

Non-motorised User Amenity (including Fear and Intimidation)

4.5.42. Pedestrian amenity is broadly defined in the IEMA Guidelines as '*the relative pleasantness of a journey*' (paragraph 3.29) and can be affected by traffic flow, composition, and footway width/separation from traffic. The definition includes pedestrian fear and intimidation and can be considered a much broader category when considering the overall relationship between pedestrians and traffic. The IEMA Guidelines suggest that a threshold for judging this would be '*where the traffic flow (or its HGV component) is halved or doubled*' (paragraph 3.30).

4.5.43. The number of vehicles associated with the construction, operational and decommissioning phase will have a minimal impact on non-motorised user amenity. As previously identified, there are minimal pedestrian routes within the study area, no PROWs will be impacted by the Proposed Development and vehicle routes to/from worksites will not pass through the villages of Gilgarran and Branthwaite.

4.5.44. The HGV numbers associated with the Proposed Development during the construction period do not meet the threshold for assessment based on the IEMA Guidelines. Therefore, significant effects on non-motorised user amenity resulting from the Proposed Development are not anticipated.

Hazardous/Large Loads

4.5.45. The IEMA Guidelines state that some developments include hazardous and large (abnormal) loads, and that this should be recognised as an environmental impact criterion. There may be a limited number of Abnormal Indivisible Loads ('AIL') to transport items for the Proposed Development, such

as the transformers for the substation. It is anticipated that there could be up to a maximum of five AIL trips for the Proposed Development.

4.5.46. An AIL is typically classified as a vehicle which exceeds 44 tonnes Gross Vehicle Weight, or its width is more than 2.9m, or its rigid length is more than 18.65m.

4.5.47. The maximum number of potential AIL trips for the Proposed Development is very low. There are also established management practices including the requirement for Movement Orders, use of specialist hauliers, stakeholder notification procedures, routeing assessments and Police escorts (where necessary) that could be implemented for the Proposed Development, as required. Due to this embedded mitigation which will be incorporated into the oCTMP and outline Decommissioning Traffic Management Plan, the impacts from the Proposed Development's large loads are not anticipated to be significant.

Summary

4.5.48. As significant effects are not anticipated from traffic and access as a result of the Proposed Development, it is proposed to scope out this topic from the ES. As agreed with the Council and NH, a Transport Statement, which would assess traffic and access impacts from the Proposed Development and an oCTMP including a framework CWTP would be submitted in support of the DCO application.

4.5.49. After consultation with both the Council and NH, both stakeholders agreed that it is appropriate to scope traffic and access out of the ES. Correspondence with the Council and NH confirming their agreement is included in Appendix 4.2. The meeting minutes from these consultations are additionally included in Appendix 4.3.

4.6. Noise and Vibration

Baseline Noise Environment

4.6.1. Based on a desktop review of the Site and its surroundings, the closest human noise sensitive receptors ('NSR') to the Site are noted below and indicated in Figure 4.10:

i. Rigg House Farm, to the east of the Site;
ii. Jackie Hill, to the east of the Site;
iii. Dean Cross Cottage, to the south-east of the Site;
iv. Fulton's Landrovers to the south-east corner of the Site;
v. Dean Moor Motocross Park to the south of the Site;
vi. Fellview Cottage, to the south-west of the Site;
vii. Colinside and Colingate dwellings on the north junction of Keekle Head Farm to the south-west of the Site;
viii. Wythemoor Sough and Wythemoor House dwellings, to the north-west of the Site;
ix. Bannockburn dwelling, to the east of the Site;
x. AVS Cumbria Metals, to the east of the Site;
xi. Brookfield dwelling, to the east of the Site; and
xii. Longcross Intack dwelling, to the east of the Site.

Figure 4.10: Identified Noise Sensitive Receptors

h. Wythemoor House

h. Wythemoor Sough

i. Bannockburn dwelling

j. AVS Cumbra Metals

k. Brookfield Dwelling

l. Longcross Intake Dwelling

a. Rigg House Farm

b. Jackie Hill

c. Dean Cross Cottage

d. Fulton's Landrovers

e. Dean Moor Motocross Park

f. Fellview Cottage

g. Colinside and Colingate dwellings

Opencast Coal Mine (disused)

Wythemoor Head

Lostrigg High Bridge

Branthwaite Outgang

Weir

Browtop

Branthwaite

High House

Dismantled Railway

Near Branthwaite Edge

Raise

Far Branthwaite Edge

Branthwaite Rigg

Longcross Intake

Totter Gill

Crow Wood

Struther's Wood

Colingate

Gilgarran

Saw Mill Quarry Wood

Dean Moor

Jackie Planting

Branthwaite Edge Quarry (dis)

Glenmore Edge Wood

Quarry Wood

Lime Kiln Wood

Thief Gill

Shaft (dis)

Mine (dis)

Dean Cross

Feather Knott

Stone Circle

Studfold

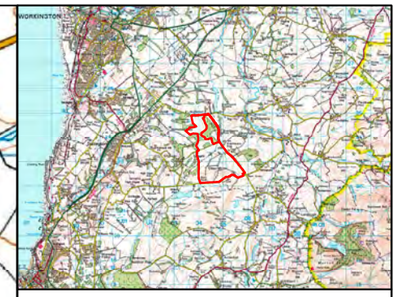
Wilson Park

Shaft (dis)

CP Bdy

Wright Green

0 0.5 1 1.5 2 km



Legend

Draft Order Limits

Noise Sensitive Receptor

Project Title: Dean Moor Solar Farm

Client: FVS Dean Moor Limited

Title: DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Identified Noise Sensitive Receptors

Scale: 1:12,500 @ A3	Date: 07/08/2023
Drawn: TL	Checked: HC
Figure: 4.10	Sheet 1 of 1 Rev: A

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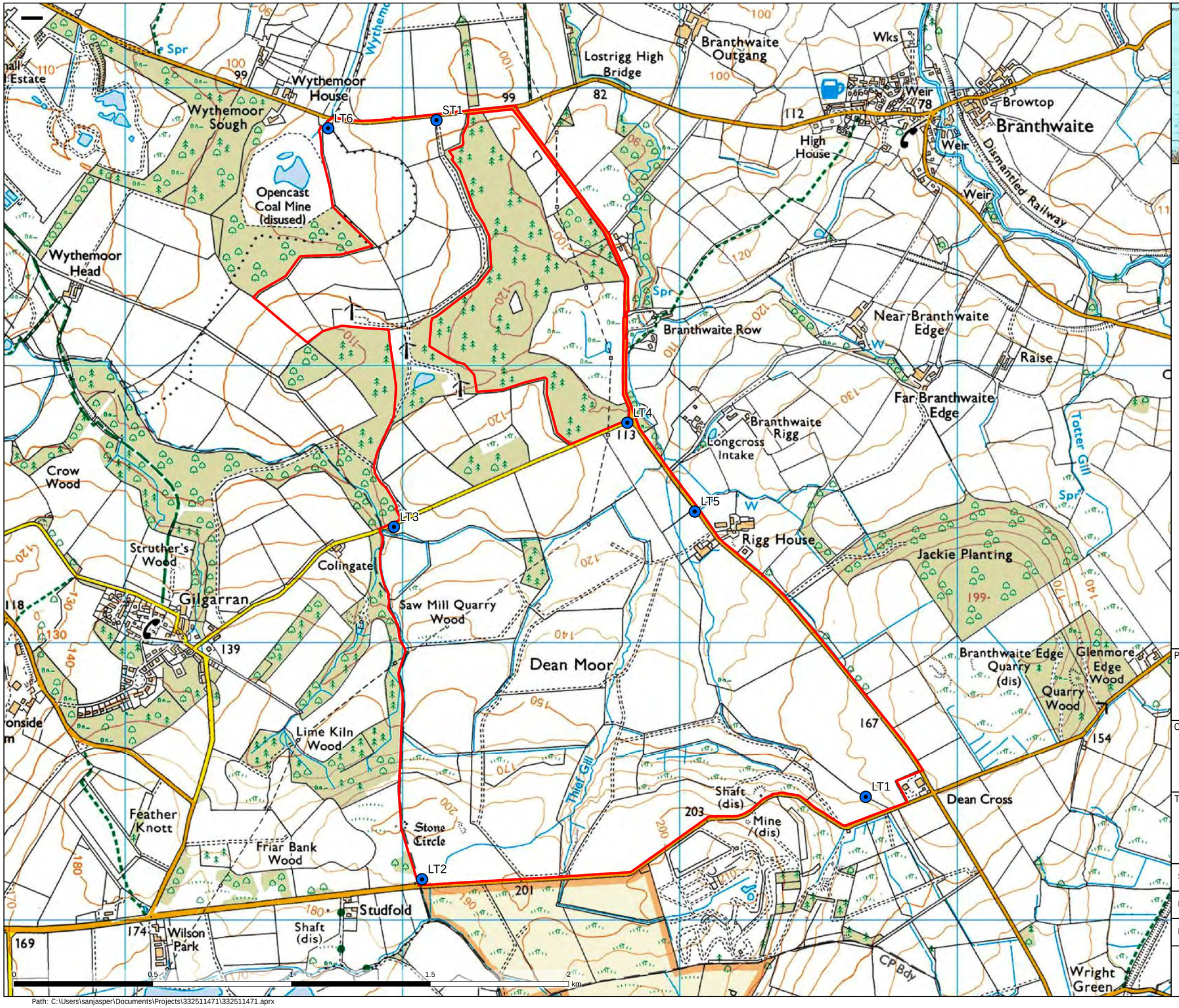
4.6.2. A baseline sound survey was conducted between the following dates:

a. 23rd to 27th March 2023; and
b. 4th to 11th May 2023.

4.6.3. Measurements were taken at six unattended locations (LT1-6), and one attended location (ST1). The locations of the measurements are indicated in Figure 4.11.

Figure 4.11: Sound Survey Locations



Legend

- Draft Order Limits
- Sound Survey Location

Project Title: Dean Moor Solar Farm

Client: FVS Dean Moor Limited

Title: DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Sound Survey Locations

Scale: 1:12,500 @ A3	Date: 07/08/2023
Drawn: TL	Checked: HC
Figure: 4.11	Sheet 1 of 1 / Rev: A

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4.6.4. Based on a review of publicly available data, weather conditions over the period 23rd to 25th March 2023 were unlikely to be suitable for robust environmental sound measurements, due to rainfall and windspeeds above 5 m/s. This period has therefore been omitted from the analysed dataset. However, the baseline sound survey measurements recorded between 25th and 27th March 2023 and between 4th and 11th May 2023 comprise a robust dataset for the baseline assessment. A summary of the results of the sound survey is provided in Appendix 4.4.

4.6.5. Based on a statistical analysis of the measured data, the ambient and range of background sound levels at measurement locations LT1-LT6 are presented in Table 4.3 below.

Table 4.3: Sound Levels at Measurement Locations LT1-LT6

Measurement Location	Period	Ambient Sound Level $L_{Aeq,T}$ decibels ('dB')	Typical Background Sound Level $L_{A90,15minutes}$ decibels ('dB')
LT1	Daytime 07:00 – 23:00 hours	43	27-36
	Night-time 23:00 – 07:00 hours	38	18-35
LT2	Daytime 07:00 – 23:00 hours	45	22-28
	Night-time 23:00 – 07:00 hours	40	19-24
LT3	Daytime 07:00 – 23:00 hours	52	34-41
	Night-time 23:00 – 07:00 hours	47	26-41
LT4	Daytime 07:00 – 23:00 hours	52	34-35
	Night-time 23:00 – 07:00 hours	44	32
LT5	Daytime 07:00 – 23:00 hours	54	30-43
	Night-time	47	21-40

	23:00 – 07:00 hours		
LT6	Daytime 07:00 – 23:00 hours	53	31-35
	Night-time 23:00 – 07:00 hours	48	26-29

4.6.6. The measured average sound level at ST1 was 56 dB $L_{Aeq30minutes}$ between 12:00 and 13:00 hours on 4th May 2023.

Construction Traffic Noise

4.6.7. Based on guidance within the Design Manual for Roads and Bridges ('DMRB') LA 111[28], construction traffic noise shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

i. 10 or more days or nights in any 15 consecutive day or nights; or
ii. A total number of days exceeding 40 in any 6 consecutive months.

4.6.8. Based on Table 3.17 of the DMRB LA 111[28], moderate impacts from construction traffic noise are deemed to occur when there is an increase of between 3 and 5 dB in the basic noise level ('BNL'). Major impacts are deemed to occur when there is an increase of 5 dB or more in the BNL.

4.6.9. The Proposed Development is anticipated to result in the following average construction traffic at the Site:

i. 20 HGV (40 two-way movements) during the peak construction works;
ii. 8 LGV (16 two-way movements) during the peak construction works; and
iii. 50 construction staff cars (100 two-way movements) during the peak construction works.

4.6.10. It is estimated that construction staff numbers will peak at up to 150 per day. However, the average number of workers on-site is expected to be between

[28] Standards for Highways. (2020) DMRB LA111 *Noise and Vibration*

50-80 per day. This includes both labourers and technical/office staff. Staff are expected to be locally accommodated and minibuses will be used to transport these workers to the Site. A car-sharing scheme will be promoted for workers who normally reside in the area. Such measures will minimise vehicle trips for construction staff.

4.6.11. Based on these traffic movements, the BNL for baseline and construction / decommissioning phase scenarios have been calculated having regards to the methodology outlined within the Calculation of Road Traffic Noise ('CRTN')[29] at receptors identified in Figure 4.10 along the identified construction and decommissioning traffic route as indicated in Figure 4.8, which include receptors a, b, c, d, h and i. The calculated BNLs for the baseline and construction / decommissioning traffic scenarios are presented in Table 4.4.

Table 4.4: Calculated Basic Noise Level During Baseline and Construction/ Decommissioning Phase Scenarios

Receptor	Road Link	Baseline Basic Noise Level $L_{A10,18hour}$	Construction Basic Noise Level $L_{A10,18hour}$	Increase in BNL
a-d and i	Automated Traffic Count 2 (ATC2) Road South of Branthwaite Edge Junction	60.6	61.6	+0.5
h	Automated Traffic Count 1 (ATC1) Cumbria Way	63.2	63.8	+0.3

4.6.12. Based on the results of the calculations, the BNL is not anticipated to increase by more than 1 dB at receptors along the construction/decommissioning traffic route. This is below the criteria at which a significant effect is identified. As such, it is considered that construction and decommissioning traffic noise will not result in a significant effect and therefore it is proposed that they are scoped out of the ES.

[29] Department for Transport Welsh Office (1988) *The Calculation of Road Traffic Noise (CRTN)*

Construction Activity Noise and Vibration

4.6.13. It is anticipated that construction hours would be limited to 07:00 – 19:00 during weekdays and 07:00 – 13:00 on Saturdays.

4.6.14. Based on guidance within DMRB LA 111 (Noise and Vibration)[28], construction noise and vibration shall constitute a significant effect where it is determined that a major or moderate magnitude of impact will occur for a duration exceeding:

i. 10 or more days or nights in any 15 consecutive day or nights; or
ii. A total number of days exceeding 40 in any 6 consecutive months.

4.6.15. The dominant source of noise and vibration associated with the construction phase of the Proposed Development is anticipated to be piling.

4.6.16. Based on guidance provided in BS 5228-1:2009+A1:2014[30] and DMRB LA 111[28], the Significant Observed Adverse Effect Level ('SOAEL') for construction noise at noise sensitive receptors would be 70 dB $L_{Aeq,12hours}$ and the Lowest Observed Adverse Effect Level ('LOAEL') would be 65 dB $L_{Aeq,12hours}$. Where the noise level exceeds the SOAEL, this is considered to be a moderate impact.

4.6.17. The technique likely to result in the highest levels of noise would be percussive piling. Based on two piling rigs working close to receptors simultaneously, the pile depths being 2.5m or less and a diameter of 300mm or less and from noise data provided within BS 5228-1:2009+A1:2019[30], the SOAEL would not be expected to be exceeded at distances of 40 m or more from the piling location. Receptors are located at least 40 m away from

[30] The British Standards Institution (BSI) (2014a). 5228-1:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise*

anticipated piling locations, and therefore significant effects from construction noise are not anticipated as the SOAEL is not anticipated to be exceeded.

4.6.18. Based on guidance provided within BS 5228-2:2009+A1:2014[31], the SOAEL for vibration at vibration sensitive receptors would be 1 mm/s peak particle velocity ('PPV') and the LOAEL would be 0.3 mm/s PPV. Where the vibration level exceeds the SOAEL, this is considered a moderate impact.

4.6.19. The technique likely to result in the highest levels of vibration would be percussive piling. Based on the piles not being at refusal (i.e., a scaling factor of 1), pile depths being 2.5m or less and a nominal hammer energy of 4KJ or less, the SOAEL would not be exceeded at distances of 25m or more from the piling location based on guidance provided within BS 5228-2:2009+A1:2014. Receptors are located at least 25m away from anticipated piling locations, and therefore significant effects from construction vibration are not anticipated as the SOAEL is not anticipated to be exceeded.

4.6.20. Mitigation measures are to be set out in the CEMP and CTMP, which would outline relevant noise and vibration mitigation for the construction phase. Typical measures to be included with the CEMP and CTMP may include but not be limited to:

i. Encouraging the use of quiet working methods, the most suitable plant and reasonable hours of working for noisy operations, where reasonably practicable.
ii. Locating noisy plant and equipment as far away from dwellings as reasonably possible, and where practical, carry out loading and unloading in these areas;
iii. Screening plant to reduce noise which cannot be reduced by increasing the distance between the source and the receiver (i.e., by installing noisy plant and equipment behind large site buildings);
iv. Shutting down any machines that work intermittently or throttling them back to a minimum;

[31] The British Standards Institution (BSI) (2014b). 5228-2:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration*

v. Orientating plant that is known to emit noise strongly in one direction so that the noise is directed away from houses, where possible;

vi. Closing acoustic covers to engines when they are in use or idling;

vii. Lowering materials slowly, whenever practicable, and not dropping them;

viii. Wherever possible appropriate fencing or hoarding, to the required height and density, will be provided in locations which have noise sensitivity to reduce noise breakout from the Site. All Site gates will be controlled to give the minimum amount of time open for passage of vehicles in order to minimise stray noise to external surrounding areas;

ix. Wherever possible, fixed items of plant will be electrically powered rather than diesel or petrol driven. Where this is not feasible, suitable attenuation measures will be provided, such as acoustic enclosures;

x. Vehicles and mechanical construction plant will be fitted with effective exhaust silencers, be maintained in good working order and operated in such a manner so as to minimise noise emissions;

xi. On surface areas where environmental disturbance may arise, compressors must be 'sound reduced' models fitted with properly lined and sealed acoustic covers kept closed whenever the machine is in use. In addition, pneumatic drills etc. must be fitted with the most effective muffler or silencer available;

xii. Care will be taken when loading and unloading vehicles or moving materials to reduce noise impact;

xiii. All deliveries to the Site, and any removals of waste or other material, must take place within the permitted hours;

xiv. Arrival of delivery vehicles to the Site will be coordinated to prevent parking of construction vehicles on adjacent local streets whilst awaiting access to the Site;

xv. No employees, sub-contractors and persons employed on-site must cause unnecessary noise from their activities; and

xvi. Any construction work, including deliveries to and from the Site, which is likely to exceed ambient noise levels at nearby existing residential development shall be limited to the working hours of 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 hours on Saturdays and at no time on Sundays or Bank Holidays.

4.6.21. A piling and vibration management plan will also be prepared as part of the oCEMP.

4.6.22. With the implementation of the standard mitigation measures to be set out in the CEMP and CTMP, significant effects as a result of construction activity noise and vibration are not anticipated.

Construction Traffic Vibration

4.6.23. Construction traffic vibration is proposed to be scoped out of the ES. In relation to vibration from traffic movements, DMRB LA 111[28], states the following:

> *'Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effects.'*

4.6.24. While DMRB LA 111[28] applies to road schemes, this guidance is relevant to this assessment, as it indicates that road surfaces which do not contain irregularities should not result in vibration effects at receptors.

Operational Noise

4.6.25. The key consideration in relation to the noise during operation is the noise generated by elements of the Proposed Development that contain plant, such as substations and associated infrastructure.

4.6.26. Based on the measured background sound levels shown in Table 4.5 below and guidance provided within BS 4142:2014+A1:2019[32], the following preliminary noise criteria have been developed at the receptor locations to assess whether or not a significant effect is likely to occur.

Table 4.5: Background Sound Levels at Measurement Locations LT1-LT6

Receptor	Measurement Location	Period	Significance Criteria (Noise Rating Level $L_{Ar,Tr}$ dB)
a and b	LT5	Daytime	35

[32] The British Standards Institution (BSI) (2019) British Standard 4142:2014 +A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound*

		07:00 – 23:00 hours	
		Night-time 23:00 – 07:00 hours	30
c, d and e	LT1	Daytime 07:00 – 23:00 hours	30
		Night-time 23:00 – 07:00 hours	25
f	LT2	Daytime 07:00 – 23:00 hours	30
		Night-time 23:00 – 07:00 hours	25
g	LT3	Daytime 07:00 – 23:00 hours	37
		Night-time 23:00 – 07:00 hours	32
h	LT6	Daytime 07:00 – 23:00 hours	32
		Night-time 23:00 – 07:00 hours	27
i	LT4	Daytime 07:00 – 23:00 hours	35
		Night-time 23:00 – 07:00 hours	30

4.6.27. The background sound levels during daylight hours have been reviewed (which are understood as being between approximately 04:30 and 22:00 hours for the Site). The background sound levels measured during the daytime hours (between 07:00 and 23:00 hours) were noted to be the same as those during daylight hours (04:30 and 22:00 hours).

4.6.28. Preliminary noise calculations have been undertaken based on potential equipment which could be installed for the Proposed Development. Noise levels used within the preliminary assessment are based on typical worst-case manufacturer's noise data. The number of items of equipment, and noise levels produced by the equipment could change, however, through inherent mitigation incorporated into the design of the Proposed Development, significant effects resulting from operational noise are not anticipated. The

calculations are based on the following potential equipment and associated noise levels:

i. BESS – 75 dBA L_w – 40 no. units within a single compound;
ii. PCS – 88 dBA L_w – 10 no. units within a single compound with the battery systems;
iii. Substation Transformer – 91 dBA L_w – 1 no. transformer unit within a single compound; and
iv. Central Inverter-Transformer Units – 91 dBA L_w – 19no. units across the Site.

4.6.29. For the units located within compounds (i.e. the BESS containers, PCS units, and the substation), it has been assumed that an acoustic barrier would be included within the design, if required, providing an insertion loss of approximately 5 dB. This would be achieved by an acoustic barrier which provides line of sight screening between the noise source and the receptor. The potential manufacturers of the PCS units have advised that a noise reduction system can be incorporated within the PCS, which would reduce noise emissions by at least 5 dB. This would therefore reduce the sound power level produced by the PCS units to 83 dB L_w. This sound power level has been used within the assessment.

4.6.30. For the central inverter-transformer units, multiple manufacturers have advised that a noise reduction system can be incorporated, which would reduce noise emissions by 5 dB. This would therefore reduce the sound power level produced by the system to 86 dBA L_w, which is what has been used within the assessment. The inverter-transformer units would only operate when electricity is being produced, which would be during daylight hours (i.e. up to between 04:30 and 22:00 during the peak of summer). When there is no daylight, the inverter-transformer units would not generate noise.

4.6.31. The main noise source associated with the BESS is the heating, ventilation and cooling ('HVAC') system which operates when outdoor temperatures are above approximately 24°C or below approximately 12°C. The noise generating aspect of the BESS would therefore not be operating continuously.

4.6.32. As part of the calculation procedure, a 2 dB loss has been included within the calculations, allowing for ground absorption and atmospheric attenuation over distances of 250 m. The loss from ground absorption and atmospheric attenuation is expected to increase at greater distances, although this has not been considered within the assessment as a worst-case assumption.

4.6.33. Acoustic feature corrections, as defined in BS 4142:2014+A1:2019[32] have not been applied at this stage of the assessment.

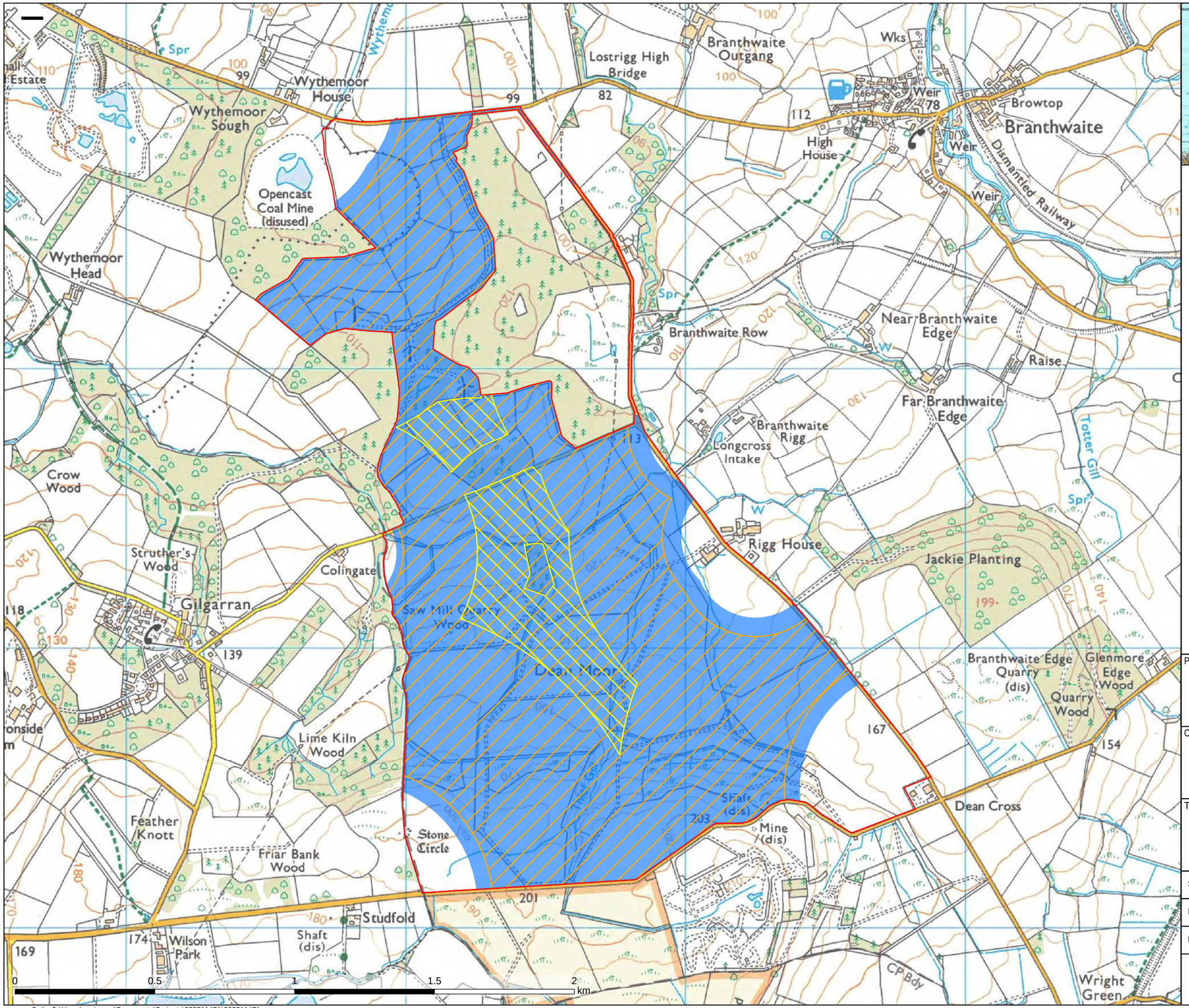
4.6.34. Based on the application of this mitigation, the Table 4.6 presents the minimum distances to each receptor which have been calculated, which would result in noise levels being equal to or below the proposed significance criteria in Table 4.6. The calculations are based on hemispherical point source propagation, which means the sound power for each piece of plant radiates from a single point, and spreads over a hemisphere.

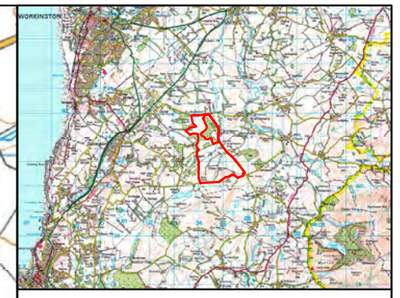
Table 4.6: Minimum Distances Between Equipment and Receptors to Not Exceed Significance Criteria

Receptor	System	Minimum Distance (m)
a, b and l	BESS + PCS Compound Substation Compound Central Inverters	617 251 283
ci	BESS+ PCS Compound Substation Compound Central Inverters	1098 447 502
f	BESS + PCS Compound Substation Compound Central Inverters	1098 447 502
g	BESS + PCS Compound Substation Compound Central Inverters	490 200 224
h	BESS + PCS Compound Substation Compound Central Inverters	872 355 399
i and k	BESS + PCS Compound Substation Compound Central Inverters	617 251 283

4.6.35. Based on the equipment being appropriately mitigated and located in compliance with the minimum distances in Table 4.6, significant effects from operational noise are not anticipated to occur. The concept layout in Figure 4.12 indicates that it would be possible to accommodate the minimum required distances on the Site. As such, operational noise is proposed to be scoped out of the ES, as likely significant effects from operational noise are not anticipated. However, a separate Noise and Vibration Impact Assessment ('NVIA') for the Proposed Development will be undertaken and submitted with the DCO application as an appendix to the ES. The NVIA will be based on representative noise data for the equipment and the Proposed Development's indicative layout and will consider any potential noise impacts from operational noise.

Figure 4.12: Potential Equipment Locations





Legend

- Draft Order Limits
- Potential Battery and Power Condition Systems Location
- Potential Inverter Location
- Potential Substation Location

Project Title: Dean Moor Solar Farm

Client: FVS Dean Moor Limited

Title: DEAN MOOR SOLAR FARM DEVELOPMENT CONSENT ORDER

Potential Equipment Locations

Scale: 1:12,500 @ A3	Date: 07/08/2023	
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Operational Traffic Noise and Vibration

4.6.36. Vehicular movements during the operational phase of the Proposed Development, related to routine servicing and maintenance, would be very limited and unlikely to be associated with any significant noise effects. Operational traffic noise and vibration impacts are therefore proposed to be scoped out of the ES. It is proposed that a separate NVIA will be submitted with the DCO application as an appendix to the ES.

Operational Vibration

4.6.37. The Proposed Development's operational equipment includes the BESS, PCS, Substation Transformer and Central Inverter-Transformer Units. Based on Table 4.6, the minimum distance between equipment and vibration sensitive receptors is 200m.

4.6.38. Based on experience of similar recent installations, the Proposed Development's operational equipment would generate insignificant levels of vibration at vibration sensitive receptors. Therefore, operational vibration impacts are proposed to be scoped out of the ES. The separate NVIA to be submitted in support of the DCO application as an appendix to the ES would assess operational vibration, as required.

Summary

4.6.39. As likely significant effects on noise and vibration from the Proposed Development's construction, operational and decommissioning phases are not anticipated, it is proposed to scope out this topic from the ES.

4.7. Ground Conditions

4.7.1. This section considers the likely effects of the Proposed Development on the environment in respect of Ground Conditions (stability and existing ground contamination) and identifies the potential impacts and associated effects from the disturbance of land on the Proposed Development, human health, and the

environment during the construction, operational and decommissioning phases.

4.7.2. Within this section, reference has been made to sections of the PPG that are relevant to ground condition considerations[33,34].

4.7.3. Guidance on how to assess and manage the risks from land contamination is provided in Land Contamination Risk Management ('LCRM')[35].

4.7.4. Guidance on the assessment of Ground Conditions for EIA is limited but reference has been made to LA 109 – Geology and Soil[36]. This guidance aligns the assessment process presented in the DMRB more closely with the requirements of the EIA Regulations.

4.7.5. Soils as a resource/natural asset are considered in section 4.2 (Agricultural Land and Soils) of this Scoping Report.

4.7.6. The underlying principle to ground conditions assessment is the identification of linkages formed of the following three elements:

i. A source/hazard (a substance or situation (including unstable ground) that has the potential to cause harm or pollution);
ii. A pathway (a means by which that the hazard moves along / generates exposure); and
iii. A receptor/target (an entity that is vulnerable to the potential adverse effects of the hazard).

4.7.7. To assess the potential for ground conditions and land contamination to cause an effect, the extent and nature of the potential hazard is assessed, exposure

[33] PPG Land Stability published by the *Department for Communities and Local Government*

[34] PPG Land Affected by Contamination published by the *Department for Communities and Local Government*

[35] Available at: **https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm** Accessed June 2023

[36] Design Manual for Roads and Bridges LA 109 Geology and Soils, 2019 (replaces DMRB Volume 11, Section 3, Part 11 & Part 6)

or migration pathways are identified, and sensitive receptors or resources are identified and appraised to determine their value and sensitivity.

4.7.8. This section summarises the current and former land uses in the context of contamination generation potential, including potential for unexploded ordnance ('UXO') and the environmental setting in terms of geology (including geomorphological features), groundwater, surface water, ecology, and the built environment. Guidance on data collection to inform a ground conditions assessment for contamination is given in BS10175[37].

4.7.9. The information summarised below is presented in more detail in Appendix 4.5 Phase 1 Ground Conditions Assessment ('Phase 1 GCA') and Appendix 4.6 Coal Mining Hazard Assessment ('CMHA'). The Phase 1 GCA presents the following:

i. A preliminary investigation comprising a desk-based study of published and readily available public information including historical OS maps and aerial photographs and a Site reconnaissance (walkover).
ii. A preliminary ground stability appraisal and initial identification of potential ground condition constraints to development (including a summary of those hazards identified in the CMHA).
iii. A Preliminary Risk Assessment (Tier 1 'PRA') which is a qualitative assessment of data to develop a conceptual model ('CM') including the identification of potentially contaminative current and historical activities on-site and off-Site and source pathway-receptor pollutant linkages.

4.7.10. Appendix 4.5 Phase 1 GCA contains the details of the sources of information used to inform this section of the Scoping Report. It is noted that the Phase 1 GCA and CMHA were prepared for the previous iteration of the Draft Order Limits (which extended to 279.62ha) rather than the extent of the Draft Order Limits set out in section 2 (The Proposed Development) of this Scoping Report

[37] BS101752011+A2:2017 Investigation of potentially contaminated sites. Code of practice, *British Standards Institute*

(which extends to 279.50ha). This minor difference in extent does not change the conclusions of these reports.

Baseline Environmental – Potential Ground Condition Hazards

Land Contamination/Radon/Unexploded Ordnance Hazards

4.7.11. The land in the north of the Site (Areas A and B, shown on Figure 1.2) was historically part of an opencast coal mine that was operational between the late 1980s and early 1990s. Opencast mining ended in 1993, followed by backfilling and restoration (refer to Appendix 4.6 CMHA). The searches undertaken have not revealed any information about the materials used as backfill. The only information provided by the Coal Authority was that the backfill was “uncompacted”. On the basis that the backfilling took place relatively recently, the backfilling would have been undertaken in a controlled and regulated manner, and therefore it is considered likely that the pit has been backfilled with overburden and mine arisings. The mine arisings could contain elevated concentrations of metals.

4.7.12. The majority of the land in Area C, at the southern extent of the Site has historically been used for agriculture, with the exception of limited areas of quarrying and mining (refer to Appendix 4.6 CMHA, Figure 2). The quarries recorded on the historical maps remain visible on contemporary aerial imagery, and therefore are not considered to present an environmental hazard to the Site. Residual concentrations of agrichemical residues could be present in the soil.

4.7.13. Where access tracks have been formed using imported materials of unknown origin, these are identified as potentially containing contaminants, including asbestos-containing materials, noting these are limited in extent in the context of the Site.

4.7.14. Off-Site activities with the potential to generate contamination are the garage/car dealer immediately to the south-east and Rigg House Farm to the east, where bulk storage of fuels and chemicals may have taken place.

4.7.15. There is a potential for mine gas emissions, although this hazard would only apply to entry into confined spaces during construction and the Proposed Development where structures with enclosed spaces are present.

4.7.16. Approximately 50% of the Site is mapped as located within an area where less than 1% of properties are estimated to be at or above the UK Health Security Agency Radon Action Level. However, parts of the Site are located in areas of higher radon risk, with the maximum band identified being between 10% and 30%. For commercial properties, the Ionising Radiations Regulations[38] require action to protect employees if the average radon gas concentration exceeds 300 Bq/m^3. If the level of radon in a building is close to or above these levels, action should be taken to reduce the levels of radon. The proposed structures of the Proposed Development will not be occupied. Therefore, levels of radon are not relevant to the Proposed Development.

4.7.17. As described in Appendix 4.5 Phase 1 GCA, the risk associated with UXO is identified as being low on the basis of a review of Zetica Ltd's risk map for unexploded bombs and a Pre-Desk Study Assessment, which identified a "Low" risk and concluded that a more detailed desk study to define protection measures is not considered necessary.

Instability Hazards

4.7.18. Instability hazards considered at the Site have been divided into naturally occurring geological hazards (including collapsible ground, compressible ground, dissolution features, landslides, running sands, shrinking/swelling clay), and hazards arisings from historical land use.

4.7.19. Of the naturally occurring geological hazards, the following were identified:

[38] Ionising Radiations Regulations, Statutory Instrument 2017 No1075

i. Low potential for running sands;
ii. Moderate potential for compressible ground where peat and alluvium are present (localised and relatively small scale); and
iii. High potential for landslides/slope instability, as there are several steep sloping areas of the Site, particularly in the south of Area C.

4.7.20. The following hazards arising from historical land use have been identified:

i. Known and potential mine entries (shafts and adits);
ii. Potential shallow and / or surface mine workings;
iii. Opencast coal mine and mapped artificial ground;
iv. Coal mine gases; and
v. Potential differential settlement associated with the opencast mine high wall.

Receptor Identification and Likely Impacts

Groundwater (Geology and Aquifer Designations)

4.7.21. The 1:50,000 scale geological sheet[39] indicates that the bedrock geology is dominated by Carboniferous strata (the Whitehaven Sandstone Formation and Coal Measures Group (Middle and Lower)). The Carboniferous deposits unconformably overlie the Lower Palaeozoic Caledonian basement at depth.

4.7.22. Carboniferous strata are overlain by a variable but generally minor thickness of superficial deposits comprising Glacial Till, Alluvium, Peat, Landslide Deposits and Alluvial Fan Deposits.

4.7.23. Artificial Ground (consisting of Infill Deposits and Made Ground) is mapped as present across the northern part of the Site.

4.7.24. The EA aquifer classifications are as follows:

i. Alluvium and Alluvial Fan Deposits - Secondary A Aquifers;
ii. Glacial Till - Secondary Undifferentiated Aquifer;

[39] Whitehaven. England and Wales Sheet 28. Solid and Drift Geology. 1:50,000. Keyworth, Nottingham. *British Geological Survey*, published 2004

iii. Peat – Unproductive; and

iv. Bedrock Geology (all of the bedrock strata) - Secondary A aquifers.

4.7.25. Groundwater is identified as a potential receptor (to contamination) and allocated a sensitivity/value/importance of low for the superficial deposits and moderate for the deeper aquifer.

4.7.26. The construction of the Proposed Development will require very limited ground disturbance, with the majority of it comprising solar PV arrays which are supported on a framework that rests on small (75mm x 170mm) “C” shaped piles driven into the ground (i.e., there will be no pile arisings) to a depth of typically between 1m and 2.5m.

4.7.27. All ancillary buildings, except for the DNO substation building, will be prefabricated metal containers or GRP kiosks. These structures will either be supported upon a 300mm to 500mm thick platform of compacted aggregate and elevated above the platform by plinths/blocks or otherwise will be supported on prefabricated concrete pads. The DNO substation building, and any associated external electrical equipment may rest upon deeper foundations.

4.7.28. The individual solar PV arrays will be connected by buried cables to inverters, which in turn connect by buried cables to the on-site DNO substation which in turn connects (in-part) by buried cables to the existing 132kV OHL. The proposed cable trenching is likely to be shallow (anticipated to be less than 2m BGL), with the cable surrounded by a permeable backfill material above which the excavated overburden will be replaced.

4.7.29. Given that the footprint of these structures would be a relatively small percentage of the Site, any impact on groundwater quality is likely to be very low and the effect would be not significant. The likelihood of an impact can be reduced through the provision of a Foundation Works Risk Assessment to select a solution that does not introduce contamination migration pathways, if required.

Surface Water (Hydrology)

4.7.30. Section 4.3 (Water Resources and Flood Risk) of this Scoping Report addresses the potential impacts to physical attributes (water quantity and flow) and pollution creation. This section of the Scoping Report considers the release of existing contamination, noting that the mitigation measures for reducing the potential for pollution creation and siltation are applicable to reducing the potential for release of existing contamination.

4.7.31. Section 4.3 (Water Resources and Flood Risk) of this Scoping Report provides a description of the surface water features and their locations (refer to paragraph 4.3.4 and Figure 4.2).

4.7.32. Surface water is identified as a potential receptor (to existing contamination) and allocated a sensitivity/value/importance of moderate.

4.7.33. Whilst the nature of the Proposed Development means that ground disturbance is limited and therefore exposure of contamination soils is also limited, contamination release control measures will be put in place. These protective measures will be integral components of the CEMP strategy to minimise the environmental impact throughout the construction process. These measures include a buffer zone around all surface waters of 8m, drainage controls within working areas and compounds and stockpile management requirements. Should excavated soils be stockpiled pending off-Site disposal and/or on-site reuse for construction purposes, stockpiles will be subject to management controls to prevent run-off generation and/or migration. Excavations would be reinstated including re-establishing vegetation so that contaminated soils, if present, are not exposed. During operation, exposed soils are not anticipated. During decommissioning, the same control measures applied during construction will be applicable.

4.7.34. Any impact on surface water quality is therefore likely to be very low and the effect would be not significant.

Mineral Resource/Natural Asset

4.7.35. A review of the Adopted Cumbria Minerals and Waste Local Plan[40] (the 'MWLP') indicates that the Site is located within a Minerals Safeguarding Area for Brick Clay and a Minerals Consultation Area. The maps within the MWLP show these areas as extending substantial distances beyond the Site.

4.7.36. Mineral resources are not identified as a resource for consideration on the basis that land within the Site to the north of the 'Gilgarran Road' was part of an historical opencast mine and therefore the safeguarded mineral (brick clay) will have been removed to facilitate coal extraction and also because the nature of the Proposed Development will not permanently sterilise the resource if present elsewhere within the Site.

Geomorphological Features/Natural Asset

4.7.37. Information relating to Regionally Important Geological Sites ('RIGS'), referred to in Cumbria as 'Local Geological Sites' ('LGS') is presented on the Cumbria GeoConservation website[41]. A review of this information indicates that the Site is not located within 1km of any designated LGS with public access. Branthwaite Edge, a LGS without public access, is located approximately 170m east of the Site.

4.7.38. The construction of the Proposed Development will involve minimal ground disturbance, being limited typically to mini-piles for the solar PV arrays and trenching for the associated cables. The potential for these activities to impact

[40]Adopted Cumbria Minerals and Waste Local Plan 2015-2030. Available at: **https://legacy.westmorlandandfurness.gov.uk/planningenvironment/policy/minerals_waste/MWLP/Adopted.asp** Accessed July 2023

[41] Cumbria GeoConservation website. Available at: **https://www.cbdc.org.uk/cumbria_geoconservation_home/** Accessed July 2023

the LGS located 170m east of the Site is highly limited, and impacts to geomorphological features, which are highly unlikely, would not be significant.

Ecology

4.7.39. There are no SSSIs, Special Areas of Conservation ('SAC'), Special Protection Areas ('SPA'), Local or National Nature Reserves ('LNR' / 'NNR'), Groundwater Dependent Terrestrial Ecosystems or Ramsar sites, on the Site or within 500m of the Site. Saw Mill Quarry Wood, located adjacent to the western part of the Site boundary and Jackie Planting, located approximately 180m east of the Site, are designated ancient woodlands.

4.7.40. Dean Moor County Wildlife Site ('CWS') is partially located within the Site and is shown on Figure 8.2 Non-Statutory Sites and Notable Habitats. This CWS is designated for acidic moorland habitats.

4.7.41. Whilst the Phase 1 GCA (Appendix 4.6) considers ecology as a receptor for the purposes of risk assessment, section 8 (Biodiversity) of this Scoping Report provides details on the proposed approach to the assessment of the Proposed Development's likely significant effects on biodiversity, including in respect of any pollutants.

Archaeological Setting

4.7.42. There is one designated heritage receptor located partially within the Site, namely the Large Irregular Stone Circle and a Round Cairn on Dean Moor Scheduled Monument.

4.7.43. Whilst the Phase 1 GCA (Appendix 4.6) includes consideration of archaeology as a receptor for the purposes of risk assessment, section 6 (Cultural Heritage) of this Scoping Report provides details on the proposed approach to the assessment of the Proposed Development's likely significant effects on archaeology.

Buildings

4.7.44. Buildings for residential and commercial use are present adjacent to the boundaries of the Site.

4.7.45. The Proposed Development is for either limited-construction surface infrastructure (such as solar PV panels) or small-scale surface development (such as the DNO substation building and ancillary buildings).

4.7.46. The solar PV arrays are to be supported on small driven piles. A piling and vibration management plan will be prepared as part of the oCEMP to be submitted as part of the DCO application, which will describe how vibration impacts will be managed and mitigated.

4.7.47. Potential mounting framework suppliers identified in the procurement exercise will use the geotechnical information obtained as part of a future ground investigation to prepare a piling plan which will establish the depths and locations for piles. This, along with other studies such as corrosion modelling will establish what will be used, where, and how, in a manner enabling the suitability and stability of the mounting structure for the operational lifetime of the Proposed Development.

4.7.48. If and where required above ground (no-dig) mounting structures are also possible.

4.7.49. The proposed cable trenching is likely to be shallow (anticipated to be less than 2m BGL), with the cable ducting surrounded by a permeable backfill material above which the excavated overburden will be replaced. Impacts on the buried cables are anticipated to be limited on the basis that the cables will be able to tolerate a degree of flexing and will be laid within a permeable

bedding to allow movement that might occur as a result of settlement. Any trenches excavated for the cables are anticipated to be shallow, open for only a limited amount of time and will be backfilled with arisings in the order in which they were excavated.

4.7.50. The proposed structures (solar PV arrays and ancillary buildings) are identified as potential receptors for consideration in the context of ground conditions as the identified instability hazards identified could cause differential settlement. The impact on the solar PV arrays can be accommodated through selection of appropriate materials, adoption of adjustable footings, geotechnical design (informed by the results of a future ground investigation and modelling undertaken by the framework designer) and design layout of the Proposed Development to locate the structures away from mine entries and compressible ground. Impacts to other ancillary structures are not anticipated as these will comprise either prefabricated metal containers or GRP kiosks placed on a compacted aggregate platform/ concrete pads, i.e., these structures will not be connected to the ground.

4.7.51. The impact on the DNO substation building could result in structural damage ranging from cracking to failures rendering the structure unsafe. However, due to the replaceable nature of the structure, even the worst-case consequence would not be identified as a significant effect. The likelihood of such damage can be reduced through geotechnical design (informed by the results of ground investigation) and design layout of the Proposed Development to locate the structures away from mine entries and compressible ground.

4.7.52. The Proposed Development is therefore unlikely to introduce impacts e.g., vibration or groundwater level change, that could affect the on-site or off-site receptors.

Human Health

4.7.53. In the context of the Proposed Development, human health receptors will be construction and decommissioning workers during the construction and

decommissioning phases, and workers who will require transient access for maintenance activities during the operational phase.

4.7.54. Due to the limited ground disturbance required by the Proposed Development, exposure to soil contamination, if present, would also be limited. A CEMP and DEMP will be prepared (see paragraph 4.7.58 below) which will include good practice measures such as the adoption of good standards of hygiene to prevent prolonged skin contact, inhalation, and ingestion of soils during construction. In addition, appropriate methods of working will be selected to limit disturbance of contaminated soil or water, where possible. Given that any exposure would be temporary and/or short in duration, potentially significant effects are not anticipated. The oCEMP will also include a strategy describing the actions and activities that will be undertaken if unexpected contamination is encountered during construction.

4.7.55. During construction and decommissioning, ground gases and coal mine gas emissions could cause significant effects if accumulating in a confined space. However, this is unlikely to arise due to the implementation of standard working practises during the construction and decommissioning phases of the Proposed Development, including the preparation of risk assessments and method statements ('RAMS') and the use of gas alarms as required by various health and safety obligations and raising temporary offices and welfare to prevent gas ingress, if required. The likelihood will be further reduced by the implementation of a ground investigation to identify the location and condition of mine entries and gas monitoring to define the gas regime and any need for gas protection measures in permanent structures.

4.7.56. There are known and potentially unrecorded mine entries on the Site which might not be safely capped at surface. Whilst significant effects could arise without mitigation, it is considered that these would not occur as mitigation measures in accordance with various Health and Safety legislation would be in place.

Other Standard Mitigation Measures to be Implemented for the Proposed Development

Compliance with Legislative Requirements

4.7.57. The CDM Regulations are regulations which regulate the health, safety and welfare of construction projects and will apply to the Proposed Development. A Principal Designer and a Principal Contractor ('PC') would be appointed by the Applicant to plan, manage, monitor and coordinate health and safety during the pre-construction and construction phases, respectively. The PC will have responsibility for ensuring legislative compliance and obtaining all permits/licenses as required. Notably, the PC will undertake risk assessments to determine the appropriate methods to be adopted. The risk assessments will be informed by the Phase 1 GCA and CMHA reports (Appendices 4.5 and 4.6), as well as the proposed future ground investigation work. Construction activities will be governed by a CEMP and DEMP and construction phase RAMS. The CDM Regulations require a pre-construction information pack ('PCIP') to be provided by the Applicant or by the Principal Developer ('PD') if an applicant delegates this duty. The pack contains all information that is held or is readily available. The PCIP will be used by the PC to prepare the construction phase RAMS.

CEMP and DEMP

4.7.58. The CEMP and DEMP will outline how the construction and decommissioning of the Proposed Development will avoid, minimise, or mitigate effects on the environment and surrounding area and will cover a range of topics that include geology and soils. Many of the mitigation measures captured in this Scoping Report are standard / good practice for any development.

4.7.59. The adoption of good hygiene standards will prevent prolonged skin contact, inhalation, and ingestion of soils during construction. In addition, appropriate methods of working will be implemented to limit disturbance of potentially contaminated soil or water, where possible.

4.7.60. The CEMP and DEMP will include measures to prevent the introduction of new contamination during construction and decommissioning (e.g., accidental spills

during refuelling and chemical storage with reference to the pollution prevention for businesses guidance[42]).

4.7.61. The CEMP and DEMP will also include (but not be limited to) the following:

i. Measures to minimise exposure to contaminated soils (e.g., by controlling dust generation);
ii. Measures to minimise and control runoff/leaching to controlled waters;
iii. Measures to protect soils; and
iv. Prevention measures including bunded storage, designated wheel washing areas, settling basins, screening stockpiles of materials, and dampening exposed soils as appropriate.

4.7.62. The CEMP and DEMP will define the requirements / restrictions for materials re-use on-site. These will also present chemical criteria that must be met by any soils or recycled aggregates imported to the Site during the construction phase, to ensure that imported materials are suitable for use and do not present a hazard to during the construction phase (e.g., for groundworkers constructing the Proposed Development and controlled waters), during the operational phase (e.g., for maintenance workers undertaking in-ground cable repair works for the Proposed Development) or during the decommissioning phase (e.g., groundworkers removing any haul roads constructed using imported aggregates).

Ground Investigation

4.7.63. A ground investigation will be undertaken to provide Site-specific information on ground conditions and facilitate the design of foundations and specification of control measures. Whilst it is not considered that a ground investigation is required to define baseline conditions, this will be required for the detailed design of the Proposed Development, and this can be secured by a suitably worded DCO requirement. It is anticipated that such an investigation would comprise geophysical surveys, the excavation of trial pits and the drilling of

[42] Available at: https://www.gov.uk/guidance/pollution-prevention-for-businesses Accessed July 2023

boreholes and the recovery of soil samples for geotechnical and geoenvironmental laboratory analysis.

4.7.64. Investigations will also inform the specification of construction materials to mitigate aggressive ground conditions (if present) and specification of mitigation measures, as required.

Summary

4.7.65. Whilst potential ground condition hazards (both potential sources of contamination and ground instability) have been identified on the Site, the impacts from the Proposed Development on groundwater, surface water, human health and building receptors would not lead to significant effects with the mitigation measures defined in the CEMP implemented. The approach to the assessment of likely significant effects on the heritage and ecological receptors identified in the Phase 1 GCA (Appendix 4.5) are set out in section 6 (Cultural Heritage) and section 8 (Biodiversity) of this Scoping Report. It is proposed to scope out Ground Conditions as a topic from the ES.

4.7.66. The detailed design of the Proposed Development will be informed by the following activities which will also ensure that appropriate mitigation measures are implemented to manage identified and unforeseen ground hazards.

4.7.67. Whilst an intrusive ground investigation has not been undertaken at this stage as it is not considered to be required to reduce uncertainty in the anticipated ground conditions, an intrusive investigation will be undertaken, comprising both targeted and non-targeted exploratory holes to determine the chemical and physical ground conditions. This will be required to support the detailed design of the Proposed Development. The ground investigation will inform the siting of the ancillary buildings to avoid adverse stability hazards. If, during this future ground investigation, contaminated ground conditions are encountered and risk assessment identifies these as requiring mitigation, established measures are available and control measures will be set out in the CEMP and DEMP.

4.7.68. The CDM Regulations require a PCIP to be provided by the applicant or by the PD if an applicant delegates this duty. The PCIP contains all information that is held or is readily available and will be used by the PC to prepare the construction phase RAMS.

4.7.69. A piling and vibration management plan will form part of the CEMP and DEMP. This will include details on how vibration effects from construction activities on-site will be mitigated to avoid adverse impacts on sensitive receptors.

4.8. Major Accidents & Disasters

4.8.1. The IEMA Primer on Major Accidents and Disasters in EIA[43] (the 'IEMA Primer') defines a major accident as:

> *'… an event (for instance, train derailment or major road traffic accident) that threatens immediate or delayed serious environmental effects to human health, welfare and/or the environment and requires the use of resources beyond those of the client or its appointed representatives (i.e. contractors) to manage.'*

4.8.2. It goes onto state that, *'major accidents can be caused by disasters resulting from both man-made and natural hazards'.*

4.8.3. The IEMA Primer defines a disaster as:

> *'a man-made/external hazard (such as an act of terrorism) or a natural hazard (such as an earthquake) with the potential to cause an event or situation that meets the definition of a major accident.'*

4.8.4. The following risks have been further considered and will be reported on within the relevant chapters of the ES (if likely significant environmental effects are anticipated) or standalone technical assessments submitted in support of the DCO application:

i. Flooding (refer to Section 4.3);
ii. Climate change (refer to Section 9);

[43] Available at: **https://www.iema.net/resources/blog/2020/09/23/iema-major-accidents-and-disasters-in-eia-primer** Accessed June 2023

iii. Road traffic accidents (refer to Section 4.5);

iv. Ground conditions and subsidence (from coal mining shafts) (refer to Section 4.7);

v. Fire; and

vi. Glint and Glare (refer to section 4.16).

4.8.5. To manage any potential risks, the Proposed Development will be developed in accordance with the relevant health and safety legislation, regulations, and industry guidance.

4.8.6. It is proposed that a separate topic chapter on major accidents and disasters is scoped out of the ES, as likely significant effects on sensitive receptors resulting from major accidents and disasters will be considered in the relevant chapters scoped into the ES, as well as standalone technical assessments submitted with the DCO application. An Outline Battery Safety Management Plan would also be prepared in support of the DCO application and appended to the ES.

4.9. Electric, Magnetic and Electromagnetic Fields

4.9.1. The planning system does not include a statutory provision regarding protection from magnetic, electric, and electromagnetic fields. In 2012, the Department for Energy and Climate Change ('DECC')[44] advised that guidelines published by the International Commission on Non – Ionizing Radiation Protection ('ICNIRP')[45] in 1998 for both occupational and public exposure should be considered.

4.9.2. These guidelines state that '*overhead power lines at voltages up to and including 132kV, underground cables at voltages up to and including 132kV and substations at and beyond the publicly accessible perimeter'* are not capable of exceeding the ICNIRP exposure guidelines for electromagnetic fields.

[44] DECC (2012), Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice

[45] International Commission on Non-Ionizing Radiation Protection (ICNIRP) (1998); ICNIRP Guidelines: For limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300GHz), Health Physics 74 (4): 494-522

4.9.3. The Proposed Development will use cables and infrastructure with a maximum voltage up to and including 132kV. Furthermore, the existing OHL on the Site are also 132kV.

4.9.4. In the light of this, it is proposed that this topic is scoped out of the ES.

4.10. Telecommunications, Television Reception, and Utilities

4.10.1. Given the nature of the Proposed Development, likely significant effects on telecommunications are not anticipated.

4.10.2. Although the design of the Proposed Development will aim to avoid any diversions of existing telecommunications or utilities, if this is required, the Applicant will consult with the relevant providers and evidence of agreement to any diversions will be included with the DCO application.

4.10.3. It is therefore proposed that telecommunications, television reception and utilities as a topic is scoped out of the ES.

4.11. Wind Microclimate

4.11.1. Likely significant wind effects are not anticipated given that energy generation uses are proposed that will not include large areas of public realm and outdoor amenity space where the public or Site users will experience significant wind effects. The Proposed Development will not include any high-rise buildings or high-rise structures which could influence wind patterns. Therefore, likely significant wind effects are not anticipated, and it is proposed that this topic will be scoped out of the ES.

4.12. Daylight, Sunlight and Overshadowing

4.12.1. The scale and massing of the Proposed Development will not cause changes to daylight or sunlight availability or cause overshadowing of residents or amenity space. It is therefore proposed to scope this topic out of the ES.

4.13. Waste

4.13.1. A description of the potential types of construction waste and estimated volumes will be described in the Site and Proposed Development Chapter of the ES. The CEMP will detail the mitigation measures to be implemented during the construction phase to minimise and appropriately manage waste. For example, it is not intended to remove significant quantities of material from the Site during construction, particularly as there are no structures on-site that require demolition. The LEMP will establish waste management practices for the limited volumes of waste (e.g., arisings from grounds management or the disposal or recycling of any materials replaced during technical maintenance) over the Proposed Development's operational lifetime. The DEMP provide for effective waste management to be implemented during the decommissioning phase, such as recycling or re-using materials where possible.

4.13.2. An oCEMP, oLEMP, and oDEMP will be provided with the DCO application, with requirements for detailed final updates to be secured at the appropriate time by requirement within the DCO. Where appropriate this topic will also be dealt with in chapters scoped into the ES. Therefore, is proposed that a separate waste ES Chapter can be scoped out of the ES.

4.14. Minerals

4.14.1. The adopted Cumbria MWLP[46] indicates that the Site is located within a Minerals Safeguarding Area ('MSA') for Brick Clay and a Minerals Consultation Area. MSAs cover areas of known mineral resource that are, or may be, of sufficient value to warrant protection for future generations and should be taken into account in land use decisions to ensure mineral resources are not unknowingly or needlessly sterilised.

4.14.2. The Proposed Development will not sterilise the mineral resource as minerals could be extracted, if required, following decommissioning of the Proposed

[46]Available at: https://www.cumbria.gov.uk/eLibrary/Content/Internet/538/755/1929/4298491253.pdf Accessed July 2023

Development. It is therefore proposed to scope a minerals chapter out of the ES.

4.15. Lighting

4.15.1. Construction and decommissioning activities associated with the Proposed Development are not anticipated to occur during the hours of darkness. In the unlikely event of this occurring, emergency temporary lighting would be used and operated in accordance with best practice. Construction and decommissioning lighting will be controlled by measures set out in the CEMP and DEMP. As the Site is not located within an area sensitive for dark skies, significant effects on the existing character of the night -sky are not anticipated and therefore it is proposed to be scoped out of the Landscape and Views ES chapter. Further details are provided in Section 7 (Landscape and Views) of this Scoping Report. No significant lighting effects on sensitive ecology from the emergency temporary lighting are anticipated and therefore it is proposed to be scoped out of the Biodiversity ES chapter. Further details are provided in Section 8 (Biodiversity) of this Scoping Report.

4.15.2. During the operational phase the Proposed Development will not be permanently lit. However, lighting may be attached to the substation and other structures for access and safety reasons (not for security) in the unlikely event of a requirement to attend for maintenance activities in hours of darkness. No such lighting would be attached to the perimeter fencing or for site access purposes. In the limited circumstances lighting is needed for safety at building or structure access points, this would be shielded, motion sensor activated low intensity down-lighting. On this basis, significant effects on the existing character of the night-sky and sensitive ecology during the Proposed Development's operational phase are not anticipated. Further details are provided in Section 7 (Landscape and Views) and Section 8 (Biodiversity) of this Scoping Report. Operational lighting will be controlled by measures set out in the LEMP.

4.15.3. Therefore, it is proposed to scope this topic out of the ES.

4.16. Glint & Glare

4.16.1. The definition of glint and glare can vary. The definition to be used in the assessment is aligned with the Federal Aviation Administration ('FAA') in the United States of America as follows:

i. Glint is defined as a momentary flash of bright light typically received by moving receptors or from moving reflectors.

ii. Glare is defined as a continuous source of bright light typically received by static receptors or from large reflective surfaces.

4.16.2. In context, glint will be witnessed by moderate to fast moving receptors whilst glare would be encountered by static or slow-moving receptors with respect to a reflector. The term 'solar reflection' is used to refer to both reflection types i.e., glint and glare.

4.16.3. For solar developments, solar reflection can occur from solar PV panels installed at a site. Effects are sensitive to the orientation, tilt angle, and height above ground level.

Assessment Process

4.16.4. A Glint and Glare Study for the Proposed Development will be submitted in support of the DCO application as an appendix to the ES. The proposed glint and glare assessment methodology has been derived from industry best practices, guidance, and studies, as well as from professional judgement based on other schemes similar in nature, size, and scale to the Proposed Development. The proposed methodology for the ground level Glint and Glare Study of the Proposed Development comprises:

i. Identification of the key receptors in the area surrounding the Site;

ii. Consideration of the direct solar reflections from the Proposed Development towards the identified receptors by undertaking geometric calculations;

iii. Consideration of the visibility of the solar PV panels from the receptor's location. If the solar PV panels are not visible from the receptor, then no reflection can occur;

iv. Based on the results of the geometric calculations, determination of whether a reflection can occur, and if so, at what time of day and year it will occur;

v. Consideration of both the solar reflection from the Proposed Development and the location of the direct sunlight with respect to the receptor's position;

vi. Consideration of the solar reflection with respect to the published guidance and studies, and industry best practices; and

vii. Consideration of whether an adverse impact is expected in line with guidance and studies, industry best practices, as well as from professional judgement based on other schemes similar in nature, size, and scale to the Proposed Development.

4.16.5. The following receptors have been identified within the 1km of the Site:

i. Users of local roads; and

ii. Occupants of residential dwellings.

4.16.6. No aerodromes have been identified within 10km of the Site. An assessment of glint and glare effects upon aviation activity, including Air Traffic Control and approach paths for licensed and unlicensed aerodromes, is proposed to be scoped out of the assessment, on the basis that there are no aerodromes within 10km of the Site.

4.16.7. Mitigation can be implemented to mitigate any predicted effects, such as screening vegetation. Should mitigation be required to reduce any adverse impacts, no significant residual impacts are predicted.

4.16.8. Cumulative glint and glare effects are possible when two or more solar developments are located sufficiently close to share receptors. No existing or proposed solar developments surrounding the Site have been identified, and therefore no cumulative impacts are predicted.

4.16.9. The G&G Study will be prepared by Pager Power. It will be appended to the ES and referenced in the Landscape and Views ES chapter, which will consider glint and glare impacts within the assessment of likely significant landscape and visual effects, where relevant, with consideration to the LSP for the

Proposed Development. Therefore, it is proposed to scope out a specific glint and glare chapter from the ES.

Table 4.7: Summary of Topics to be Scoped Out

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Agricultural Land and Soils	Medium	Low	Minor	Area C, which comprises the majority of the Site, is the subject of a detailed ALC survey carried out by the MAFF in 1990. This detailed ALC survey identified a mix of agricultural land of Grades 4 and 5 across the majority of Area C, with some sub-grade 3b land in its northern area. Areas A and B have not been surveyed. However, as identified in the MAFF detailed ALC survey of Area C, land over 110m AOD is limited by climatic conditions to no higher than a sub-grade 3b ALC. The Site therefore does not comprise BMV agricultural land and significant effects are therefore not considered likely.
Water Resources and Flood Risk	Low	Low	Negligible - Minor	The Site has been identified as low risk of flooding from all sources. Potential likely effects on the environment for all stages of the project are considered and adequate mitigation measures have been set out to limit and, in some cases, eliminate these impacts. Likely significant effects from the Proposed Development on the water environment are not anticipated.

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Air Quality	Very Low	Low	Negligible	The area does not have a declared AQMA. Potential impacts from dust emissions during the construction and decommissioning phases of the Proposed Development will not be significant and standard mitigation measures to control these emissions will be outlined in the CEMP and DEMP, to be secured by requirement in the DCO. The CTMP will control construction and decommissioning traffic movements and mitigation measures will be implemented to ensure that effects will not be significant. During operation, a limited number of visits per week for maintenance (comprising 1-2 visits per week consisting of 2-4 vehicular movements). These would typically be made by car, van, or other LGV. The Proposed Development will include a minimum of two EV charging points which will support the transition of operational vehicle movements to be zero emissions.

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Traffic and Access	Low	Low	Negligible - Minor	An initial appraisal of the likely impacts of the Proposed Development has shown an anticipated level of traffic during the construction phase with an average of up to around 20 HGV trips (40 movements) and 8 LGV trips (16 movements) per day during peak construction. The peak period of construction is expected to occur when multiple teams are on-Site undertaken piling, constructing the framework, and mounting solar PV modules concurrently, although such activities will also be phased so only occurring concurrently for a limited peak period. During the Proposed Development's operational phase, there are anticipated to be a limited number of visits per week for maintenance (comprising 1-2 visits per week consisting of 2-4 vehicular movements). A Transport Statement, which would assess traffic and access impacts from the Proposed Development and an oCTMP including a framework CWTP would be submitted in support of the DCO application.

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Noise and Vibration	Low	Low	Negligible - Minor	Temporary effects relating to construction noise and vibration would be mitigated through the implementation of standard mitigation measures set out in the CEMP. Based on the equipment being appropriately mitigated and located in compliance with the minimum distances, significant effects from operational noise are not anticipated to occur. As such, operational noise is proposed to be scoped out of the ES. However, a separate NVIA for the Proposed Development will be undertaken and submitted in support of the DCO application. Vehicular movements during the operational phase of the Proposed Development, related to routine servicing and maintenance, would be very limited and unlikely to be associated with any significant noise effects. Any likely significant effects resulting from noise and vibration disturbance on sensitive ecological receptors would be assessed in the Biodiversity ES chapter.
Ground Conditions	Low	Medium	Minor	Whilst potential ground condition hazards (both contamination sources and ground instability) have been identified on the Site, the impacts from the Proposed Development on groundwater, surface water, ecology, archaeology, and building receptors would not lead to significant effects. Whilst potentially significant effects to human health are identified (prior to the implementation of mitigation) it is considered that these will be mitigated through standard mitigation measures required by Health and Safety legislation. It is proposed to scope out Ground Conditions from the ES, as likely significant effects from the Proposed Development in respect to this topic are not anticipated.

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Major Accidents and Disasters	Very Low - Medium	Very Low - High	Negligible - Minor	The following risks have been further considered and will be reported on within the relevant chapters of the ES (if likely significant environmental effects are anticipated) or standalone technical assessments submitted in support of the DCO application: i. Flooding (refer to Section 4.3); ii. Climate change (refer to Section 9); iii. Road traffic accidents (refer to Section 4.5); iv. Ground conditions and subsidence (from coal mining shafts) (refer to Section 4.7); v. Fire; and vi. Glint and Glare (refer to section 4.16). To manage any potential risks, the Proposed Development will be implemented in accordance with the relevant health and safety legislation, regulations, and industry guidance. An Outline Battery Safety Management Plan would be submitted in support for the DCO application as an appendix to the ES.
Electric, Magnetic and Electromagnetic Fields	Very Low	Very Low	Negligible	Guidelines published by ICNIRP state that *'overhead power lines at voltages up to and including 132kV, underground cables at voltages up to and including 132kV and substations at and beyond the publicly accessible perimeter'* are not capable of exceeding ICNIRP exposure guidelines for electromagnetic fields. There is an existing 132kV OHL on-Site. The Proposed Development will use cables and infrastructure with a maximum voltage not exceeding132kV

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Telecommunica-tions, Television Reception and Utilities	Very Low – Medium	Very Low	Negligible	Given the nature of the Proposed Development likely significant effects on telecommunications are not anticipated. Although the design of the Proposed Development will aim to avoid any diversions of existing telecommunications or utilities, if this is required, the Applicant will consult with the relevant undertakers and evidence of agreement to any diversions will be included with the DCO application.
Wind Microclimate	Very Low	Very Low	Negligible	Likely significant wind effects are not anticipated given that energy generation uses are proposed that will not include large areas of public realm and outdoor amenity space where the public or Site users will experience significant wind effects. The Proposed Development will not include any high-rise buildings or high-rise structures which could influence wind patterns.
Daylight, Sunlight and Overshadowing	Very Low	Very Low	Negligible	The scale and massing of the Proposed Development will not cause changes to daylight or sunlight availability or cause overshadowing of residents or amenity space.
Waste	Very Low	Very Low	Negligible	The CEMP, LEMP, and DEMP will be secured by requirement to the DCO which will secure appropriate waste management measures for each phase of the Proposed Development in accordance with all relevant regulations and industry best practice standards.

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Minerals	Very Low	Very Low	Negligible	The Site is located within a MSA for Brick Clay and a Minerals Consultation Area. MSAs cover areas of known mineral resource that are, or may in future be, of sufficient value to warrant protection for future generations and therefore should be taken into account in land use planning decisions to ensure that mineral resources are not unknowingly or needlessly sterilised. The Proposed Development will not sterilise the mineral resource as minerals could be extracted, if required, following decommissioning of the Proposed Development.
Lighting	Very Low	Very Low	Negligible	As the Site is not located within an area sensitive for dark skies, significant effects on the existing character of the night-sky are not anticipated. Further details are provided in Section 7 (Landscape and Views) of this Scoping Report. No significant lighting effects on sensitive ecology from the emergency temporary lighting are anticipated and therefore it is proposed to be scoped out of the Biodiversity ES chapter. In the operational phase the Proposed Development will not be permanently lit. However, lighting may be attached to the substation and other structures for access and safety reasons (not for security). No lighting would be attached to the perimeter fencing or for Site access purposes. In the limited circumstances lighting is needed for safety at buildings or structures, this would be shielded, motion sensor activated, low intensity down-lighting.

Topic	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Justification for Scoping Out
Glint and Glare	Very Low - Low	Very Low - Medium	Negligible - Minor	An assessment of glint and glare effects upon aviation activity, including Air Traffic Control and approach paths for licensed and unlicensed aerodromes, is proposed to be scoped out of the assessment, on the basis that there are no aerodromes within 10km of the Proposed Development. With respect to ground-based receptors mitigation can be implemented for any potential effects via the LSP such that no significant residual impacts are predicted. The Landscape and Views ES chapter will take cognisance of the Glint and Glare assessment which will be appended to the ES, and where appropriate, the impacts of reflectivity will be considered within the assessment of landscape and visual effects.

5. Topics to be Scoped In

5.1. Introduction

5.1.1. As set out in Section 4 (Topics to be Scoped Out), this scoping exercise has been informed by Site surveys, desk-based research, professional judgment, and other information available for the Site. The Proposed Development is anticipated to result in likely significant environmental effects on the environmental topics considered in this section.

5.2. Overview of Topics to be Scoped In

5.2.1. The following topics are proposed to be scoped into the ES:

i. Cultural Heritage;
ii. Landscape and Views;
iii. Biodiversity;
iv. Climate Change; and
v. Socio-Economics.

6. Cultural Heritage

6.1. Introduction

6.1.1. This section sets out the proposed approach and methodology for undertaking an assessment of the likely significant effects of the Proposed Development on known or potential buried heritage receptors (archaeological remains) and above ground heritage receptors (structures and landscapes of heritage interest).

6.2. Study Area

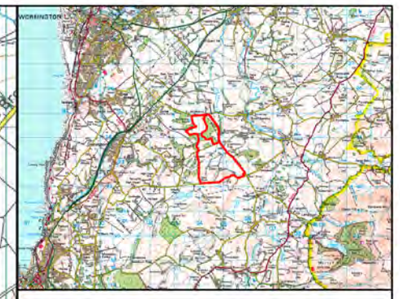
6.2.1. As the assessment of likely significant effects in the Cultural Heritage ES chapter will focus on several types of heritage receptors, appropriate study areas have been established through professional judgement and will be the subject of consultation with the Council's Historic Environment Advisor, Conservation Officer, Historic England ('HE') and the LDNP Partnership.

6.2.2. A study area comprising the land within the Site and a 1km buffer from the Site boundary will be used to assess the potential for non-designated heritage receptors (consisting of receptors of archaeological interest, locally listed buildings, and parks and gardens of local interest). This is considered an appropriate and proportionate study area in response to the scale and nature of the Proposed Development, the Site, and its surroundings and the local interest of such receptors (see below for discussion of designated heritage receptors for assessment). It is consistent with best practice guidance set out in Historic England's ('HE') Advice Note 3: The Setting of Heritage Assets (2017) ('HEAN3')[47]. Figure 6.1 sets out the locations of the non-designated receptors (and other Council Historic Environment Record ('HER') data points) with the unique site and monument record number ('SMR no').

[47] Available at: https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/. Accessed June 2023

Figure 6.1: Non-designated Heritage Receptors within 1.0km Study Area

Path: C:\Users\sanjasper\Documents\Projects\332511471\332511471.aprx



Legend

- Draft Order Limits
- 1km Buffer from Draft Order Limits
- Prehistoric evidence
- Roman evidence
- Medieval evidence
- Post-Medieval to Modern evidence
- Unknown date (potential heritage receptors)

Project Title: Dean Moor Solar Farm

Client: FVS Dean Moor Limited

Title: DEAN MOOR SOLAR FARM DEVELOPMENT CONSENT ORDER

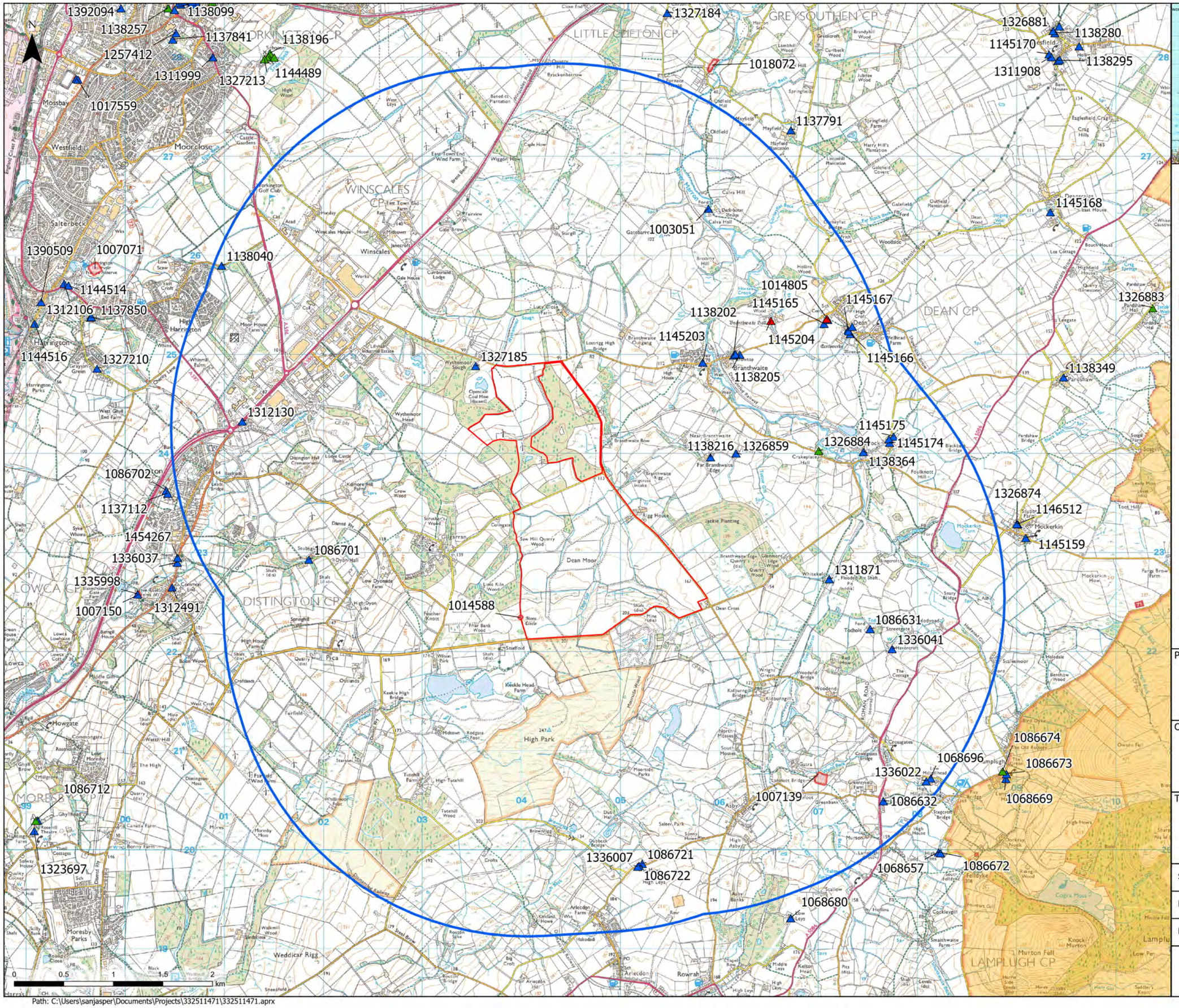
Designated Heritage Receptors within 1km of the Draft Order Limits

Scale: 1:20,000 @ A3	Date: 03/08/2023	
Drawn: TL	Checked: HC	
Figure: 6.1	Sheet 1 of 1	Rev: A

Stantec

6.2.3. The extent of the study area for designated heritage receptors (consisting of scheduled monuments, listed buildings, conservation areas, registered parks and gardens, registered battlefields, and World Heritage Sites ('WHS')) has been determined by the low-rise nature of the Proposed Development and the views that the surrounding topography afford towards the Site. As the solar PV panels are not expected to be above single storey height (approximately 3m), a study area that includes the land within the Site and a 3km area measured from the boundary of the Site is proposed. The extent of the study area is considered proportionate and appropriate to identify those designated receptors to which the Site may form part of their setting and therefore contribute to their sensitivity, which is informed by HE guidance in HEAN3. Figure 6.2 shows the designated heritage receptors within the 3km study area. Further details of each receptor are included in Table 6.1, Table 6.2 and Table 6.3.

Figure 6.2: Designated Heritage Receptors within 3.0km Study Area



Legend

- Draft Order Limits
- 3km Buffer from Draft Order Limits

Grade

- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building
- Scheduled Monument
- The English Lake District World Heritage Site

Project Title: Dean Moor Solar Farm

Client: FVS Dean Moor Limited

Title: DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Designated Heritage Receptors within 3km of the Draft Order Limits

Scale: 1:35,000 @ A3	Date: 03/08/2023
Drawn: TL	Checked: HC
Figure: 6.2	Sheet 1 of 1 Rev: A

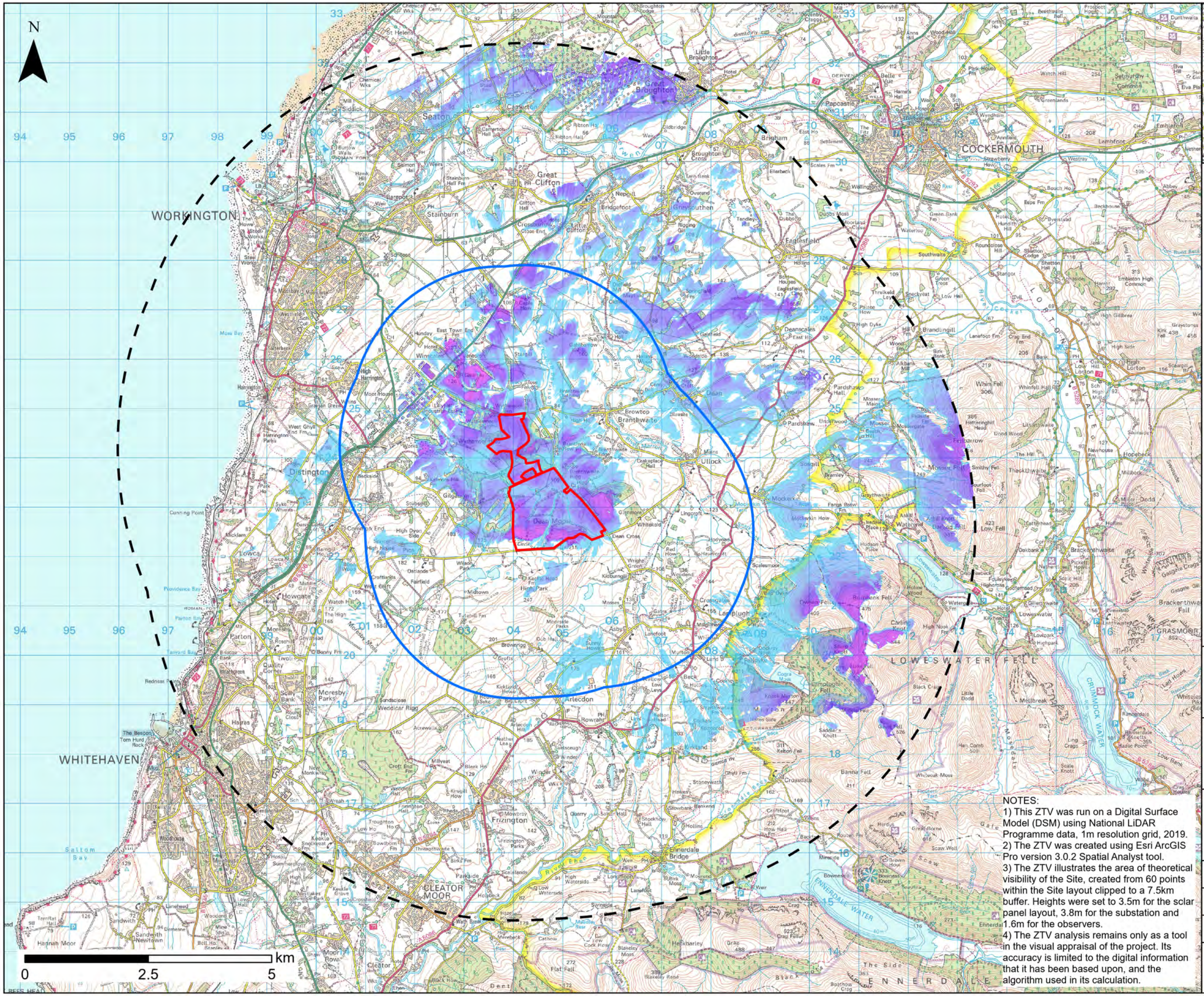
Stantec

Path: C:\Users\sanjasper\Documents\Projects\332511471\332511471.aprx

6.3. Zone of Theoretical Visibility

6.3.1. A preliminary Zone of Theoretical Visibility ('ZTV') analysis for the Proposed Development is provided at Figure 6.3. This (along with a site visit) has been used as a tool to identify areas where the Proposed Development may be visible from areas surrounding the Site (including beyond the 1km study area for non-designated assets and the 3km study area for designated assets). The preliminary ZTV analysis was informed by an indicative height of solar PV panels at no greater than 3m. Overall, it is judged that the ZTV represents a theoretical exposure of the Proposed Development in regard to heritage receptors prior to consideration of mitigation, which may include screening and the overall location of the solar PV panels within the Site (which will be located within Areas A, B and C shown on Figure 1.3).

Figure 6.3: Gradient of Visibility (Zone of Theoretical Visibility) Analysis



Legend

- Draft Order Limits
- 3km Study Area
- 7.5km Initial Search Area

Theoretical Visibility (%)

10, 20, 30, 40, 50, 60, 70, 80, 90, 100

NOTES:
1) This ZTV was run on a Digital Surface Model (DSM) using National LiDAR Programme data, 1m resolution grid, 2019.
2) The ZTV was created using Esri ArcGIS Pro version 3.0.2 Spatial Analyst tool.
3) The ZTV illustrates the area of theoretical visibility of the Site, created from 60 points within the Site layout clipped to a 7.5km buffer. Heights were set to 3.5m for the solar panel layout, 3.8m for the substation and 1.6m for the observers.
4) The ZTV analysis remains only as a tool in the visual appraisal of the project. Its accuracy is limited to the digital information that it has been based upon, and the algorithm used in its calculation.

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Gradient of Visibility (ZTV)

Scale: 1:70,000 @ A3	Date: 17.07.23
Drawn: SJ	Checked: HC
Figure: 6.3	Sheet 1 of 1 / Rev: A

Stantec

6.3.2. The analysis to be undertaken in the Cultural Heritage ES chapter will demonstrate a screened scenario accounting for features such as vegetation and other forms of screening, which provides additional filtering and reduction of theoretical visibility. Visibility is typically focused within short range views (~1km) from the Site. Some mid-range visibility (2-3km) from the Site specifically to the east, north and northwest is available, together with some longer-range visibility (beyond 5km) from the Site.

6.3.3. There are designated receptors located outside the 3km study area that may experience potential effects which are proposed to be included for assessment. These designated receptors are the English Lake District World Heritage Site ('WHS') and High Trees West farmhouse and adjoining Byre Range (Grade II Listed) and High Trees East farmhouse and adjoining Cart Shed and Store (also Grade II Listed). These receptors are located at elevated levels to the east and have the potential to have visibility of the Proposed Development in long range views and have been included in the baseline environment (see following section).

6.4. Baseline Environment

Built Heritage and Archaeology

6.4.1. There is one designated heritage receptor located within the Site, namely the Large Irregular Stone Circle and a Round Cairn on Dean Moor Scheduled Monument. The western boundary of the Site bisects the scheduled monument.

6.4.2. Within the wider 3km study area around the Site, there are:

i. Two Grade I Listed Buildings;
ii. One Grade II* Listed Buildings; and
iii. 25 Grade II Listed Buildings.

6.4.3. Beyond the wider 3km study area is the Grade II Registered Park and Garden at Workington Hall approximately 3.3km to the northwest and The English Lake District WHS, approximately 3.4km to the east. There are also several listed

buildings that have been considered for assessment as they fall within the preliminary ZTV, but beyond the 3km study area. These are:

i. High Trees West farmhouse and adjoining Byre Range (Grade II Listed); and

ii. High Trees East farmhouse and adjoining Cart Shed and Store (also Grade II Listed).

6.4.4. The Council is in the process of preparing a 'local list' of heritage assets[48]. This is yet to be published in draft for consultation.

6.4.5. The Overarching National Policy Statement for Energy (EN-1) states that:

'there should be a presumption in favour of the conservation of designated heritage assets and the more significant the designated heritage asset, the greater the presumption in favour of its conservation should be.'

6.4.6. The International Council on Monuments and Sites ('ICOMOS') guidance on *Heritage Impact Assessments for Cultural World Heritage Properties* (2011)[49] (the 'ICOMOS guidance') considers Grade I and II* listed buildings, scheduled monuments, and WHSs to be receptors of 'High' sensitivity. Grade II listed buildings are designated heritage receptors with 'Moderate' sensitivity.

6.4.7. The preliminary ZTV analysis has identified areas of no theoretical visibility of the Proposed Development. Designated heritage receptors located within these identified areas and hold no historical or functional association with the Site are proposed to be scoped out of the assessment of likely significant effects of the Proposed Development in the Cultural Heritage ES chapter.

6.4.8. Table 6.1 below lists the designated heritage receptors located within the 1km study area for non-designated receptors and within the 3km study area for designated receptors. A select group of assets within 5km of the Site was also considered and has been included for robustness. There are no conservation

[48] Local heritage lists are lists of buildings and sites with heritage interest of local significance, that are formally identified by plan-making bodies, as part of the wider range of designation, so that their significance can be taken into account in planning applications affecting the building or site or its setting. Further information can be found in HE Advice Note 7- Local Heritage Listing: Identifying and Conserving Local Heritage (2021).

[49] ICOMOS (2011) Guidance on Heritage Impact Assessments for Cultural World Heritage Properties

areas, registered parks and gardens or registered battlefields within the 3km study area.

Table 6.1: Designated Heritage Receptors

Receptor	Designation	Direction from the Site	Approximate Distance from the Site	Within Preliminary ZTV?
Designated Heritage Receptors (archaeological remains) within the Site				
Large Irregular Stone Circle and a Round Cairn on Dean Moor	Scheduled Monument NHLE: 1014588	South-west corner of the Site	Within the Site	Yes
Designated Heritage Receptors (archaeological remains) within 3km of the Site				
Settlement 25m south-east of Gatra	Scheduled Monument NHLE: 1007139	South-east	2km	No
Designated Heritage Receptors (built heritage) within 3km of the Site				
Wythemoor Sough and adjoining barn and stable	Grade II Listed NHLE: 1327185	North-west	160m	Yes
Far Branthwaite Edge, Dairy and Barn	Grade II Listed NHLE: 1138216	East	1.1km	Yes
Wadsworth Farmhouse	Grade II Listed NHLE: 1145203	North-east	1.2km	No
Whitekeld and Barns adjoining	Grade II Listed NHLE: 1311871	East	1.2km	No
The Raise	Grade II Listed NHLE: 1138216	East	1.4km	Yes
Roche House	Grade II Listed NHLE: 1138202	North-east	1.5km	No
Hill Crest	Grade II Listed NHLE: 1326858	North-east	1.5km	No
Brow Top	Grade II Listed NHLE: 1138205	North-east	1.6km	No
Todhole Farmhouse	Grade II Listed NHLE: 1086631	East-south-east	1.7km	No
Havercroft Farmhouse	Grade II Listed NHLE: 1336041	East-south-east	1.9km	No

Receptor	Designation	Direction from the Site	Approximate Distance from the Site	Within Preliminary ZTV?
Stubsgill Farmhouse, area wall and gate piers, and byre adjoining to the south-west	Grade II Listed NHLE: 1086701	West	2.1km	No
Crakeplace Hall	Grade II* Listed NHLE: 1326884	East	2.2km	No
Calva Hall Bridge	Grade II Listed NHLE: 1138225 Scheduled Monument NHLE: 1003051	North-east	2.2km	No
Branthwaite Hall (Grade I Listed Building)	Grade I Listed NHLE: 1145204	East-north-east	2.2km	Yes
Milestone east of Distington Secondary School	Grade II Listed NHLE: 1312130	West	2.3km	No
Church of St Michael	Grade II Listed NHLE: 1086721	South	2.4km	No
War Memorial in St Michael's Churchyard to the east of Lych Gate	Grade II Listed NHLE: 1086722 Scheduled Monument NHLE: 1014805	South	2.4km	No
Lych Gate and churchyard wall, incorporating drinking trough and belvedere, to west of St Michael's Church	Grade II Listed NHLE: 1336007	South	2.4km	No
Church of St Oswald	Grade I Listed NHLE: 1145164	North-east	2.5km	Yes
Barn North of Ullock Mains on opposite side of road	Grade II Listed NHLE: 1146311	East-north-east	2.6km	No
Barn west of Ullock Mains on opposite side of road	Grade II Listed NHLE: 1145174	East-north-east	2.6km	No
Whinnah Cottages and adjoining Store	Grade II Listed NHLE: 1086632	South-east	2.6km	No

Receptor	Designation	Direction from the Site	Approximate Distance from the Site	Within Preliminary ZTV?
Hillcrest and Barns adjoining	Grade II Listed NHLE: 1138364	East	2.6km	No
Croft House and adjoining barn	Grade II Listed NHLE: 1145175	North-east	2.7km	No
The Rectory	Grade II Listed NHLE: 1145165	East	2.7km	Yes
Low Millgillhead with adjoining Coach House and Stables	Grade II Listed NHLE: 1336022	South-east	2.9km	No
Coffin Rest at low Millgillhead in garden circa 35 yards north-east of house	Grade II Listed NHLE: 1068696	South-east	2.9km	No
Churchyard Cross south of Church of St Oswald	Grade II Listed NHLE: 1326878	East	2.9km	Yes
Designated Heritage Receptors (built heritage) within 5km of the Site				
Rose Farmhouse	Grade II Listed NHLE: 1145167	East-north-east	2.7km	No
Dean Mains	Grade II Listed NHLE: 1326879	East-north-east	2.7km	No
Manor House	Grade II Listed NHLE: 1145166	East-north-east	2.7km	No
Orchard House	Grade II Listed NHLE: 1326880	East	2.7km	No
High Trees West farmhouse and adjoining Byre Range (Grade II Listed)	Grade II Listed NHLE: 1068657	Southeast	3.4km	Yes
High Trees East farmhouse and adjoining Cart Shed and Store	Grade II Listed NHLE: 1086672	Southeast	3.4km	Yes
Workington Hall	Grade II Registered Park and Garden NHLE:1001262	Northwest	3.4km	No
The English Lake District	WHS NHLE: 14526155	East	3.4km	Yes

6.4.9. Table 6.2 below lists the non-designated built heritage receptors located within the Site and within the 3km study area for consideration.

Table 6.2: Non-Designated Heritage Receptors

Receptor	Designation	Direction from the Site	Approximate Distance from the Site	Within Preliminary ZTV?
Heritage Receptors (built heritage) within 3km of the Site				
Rigg House	Non-designated Heritage Receptor	East	65m	Yes

6.4.10. The Council's Historic Environment Record ('HER') identifies several features within or adjacent to the Site boundary which could be considered heritage receptors of archaeological interest. The only designated heritage receptor of archaeological interest within the Site boundary is a scheduled monument, which comprises a Large Irregular Stone Circle and a Round Cairn on Dean Moor (HE scheduled monument reference 1014588, SMR no 3048).

6.4.11. Three other scheduled monuments lie outside the 1km study area but within the wider 3km study area, consisting of Calva Hall Bridge (HE reference 1003051), a medieval standing cross in St Oswald's churchyard (HE reference 1014805) and a settlement 25m south-east of Gatra (HE reference 1007139).

6.4.12. The Council's HER notes several instances of cropmarks along with industrial features (Thief Gill Quarry, for example) within the Site. The northernmost part of the Site has been subject to disturbance as part of opencast mining in the 1990s, and thus its archaeological potential is considered to be low. Figure 6.4 shows an aerial photograph of the Site taken in 1992.

Figure 6.4: 1992 Aerial photograph (NMR ref: OS/92206)

6.4.13. Therefore, there is only potential for unknown below ground archaeological remains to be present on the land within the Site to the south of the Gilgarran Road (Area C). It was agreed with the Historic Environment Officer for Westmorland and Furness Council (the Council's Archaeological Advisor) that *'the area of mining can therefore be discounted from any further archaeological work'* (refer to Appendix 6.1 Consultation Correspondence on Archaeology). It is noted that there is also evidence of areas of previous mining (noted in the HER) across the southern part of Area C, which could have impacted any surviving pre-industrial heritage receptors (of archaeological interest).

6.4.14. Beyond the Site boundary, there is evidence of a possible alignment of a Roman road approximately 330m to the east of the Site (HER ref: 4672) and Bronze Age activity (craft and a pile dwelling) approximately 350m to the east

of the Site and to the south-west of the village of Branthwaite (HER ref: 45049).

6.4.15. Table 6.3 below lists the non-designated heritage receptors located within the Site and within the 3km study area for above ground heritage receptors. These receptors have been evidenced within the Council's HER[50].

Table 6.3: Non-Designated Heritage Receptors of Archaeological Interest

Receptor	Designation	Direction from the Site	Distance from the Site	Within Preliminary ZTV?
Heritage Receptors (archaeological remains)				
Whitebanks Wood Mines	Non-designated Heritage Receptor Earthwork (SMR no 45802)	Within the Site	Within the Site	Not Applicable
Thiefs Gill Quarry	Non-designated Heritage Receptor Quarry (SMR no 11699)	Within the Site	Within the Site	Not Applicable
Dean Moor Mine Workings	Non-designated Heritage Receptor Mine (SMR no 45802, 11805)	Within the Site	Within the Site	Not Applicable
Rigg House Earthworks, Dean	Non-designated Heritage Receptor Building, Mound, Ridge and Furrow (SMR no 45801)	Within the Site	Within the Site	Not Applicable
Dean Moor Unclassified Cropmarks	Non-designated Heritage Receptor Cropmark, Earthwork (SMR no 16630, 16629)	Within the Site	Within the Site	Not Applicable

6.5. Project Basis for Scoping Assessment

6.5.1. The Proposed Development's solar PV arrays are assumed to be no higher than 3m above existing ground level. The Proposed Development's other structures (including its associated infrastructure) are assumed to be no higher than a single storey. Cable runs required for the Proposed Development can be located below-ground or no-dig cable options are also available.

[50] The known extent of the L & NW & Furness Joint Railway, Whitehaven, Cleator & Egremont Branch (SMR no 11612) runs though land within the Site to the north of Gilgarran Road. This area has been previously quarried and therefore this CC HER entry has not been considered further.

6.6. Embedded Mitigation

Construction and Decommissioning

6.6.1. Construction activities associated with the Proposed Development would give rise to temporary changes within the setting of the built heritage receptors. It is anticipated that all such works will be undertaken in accordance with an agreed programme and a detailed CEMP and detailed DEMP will be prepared as a requirement of the DCO, with plant and machinery on-Site for the minimum practicable period.

Operational

6.6.2. The Proposed Development would not result in any physical impact or change to the identified built heritage receptors and therefore, there would be no direct physical impacts during the operational phase. Any impacts would be indirect, arising through a change to the landscape setting of the receptors identified.

6.6.3. Mitigation of adverse impacts and effects (primarily on the setting of designated heritage receptors) would include buffer areas, careful consideration of the positioning of solar PV panels and associated infrastructure in relation to topography and the existing built form, and the use of appropriate landscape screening (new woodland and scrubland planting and hedgerow enhancement).

6.7. Likely Significant Effects

6.7.1. The Proposed Development has the potential to have significant environmental effects on the identified heritage receptors. There is also the potential for the Proposed Development to have effects on other heritage receptors, designated or non-designated, that are not considered to be 'significant' effects under the EIA Regulations. These are considered in turn below.

6.7.2. All effects arising from the Proposed Development on the heritage receptors will be identified within a Historic Environment Desk Based Assessment ('HEDBA') which will set out the baseline conditions at the Site and its

surroundings. The HEDBA will establish the heritage sensitivity of the identified receptors, as well as any contribution made by their setting. This assessment will inform the Cultural Heritage ES Chapter and form an appendix to it. Table 6.6 provides a summary of potential effects and impacts on heritage receptors at this stage of the assessment process.

Construction - Archaeology

6.7.3. There is potential for below ground heritage receptors (archaeological remains), either known or unknown, to be impacted during the construction of the Proposed Development (where they survive). Construction effects will be identified using professional judgement and considering the type and likely scale and duration of construction activity likely to affect the setting of heritage assets.

6.7.4. Works during the construction of the Proposed Development with the potential to impact upon below ground archaeological remains include the following:

i. The creation of Site compounds, temporary access tracks, the installation of temporary services;
ii. Excavation/groundworks associated with the Proposed Development; and
iii. The cutting of other related foundations and services.

6.7.5. All effects upon the buried archaeological resource will occur within the construction phase as a result of any intrusive groundworks associated with the Proposed Development.

6.7.6. Any element of the Proposed Development which may remove or disturb the entirety of archaeological remains within its footprint (dependant on the nature of the below ground impact) will be assessed. As a result, this assessment presents a ‘worst case scenario’ regarding the likely significance of the effects.

6.7.7. As land within the Site to the north of the Gilgarran Road (Areas A and B) has been subject to extensive opencast mining, these activities will have had a destructive impact upon the archaeological resource. Further industrial activities (as noted on the HER) within the southern part of Area C will have

also impacted (removed) any archaeological remains that may have been present in these areas.

6.7.8. The assumption has been made that the Proposed Development will result (prior to mitigation) in a major magnitude of impact to below ground heritage receptors of archaeological interest (where these survive). However, the archaeological interest/sensitivity of a receptor (and therefore the magnitude of impact) will depend on its nature, importance and condition (as well as the nature of the below ground impact from the Proposed Development).

6.7.9. Prior to mitigation, the construction of the Proposed Development is therefore assessed as likely having a permanent moderate to minor adverse effect on below ground heritage receptors of archaeological interest (where these survive). On this basis, an assessment of likely significant effects from the construction of the Proposed Development on archaeology is proposed to be scoped into the Cultural Heritage ES chapter.

6.7.10. Archaeological mitigation will comprise a staged approach, initially involving a site evaluation of the surviving archaeological resource in relation to the below ground impacts of the Proposed Development.

6.7.11. This evaluation will involve a programme of Site walkover and geophysical survey. Any intrusive evaluation will be defined by the detailed structural design subject to a requirement of the DCO once a final design is established and would aim to identify the nature and extent of archaeological material within the Site to provide sufficient detail to inform the scope and extent of the second stage of mitigation. The details of any secondary mitigation will be set out in a supplementary Written Scheme of Investigation ('WSI') prepared by the Archaeological Contractor and agreed in advance with the Council's Archaeological Advisor.

6.7.12. The requirement for any stage two mitigation will be dependent on the results of the stage one evaluation. The details of any secondary mitigation will be set out in a further WSI and agreed with the Council's Archaeological Advisor. Any archaeological work could be secured by DCO requirement. Alternative

mounting frameworks could also be used to mitigate potential impacts to archaeological receptors (i.e., ballasted arrays and on-ground cable trays).

6.7.13. In summary, several forms of archaeological mitigation may be required:

Stage 1

i. Evaluation fieldwork (site investigations to determine nature and extent of the identified archaeological potential);

Stage 2

ii. Archaeological monitoring and recording and/or excavation (preservation by record); and

iii. Public dissemination of archaeological and historical data.

6.7.14. All archaeological fieldwork will be monitored by the Council's Archaeological Advisor to ensure that the works comply with the agreed scope and methodology detailed in the appropriate WSI. The Council's Archaeological Advisor will also review all reporting on the archaeological fieldwork.

Construction – Built Heritage

6.7.15. There is potential for indirect impacts on the setting of built heritage receptors through noise, dust, and vibration, as well as the location of construction machinery within the wider setting of the identified heritage receptors.

6.7.16. Any impacts would be short-term and temporary in nature, such that any impacts on the sensitivity of built heritage receptors is anticipated to be low. However, a detailed assessment of construction effects on the setting of designated and non-designated above ground heritage receptors will be prepared and included in the HEDBA that will be appended to the Cultural Heritage ES chapter, which will assess the likely significant effects from the construction of the Proposed Development on built heritage.

Large Irregular Stone Circle and a Round Cairn on Dean Moor (Scheduled Monument)

6.7.17. The Large Irregular Stone Circle and a Round Cairn on Dean Moor (as shown in Figure 6.5), within which there is a round funerary cairn, is situated close to the highest point of Dean Moor and commands extensive views in all directions. As one of only 45 examples of known large irregular circles in England, the stone circle at Dean Moor has high significance as a rare monument type with very high evidential value.

Figure 6.5: View across part of the site of the Scheduled Monument looking northeast across the Site.

6.7.18. The immediate setting of the Large Irregular Stone Circle and a Round Cairn on Dean Moor is the barren plateau of Dean Moor. There are long distance views from the monument across the Site to the wider setting to the north, northwest and east. Modern infrastructure is prominent within the landscape from views to the north including the Wind Farm, distant groups of turbines, pylons, and some built form visible near the horizon. The contribution that the

Site makes to the setting of the monument is the largely open rural character of the fields to the north.

6.7.19. The key archaeological interest of the receptor is the physical material which makes up the receptor itself (i.e., the surviving stones and the land beneath). There would be no direct impact on the monument nor change to its immediate setting arising from the Proposed Development. The introduction of the infrastructure would change the rural character of the wider setting of the receptor. However, the new built elements of the Proposed Development (i.e., in Areas A, B and C of the Site) would be set at a distance from the receptor (which will be at a higher elevation to the Proposed Development) and long-distance sight lines form the point of high elevation would not be impacted by the Proposed Development.

6.7.20. Mitigation measures including a buffer zone within the Dean Moor escarpment (within the Site), would facilitate the visual separation of the receptor from the Proposed Development at lower levels, so that the significance of effect is likely to be minor adverse.

Operational – Built Heritage

6.7.21. The Proposed Development has the potential to impact upon the setting of the designated heritage receptors within the wider study area. Due to the landscape character of the study area, combined with topography, intervening built form, existing landscape features, and in some instances the distance from the Site, the majority of the built heritage receptors are unlikely to experience any change to their significance as a result of the Proposed Development. Table 6.6 provides a summary of potential effects and impacts on heritage receptors at this stage of the assessment process.

6.7.22. Within the 3km study area, those heritage receptors identified as being sensitive to change within their setting and with the greatest potential to be affected by the Proposed Development are considered in turn below, together with the specific design objectives that will be important in mitigating the potential for significant adverse effects. Additionally, The English Lake District WHS that lies within the wider 5km study area has been considered due to its

elevated position, heritage sensitivity, and the large extent of the receptor resulting in greater potential intervisibility between the Site and the receptor.

Wythemoor Sough and Adjoining Barn and Stable (Grade II Listed)

6.7.23. Wythemoor Sough (shown in Figures 6.6 and 6.7) has heritage significance as an 18th century vernacular farmhouse that retains its traditional rural character. As a Grade II listed building, the heritage sensitivity of the receptor is moderate.

Figure 6.6: The northwest elevation of Wythemoor Sough (Grade II Listed)

6.7.24. The wider setting beyond the curtilage of Wythemoor Sough, is a landscape that has undergone substantial change with a history of farming and periods of mining within the area throughout the 19th and 20th centuries.

Figure 6.7: Wythemoor Sough, looking southeast across part of the Site

6.7.25. The contribution that the setting makes to the significance of the receptor relates to the industrious use of the land within an open rural landscape. There would be a change in the open rural setting as development features are introduced to the south and east. The ability to appreciate the special interest of the receptor is unlikely to be significantly diminished due to a change in its wider setting, and the magnitude of the impact would be moderate to minor adverse.

6.7.26. The use of buffer areas, landscape screening, and the sensitive design and positioning of elements of the Proposed Development are potential mitigation measures that would reduce the magnitude of impact on the receptor. Due to the moderate sensitivity of the receptor and the potential for mitigation measures, the significance of effect is therefore likely to be moderate to minor adverse.

The English Lake District – WHS

6.7.27. The English Lake District WHS, located approximately 3.4km to the east of the Site, has Outstanding Universal Value due to its distinctive cultural landscape that reflects a vital interaction between the spectacular natural landscape and

an agro-pastoral land-use system and traditions that have evolved in response to the environment. The 19th century Romantic and Picturesque interest in the area, led to the recognition of the universal value of scenic landscapes and the subsequent development of the conservation movement.

6.7.28. The special qualities of the WHS are largely contained within its boundaries. However, there are sensitive areas within the upland edge of the Loweswater Fells that are receptive to change within the setting to the west. Views of the Site from The English Lake District WHS are partially screened by the intervening topography of the low hills and ridges to the east of Dean Moor. There is the potential for parts of the Site to be visible from some viewpoints within the WHS, resulting in a change in setting. The impact on the setting is lessened by the existing infrastructure seen in the views within and near the Site. Mitigation measures such as appropriate siting of the Proposed Development's structures and screening would help to reduce this impact. At this scoping stage, the significance of effects is likely to be negligible following embedded mitigation.

6.8. Impacts Scoped Out of the Assessment

6.8.1. There will not be any physical or direct impacts on designated heritage receptors.

6.8.2. The Proposed Development will not result in any impacts on the heritage sensitivity of any registered parks and gardens, conservation areas or registered battlefields.

6.8.3. Table 6.6 provides a summary of potential effects and impacts on heritage receptors at this stage of the assessment process.

6.9. Proposed Approach to the ES

Methodology

6.9.1. An assessment will be undertaken of the likely significant effects of the Proposed Development on the environment in respect of cultural heritage, assessing both built heritage and archaeological impacts.

6.9.2. The assessment will be informed by NPS policies and tests specifically set out in the NPS EN-1[51] (and Revised (Draft) NPS EN-1) (accounting for section 5.9 'the Historic Environment') and consultation with other statutory and non-statutory bodies, where applicable.

6.9.3. The following paragraphs set out the stages of establishing the baseline and assessing the likely significant environmental effects on potential heritage receptors.

6.9.4. Baseline data will be gathered to inform the baseline that will identify the heritage resource within the study area.

6.9.5. The preliminary ZTV analysis will be used as a tool to identify the receptors for consideration within the assessment. Should it be established that there are no historic associations between the receptor and the Site, these receptors would be excluded from assessment.

6.9.6. An HEDBA will be prepared to identify those built heritage receptors with the potential to be affected by the Proposed Development. Those heritage receptors that will not experience any effect arising from the Proposed Development, will be considered in broader terms and eliminated from further assessment.

6.9.7. Consultation will be undertaken with relevant stakeholders including HE, the Council's Conservation Officers and Archaeological Advisors to inform the assessment of likely significant effects from the Proposed Development on cultural heritage.

6.9.8. Considering the size and scale of the Proposed Development, preliminary site-based investigation may be required to inform the baseline assessment and ES Chapter. This will be undertaken in the form of a geophysical survey. If

[51] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf Accessed July 2023

required, the scope of the preliminary site-based investigation will be agreed with the Council's Archaeological Advisor.

6.9.9. The assessment of the likely significant environmental effects on potential archaeological buried heritage receptors and above ground heritage receptors will entail:

i. The determination of the importance and sensitivity to change of a heritage receptor based on statutory designation and/or professional judgement against the identified in HE's Conservation Principles[52].

ii. Evaluating the contribution that setting makes to the overall importance of above ground heritage receptors selected for assessment;

iii. Predicting the 'magnitude of change' upon the known or potential significance of heritage receptors, including impacts to significance through change in setting, and the likelihood and resulting scale of environmental effect;

iv. Assessing any likely significant cumulative effects upon the heritage resource resulting from the Proposed Development in combination with other schemes, as appropriate;

v. Considering the mitigation measures that have been included within the design of the Proposed Development and any additional mitigation that might be required to avoid, reduce, or off-set any significant adverse effects; and

vi. Quantifying any residual effects (those that might remain after mitigation as required).

6.9.10. Additionally, the level of harm on the significance of the receptors will be assessed against NPS policies and tests set out in NPS EN-1 (and Revised (Draft) NPS EN-1). This assessment will form part of the conclusion within the ES Chapter.

6.9.11. The criteria for establishing the sensitivity of heritage receptors, the principles of determining the magnitude of impact, and the method of assessment to determine the significance of effect based on the ICOMOS guidance is set out in Tables 6.4 and 6.5 below.

[52] English Heritage (as was), Conservation Principles, Policies and Guidance (2008); updated version consulted upon 2017-18

6.9.12. The thresholds for “significant effects” on built heritage receptors are determined by considering the sensitivity of heritage receptors alongside the magnitude of impact that will be experienced.

6.9.13. The sensitivity of a built heritage receptor is determined by its designated status and desk-based research to inform a professional judgement in relation to its heritage interest, accounting for the likely nature, date, extent, survival, condition, rarity, and group value of the heritage receptor.

Table 6.4: Criteria for Establishing Sensitivity of Heritage Receptors

Sensitivity	Criteria for Establishing Sensitivity
High	• Remains of inscribed international importance, such as WHSs; • Grade I and Grade II* Listed Buildings; • Grade I and Grade II* Registered Parks and Gardens; • Scheduled Monuments; • Registered battlefields; • Conservation areas containing very important buildings; and • Undesignated archaeological assets of clear national or international importance.
Moderate	• Grade II Listed Buildings; • Conservation Areas; • Grade II Registered Parks and Gardens; • Undesignated buildings, monuments, sites, or landscapes that can be demonstrated to have heritage value; equivalent to the designation criteria; and • Designated or undesignated archaeological remains or sites that have regional interest.
Low	• Locally listed buildings as recorded on a local authority list; • Undesignated buildings, monuments, sites, or landscapes that can be demonstrated to have heritage value equivalent to the local listing criteria; and • Archaeological remains of limited value but with a potential to have interest at a local level.
Not significant	• Buildings, monuments, sites, or landscapes identified as being of negligible or no historic, evidential, aesthetic, or communal interest; and • Archaeological resources that have very little or no surviving archaeological interest.

6.9.14. Assessing the magnitude of impacts is similarly an exercise of professional judgement, applying an understanding of the impacts of the Proposed Development on the sensitivity of the receptors established in the baseline condition. An impact can be characterised in terms of timing, scale, duration, and reversibility. A direct impact on a heritage receptor is likely to result from changes to the physical fabric of the receptor. An indirect impact is likely to result from changes to the receptor's setting.

Table 6.5: Magnitude of Impact on Built Heritage Receptors

Magnitude of Impact	Criteria for Assessing the Magnitude of Impact
Major	• Change to the receptor, such that it is totally altered or destroyed. Comprehensive change to the setting.
Moderate	• Change to the receptor, such that it is significantly modified. Change to the setting such that it is significantly modified.
Minor	• Change to the receptor, such that the receptor is slightly different. Change to the setting.
Negligible	• Very little change to the fabric or setting that would materially harm significance, approximating to a 'no change' situation
No change	• No change to fabric or setting that would harm significance.

6.9.15. The assessment to determine the significance of the effect would utilise a matrix that considers the sensitivity of the receptor against the magnitude of the impact from the Proposed Development (Table 6.5). The significance of effect is determined by the interaction of the receptor's sensitivity to change and the magnitude of change (impact). Effects that are graded as Major or Moderate are considered 'significant' with respect to the EIA Regulations. Effects can be adverse, beneficial or neutral.

6.9.16. Table 6.6 provides a summary of potential effects and impacts on heritage receptors at this stage of the assessment process.

6.9.17. Further details on the proposed methodology for the assessment of likely significant effects from the Proposed Development on cultural heritage are provided at Appendix 6.2.

Table 6.6: Summary of Potential Effects and Impacts

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
Archaeological Receptors (Below Ground) within 1km Study Area				
Large Irregular Stone Circle and a Round Cairn on Dean Moor - Scheduled Monument Located within the Site and potential for the Proposed Development to affect its significance through development within its setting.	Minor - Moderate	High	Minor - Moderate Adverse	Scoped In (Construction and operational phases scoped in. Decommissioning phase scoped out).
Archaeological Receptors (Below Ground) within 1km – 3km Study Area				
Scheduled Monuments: • Settlement 25m south-east of Gatra (approximately 2km south-east from the Site) • Calva Hall Bridge (approximately 2.2km north-east from the Site) • Churchyard Cross South of Church of St Oswald (approximately 2.9km from the Site) Given the substantial distance from the Site to the receptors, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect to its setting. The Site holds no associative or functional relationship with the heritage receptor.	No Change - Negligible	High	Neutral – Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
Designated Heritage Receptors (Above Ground) within 3km Study Area				
Church of St Oswald - Grade I Listed Building (approximately 2.5km north-east from the Site) The Site holds no associative or functional relationship with the heritage receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect on its setting.	No Change - Negligible	High	Neutral - Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
Branthwaite Hall - Grade I Listed Building (approximately 2.2km north-east from the Site) The Site holds no associative or functional relationship with the heritage receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect on its setting.	No Change - Negligible	High	Neutral - Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
Crakeplace Hall - Grade II* Listed Building (approximately 2.2km east from the Site) The Site holds no associative or functional relationship with the heritage receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect on its setting.	No Change	High	Neutral	Scoped Out Construction, operational and decommissioning phases)
Wythemoor Sough and Adjoining Barn and Stable - Grade II Listed Building (approximately 160m west-north-west from the Site) Located within close proximity to the Site and potential for the Proposed Development to affect its significance through development within its setting.	Moderate	Moderate	Minor – Moderate Adverse	Scoped In (Construction and operational phases scoped in. Decommissioning phase scoped out)
Far Branthwaite Edge, Dairy and Adjoining Barn - Grade II Listed Building (approximately 1.1km east from the Site) Potential for the Proposed Development to affect its significance through development within its setting.	Negligible – Minor	Moderate	Neutral - Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
The Raise - Grade II Listed Building (1.4km east from the Site) Potential for the Proposed Development to affect its significance through development within its setting.	Negligible - Minor	Moderate	Neutral - Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
The Rectory - Grade II Listed Building (2.7km east from the Site) The Site holds no associative or functional relationship with the heritage receptor. There is the potential for some intervisibility between the Site and the receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect on its setting.	No Change - Negligible	Moderate	Neutral - Minor Adverse	Scoped Out (Construction, operational and decommissioning phases)

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
Listed buildings excluding those listed above, construction, operational and decommissioning phases. The Site holds no associative or functional relationship with the heritage receptors. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptors or a significant indirect effect on their setting.	No Change	Moderate	Neutral	Scoped Out (Construction, operational and decommissioning phases)
Designated Heritage Receptors (Above Ground) outside 3km Study Area				
High Trees West Farmhouse and adjoining Byre Range - Grade II Listed Building (approximately 3.4km south-east from the Site) The Site holds no associative or functional relationship with the heritage receptor. There is the potential for some intervisibility between the Site and the receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptors or a significant indirect effect to their setting.	No Change - Negligible	Moderate	Neutral - Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
High Trees East Farmhouse and adjoining Cart Shed and Store - Grade II Listed Building (approximately 3.4km south-east from the Site) The Site holds no associative or functional relationship with the heritage receptor. There is the potential for some intervisibility between the Site and the receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect to its setting.	No Change - Negligible	Moderate	Neutral - Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
Workington Hall - Grade II Registered Park and Garden (approximately 3.4km north-west from the Site) The Site holds no associative or functional relationship with the heritage receptors. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptors or a significant indirect effect to their setting.	No Change	Moderate	Neutral	Scoped Out (Construction, operational and decommissioning phases)

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
The English Lake District National Park – World Heritage Site (approximately 3.4km east-south-east from the Site) The Site holds no associative or functional relationship with the heritage receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect on its setting.	Negligible	High	Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
High Trees East Farmhouse and adjoining Cart Shed and Store - Grade II Listed Building (approximately 3.4km south-east from the Site) The Site holds no associative or functional relationship with the heritage receptor. Given the substantial distance from the Site to the receptor and intervening topography and landscaping, it is considered that there will be no direct impact to either the receptor itself or a significant indirect effect on its setting.	Negligible	Moderate	Neutral	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
Non-designated Heritage Receptors (Above Ground) within 3km Study Area				

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
Rigg House (approximately 65m east from the Site)	Moderate	Not Significant - Low	Negligible – Minor Adverse	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
Non-designated Heritage Receptors (Below Ground) within 3km Study Area				
Potential Non-designated Heritage Receptors ((archaeological remains) within Area C) Potential physical impact during construction phase on surviving unknown Non-designated Heritage Receptors (archaeological remains)	High	Low - Moderate	Minor Beneficial - Moderate Beneficial	Scoped In (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA.
Dean Moor Unclassified Cropmarks (within the Site) Potential physical impact during construction phase.	High	Low - Moderate	Minor Beneficial - Moderate Beneficial	Scoped In (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage (Pre-mitigation)	Proposed Approach – Scoped in / Scoped Out
Whitebanks Wood Mines (within the Site) Not impacted, Proposed Development will be designed around receptor.	No Change - Negligible	Not Significant - Low	Neutral	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
Thiefs Gill Quarry (within the Site) Not impacted, Proposed Development will be designed around receptor.	No Change - Negligible	Not Significant - Low	Neutral	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
Dean Moor Mine Workings (within the Site) Not impacted, Proposed Development will be designed around receptor.	No Change - Negligible	Not Significant - Low	Neutral	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA
Rigg House Earthworks, Dean (within the Site) Not impacted, Proposed Development will be designed around receptor.	No Change - Negligible	Not Significant - Low	Neutral	Scoped Out (Construction, operational and decommissioning phases) Non-significant impacts to be assessed as part of HEDBA

7. Landscape & Views

7.1. Introduction

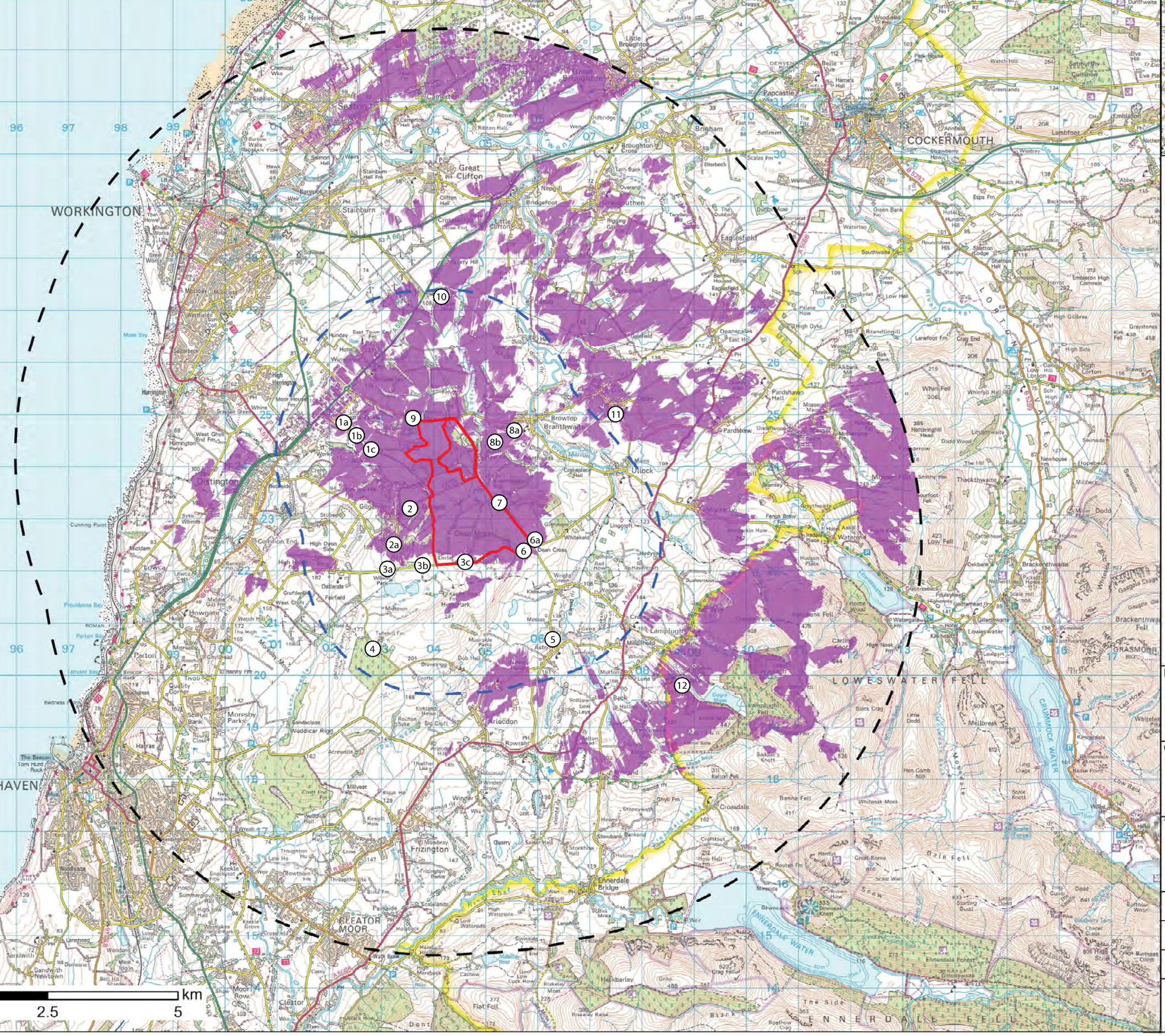
7.1.1. This section of the Scoping Report sets out the proposed approach and methodology for undertaking an assessment of the likely significant landscape and visual effects of the Proposed Development on the environment.

7.1.2. An overview of the landscape and visual baseline data that will be used within the assessment is provided, as well as landscape designations and published landscape character assessments which are relevant to the Site. Proposed view locations for the visual assessment and the reasoning for their selection are also given. The scope of the landscape and visual impact assessment is outlined, and potential likely significant effects identified.

7.2. Study Area

7.2.1. Following an initial review of a search area extending to a 7.5km radius from the Site, and consideration of the nature of the Proposed Development (as set out in Section 2), it is considered that no likely significant landscape or visual impacts resulting from the Proposed Development would occur beyond 2.5km from the Site. This is due to the limited height of the elements that comprise the Proposed Development, the undulating topography within the landscape surrounding the Site, which limits views, and the presence of field boundary vegetation and woodland blocks within and adjacent to the Site. It has also been informed by an analysis of a Preliminary Zone of Theoretical Visibility with View Locations ('ZTV') undertaken for the Proposed Development (see Figure 7.1), and a Gradient of Visibility ZTV (Figure 7.2), which show limited visibility of the Proposed Development beyond 2.5km from the Site.

Figure 7.1: Zone of Theoretical Visibility (ZTV)



Legend

- Draft Order Limits
- 2.5km Study Area
- 7.5km Initial Search Area
- Theoretical Visibility
- (1) View Locations
- Lake District National Park (LDNP) Boundary

NOTES:

1) This ZTV was run on a Digital Surface Model (DSM) using National LiDAR Programme data, 1m resolution grid, 2019.
2) The ZTV was created using Esri ArcGIS Pro version 3.0.2 Spatial Analyst tool.
3) The ZTV illustrates the area of theoretical visibility of the Site, created from 60 points within the Site layout clipped to a 7.5km buffer. Heights were set to 3.5m for the solar panel layout, 3.8m for the substation and 1.6m for the observers.
4) The ZTV analysis remains only as a tool in the visual appraisal of the project. Its accuracy is limited to the digital information that it has been based upon, and the algorithm used in its calculation.

Project Title: Dean Moor Solar Farm

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Title: DEAN MOOR SOLAR FARM
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Zone of Theoretical Visibility (ZTV)

Scale: 1:70,000 @ A3	Date: 17.07.23
Drawn: IM	Checked: RW
Figure: 7.1 Sheet 1 of 1	Rev: A

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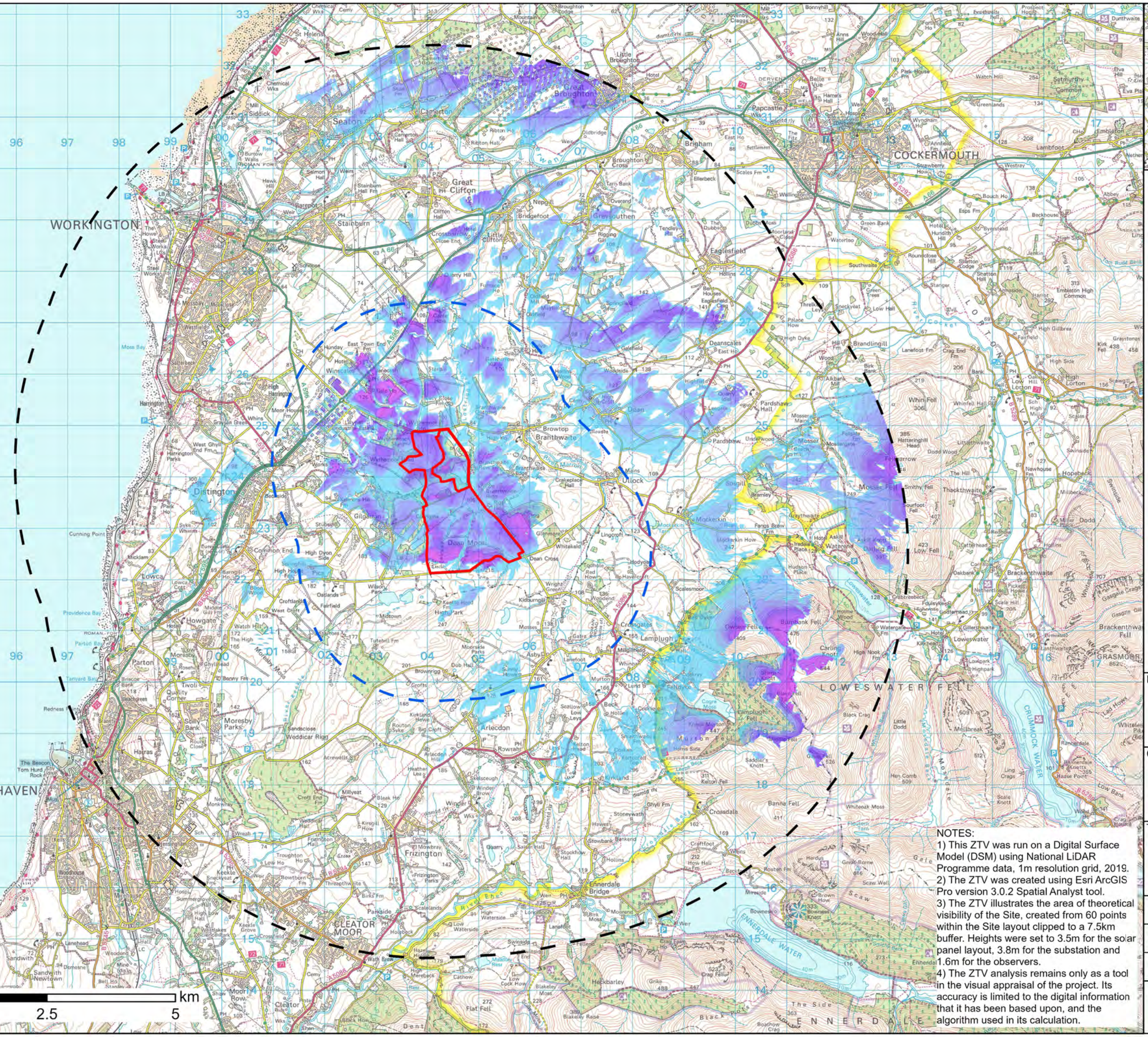
Figure 7.2: Gradient of Visibility (ZTV)



NOTES:
1) This ZTV was run on a Digital Surface Model (DSM) using National LiDAR Programme data, 1m resolution grid, 2019.
2) The ZTV was created using Esri ArcGIS Pro version 3.0.2 Spatial Analyst tool.
3) The ZTV illustrates the area of theoretical visibility of the Site, created from 60 points within the Site layout clipped to a 7.5km buffer. Heights were set to 3.5m for the solar panel layout, 3.8m for the substation and 1.6m for the observers.
4) The ZTV analysis remains only as a tool in the visual appraisal of the project. Its accuracy is limited to the digital information that it has been based upon, and the algorithm used in its calculation.

Legend

▭ Draft Order Limits

▭ 2.5km Study Area

▭ 7.5km Initial Search Area

Theoretical Visibility (%)

0

🟦 10

🟦 20

🟦 30

🟦 40

🟪 50

🟪 60

🟪 70

🟪 80

🟪 90

🟪 100

▬ Lake District National Park (LDNP) Boundary

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
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Gradient of Visibility (ZTV)

Scale: 1:70,000 @ A3	Date: 17.07.23
Drawn: IM	Checked: RW

Figure: 7.2	Sheet 1 of 1	Rev: A

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7.3. Baseline Environment

Landscape Designations

7.3.1. Landscapes may be valued at community, local, national or international levels. Existing landscape designations will be taken as the starting point for the assessment of the baseline conditions, and the value of landscapes beyond designated areas with reference to the Landscape Institute *Technical Guidance Note 02/21: Assessing Landscape Value Outside National Designations*[53] will also be considered, where appropriate. The setting of heritage designations within 1km from the Site will also be considered, as it is considered that effects from the Proposed Development on the landscape setting of heritage assets would not be significant beyond 1km from the Site.

7.3.2. Relevant designations for the Site and study area are set out in Table 7.1 below.

Table 7.1: Landscape Designations

Typical Designation Type and Importance (Value)	Designations Applicable to the Site or within Surrounding Area
WHSs: *International (Very High)*	The English Lake District WHS, which is situated approximately 4km to the east of the Site.
National Parks and Areas of Outstanding Natural Beauty ('AONB'): *National (High)*	LDNP which lies approximately 4km to the east of the Site. The Site is not located within an AONB.

[53] Landscape Institute (2021), *Technical Guidance Note 02/21: Assessing Landscape Value Outside National Designations.* Available at: **https://www.landscapeinstitute.org/publication/tgn-02-21-assessing-landscape-value-outside-national-designations/** Accessed June 2023

Typical Designation Type and Importance (Value)	Designations Applicable to the Site or within Surrounding Area
Conservation Areas ('CA'), curtilage of Grade I, II* and II Listed Buildings ('LB'), Registered Parks of Special Historic Interest ('RHPG'), Scheduled Monuments ('SM') (within 1km of the Site boundary): *National (High)*	The Site is not within a CA and does not contain any LBs. The Site does not contain an RHPG. The '*Large irregular stone circle and round cairn on Dean Moor'* SM is located within the south-western part of the Site. The SM lies partially within the Site. A number of LBs lie within the 1km study area for heritage assets, with one Grade II LB (*Far Branthwaite Edge, Dairy and barn adjoining)* located approximately 1km to the east of the Site.
Special Landscape Areas ('SLA'), Areas of Great Landscape Value ('AGLV'), Long-distance paths, National Cycle Routes: *Regional or Local (High/ Medium)*	The Site does not lie within an SLA or AGLV. There are no long distance routes or National Cycle Routes within the 2.5km study area.
Areas of Local Landscape Importance, Designated Public Open Space, Tree Preservation Orders ('TPO'): *District (Medium/ Low)*	The Site does not lie within an area of Local Landscape Importance. The Site lies adjacent to the east of Struthers Wood Ancient Woodland, and approximately 200m to the west of Branthwaite Edge Wood Ancient Woodland. There are no TPOs in place within the Site or surrounding area.
Non-designated landscape features, local PRoW: *Local (Medium/ Low)*	No PRoWs are located within the Site. There is a network of PRoWs within the countryside surrounding the Site. High Park Open Access Land is located directly to the south of the Site and the minor road.

7.3.3. The *Lake District National Park Local Plan (2020 – 2035*)[54] provides detail on the 13 'Special Qualities' of the LDNP which covers aspects of its cultural landscape, complex geology and geomorphology, high fells, wealth of habitats and wildlife, and distinctive buildings and settlement character. The Special Qualities provide evidence on the physical and experiential qualities which make up the LDNP, and parts of these Special Qualities also became the

[54] National Park Authority (2021), *Lake District National Park Local Plan (2020 – 2035)*. Available at: **https://www.lakedistrict.gov.uk/planning/planningpolicies/local-plan** Accessed June 2023

attributes of Outstanding Universal Value[55] on obtaining its WHS status in July 2017.

Landscape Character

7.3.4. The Site lies within the following landscape character areas:

i. *National Landscape Character Area[56] 7: West Cumbria Coastal Plain*; and

ii. *Cumbria Landscape Character Guidance and Toolkit*[57] Type 5 Lowland, sub-type 5a: Ridge and Valley, Type 9: Intermediate Moorland & Plateau, sub-types 9a: Open Moorlands and 9d: Ridges.

7.3.5. The LDNP lies approximately 4km to the east of the Site, and the National Park Authority undertook its own landscape character assessment (*Lake District National Park Landscape Character Assessment and Guidelines*[58] (revised in April 2021)). The assessment identifies distinct Landscape Character Types ('LCT') and sub-type LCTs, but also provides an assessment of 'Areas of Distinctive Character', with the nearest of these to the Site being Area 8: Loweswater, approximately 2.2km south east of the Site at its nearest point.

7.3.6. LCT sub-type D: Lowland and LCT sub-type I: Upland Limestone Farmland are the closest to the Site at an approximate distance of 1.5km and 1km east from the Site, respectively. These LCTs are described as forming the setting of the LDNP and extend beyond the boundaries of the LDNP itself.

People's Views and Visual Amenity

7.3.7. Potential visual receptors are people who are visiting, living or working within the 2.5km study area. Given the largely rural nature of land within the study

[55] Outstanding Universal Value is one of the central ideas underpinning the World Heritage Convention. Potential WHSs must meet certain criteria to be considered.

[56] Natural England (2014) *National Character Area Profiles*. **https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles** Accessed June 2023

[57] Cumbria County Council (2011) *Cumbria Landscape Character Guidance and Toolkit*. **https://www.cumbria.gov.uk/elibrary/content/internet/538/755/2789/406869467.pdf** Accessed June 2023

[58] National Park Authority (2021) *Lake District National Park Landscape Character Assessment and Guidelines* **https://www.lakedistrict.gov.uk/caringfor/policies/lca** Accessed June 2023

area, visual receptors are broadly limited to users of the local road network, residents of settlements surrounding the Site such as Branthwaite and Gilgarran, isolated rural properties, and recreational users of the PRoW network in the vicinity of the Site.

7.3.8. Table 7.2 below lists the selected representative view locations for visual assessment at which significant visual effects upon people's views and visual amenity are anticipated, and upon which agreement with officers of the Council and the LDNP Authority is sought. These view locations are shown on Figure 7.1.

Table 7.2: Proposed View Locations and Reasons for Inclusion

View Location Reference	Location	Reason for Inclusion and Type of Visual Receptor
VL1(a-c)	Local PRoW (260005) on edge of Lillyhall	Sequential views of recreational users on local bridleways, including specific views from the settlement edge at Lillyhall Industrial Estate (VL1a), and the isolated farmstead at Wythemoor Head (VL1c)
VL2	Settlement of Gilgarran	Representative of residential receptors at Gilgarran
VL2a	Settlement of Gilgarran	Representative of residential receptors at Gilgarran
VL3 (a-c)	Unnamed road near isolated rural properties - Wilson Park / Studford	Representative of users of the unnamed local road, with specific views from Studford farmstead, and from local PRoW 404018 near Wilson Park
VL4	Unnamed road near isolated rural property – Tutehill Farm	Representative of users of the unnamed local road, near Tutehill Farm
VL5	Settlement of Asby	Representative of residential receptors at Gilgarran
VL6	Dean Cross	Representative of users of the local highway and adjacent commercial premises, located near to Dean Moor motocross park

View Location Reference	Location	Reason for Inclusion and Type of Visual Receptor
VL6a	Dean Cross	Representative of users of the local highway and adjacent commercial premises, located on the eastern part of the Site boundary
VL7	Unnamed road adjacent to isolated rural property – Rigg House	Representative of users of the unnamed local road, and Rigg House residential property
VL8 (a-b)	Local PRoW (260005) on edge of Branthwaite	Sequential views, representative of recreational users on local footpath (260005) with specific views from the settlement edge at Branthwaite
VL9	Unnamed road near isolated rural property – Wythemoor House	Representative of users of the unnamed local road, and Wythemoor House residential property
VL10	Local PRoW (230010) at Caple How	Representative of recreational users on local footpath (230010)
VL11	Settlement of Dean and local PRoW (225006)	Representative of residential receptors at Dean, and users of the local footpath (225006)
VL12	Local PRoW (412025) near Cogra Moss / Felldyke within LDNP	Representative of recreational users on the local footpath (412025) and users of the LDNP. including areas of Open Access Land

7.4. Project Basis for Scoping Assessment

7.4.1. The scoping assessment is based on the description of the Proposed Development set out in Section 2 (The Proposed Development) of this Scoping Report.

7.5. Embedded Mitigation

7.5.1. The Proposed Development is evolving through an iterative design process. This has included the consideration of landscape and visual impacts.

7.5.2. Embedded mitigation for the Proposed Development is likely to include the following:

i. Retention of existing vegetation throughout the Site, wherever possible;

ii. Suitable buffers to the Site's features including ancient woodland, watercourses and electricity infrastructure;

iii. Reinforcement of existing field boundaries, where appropriate; and

iv. New planting to provide visual screening, break-up of the extent of development, and linking of existing habitat to provide enhanced green infrastructure and biodiversity opportunities.

7.5.3. Mitigation measures will be incorporated into the oLEMP (and subsequently the LEMP) and supporting plans being prepared as part of the ES submission planting strategy.

7.6. Methodology

7.6.1. A summary of the proposed methodology for the assessment of the Proposed Development's likely significant effects LVIA has been set out in Appendix 7.1. A detailed methodology will be set out within an appendix in the ES.

7.7. Likely Significant Effects

Potential Landscape and Visual Effects

7.7.1. Potential landscape and visual effects arising from the Proposed Development during the construction, operational and decommissioning phases comprise:

i. Reversible and temporary effects as a result of increased vehicle movements and activity during construction and decommissioning;

ii. Reversible and long-term temporary effects on landscape features of the Site during operation;

iii. Reversible and temporary long-term changes to landscape character and views from sensitive receptors in the vicinity of the Site during operation; and

iv. Reversible changes following decommissioning of the Proposed Development.

7.8. Impacts Scoped Into the Assessment

7.8.1. Prior to mitigation significant effects are predicted to occur to localised landscape character, particularly on land within the Site boundary following the

introduction of the Proposed Development, with potential wider effects on the identified published local landscape character areas 5: Lowlands, sub-type 5a: Ridge and Valley, 9: Intermediate Moorland & Plateau, sub types 9a: Open Moorlands and 9d: Ridges.

7.8.2. With regards to visibility, the assessment of view locations illustrated on Figure 7.1 within the ES will provide information on the perceived significance of effect from static locations within the 2.5km and 1km study areas (VLs 11 and 12 provide assessments on visibility from sensitive locations beyond the study area). VL11 has been included to illustrate potential visibility from the settlement edge of Dean along a PRoW, and VL12 has been included to illustrate potential visibility from the LDNP/ WHS.

7.8.3. Visibility for receptors within the 2.5km and 1km study areas will be assessed through view locations to be agreed with the Council and the LDNP, which have been chosen to represent a suitable geographical spread and range of sensitivity. Views from the Lake District fells which lies beyond the study area will also be considered following discussions with representatives of the LDNP. This is largely due to the understanding that visitors to the LDNP are highly sensitive visual receptors and may experience views towards the Proposed Development.

7.9. Impacts Scoped Out of the Assessment

7.9.1. As a result of the Proposed Development, no significant landscape effects are predicted for the English Lake District WHS or the LDNP, including its setting. This considers the LDNP Special Qualities and associated attributes of Outstanding Universal Value. This is generally because there are no direct effects on land within these designations, and although indirect effects may occur as a result of the Proposed Development, these are not predicted to be significant in nature given the overall distance at approximately 4km. No potentially significant effects are predicted on the setting of Listed Buildings within the 1km study area, including those at Far Branthwaite Edge, which lies 1km to the east of the Site. No potentially significant landscape or visual

effects are predicted for the Scheduled Monument located within the south-western part of the Site.

7.9.2. No significant effects are predicted for NCA 7: West Cumbria Coastal Plain given the limited footprint of the Proposed Development within the wider character area. No significant landscape effects are predicted for the local PRoW network, National Cycle Network or areas of Open Access Land given that none lie within the Site, and any indirect effects incurred as a result of the Proposed Development would not be significant.

7.9.3. With regards to visibility it is considered that although there is predicted to be limited visibility from locations beyond the 2.5km study area, in general the visual change experienced by receptors is not considered to be significant given the limited height of the Proposed Development, intervening features, and overall distance. The Preliminary ZTV (Figure 7.1) indicates those areas where potential visibility is not available.

7.9.4. Night-time lighting effects from a landscape and visual perspective are proposed to be scoped out of the assessment for the construction, operational and decommissioning phases. The Site and 2.5km study area do not lie within a designated ‘dark sky area’, and given the nature of the Proposed Development, permanent lighting during operation would not be required, and would instead be limited to emergency and motion activated security lighting around ancillary structures. Similarly, lighting effects during construction and decommissioning are expected to be limited in extent, intensity and duration, and although there may be a slight increase in these factors during the winter months, they are predicted to remain insignificant overall.

7.9.5. The Landscape and Views ES chapter will take cognisance of the Glint and Glare Study which will be appended to the ES, and where appropriate, the impacts of reflectivity will be considered within the assessment of landscape and visual effects.

7.10. Proposed Approach to ES

7.10.1. The proposed approach to the ES for landscape and views is as follows:

i. Identification and recording of the baseline environment through a combination of desk study and site visits;

ii. Consultation with relevant stakeholders during the scoping process to agree landscape and visual assessment methodology and view locations illustrated on the Preliminary ZTV with View Locations Plan;

iii. Identification of proposed mitigation measures, as required, following an iterative design process;

iv. Assessment of landscape and visual receptors predicted to experience significant effects as a result of the Proposed Development;

v. Assessment of the Proposed Development's likely significant cumulative effects with other developments, as appropriate; and

vi. Outline summary and conclusions following assessment.

7.11. Summary of Effects & Impacts

7.11.1. Table 7.3 below outlines receptors which are proposed to be scoped in or out of the landscape and visual assessment and provides their predicted magnitude of effect, level of sensitivity, and likely significance of effect at scoping stage.

Table 7.3: Summary of Effects & Impacts

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped in / Scoped Out
Lake District WHS and National Park	Neutral	Very High/High	Minor	Scoped Out
Lake District Character Areas	Neutral	Medium	Negligible	Scoped Out
LDNP Special Qualities	Neutral	High	Minor	Scoped Out
National Character Area	Negligible	Medium	Negligible	Scoped Out
Cumbria Landscape Character Areas	Moderate	Medium	Moderate	Scoped In
Non-designated landscape features of the Site	Major	Medium	Major	Scoped In
Listed Buildings (setting of)	Negligible	High	Minor	Scoped Out
Scheduled Monuments (setting of)	Negligible	High	Minor	Scoped Out
Recreational Routes (PRoWs)	Negligible	High/Medium	Minor/Negligible	Scoped Out
Open Access Land	Slight	Medium	Minor	Scoped Out
People's Views and Visual Amenity within 2.5km study area (View Locations 1 – 9) including reference to glint and glare	Neutral - Major	Low - High	Negligible - Major	Scoped In
People's Views and Visual Amenity from sensitive receptors beyond the 2.5km study area as defined by View Locations 11 and 12, including reference to glint and glare	Neutral - Major	Low - High	Negligible - Major	Scoped In

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped in / Scoped Out
Other views and visual amenity beyond the 2.5km study area	Neutral - Major	Low - High	Negligible - Major	Scoped Out
Night-time views and perception of the night sky	Negligible	Low	Negligible	Scoped Out

8. Biodiversity

8.1. Introduction

8.1.1. An assessment of the likely significant effects of the Proposed Development on the environment with respect to biodiversity will be undertaken.

8.1.2. The Biodiversity chapter of the ES will set out the ecological baseline and an assessment of potential impacts and subsequent effects on any identified important ecological features. It will provide details of the agreed avoidance, mitigation, compensation, and enhancement measures required to ameliorate potentially significant adverse effects and confirm the residual effects once these measures have been implemented.

8.2. Study Area

8.2.1. The proposed study areas to inform the assessment of impacts to biodiversity features are set out below. Due to differing zones of influence ('ZoI') within which ecological features may be subject to impacts and subsequent effects during the Proposed Development's construction, operation and decommissioning phases, a range of study areas has been used. The selection of the study areas has been informed by the Chartered Institute of Ecology and Environmental Management ('CIEEM') *Guidelines for Ecological Impact Assessment in the UK and Ireland*[59].

i. For the desk study, the proposed study areas consist of the following search radii from the Site boundary (the Draft Order Limits), which are proposed to be used:

ii. 10km radius from the Site boundary for internationally designated sites, to be extended beyond this radius where any hydrological pathways from the Site to the designated site are known to occur;

iii. 2km radius from the Site boundary for all other statutory and non-statutory locally designated sites;

[59] Chartered Institute of Ecology and Environmental Management 'Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater, Coastal and Marine'. CIEEM (2018).

iv. 2km radius from the Site boundary for notable habitats, including ancient woodland and Habitats of Principal Importance; and

v. 2km radius from the Site boundary for protected species records.

8.2.2. For field surveys, the proposed study area comprises all land within the Site. For some species, including great crested newts and badgers, this will be extended beyond the Site boundary where appropriate, and access to the land is secured.

8.3. Baseline Environment

8.3.1. A Preliminary Ecological Appraisal ('PEA') (Appendix 8.1) was undertaken in May 2023, which provided an appraisal of the ecological features present or potentially present within the Site and surrounding area. In addition, the baseline conditions presented below includes initial results from species surveys undertaken at the Site at the time of writing, consisting of a wintering bird scoping survey in February 2023 and a great crested newt eDNA survey in May 2023.

Designated Sites

8.3.2. No internationally, nationally, or local designated statutory sites are present within the Site.

8.3.3. Internationally designated sites present within 10km of the Site are described in Table 8.1 below and presented on Figure 8.1 Statutory Designated Sites.

Table 8.1: Internationally Designated Sites present within 10km of the Site

Designated Site Name	Approximate Distance and Direction from the Site Boundary	Reason for Designation
River Derwent & Bassenthwaite Lake SAC	1.2km to the east (and hydrologically connected to the Site via watercourses)	Designated for aquatic habitats and species which the River Derwent and Bassenthwaite Lake support, including lamprey species, Atlantic salmon, otter, marsh fritillary butterfly, and floating water plantain.

Designated Site Name	Approximate Distance and Direction from the Site Boundary	Reason for Designation
River Ehen SAC	6.1km to the south	Designated for the presence of freshwater pearl mussel and Atlantic salmon.
Solway Firth Special Protection Area ('SPA')	5km to the west	Designated due to its importance during winter for non-breeding waterfowl and non-breeding gulls.
Lake District High Fells SAC	8km to the southeast	Designated for a range of upland habitats including heathland, tarns (waterbodies), grassland, bogs, scree, woodland, and tall herb communities.
North Pennine and Dales Meadows SAC	8.9km to the east	Designated due to the presence of mountain hay meadows and *Molinia* meadows.

8.3.4. Nationally and locally designated statutory sites present within 2km of the Site boundary are described in Table 8.2 below and presented on Figure 8.1 Statutory Designated Sites.

Table 8.2: Nationally Designated Statutory Sites present within 2km of the Site

Designated Site Name	Approximate Distance and Direction from the Site Boundary	Reason for Designation
River Derwent and Tributaries SSSI	1.2km to the east	Designated for aquatic habitats and species which the River Derwent and its tributaries support.

Figure 8.1: Statutory Designated Sites

N

River Derwent & Bassenthwaite Lake SAC

WORKINGTON

Solway Firth SPA

River Derwent & Tributaries SSSI

North Pennine Dales Meadows SAC

COCKERMOUTH

River Derwent & Bassenthwaite Lake SAC

WHITEHAVEN

River Ehen SAC

Lake District High Fells SAC

the Lake District National Park

0 2.5 5 7.5 10 km

Path: C:\Users\tletendrie\Documents\ArcGIS\Projects\332511471\332511471.aprx

Legend

- Draft Order Limits
- 2km Buffer from Draft Order Limits
- 10km Buffer from Draft Order Limits
- Sites of Special Scientific Interest (SSSI)
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)

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Title

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Statutory Designated Sites

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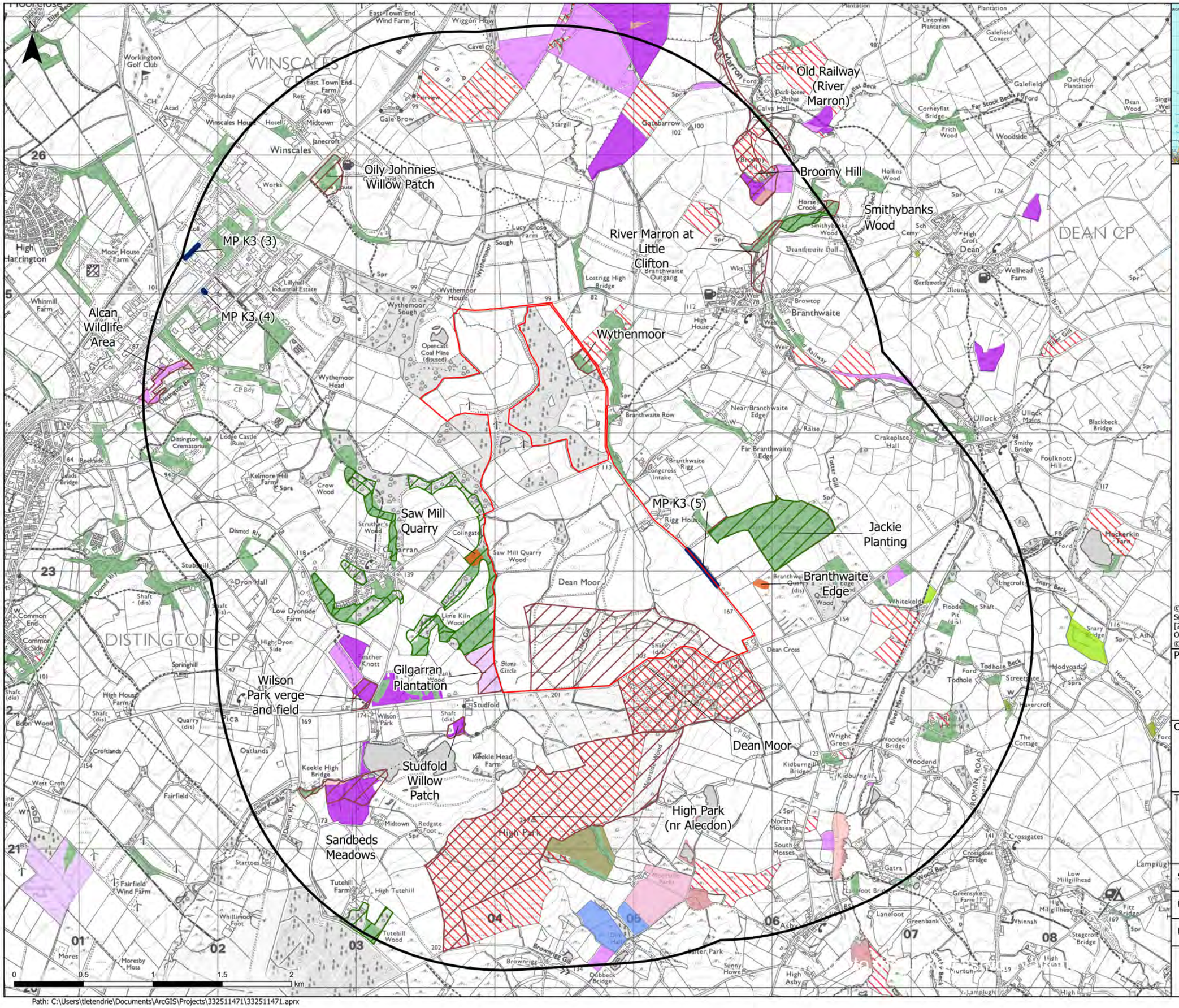
8.3.5. Dean Moor CWS is partially located within the Site and is shown on the Non-Statutory Sites and Notable Habitats figure. This CWS is designated for acidic moorland habitats.

8.3.6. There are a further 13 CWSs and three Special Roadside Verges within 2km of the Site.

Habitats

8.3.7. Notable habitats are shown on Figure 8.2 Non-Statutory Sites and Notable Habitats.

Figure 8.2: Non-Statutory Designated Sites and Notable Habitats



Legend

- Draft Order Limits
- 2km Buffer from Draft Order Limits
- Ancient Woodland
- County Wildlife Site
- Local Geological Site
- Special Roadside Verge

Priority Habitat

- Coastal and floodplain grazing marsh
- Deciduous woodland
- Good quality semi-improved grassland
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland
- Lowland meadows
- No main habitat but additional habitats present
- Purple moor grass and rush pastures
- Traditional orchard
- Upland hay meadow

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Non-Statutory Sites and Notable Habitats

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8.3.8. Seven parcels of ancient woodland are present within 2km of the Site, the closest being located adjacent to the western part of Area C of the Site. No ancient woodland is present within the Site.

8.3.9. The majority of the grassland habitats within the Site are heavily sheep grazed and would be classified using the UKHab[60] system as 'modified grassland' in poor condition. Two areas of grassland showed some botanical interest and will be subject to more detailed survey to be included in the ES; the valley in the southern section of Area C was found to contain acid grassland / heath indicator species, and a wetter area in the southwest of in Area C.

8.3.10. Woodland on the boundary of Area A is reasonably diverse but is relatively recently planted, with an absence of distinctive woodland ground flora. Similarly, plantation woodland within Area C is still establishing. A number of more mature trees were recorded along the Gilgarran Road that divides Area B and Area C.

8.3.11. Hedgerows in the north of the Site are well established but vary in condition, with several displaying gaps. Most of the hedges in the south of the Site are newly planted (estimated to be in the last two years or so).

8.3.12. A network of watercourses is present in the south of the Site. The water quality appeared to be quite poor, likely due to agricultural run-off.

Protected and Notable Species

8.3.13. A suite of detailed ecological survey work is being undertaken during 2023 to establish the use of the Site by protected and notable species. Based on the findings of the PEA (Appendix 8.1) and species surveys undertaken at the time of writing, the following species or species groups are considered to be present, or potentially present, within the Site:

i. Bats (roosting and foraging/commuting);
ii. Breeding birds;

[60] Butcher, B., Carey, P., Edmonds, R., and Treweek, J. (2020) UK Habitat Classification – Habitat Definitions V1.1 at **https://ukhab.org/** Accessed June 2023

iii. Common species of reptile;

iv. Dormice;

v. Otter;

vi. Water vole; and

vii. Wintering birds (although only limited wintering bird assemblage was identified during the wintering bird scoping survey in February 2023).

8.3.14. The following species are considered to be likely absent from the Site:

i. Badger (no evidence of their presence was identified in the PEA undertaken in May 2023);

ii. Great crested newts (eDNA surveys undertaken in May 2023 at three on-site ponds returned negative results for this species); and

iii. Notable invertebrate assemblage (the majority of the habitat within the Site is intensively sheep grazed pasture and is unlikely to support a notable invertebrate assemblage).

8.4. Project Basis for Scoping Assessment

8.4.1. The Proposed Development is being developed to avoid adverse impacts in the first instance through an iterative approach to design. For the purposes of this scoping assessment the following measures have been assumed to be implemented for the Proposed Development:

i. The design of the Proposed Development will be informed by the Building Research Establishment's Biodiversity Guidance for Solar Developments (2014)[61];

ii. Impacts to Dean Moor CWS during the construction and decommissioning phases will be avoided or minimised. The potential for the enhancement of the CWS through the implementation of appropriate management will be considered, and subject to agreement with stakeholders including Cumbria Wildlife Trust and the Council;

iii. Infrastructure development on habitats of ecological value within the Site, including woodlands, hedgerows, watercourses, will be avoided, with infrastructure development focused on grazed grassland areas;

iv. The design will include appropriate buffers between infrastructure development and sensitive habitats, such as watercourses and woodland. The extent of the buffer will be determined by the sensitivity

[61] BRE (2014) Biodiversity Guidance for Solar Developments. Eds G E Parker and L Greene

of the feature, the proposals in that area, and industry standards and guidance;

v. Existing accesses to the Site will be used during construction, operation and decommissioning;

vi. Existing farm buildings within the Site will not be demolished; and

vii. During operation, the intensity of sheep grazing within the Site will be reduced compared with the existing baseline conditions, which will allow an improvement of habitat quality and diversity relative to the existing baseline conditions.

8.5. Embedded Mitigation

8.5.1. A hierarchical approach to mitigation is being adopted through the iterative design process which seeks to avoid adverse impacts in the first instance, e.g., informing layout to avoid sensitive receptors, where possible. In areas where avoidance is not possible, measures will be proposed to prevent or reduce (mitigate) potentially significant negative effects. Measures to compensate adverse effects may also be required, e.g., habitat creation to offset impacts associated with habitat loss and fragmentation where these cannot be avoided.

8.5.2. Where appropriate, recommendations have been made below with respect to design, mitigation and enhancement measures. It is important to note that these should be treated as preliminary and revisited and developed as designs evolve and more survey data emerge. Full details of mitigation embedded within the design, or essential mitigation measures needed to address potentially significant effects or to ensure legal compliance, along with the mechanism for delivery, will be provided within the ES. A preliminary summary of mitigation measures for the Proposed Development is provided below:

i. Impacts to Dean Moor CWS during construction and decommissioning to be avoided or minimised. The potential for the enhancement of the CWS through the implementation of appropriate management will be considered, and subject to agreement with stakeholders including Cumbria Wildlife Trust and the Council;

ii. Infrastructure development will be sited in grassland areas of low ecological value;

iii. Removal of woodland, trees, hedges will be avoided, other than limited clearance to enable access, where required. The removal of habitats

will be done sympathetically. For example, through the implementation of phased clearance of habitats to minimise impacts to species, such as reptiles;

iv. To avoid direct impacts, the Proposed Development's design will incorporate appropriate buffers between infrastructure development and sensitive habitats, such as watercourses and woodland;

v. The provision of an ecologically informed Landscape Strategy Plan and oLEMP in the ES. This will include habitats of ecological value which are appropriate to the local area, with the aim of delivering a net gain for biodiversity;

vi. The enhancement of watercourses within the Site through the exclusion of livestock and the implementation of supplementary planting to reduce the erosion of banks and sediment input;

vii. The implementation of a CEMP to capture all committed mitigation and to ensure legal compliance during construction and decommissioning (e.g., to specify appropriate timings of construction to avoid sensitive periods, for example, the breeding bird season); and

viii. During operation, the intensity of sheep grazing within the Site will be reduced which will allow an improvement of habitat quality and diversity relative to the existing baseline conditions. In addition, this is likely to provide further enhancement to watercourses within the Site, and downstream, through a reduction in nutrients generated through agricultural activity entering these watercourses.

8.6. Likely Significant Effects

8.6.1. Having regard to the characteristics of the Site and the surrounding area, in the absence of mitigation measures, the construction, operation and decommissioning of the Proposed Development has the potential to result in the following likely significant effects:

i. Habitat loss, disturbance or fragmentation (during construction, operation and decommissioning);

ii. Disturbance, displacement, or mortality of wildlife (during construction and decommissioning);

iii. Disturbance, damage or loss of protected species breeding sites, hibernation sites or resting places (during construction and decommissioning);

iv. Noise and/or visual disturbance to species using the Site (during construction, and decommissioning);

v. Impacts to designated sites or habitats through generation of dust or other pollutants (during construction and decommissioning); and

vi. Changes to habitats through alteration of surface water drainage (during construction and decommissioning).

8.6.2. The detailed approach required for the management, mitigation, compensation, enhancement and/or monitoring of likely significant ecological effects will be determined following the establishment of the full ecological baseline and having regard to planning policy requirements and/or the legislative protection afforded to the ecological feature.

8.6.3. The Proposed Development has the potential to enhance the biodiversity value of the Site through habitat creation and changes to habitat management. This could also increase the extent and suitability of habitats for protected and notable species on the Site, together with other measures, such as creation of hibernacula for amphibians and reptiles, and installation of bird nest/ bat roost boxes. Enhancement measures could include the use of low intensity sheep grazing to integrate agricultural uses alongside the operation of the Proposed Development, and by planting hedgerows to fill gaps in the hedgerow network.

8.7. Impacts Scoped Out of the Assessment

8.7.1. Having regard to the characteristics of the Site and the surrounding area, the following impacts are considered unlikely to result in significant effects and are therefore proposed to be scoped out of the assessment.

8.7.2. During the operational phase, there will be very limited maintenance activity on the Site. As set out in Section 4.5 Traffic and Access, there would be approximately 1 to 2 maintenance vehicles visiting the Site per week, consisting of 2-4 vehicular movements. These vehicles are expected to be LGVs or four-wheel drive vehicles with operatives to perform checks and maintenance of plant and equipment. There could also be an occasional ad-hoc visit by HGV for operations such as equipment replacement. The permanent Site accesses will be designed to accommodate HGVs allowing them to enter and exit in forward gear. As such, the impacts of the operational phase on traffic and access are expected to be minimal. Therefore, it is

proposed to scope out an assessment of operational phase disturbance from the Proposed Development due to noise, visual (lighting, vehicle & people movements) and vibrational disturbance from the ES. It is also proposed to scope out from the ES an assessment of operational phase pollution from the Proposed Development to designated sites or habitats resulting from on-Site maintenance activities.

8.7.3. An increase in traffic during construction, operation, and decommissioning could result in potential effects to designated sites and notable habitats through a reduction in air quality from associated exhaust emissions. However, as set out in Section 4.5 Traffic and Access the anticipated increases in traffic are predicted to be in the region of:

i. An average of 20 (40 two-way movements) for HGVs during peak construction and decommissioning phases;

ii. An average of 8 (16 two-way movements) for LGVs during peak construction and decommissioning phases; and

iii. 1 – 2 maintenance vehicles (LGVs) per week during operational phase.

8.7.4. Changes in traffic during decommissioning is likely to be similar to construction levels. These increases are well below the thresholds Natural England[62] suggests as a benchmark below which significant effects from air quality to designated sites can be screened out - predicted change of daily traffic flows of 1,000 AADT[63] or more (or heavy-duty vehicle flows on motorways (HDV) change by 200 AADT or more). Therefore, it is proposed to scope out an assessment of potential effects on designated sites and notable habitats due to a reduction in air quality (during the Proposed Development's construction, operation, and decommissioning) from the ES.

8.7.5. Following a review of potential construction, operational and decommissioning impacts from the Proposed Development, the species or species groups set out below are proposed to be scoped out of further survey and assessment.

[62] Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (June 2018)

[63] Average annual daily traffic

Dormice

8.7.6. Whilst hedgerows and woodland within, and adjacent to, the Site are suitable for dormice, the Site is on the edge of the natural range of this species in the UK and their presence is unlikely. However, even if dormice are present on the Site, the design of the Proposed Development will retain all suitable dormice habitat (woodland, scrub, and hedgerows) within the Site, and the design is likely to provide additional habitats for this species in the unlikely event that they are present. Operational phase management of the habitats within the Site will also improve existing suitable habitats. Therefore, likely significant effects from the Proposed Development on dormice are not anticipated and it is proposed to scope out an assessment of effects on this species from the ES.

Bats (Foraging and Commuting)

8.7.7. The Site is located in a rural setting with woodland, hedgerows, watercourses and other habitats of value to foraging and commuting bats present. Bats are likely to be using these habitats for foraging and moving through the Site and the wider landscape. Desk study records indicate an assemblage of common species of bats are likely to be present. These habitats will be retained during construction, operation and decommissioning and enhanced through provision of additional habitats within the design of the Proposed Development. Bats will continue to be able to move through the landscape and use these habitats for foraging and commuting.

8.7.8. There is potential for temporary disturbance to bats from construction and decommissioning phase lighting. These potential impacts can be readily avoided through standard mitigation measures including avoidance of night-time working, and sensitive design of construction phase lighting which can be captured within a CEMP and secured through planning requirement attached to the DCO. Operational phase lighting may be attached to the substation and other structures for access and safety reasons (not for security). No lighting would be attached to the perimeter fencing or for site access purposes. In the limited circumstances lighting is needed for safety at building or structure

access points, this would be shielded, motion sensor activated low intensity down-lighting.

8.7.9. Sheep grazed pasture within the Site is of limited suitability for foraging and commuting bats. There will be some disturbance to this habitat during the construction and decommissioning phases of the Proposed Development as the solar arrays and associated infrastructure are installed. However, access for bats through the Site along hedgerows and through woodlands will be maintained during construction. During operation, the intention is to relax grazing pressure across the majority of the Site, allowing a longer and more diverse grassland sward to develop. This will improve the habitat for invertebrates, a key food source for bats, and is likely to enhance the existing situation for foraging bats.

8.7.10. As existing habitats of value to foraging and commuting bats will be retained and enhanced, and potential construction and decommissioning phase impacts can be avoided, it is proposed to scope out an assessment of likely significant effects on foraging and commuting bats from the ES.

8.8. Proposed Approach to the ES

Establishing Baseline

8.8.1. In addition to the PEA and great crested newt survey (Appendix 8.1) undertaken in May 2023 (see Section 8.3) and the wintering bird scoping survey undertaken in February 2023, targeted ecological surveys following standard industry guidelines to confirm presence or likely absence, and a full evaluation of other ecological features relevant to the Proposed Development is underway in 2023 and will be included in the ES. These surveys to be undertaken at the Site comprise:

i. Bats (roosting): Preliminary roost assessments and follow up surveys (emergence/re-entry during May - August 2023), as required. Whilst the intention is to retain all existing trees within the Site, further work may be required if proposed infrastructure is located close to trees with potential for roosting bats;

ii. Breeding birds (four to six visits to be undertaken between March and June 2023);

iii. Habitats – further survey of areas with elevated botanical interest (single visit to be undertaken in June or July 2023);

iv. Otter (single visit to be undertaken in June 2023);

v. Water vole – two survey visits to be undertaken during 2023 (one visit in June/July 2023, with a second visit in August/September 2023); and

vi. Wintering birds – one visit per month to be undertaken during October 2023 to February 2024.

8.8.2. Given the range of habitats present and the rural location of the Site, common species of reptiles, such as slow worms and common lizards are likely to be present on Site. Whilst the sheep grazed grasslands at the Site have limited suitability for reptiles, areas of rough grassland and scrub in marginal areas offer good potential for reptiles. No detailed surveys for reptiles are proposed. However, the presence of reptiles will be assumed within all suitable habitats, and mitigation provided accordingly.

8.8.3. The species above (if present) could potentially be affected by the Proposed Development and/or require specific consideration during construction and decommissioning and/ or incorporated within the Proposed Development's design. The study area over which any likely significant effects could occur is variable, dependent on the sensitivity of the ecological feature and the effects being considered.

Consultation

8.8.4. Consultation with consultees will be undertaken throughout the EIA process as appropriate, including in particular, the Council ecology officer (or their nominated representative) and Natural England. Consultation will focus on the approach to baseline data collection, the approach to ecological assessment, and appropriate ecological management/mitigation and enhancement measures including biodiversity net gain requirements.

Assessment

8.8.5. The Biodiversity chapter of the ES will be guided by best practice set out in the CIEEM Guidelines.

8.8.6. The CIEEM Guidelines state that ecological impact assessment ('EcIA') '*is a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems'*. It requires an assessment of likely significant effects on important ecological features, and as such, does not require consideration of effects on every species or habitat that may be present.

8.8.7. In order to determine the likelihood of a significant ecological effect it will be necessary to identify whether an ecological feature is sufficiently important for a significant effect upon it to be material in decision-making. This assessment will follow the CIEEM Guidelines and will value the importance of ecological features with reference to a geographical framework (i.e. a feature may be of, 'Site', 'Local', 'County', 'National', or 'International' importance). This will be informed by the results of the targeted ecological surveys, and with reference to published data on conservation status.

8.8.8. Ecological features of 'Local' level importance or above will be classified as being an 'Important Ecological Feature'. Identified 'Important Ecological Features' will be considered in full in the Biodiversity chapter of the ES, ensuring the assessment focuses only on those impacts which are potentially environmentally significant.

8.8.9. Ecological features of 'Site' importance or below may still warrant consideration within the design of the Proposed Development or mitigation measures to be implemented for them, due to the requirements of legislative protection or planning policies. This will be considered in the Biodiversity ES Chapter, as appropriate.

8.8.10. The assessment of likely significant effects on biodiversity will consider whether Important Ecological Features will be subject to impacts (positive or negative), the characterisation of these impacts (extent, magnitude, duration, reversibility, timing, and frequency) and their effects. The CIEEM Guidelines state that: *'a sequential process should be adopted to avoid, mitigate and*

compensate negative ecological impacts and effects'. This is often referred to as the 'Mitigation Hierarchy'. The assessment will take into account the ecological mitigation and enhancement measures to avoid or otherwise reduce ecological effects which have been embedded within the Proposed Development's design and/ or will be set out in plans/ strategies that will accompany the DCO application. Details of additional mitigation measures will be provided where necessary, and the significance of any residual effects will be assessed i.e., those that remain after implementation of avoidance and mitigation measures (both embedded and additional).

8.8.11. A separate Habitats Regulations Assessment ('HRA') will be undertaken to assess any likely significant effects to internationally designated sites. Natural England will be consulted with respect to the findings of the HRA at the earliest opportunity. The HRA will be undertaken in line with *Advice note ten: Habitats Regulations Assessment relevant to nationally significant infrastructure*[64]*.*

8.8.12. The ES will also summarise the results of a biodiversity net gain assessment with a full report appended. This will assess the predicted habitat losses and gains associated with the Proposed Development, with the aim of maximising biodiversity outputs in accordance with national policy. The latest version of Defra's Biodiversity Metric will be used for this process.

[64] Advice Note Ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects. Available at: **https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/** Accessed July 2023

Table 8.3: Summary of Effects & Impacts

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped In / Scoped Out
River Derwent & Bassenthwaite Lake SAC / River Derwent and Tributaries SSSI Potential impacts to this receptor through: Impacts to designated sites or habitats through generation of dust or other pollutants (construction and decommissioning)	Low	International importance	Not significant	Scoped in
Solway Firth SPA Potential impact to this receptor through loss of habitat used by SPA birds, in particular those species which will utilise agricultural habitats such as lapwing and curlew, if they use the Site for foraging or roosting. Given the distance from the SPA and the limited winter bird interest identified during the winter bird scoping survey undertaken at the Site in February 2023, impacts are considered unlikely.	Negligible	International importance	Not significant	Scoped in
Dean Moor CWS Depending on the Proposed Development's layout, impacts through habitat loss, disturbance or fragmentation are possible to facilitate construction, and decommissioning of the Proposed Development. There would be no likely effects during operation. Beneficial impacts possible through changes in habitat management during operation of the Proposed Development.	Low – Medium	County importance	Significant	Scoped in

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped In / Scoped Out
Other designated sites Due to distance and lack of impact pathways, potential impacts during construction, operation, and decommissioning to other designated sites are considered unlikely	Negligible	Up to international importance	Not significant	Scoped in (due to importance and sensitivity of receptors)
Habitats: ancient woodland (adjacent to the Site), hedgerows, woodland, trees, diverse grasslands Depending on the Proposed Development's layout, impacts through habitat loss, disturbance or fragmentation are possible to facilitate construction and decommissioning of the Proposed Development. Beneficial impacts during operation are possible through changes in habitat management.	Low – Medium (depending on the Proposed Development's layout)	Local Importance	Significant	Scoped In
Habitats: modified sheep grazed grassland Impacts through habitat loss, disturbance and fragmentation are possible to facilitate construction and decommissioning of the Proposed Development. Beneficial impacts during operation are possible through changes in habitat management.	Medium	Negligible Importance	Not Significant	Scoped Out
Bats (roosting) Depending on site layout, disturbance, damage or loss of roosting bats, or breeding sites, hibernation sites or resting places (construction and decommissioning)	Low	Local Importance	Not Significant	Scoped In

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped In / Scoped Out
Bats (foraging and commuting) Existing habitats of value to foraging and commuting bats will be retained and enhanced ensuring there would be no operational impacts. Potential construction and decommissioning phase impacts can be avoided.	Negligible	Local Importance	Not Significant	Scoped Out
Common reptiles Depending on the Proposed Development's layout, impacts through habitat loss and fragmentation are possible to facilitate construction and decommissioning of the Proposed Development. However, suitable reptile habitat is likely to be retained, and any losses likely to be minor in the context of overall habitat in landscape. There would be no potential impacts to reptiles during the operational phase.	Low	Local Importance	Not Significant	Scoped In
Dormice (if present) The design will retain all suitable dormice habitat (woodland, scrub, and hedgerows) within the Site, and the landscape design is likely to provide additional habitats for this species, and operational management will improve existing habitats. There would be no negative inputs during construction, operation or decommissioning.	Negligible	Local Importance	Not Significant	Scoped Out

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped In / Scoped Out
Otter and water voles Depending on the Proposed Development's layout, construction and decommissioning impacts through habitat loss and fragmentation, damage or loss of breeding sites, disturbance, changes to habitats through alteration of surface water drainage are possible. However, appropriate mitigation measures should avoid or minimise impacts. There would be no potential impacts to otter and water vole during the operational phase.	Negligible	Local Importance	Not Significant	Scoped In
Wintering birds Construction, operation, and decommissioning likely to result in disturbance and loss of habitat used by wintering birds.	Low to Medium	Local Importance	Significant	Scoped In
Breeding birds Construction, operation, and decommissioning likely to result in disturbance and loss of habitat used by breeding birds.	Low	Local Importance	Significant	Scoped In

9. Climate Change

9.1. Introduction

9.1.1. An assessment of the likely significant effects of the Proposed Development on the environment with respect to climate change will be undertaken.

9.1.2. The EIA Regulations include a requirement for the assessment of development on the environment with relation to climate change (Schedule 4, paragraph 5(f)):

> *'A description of the likely significant effects of the development on the environment resulting from, inter alia …(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.'*

9.1.3. Following IEMA Guidance[65], there are two main approaches which may be taken to determine the Proposed Development's climate change impact, which involve identifying:

i. The vulnerability of the Proposed Development to climate change (adaptation/resilience); and

ii. The direct and indirect influence of the Proposed Development on climate change (greenhouse gas ('GHG') emissions/mitigation).

9.2. Study Area

Climate Change Mitigation

9.2.1. The study area for the assessment of GHG emissions arising through the lifecycle of the Proposed Development will include direct emissions arising from within the Draft Order Limits and indirect emissions arising from outside the Draft Order Limits boundary (such as GHG emissions from construction vehicles).

[65] Available at: **https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions** Accessed in May 2023

9.2.2. The data available to allow an assessment of GHG emissions from vehicle movements associated with the Proposed Development will be consistent with the study area set out in Section 4.5 (Traffic and Access) of this Scoping Report.

9.2.3. Given that climate change is a global issue, a qualitative assessment of the Proposed Development's effects is also made at the 'global' scale, in line with IEMA Guidance on assessing GHG emissions. Furthermore, reference will be made to the Proposed Development's effects at the 'local' level (through the use of Local Authority carbon dioxide equivalent ('CO2e') emission estimates within its administrative boundary). Furthermore, contextualisation will be made for the 'local' and the 'National' level through the use of the appropriate Local (derived from the Tyndall Centre[66]) and UK Carbon Budgets.

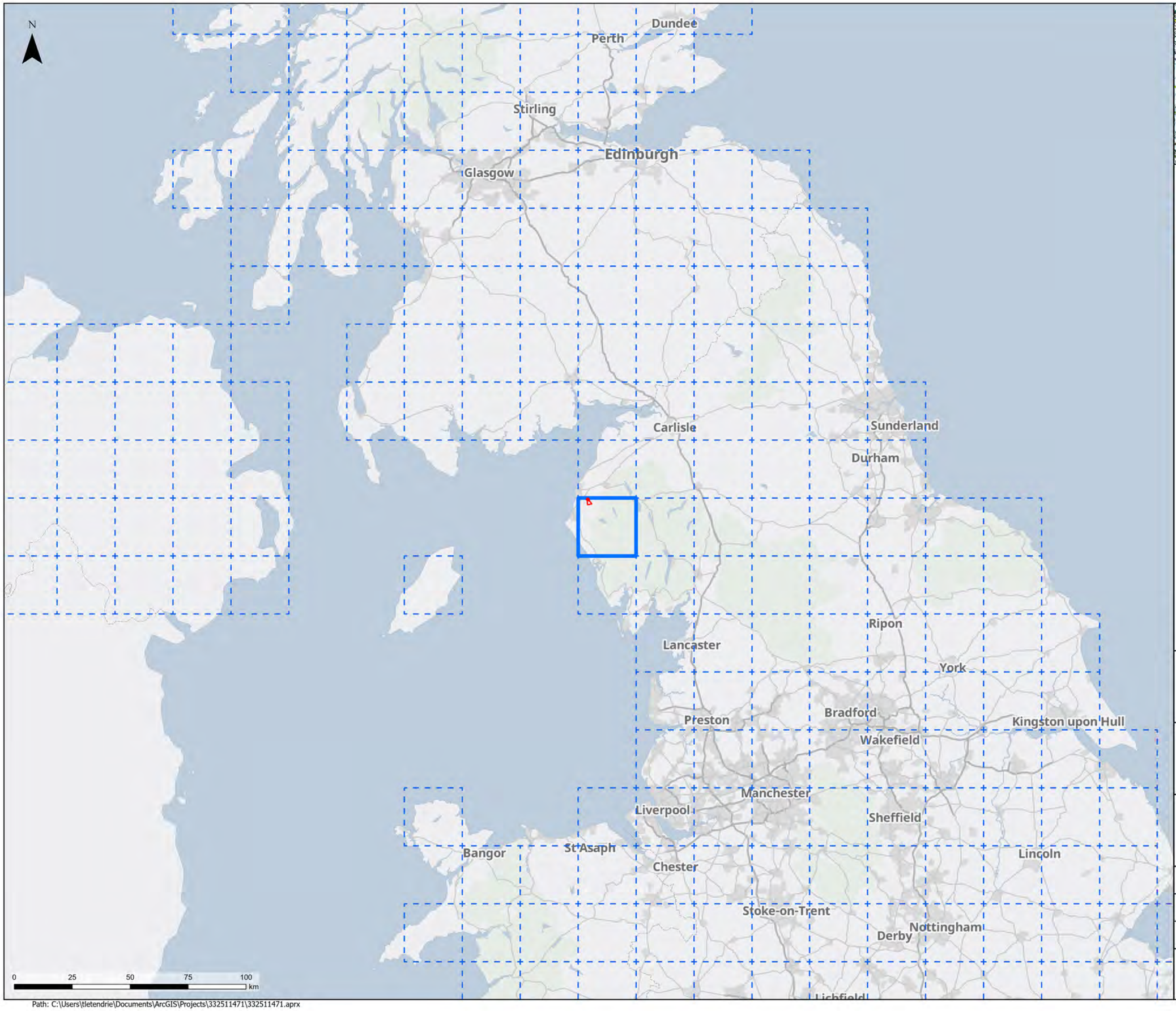
Climate Change Resilience

9.2.4. The study area for the assessment of climate resilience will be the Draft Order Limits i.e., all the assets and infrastructure which comprise the Proposed Development can be affected by climate change.

9.2.5. The climate resilience assessment will utilise climate projections using a 'worst-case' scenario of future weather projections taken from the Met Office UK Climate Projections 2018 ('UKCP18'). These climate projections will be derived from a 25km grid square where the Site is located (Figure 9.1). The UKCP18 are not predictions or forecasts but simulations of potential scenarios of future climate under a range of hypothetical emissions scenarios and assumptions, and therefore cannot be treated as exact or factual, but projection options.

[66] Available at: **https://carbonbudget.manchester.ac.uk/** Accessed in May 2023

Figure 9.1: 25km grid square where the Site is located



Legend

- Draft Order Limits
- UK Climate Projection 25km Grid Square containing Draft Order Limits
- UK Climate Projection 25km Grid Square

Project Title: Dean Moor Solar Farm

Client: FVS Dean Moor Limited

Title: DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Dean Moor UK Climate Projection 25km grid square

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9.3. Baseline Environment

9.3.1. The Climate Change Act 2008 (2050 Target Amendment) Order 2019[67] sets a legally binding target for reducing GHG emissions, in particular carbon dioxide ('CO_2'), by 100% ('net-zero') (on 1990 levels) by the year 2050 in the UK.

9.3.2. In October 2017, the UK Government published its Clean Growth Strategy ('CGS') setting out ambitious policies and proposals, to 2050, to reduce emissions across the economy and promote clean growth. The CGS provides an 'ambitious' blueprint for Britain's low carbon future, outlining how investment in green energy goes hand-in-hand with economic growth and industrial, commercial, and residential strategies. Core to the CGS are actions that will cut emissions, increase efficiency, and lower the amount consumers and businesses spend on energy.

9.3.3. In October 2021, the UK committed to decarbonise the electricity system by 2035 and secure a home-grown clean electricity supply. These commitments brought forward the government's original target of a fully decarbonised power system by 2050, as set out in the Energy White Paper and emphasised the role of green technologies to deliver cleaner, cheaper power and create thousands of new high-skilled jobs in new industries across the UK.

9.3.4. The 2023 'Powering Up Britain'[68] Policy Paper sets a target to increase solar generation to up to 70 GW by 2035, against a baseline of 14GW of solar installed as of 2021. It states that *'Ground-mount solar is one of the cheapest forms of electricity generation and is readily deployable at scale'* and highlights that large scale solar development is appropriate on low/medium grade agricultural land.

[67] Available at: **https://www.legislation.gov.uk/ukdsi/2019/9780111187654** Accessed June 2023

[68] UK Government. Powering Up Britain (2023) Available at: **https://www.gov.uk/government/publications/powering-up-britain** Accessed July 2023

Climate Change Resilience

9.3.5. In order to show how the climate is changing locally, a comparison must be made between historic climatic trends and the projected future baseline.

9.3.6. The climate profile is taken from the closest available data source to the Site[69], which is the St Bees Head (Cumbria) climate station, approximately 11.6km south west from the Site.

9.3.7. Climate averages (1990-2020) for the weather station indicate the following:

i. Average annual maximum temperature was 11.85°C;

ii. Warmest month on average was July (mean maximum temperatures of 17.66°C);

iii. Coldest month on average was February (mean minimum temperature of 2.43°C);

iv. Average total annual rainfall was 1109.40 mm (approximately 17% below the Regional (North West of England) average);

v. Wettest month on average was October (average monthly rainfall of 132.33 mm); and

vi. Driest month on average was April (average monthly rainfall of 60.09 mm).

9.3.8. The number of sunshine hours at the St Bees Head weather station is unavailable from the Met Office data.

9.3.9. In considering future climate change scenarios and managing climate change resilience and adaption, the 2020 IEMA guidance recommends the use of the UKCP platform. The latest UKCP is UKCP18 which provides updated observations and climate change projections up to 2100 in the UK; therefore, this assessment assumes projections for 2066 as the most far-reaching projection and is considered to be appropriate for the design life of the Proposed Development (modelled to be 40 years).

[69] Available at: **https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gctgjsxwu** Accessed in May 2023

9.4. Project Basis for Scoping Assessment

Climate Change Mitigation

9.4.1. It is considered that any increase or decrease in GHG emissions compared to the baseline has the potential to have an impact due to the high sensitivity of the receptor (global climate change) to increases in GHG emissions. Given the Proposed Development will be a generator of renewable electricity, it is possible that it could give rise to both adverse and beneficial likely significant effects.

Climate Change Resilience

9.4.2. The vulnerability of the Proposed Development to climate change considers likely significant effects on the Proposed Development as a receptor (this is referred to in IEMA Guidance as Climate Change Resilience and Adaptation (2020)[70]). Climate conditions are projected to change considerably over the modelled 40-year operational lifespan of the Proposed Development and therefore a climate change resilience assessment will be undertaken to determine the impacts of these changes on the Proposed Development.

9.5. Embedded Mitigation

9.5.1. Some mitigation included will be inherent to the Proposed Development. As the Proposed Development will be producing electricity when operational, the assessment of operational GHG emissions will include the carbon savings associated with the Proposed Development as it displaces electricity generation from traditional fossil fuel sources. Therefore, the assessment includes the inherent use of the Proposed Development.

9.6. Likely Significant Effects

9.6.1. A climate change risk and resilience assessment will be undertaken before the PEIR is produced to identify the potential risks of climate change to the

[70] Available at: IEMA: **https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020** Accessed in May 2023

Proposed Development and to set out design measures that will be incorporated into the Proposed Development to provide resilience and adaptation to climate hazards, such as extreme hot and cold weather, intense rainfall, high winds and storm events. An iterative approach will be taken to the assessment, whilst drawing upon and informing other reports prepared to support the DCO application, such as the FRA and Drainage Strategy.

9.6.2. The assessment will also draw upon the UK Climate Projections (UKCP 18) as the most comprehensive data set across the Proposed Development's operational phase (a modelled operational lifespan of up to 40 years will be assumed for the purposes of the ES) to highlight key changes in weather conditions within a 25km grid square where the Site is located. Future climatic conditions that will be considered include average annual temperatures and precipitation, maximum summer temperatures and precipitation, and minimum winter temperatures and precipitation.

9.6.3. A quantitative, assumptions-based assessment of the direct effects of vehicular GHG emissions, in particular CO_2, will be undertaken. This will be done using the trip generation forecast from the traffic model and DEFRA's Emission Factors Toolkit ('EFT') v11. Given that the Proposed Development will principally create vehicle movements during its construction, rather than its operational phase, the assessment will focus on this phase.

9.6.4. The assessment will provide the modelling of carbon emissions for vehicles during construction on an illustrative basis, as real-time carbon emissions associated with the Proposed Development are not available.

9.6.5. Owing to the nature of the Proposed Development as a renewable energy scheme, there will be carbon savings realised in terms of a reduction in CO_2 (and CO_2e) than if the electricity was generated using fossil fuels through the UK's current energy mix. This carbon offset will be calculated using the carbon intensity of energy generation within the UK, with the significance of effect compared at both the 'Local' level and at the 'National' level.

9.6.6. Accordingly, the Climate Change ES chapter will assess the effects of climate change on the Proposed Development and the effects of the Proposed Development on climate change by:

i. Establishing the existing baseline conditions (2023);

ii. Determining future baseline condition up to 40 years by reviewing UKCP18 data;

iii. Identifying any mitigation measures to be embedded as part of the Proposed Development;

iv. Assessing the likely significant effects of the Proposed Development (alone and cumulatively) on the established baseline and future conditions. The judgement of significance will be based on professional judgment and in line with IEMA Guidance, in order to ascertain and distinguish different levels of significance, a project's attribution of significance should consider *'whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050'*; and

v. Identification of mitigation measures as required and following that the identification of residual effects.

9.7. Impacts Scoped Out of the Assessment

9.7.1. The construction phase impact of the provision of renewable energy is scoped out of the assessment. This is because during the construction period renewable energy will not be generated or exported to the grid.

9.7.2. The construction phase impacts with regards to the vulnerability of the Proposed Development to climate change are also scoped out of the assessment. This is because it is assumed that climatic conditions are unlikely to change over the construction period and therefore an assessment is provided for when the Proposed Development is deemed operational.

9.7.3. Operational vehicle movements have been scoped out by virtue of being negligible, when compared to the construction phase of the Proposed Development. Operational vehicle movements are anticipated to only comprise 1-2 trips (consisting of 2-4 vehicular movements) per week for maintenance of the Proposed Development. The Proposed Development will also comprise a

minimum of two EV charging points on-site to support the transition to electric operational fleets.

9.7.4. The assessment will not undertake an assessment of the decommissioning phase of the Proposed Development, owing to the uncertainties surrounding this phase, such as the negative externalities associated with the loss of renewable energy and the subsequent impact on the climate in terms of potential additional emissions for replacement energy on the grid (should this not come from renewable sources). Furthermore, it is assumed that by the decommissioning phase (modelled to be approximately 2067[71]), all vehicles used in this phase of the Proposed Development would be electric and zero emissions and would therefore not contribute further to climate change.

9.8. Proposed Approach to ES

9.8.1. The assessment will be undertaken using the following steps:

i. Determination of the study area and likely sensitive receptors;

ii. Baseline assessment of current climatic conditions and the appropriate local and national carbon data sets (2023);

iii. Consideration of any mitigation, if needed, to form part of the Proposed Development (embedded mitigation);

iv. Assessment of impacts for both climate change mitigation and climate change adaptation and resilience;

v. Determination of significant effects;

vi. Implementation of any mitigation, if needed; and

vii. Assessment of residual significant effects.

[71] Completion of the Proposed Development is anticipated to be 2027, combined with a modelled operational lifespan of 40 years.

Table 9.1: Summary of Effects & Impacts

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped In / Scoped Out
Global Climate – Impact of carbon emissions associated with transport movements. Construction phase only. Operational and decommissioning phases scoped out.	Minor	High	Moderate Adverse	Scoped In (Construction Phase only)
Global Climate – Impact of provision of renewable electricity. Operational phase only. Construction and decommissioning phases scoped out.	High	High	Major Beneficial	Scoped In (Operational Phase only)
Vulnerability of the Proposed Development to climate change (Adaptation). Operational phase only. Construction and decommissioning phases scoped out.	High	Low	Moderate Adverse	Scoped In (Operational Phase only)

10. Socio-Economics

10.1. Introduction

10.1.1. This section of the Scoping Report considers the potential for likely significant effects on socio-economic receptors from the Proposed Development during the construction, operational and decommissioning phases.

10.2. Study Area

10.2.1. The likely significant effects of the Proposed Development may be experienced at varying spatial levels, dependent on the socio-economic receptor.

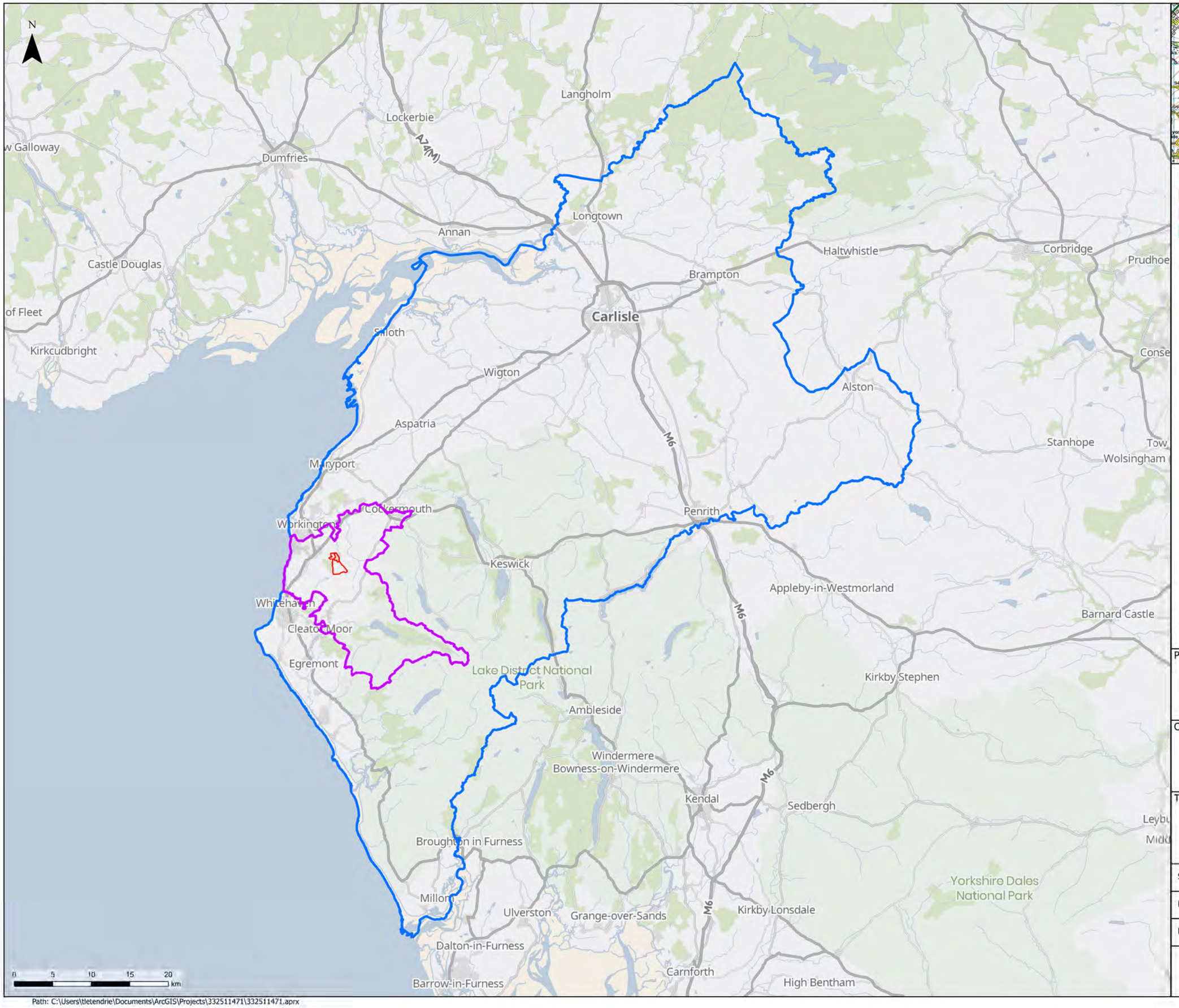
10.2.2. A Wider Study Area, comprising the Council area in which the Site is located is considered appropriate to assess the economic related effects of the Proposed Development, namely employment, economic and renewable energy contribution. Analysis of travel to work patterns[72] identifies a high level of containment, with 89% of people who work in the Council area, also living in the Council area. The Council area comprises the former local authority areas of Allerdale, Carlisle and Copeland, with the Site located in the former Allerdale Borough.

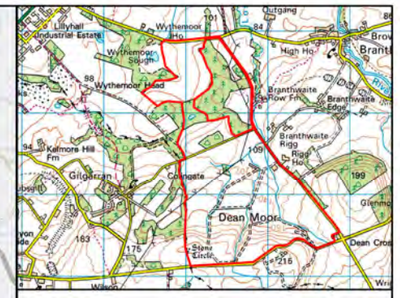
10.2.3. A Local Study Area, comprising the four electoral wards of Cockermouth South, Harrington, Howgate, and Cleator Moor East and Frizington, is considered appropriate to assess social related effects of the Proposed Development (namely effects on expenditure, residential communities, tourism and recreational uses), as such effects may be felt more closely in the area immediately surrounding the Site. The Local Study Area encompasses the villages of Gilgarran (to the west of the Site), Lillyhall, Distington, and Branthwaite to the north/ north east, and Asby and Lamplugh to the south.

[72] Office for National Statistics (ONS), 2011 Census, Table WU01UK. Available at: **https://www.nomisweb.co.uk/** Accessed July 2023. Whilst the 2021 Census was undertaken in March 2021, the travel to work data from the 2021 Census has not yet been published.

10.2.4. Figure 10.1 illustrates the Wider and Local Study Areas proposed for use within the socio-economic assessment.

Figure 10.1: Wider Study Area





Legend

- Draft Order Limits
- Local Study Area
- Wider Study Area

Project Title: Dean Moor Solar Farm

Client: FVS Dean Moor Limited

Title: DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER
Local and Wider Study Area

Scale: 1:450,000 @ A3	Date: 31/07/2023
Drawn: TL	Checked: HC
Figure 10.1	Sheet 1 of 1 / Rev: A

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10.3. Baseline Environment

10.3.1. A high-level desk study has been undertaken to provide a preliminary baseline of the main demographic, economic and employment characteristics of both the Local and Wider Study Areas.

Homes

10.3.2. The 2021 Census[73] reported that there are 136,385 homes in the Wider Study Area of which 11,359 (8%) are within the Local Study Area.

10.3.3. There are no residential properties situated within the Site.

Population

10.3.4. The 2021 Census reported that 273,244 people live within the Wider Study Area, of which, 23,723 (9%) live within the Local Study Area.

10.3.5. The Local Study Area has a similar age profile to the Wider Study Area with the same proportion of children aged 0 to 15 years (17%), working age population aged 16 to 64 years (60%) and older people aged 65+ years (23%).

Employment and Businesses

10.3.6. The 2021 Census[74] recorded that there are 129,953 residents in the Wider Study Area aged 16 and over who are classified as economically active (this includes all people in employment or available to work, for example, the unemployed). Of those, 11,114 live within the Local Study Area. This equates to 55% of the population (aged 16 years and over) within the Wider Study Area and 54% within the Local Study Area. For comparison, the North West of England regional proportion is 54%.

10.3.7. Of those economically active residents in the Wider Study Area, 5,477 are unemployed which is equivalent to 2.4% of all 16+ year olds. Within the Local

[73] ONS, 2021 Census, Table RM204 Available at: **https://www.nomisweb.co.uk/** Accessed June 2023
[74] ONS, 2021 Census, Table RM204 Available at: **https://www.nomisweb.co.uk/** Accessed June 2023

Study Area, 484 are unemployed which is equivalent to 2.5% of all 16+ year olds. Unemployment in both the Wider and Local Study Areas is lower than the regional average (3.4%).

10.3.8. 127,756 economically active residents of the Wider Study Area are in employment, which is equivalent to 56% of all 16+ year olds. 10,857 of these residents live in the Local Study Area. The employment rate in the Local Study Area is 55%; marginally lower than the rate for the Wider Study Area but comparable to the North West of England regional average (55%).

10.3.9. Industries of relevance to the assessment of the likely significant effects of the Proposed Development comprise: construction; accommodation and food services; and electricity, gas, steam and air conditioning supply. Table 10.1 presents the percentage of residents in the Local and Wider Study Areas, compared to the regional average, who are employed in each of these relevant industries according to the 2021 Census[75].

Table 10.1: Resident employment in industries relevant to the Proposed Development

Industry	Residents aged 16+		Percentage of Residents Aged 16+		
	Local Study Area	Wider Study Area	Local Study Area	Wider Study Area	North West Region
Construction	1,119	12,743	10.3%	10.0%	8.0%
Accommodation and food services	584	8,086	5.4%	6.3%	5.1%
Electricity, gas, steam and air conditioning supply	168	1,179	1.5%	0.9%	0.6%

Source: 2021 Census

10.3.10. Table 10.1 identifies that 10.3% of residents in the Local Study Area are employed within the construction industry, which is comparable to the Wider Study Area (10%), but both of which are notably higher than the regional

[75] ONS, 2021 Census, Table TS060 Available at: **https://www.nomisweb.co.uk/** Accessed June 2023

average (8%). 5.4% of residents in the Local Study Area are employed within accommodation and food services, which compares to 6.3% across the Wider Study Area and 5.1% for the North West of England region. 1.5% of residents in the Local Study Area are employed within the electricity, gas, steam and air conditioning industry. This industry represents a higher proportion of resident employment in the Local Study Area compared to the Wider Study Area (0.9%) and the North West of England region (0.6%).

10.3.11. The 2021 Business Register and Employment Survey ('BRES')[76] estimates there to be circa 134,100 jobs currently supported within the Wider Study Area, of which circa 4,900 are provided within the Local Study Area[77]. Table 10.2 provides a breakdown of these jobs by broad industrial sector.

Table 10.2: Employment by broad industrial sector

Industry	Number of Jobs		Percentage of Total		
	Local Study Area	Wider Study Area	Local Study Area	Wider Study Area	North West Region
Agriculture, forestry & fishing (A)	0	6,750	0.0%	5.0%	1.1%
Mining, quarrying & utilities (B,D and E)	150	975	3.0%	0.7%	1.0%
Manufacturing (C)	260	21,250	5.3%	15.8%	8.4%
Construction (F)	340	9,250	6.9%	6.9%	5.5%
Motor trades (Part G)	255	3,000	5.2%	2.2%	1.6%
Wholesale (Part G)	115	3,550	2.3%	2.6%	3.7%
Retail (Part G)	135	12,250	2.7%	9.1%	9.2%
Transport & storage (inc postal) (H)	330	7,450	6.7%	5.6%	5.4%
Accommodation & food services (I)	405	12,500	8.2%	9.3%	7.8%
Information & communication (J)	10	1,350	0.2%	1.0%	2.8%

[76] ONS, Business Register and Employment Survey 2021 Available at: **https://www.nomisweb.co.uk/** Accessed June 2023

[77] The BRES data is only available for 2019 electoral wards, whereas the Local Study Area has been defined using 2021 Census wards. For this reason, to report BRES data for the Local Study Area the following electoral wards have been used: Dalton, Stainburn & Clifton, Arlecdon & Ennerdale, and Distington, Lowca and Parton. These wards are the most applicable to the Local Study Area.

Industry	Number of Jobs		Percentage of Total		
	Local Study Area	Wider Study Area	Local Study Area	Wider Study Area	North West Region
Financial & insurance (K)	20	1,725	0.4%	1.3%	3.4%
Property (L)	135	1,935	2.7%	1.4%	2.2%
Professional, scientific & technical (M)	175	8,125	3.5%	6.1%	8.8%
Business administration & support services (N)	365	6,250	7.4%	4.7%	8.2%
Public administration & defence (O)	460	6,750	9.3%	5.0%	4.8%
Education (P)	975	8,000	19.8%	6.0%	7.7%
Health (Q)	565	18,750	11.4%	14.0%	14.8%
Arts, entertainment, recreation & other services (R,S,T and U)	240	4,225	4.9%	3.2%	3.7%

Source: 2021 BRES

10.3.12. Of industries that are of relevance to the assessment of the likely significant effects of the Proposed Development, Table 10.2 identifies that the construction sector accounts for a higher proportion of employment in the Local and Wider Study Areas (both 6.9% respectively) in comparison to the regional average (5.5%). Currently, the Wider Study Area supports 9,250 construction jobs, of which 340 are within the Local Study Area.

10.3.13. The accommodation and food services sector accounts for 9.3% of all employment in the Wider Study Area; a higher proportion than in the Local Study Area (8.2%) and the regional average (7.8%). Currently, the Wider Study Area supports 12,500 jobs in the accommodation and food services sector, of which 405 are within the Local Study Area.

10.3.14. Within the Local Study Area, the mining, quarrying and utilities sector accounts for a higher proportion of employment (3.0%) than the sector represents in the Wider Study Area (0.7%) and across the North West of England region (1.0%). This sector provides jobs associated with the

production, transmission, trade and distribution of electricity and is therefore particularly relevant to the Proposed Development.

Tourism

10.3.15. In 2022 in the Wider Study Area there were circa 1,245 tourism related enterprises, accounting for 11% of all enterprises in the Wider Study Area[78]. Across the North West region, tourism enterprises account for 9% of all enterprises. Data is not available for the Local Study Area.

10.3.16. 60% of tourism enterprises in the Wider Study Area are related to food and drink services, with a further 19% related to accommodation services. The remaining 21% of tourism enterprises are related to cultural, sports, recreational and conference activities.

10.3.17. Data published by Visit Britain[79] identifies that between 2017 and 2019 (the latest date for which data is available), 1.3 million domestic overnight tourism trips (including holiday trips, business trips and trips to visit friends and relatives) were taken each year to the Wider Study Area, which equates to 4.4 million nights per year. The annual value of these trips to the economy was £295 million.

Community Uses

10.3.18. Across the Local Study Area, there are a number of community facilities including primary and secondary schools, village halls, leisure facilities (playing fields, play space), Post Office/ village shops, public houses, and places of worship.

Renewable Energy Generation

10.3.19. The Department for Business, Energy and Industrial Strategy ('BEIS') reports that in 2021 the installed solar PV capacity in the Wider Study Area was circa 66MW, contributing 10.3% to the North West of England region's overall solar

[78] ONS, UK Business Counts 2021 Available at: **https://www.nomisweb.co.uk/** Accessed June 2023
[79] Visit Britain, Available at: **Destination-specific research | VisitBritain** Accessed June 2023

PV capacity and 0.4% to the UK's overall solar PV capacity (642MW and 13,965MW, respectively) [80].

10.4. Project Basis for Scoping Assessment

10.4.1. The Proposed Development has the potential to create a number of likely significant effects (both beneficial and adverse) on socio-economic receptors as outlined in NPS EN-1) (July 2011)[81] and Revised (Draft) NPS (EN-1) (March 2023) which include:

i. *'The creation of jobs and opportunities…;*
ii. *The contribution to the development of low-carbon industries at the local and regional level as well as nationally;*
iii. *The provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities;*
iv. *Any indirect beneficial impacts for the region hosting the infrastructure, in particular in relation to use of local support services and supply chains;*
v. *Effects on tourism; and*
vi. *The impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure on existing accommodation and employment markets.'*

10.4.2. Economic effects of the Proposed Development will be beneficial, for example, through creating employment opportunities and contributing to the local economy through associated workforce expenditure, the creation of gross value added ('GVA'), and energy generation. However, there is the potential for the Proposed Development to have adverse effects on existing residential, community, tourism and recreation uses.

[80] Available at: **Regional Renewable Statistics - GOV.UK (www.gov.uk)** Accessed June 2023

[81] Department for Business, Energy & Industrial Strategy (September 2021) Draft Overarching National Policy Statement for Energy (EN-1), paragraph 5.12.3. Available at: **EN-1 Overarching National Policy Statement for Energy (publishing.service.gov.uk)** Accessed June 2023

10.4.3. The scope of the socio-economic assessment has been compiled to meet the requirements of NPS EN-1 (July 2011) and Revised (Draft) NPS EN-1 (March 2023) in respect of considering socio-economic impacts.

10.5. Embedded Mitigation

10.5.1. Certain socio-economic effects, for example the visual impacts of the Proposed Development on local residents, businesses, tourism and recreational uses are linked to other matters scoped into the assessment such as landscape and views. Relevant embedded mitigation measures described in other sections of this Scoping Report for these matters will reduce the potential for adverse effects on socio-economic aspects and are not repeated here.

10.6. Likely Significant Effects

10.6.1. Having regard to the preliminary baseline conditions presented above the Proposed Development has the potential to have likely significant socio-economic effects during the construction, operational and decommissioning phases.

Construction Phase

10.6.2. Construction of the Proposed Development will result in both direct and indirect socio-economic effects, including:

i. Employment creation associated directly with construction works of the Proposed Development (direct). Effects will be assessed to the Wider Study Area;

ii. Employment created from the construction supply chain (indirect). Effects will be assessed to the Wider Study Area;

iii. Economic contribution (measured in GVA) from both direct and indirect construction employment. Effects will be assessed to the Wider Study Area;

iv. Expenditure created by construction workforce. Effects will be assessed to the Wider Study Area;

v. Direct visual effects on nearby residential properties, community uses, tourism, recreation and local business. Effects will be assessed to the

Local Study Area. This part of the assessment will be informed by other assessments undertaken in the ES; and

vi. Direct impacts on local accommodation created by construction workforce who will temporarily relocate to the area. Effects will assessed to the Local Study Area.

10.6.3. Effects during the construction phase will be temporary in nature.

Operational Phase

10.6.4. The operational phase of the Proposed Development has the potential to result in the following socio-economic effects:

i. Contribution to renewable energy generation. Effects will be assessed to the Wider Study Area; and

ii. Visual effects on nearby residential properties, community uses, tourism, recreation and local business. Effects will be assessed to the Local Study Area. This part of the assessment will be informed by other assessments undertaken in the ES.

Decommissioning Phase

10.6.5. Decommissioning of the Proposed Development will generate further direct and indirect socio-economic effects similar to those during the construction phase. However, the scale of these impacts is not possible to assess quantitatively due to the uncertainty over the nature and costs of this activity, particularly as the energy sector and associated engineering technologies are expected to evolve over the lifetime of the Proposed Development. A qualitative assessment will therefore be included.

10.7. Impacts Scoped Out of the Assessment

10.7.1. During the construction and decommissioning phases, there will be no effects on energy generation as the Proposed Development will not be generating electricity during these phases. For this reason, effects on energy generation have been scoped out of the assessment during the construction and decommissioning phases.

10.7.2. The operational phase of the Proposed Development will result in on-site employment and associated workforce expenditure. However, this employment will be limited to only a small number (circa five jobs maximum) of maintenance-related jobs and therefore operational employment, economic output from this employment and expenditure effects are not expected to be significant. For this reason, operational employment is proposed to be scoped out of the assessment.

10.8. Proposed Approach to ES

10.8.1. The Socio-Economic ES assessment will be structured as follows:

i. Outline of the relevant national and local planning policies to the socio-economic assessment;

ii. Outline of the assessment methodology including the technical scope, the spatial scope, topic specific (receptor) methodologies including any limitation and assumptions, and significance criteria;

iii. Identification of baseline socio-economic conditions using information and statistics available in the public domain including the population age profile; expenditure, economic activity, employment profile, business profile, qualifications and skills, travel to work patterns, tourism statistics and local tourism and recreational assets;

iv. Assessment of likely significant socio-economic effects of the Proposed Development by reviewing the baseline conditions and determining the change attributable to the Proposed Development using published formulae and guidance to assess effects;

v. Recommendation of mitigation or enhancement measures if necessary;

vi. Assessment of residual effects assuming implementation of the mitigation/ enhancement measures; and

vii. A cumulative assessment of the socio-economic effects of the Proposed Development with identified committed developments within proximity of the Site.

10.8.2. Although a farm impact questionnaire will be undertaken to inform the assessment of baseline conditions at the Site (including to establish the number of existing jobs); the assessment will predominantly be informed by a desktop study of secondary data sources and information provided by the Applicant.

10.8.3. Preliminary socio-economic baseline conditions have been presented earlier in this section. However, the ES chapter will present enhanced and updated baseline reporting on the latest data available at the time of writing.

10.8.4. The assessment of likely significant economic effects will be undertaken using both quantitative and qualitative methods.

10.8.5. The number of direct jobs supported during the construction phase will be aligned with the approach to jobs adopted by the 'Traffic and Access' assessment. Guidance from the Homes and Communities Agency ('HCA') '*Additionality Guide'*[82] and the more recent HM Treasury *'Green Book for Economic Appraisal and Evaluation'*[83] will be used to determine indirect effects and the quantification of the total employment effect to the Wider Study Area.

10.8.6. The Proposed Development's economic contribution will be calculated through application of average GVA estimates per worker per annum, as published by Oxford Economics[84], applied to the direct and indirect number of jobs created by the Proposed Development.

10.8.7. Effects on expenditure will be calculated through application of average convenience good expenditure per person sourced from Experian[85] for the Wider Study Area, applied to the number of jobs created by the Proposed Development.

10.8.8. The Proposed Development's contribution towards renewable energy generation will be calculated based on the Proposed Development's projected energy output based on grid export capacity and the uplift this provides to the existing installed capacity across the Wider Study Area and the UK, according to the BEIS[86] in 2022 (or any superseding data if this becomes available at the

[82] HCA, Additionality Guide, 4th Edition, 2014

[83] HM Treasury, The Green Book: Central Government Guidance on Appraisal and Evaluation, 2020

[84] Oxford Economics, UK Local Area District Forecasts: Available at: **www.oxfordeconomics.com** Accessed June 2023

[85] Experian, Retail Planner Data Available at: **www.experian.co.uk/economics/economic-forecasts/index.html** Accessed June 2023

[86] Available at **Regional Renewable Statistics - GOV.UK (www.gov.uk)** Accessed June 2023

time of writing the ES), which has since been split to form the Department for Business and Trade and the Department for Energy Security and Net Zero.

10.8.9. The Proposed Development's visual effects on nearby residential properties, local business, community uses and tourism and recreation uses will be qualitatively assessed drawing on the findings presented in other ES chapters.

10.8.10. There are no technical significance criteria relating to the assessment of socio-economic effects. The evaluation of socio-economic effects will therefore be based on professional experience and judgement, having regard to the existing baseline position and using the criteria detailed in Section 3 (EIA Methodology) of this Scoping Report.

10.8.11. Those effects which have a moderate or major beneficial or adverse effect will be considered as significant and where effects are established as significant adverse, appropriate mitigation measures will be identified to inform the assessment of residual effects.

10.8.12. Cumulative socio-economic effects of the Proposed Development combined with those schemes detailed in Section 11 (Cumulative Effects) of this Scoping Report will be assessed. The cumulative assessment of economic receptors will consider the impact of the Proposed Development cumulatively with other developments in the supply chain and labour market capacity in the identified impact areas. Cumulative effects on residential populations, community uses, tourism and recreation receptors will be assessed using other technical chapters (such as landscape and views).

Table 10.3: Summary of Effects & Impacts

Receptor, Project Activity & Potential Impact	Anticipated Magnitude	Anticipated importance / sensitivity	Likely Significance of effect at Scoping Stage	Proposed Approach – Scoped In / Scoped Out
Direct and indirect employment creation (Construction and decommissioning phases only. Operational phase scoped out)	Medium	Low to Medium	Minor/ Moderate beneficial	Scoped In (Operational phase scoped out)
Creation of workforce expenditure (Construction and Decommissioning phases only. Operational phase scoped out)	Low	Low to Medium	Negligible/ Minor Beneficial	Scoped In (Operational phase scoped out)
Creation of GVA (all three phases scoped in)	Medium	Low to Medium	Minor/ Moderate beneficial	Scoped In
Visual effects on residential properties, community uses, tourism and recreation (all three phases)	Low	Low to Medium	Negligible/ Minor Adverse	Scoped In
Effects on local accommodation (Construction and decommissioning phases only. Operational phase scoped out).	Low	Low to Medium	Negligible/ Minor Adverse	Scoped In
Contribution towards energy generation (operational phase only. Construction and decommissioning phases scoped out)	Medium to High	Low to Medium	Minor/ Major Beneficial	Scoped In (Operational phase only)

11. Cumulative Effects

11.1. Introduction

11.1.1. The ES will consider the potential for likely significant cumulative effects on the environment. This will include:

i. intra-project effects, which are also known as interactive effects (those resulting from multiple impacts/aspects of the Proposed Development affecting a single receptor); and

ii. inter-project effects (those resulting from the Proposed Development combined with other schemes in the area).

11.1.2. Intra-project effects require consideration of all completed technical assessments and therefore will be reported in the concluding chapter of the ES. Assessment will be qualitative, based on professional judgment following review of the conclusions of the technical assessments.

11.1.3. Cumulative effects (inter-project) are defined in paragraph 5(e) of Schedule 4 to the EIA Regulations as:

'the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.'

11.1.4. The best practice approach to cumulative schemes requires inclusion of proportionate information relating to projects that are not yet consented, dependent on the level of certainty of them coming forward. In this regard, the Planning Inspectorate's *Advice Note Seventeen: Cumulative Effects Assessment* relevant to NSIPs, is relevant to this Scoping Report.

11.2. Cumulative Schemes

11.2.1. Table 11.1 below details projects that have been identified for the assessment of likely significant cumulative effects on the environment for the purposes of the ES. The information contained within Table 11.1 is based upon information

available on ABC's website[87] and it is acknowledged that this may change as the scheme progresses. The final list of cumulative schemes will be agreed with the Council as soon as reasonably practicable.

[87] Available At: **https://www.allerdale.gov.uk/en/planning-building-control/planning-applications/** . Accessed June 2023

Table 11.1: Cumulative Schemes

Project Reference	Description	Status	Approximate Distance and Direction from the Site
Cumberland Council			
FUL/2021/0009 *Land at Lillyhall North, Branthwaite Road, Winscales, Workington*	Hybrid application - Full planning permission is sought for the construction of a new roundabout, site access and spine road and the extension to existing pedestrian/cycle path. Outline permission for the erection of a variety of industrial, storage, research and development and industrial process use buildings (Use classes B2, B8, E(g)ii E(g)iii) Approximately 10.6ha employment area - 33,779sqm floorspace for industrial, storage, research & development, and industrial process use classes.	Approved (March 2021)	1.3km west
FUL/2022/0159 *Proposed Residential Development, Woodville Way, High Harrington*	Proposed residential development and associated infrastructure for 99 dwellings.	Awaiting determination	2.78km west
FUL/2019/0304 *Land at Stainburn Hall Farm, Stainburn, Workington*	Full planning for the erection of 81 dwellings and associated infrastructure.	Approved (December 2020) In-Construction	4.5km north
FUL/2022/0285 *Land at Yearl Rise, north east of Calva Farm, Seaton Road, Seaton*	Residential development for up to 180 new dwellings and associated landscaping and infrastructure.	Awaiting determination	5.2km northwest

Project Reference	Description	Status	Approximate Distance and Direction from the Site
2/2018/0493 *Land east of Causeway Road, Seaton, Workington*	Outline application for residential development comprising up to 100 dwellings with details of access and associated works.	Approved (May 2021)	5.8km north
FUL/2021/0166 *Land off Curwen Road, Workington*	107-unit extra care development and associated infrastructure and parking.	Approved (February 2022)	6.5km northwest
FUL/2021/0166 *Land east of Station Road, Flimby, Maryport*	Outline application for erection of up to 59no. dwellings and associated infrastructure works including access.	Awaiting determination	9.3km north
Copeland Borough Council			
4/22/2308/0O1 *Leconfield Industrial Estate, Cleator Moor*	Outline application for the redevelopment of an existing industrial estate, a new industrial extension on land to the north, an additional extension for hotel (c1) & student accommodation (sui generis) to the east comprising up to 44,350 square metres of new floorspace, proposed uses also include research & development, light industrial, general industrial, storage & distribution (class e(g), b2, b8 uses) with ancillary food/drink (class e(b)), education & new community facilities (class f1(a & e)) along with car parking, other infrastructure & full details of the accesses.	Awaiting Determination	7km south
4/23/2076/0O1 *Land off Dalzell Street, Moor Row, Egremont*	Outline application for residential development for up to 65 dwellings with details of proposed access & all other matters reserved.	Awaiting determination	8.5km southwest

Project Reference	Description	Status	Approximate Distance and Direction from the Site
4/22/2237/0O1 *Land at Summergrove Park, Whitehaven*	Outline planning application including access for up to 30 no. Self-build dwellings.	Approved (March 2023)	8.5km southwest

12. Summary

12.1.1. This Scoping Report has been produced in accordance with the EIA Regulations and is submitted in support of a request pursuant to Regulation 10 of the EIA Regulations for a Scoping Opinion from the SoS on the scope and level of detail of the information to be provided in the ES. It includes the information required by Regulation 10(3) as follows:

i. A plan sufficient to identify the land (see Figure 1.1);

ii. A description of the Proposed Development, including its location and technical capacity (see Section 2);

iii. An explanation of the likely significant effects of the Proposed Development on the environment (see Sections 6 to 10); and

iv. Such other information or representations as the person making the request may wish to provide or make (see Figures 1.1 to 10.1 and Appendices 4.1 to 8.1).

12.1.2. A discussion of the technical topics proposed to be scoped out of the ES, informed by professional judgement, surveys, correspondence with the Council and statutory bodies, and desk-based research, has been provided. The topics proposed to be scoped out comprise:

i. Agricultural Land and Soils;

ii. Water Resources and Flood Risk;

iii. Air Quality;

iv. Traffic and Access;

v. Noise and Vibration;

vi. Ground Conditions

vii. Major Accidents and Disasters (separate chapter to be scoped out);

viii. Electric, Magnetic and Electromagnetic Fields;

ix. Telecommunications, Television Reception and Utilities;

x. Wind Microclimate;

xi. Daylight, Sunlight and Overshadowing;

xii. Waste;

xiii. Minerals;

xiv. Lighting; and

xv. Glint & Glare (separate chapter to be scoped out).

12.1.3. The topics that are proposed to be scoped into the ES are set out in Table 12.1 below.

Table 12.1: Proposed Scope of the ES

Topics	Proposed ES Approach
Cultural Heritage	Chapter to be prepared (see Section 6 for proposed scope)
Landscape and Views	Chapter to be prepared (see Section 7 for proposed scope)
Biodiversity	Chapter to be prepared (see Section 8 for proposed scope)
Climate Change	Chapter to be prepared (see Section 9 for proposed scope)
Socio-Economics	Chapter to be prepared (see Section 10 for proposed scope)

12.1.4. The application for a DCO for the Proposed Development will be made to the Planning Inspectorate on behalf of the SoS for determination in accordance with the 2008 Act. The ES to be submitted in support of the application will be prepared in accordance with the SoS's Scoping Opinion.

Glossary and Abbreviations

Glossary of Terms	
Term	**Description**
Access Tracks	The tracks within the Draft Order limits constructed to provide access around the Proposed Development.
Ancillary Infrastructure	Works to include means of enclosure and boundary treatment, security and monitoring infrastructure, landscaping and biodiversity measures including planting, drainage and irrigation works, signage, earthworks, and access including permissive paths.
Applicant	FVS Dean Moor Limited.
Battery Energy Storage System	Battery storage installation which will allow for the storage, importation and expiration of energy.
Basic Noise Level	Basic Noise Level is the level from a road at a reference distance of 10 m away from the nearside carriageway edge, based on the traffic flow, speed of the traffic, composition of the traffic, the gradient of the road and the road surface.
Cumulative effects	The inter-project cumulative effects of the Proposed Development and the identified committed developments will be assessed, as well as the intra-project cumulative effects of the Proposed Development.
Construction Phase	The process of building the Proposed Development, including the enabling works for construction, the temporary construction facilities and amenities, the solar PV array, on-site electrical infrastructure and landscaping and biodiversity enhancements, assumed to be commencing no earlier than 2026, and for a period of 18 months.
Control House	A unit that is situated adjacent to the Customer Substation that houses monitoring equipment and metering for the solar farm.
DCO Application	The application for a Development Consent Order (DCO) to be submitted by the Applicant for the Proposed Development.

Decommissioning Phase	The process of removing all solar PV array infrastructure including solar PV modules, mounting structures, cabling, inverters and transformers, for recycling or disposal in accordance with good practice and market conditions at that time.
Development Consent Order (DCO)	The order required for consent of a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 (PA 2008).
Displacement	Displacement measures the extent to which benefits of a development are offset by reductions in output or employment elsewhere.
Draft Order Limits	The land required temporarily and/or permanently for the construction, operation and maintenance of the Proposed Development.
Design Manual for Roads and Bridges	The Design Manual for Roads and Bridges (DMRB) is a series of volumes that provide standards, advice notes and other documents relating to the design, assessment and operation of trunk roads, including motorways in the United Kingdom.
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended).
Environmental Impact Assessment (EIA)	A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making.
Generating Station	An industrial facility for the generation of electric power.
Green Infrastructure	A network of multi-functional green space and other green features, urban and rural, which can deliver quality of life and environmental benefits for communities.
Grid Connection Cables	The buried 132kV cables connecting the generating substation to the grid.
Grid Connection Route	The proposed route for the Grid Connection Cables between the PV arrays to the inverter/transformer units to the Customer Substation and POC compound.
Inverters	Inverters convert the direct current (DC) electricity collected by the PV Modules into alternating current (AC), which allows the electricity generated to be exported to the National Grid.

Lowest Observed Adverse Effect Level	Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected.
Mitigation	Measures including any process, activity or design to avoid, reduce, or remedy for negative environmental impacts or effects of a development.
Mitigation and Enhancement Measures	Measures taken to avoid or otherwise reduce ecological effects which have been embedded within the Proposed Development's design.
Mounting Structure	A frame or rack designed to support the Solar PV Modules, and which will provide for either a fixed south facing orientation, or a single access tracking orientation, and will be mounted on poles driven into the ground or fixed to a concrete foundation.
Nationally Significant Infrastructure Projects (NSIPs)	Nationally Significant Infrastructure Projects (NSIPs) are large scale developments which require development consent pursuant to the PA 2008.
Noise Sensitive Receptors	Noise Sensitive Receptors (NSRs) are defined as receptors which are potentially sensitive to noise and vibration.
On-site Substation	The proposed on-site Substation comprising electrical infrastructure such as the transformers, switchgear and metering equipment required to facilitate the export of electricity from the Proposed Development to the DNO POC.
Operational Phase	The period within which the Proposed Development is operational, following the Construction Phase and following connection and first export to the grid.
Planning Practice Guidance	In the United Kingdom, Planning Policy Guidance Notes were statements of the Government's national policy and principles towards certain aspects of the town planning framework.
Primary Construction Compound	A temporary laydown area comprising an area of hard standing which would include temporary portable buildings, containerised storage areas, parking, temporary hardcore/gravel hardstanding, temporary gated compound

	and wheel washing facilities.
Proposed Development	A Nationally Significant Infrastructure Project (NSIP) for the installation of solar photovoltaic (PV) Modules and associated infrastructure which would allow for the generation and export of electricity at land at Dean Moor, Gilgarran, Cumbria. The details of the Proposed Development are described in Chapter 2 of this Scoping Report. The Proposed Development is known as 'Dean Moor Solar Farm'.
PV Array	A PV Array is a distinct grouping of PV Tables. The PV Arrays are arranged within the Solar PV Site. Sometimes known as 'Solar PV Arrays' or 'Solar Arrays' throughout the ES and supporting documents.
PV Module Mounting Structure	A solar photovoltaic panel or module designed to convert solar irradiance to electrical energy. The PV panel is attached to a Mounting Structure and is referred to as a PV Module.
Receptor	A component of the natural or man-made environment that is affected by an impact, including people.
Secondary Construction Compounds	Temporary laydown areas comprising areas of hardstanding providing welfare and waste management facilities.
Significant Observed Adverse Effect Level	Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur.
Solar Farm	Electricity generating station comprising of PV Modules connected to the Grid via a substation.
Solar PV Site	The area within the Draft Order limits that is being proposed for Solar Arrays, the on-Site Substation and areas for potential mitigation and enhancement.
String Combiner Boxes	A device to combine the output of several solar strings together.

String Inverters	Inverters located throughout the Solar PV Site, mounted on the Mounting Structures underneath the PV Modules to form a string.
Study Area	The area in which a particular assessment or survey targets. The study area will vary depending on the nature of the technical assessment. Where relevant, these are defined within the relevant technical chapter of the ES.
Substation	The proposed on-site Substation comprising electrical infrastructure such as the transformers, switchgear and metering equipment required to facilitate the export of electricity from the Proposed Development to the grid.
Switchgears	Switchgears are the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.
Temporary Decommissioning Compounds	Temporary laydown areas comprising of hard standing which would include areas for offices, car parking, storage for materials and equipment during the decommissioning phase.
Tracker System	PV Modules that are mounted to Mounting Structures that allow the PV Table to rotate and track the movement of the sun.
Transformer Units	A structure serving to transform electricity to a higher voltage which will either be a string transformer or a central container transformer.
World Heritage Site	The UK government is a signatory to the World Heritage Convention which was established in 1972 by UNESCO. The convention initiated a list of World Heritage Sites. World Heritage Sites are sites, places, monuments or buildings of "outstanding universal value" to all humanity – today and in future generations. The World Heritage List includes a wide variety of exceptional cultural and natural sites, such as landscapes, cities, monuments, technological sites and modern buildings. Designation of a World Heritage Site by UNESCO brings no

	additional statutory controls, but protection is afforded through the planning system as well as through the other designations (listed buildings, scheduled monuments and so on) that cover elements, if not the whole, of the site. The heritage significance of a World Heritage Site (its 'outstanding universal value') will inevitably be reflected, at least in part, in the significance of any listed building, scheduled monument or other heritage asset that forms part of it. The planning controls that apply to any such elements within a World Heritage Site will be an important part of the recognition and protection of the outstanding universal value of the World Heritage Site.
Written Scheme of Investigation	A Written Scheme of Investigation outlines known and potential archaeological features and deposits or built heritage elements on a site and suggests a structure for exploring them using the latest, most appropriate and cost-effective archaeological techniques.
Zones of Influence	The area for the assessment of combined effects. Zones of Influence ('ZoIs') are variable depending on the environmental factor being discussed.
Zone of Theoretical Visibility	A map, usually digitally produced, showing areas of land within which the Proposed Development is theoretically visible.

Abbreviations	
AADT	Annual Average Daily Total
AAWT	Annual Average Weekday Traffic
ABC	Allerdale Borough Council
AC	Alternating Current
AGLV	Areas of Great Landscape Value
AIL	Abnormal Indivisible Loads
ALC	Agricultural Land Classification
AN7	Planning Inspectorate Advice Note 7

AOD	Above Ordnance Datum
AONB	Areas of Outstanding Natural Beauty
APFP Regulations	Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)
AQMA	Air Quality Management Areas
ASR	Air Quality Annual Status Report 2022
ATC	Automatic Traffic Count
BESS	Battery Energy Storage System
BEIS	Department for Business, Energy and Industrial Strategy
BGL	Below Ground Level
BMV	Best and Most Versatile land – land within grades 1, 2 and 3a of the agricultural land classification.
BNL	Basic Noise Level
BRES	Business Register and Employment Survey
CA	Conservation Area
The Council	Cumberland Council
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan

CGS	Clean Growth Strategy
CIEEM	Chartered Institute of Ecology and Environmental Management
CM	Conceptual Model
CMHA	Coal Mining Hazard Assessment
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CRTN	Calculation of Road Traffic Noise
CTMP	Construction Traffic Management Plan
CWS	County Wildlife Site
CWTP	Construction Worker Travel Plan
DAS	Design and Access Statement
dB	Decibels
DC	Direct Current
DCO	Development Consent Order
DECC	Department for Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DEMP	Decommissioning Environmental Management Plan
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator
DTMP	Decommissioning Traffic Management Plan
EA	Environment Agency
EcIA	Ecological impact assessment
eDNA	Environmental DNA
EFT	Emission Factors Toolkit

EIA	Environmental Impact Assessment
EMF	Electromagnetic Frequency
ENW	Electricity Northwest
ES	Environmental Statement
EV	Electric Vehicle
FAA	Federal Aviation Administration FAA
FRA	Flood Risk Assessment
GHG	Greenhouse Gas
GRP	Glass Reinforced Plastic
GVA	Gross Value Added
GW	Giga Watt
Ha	Hectare
HCA	Homes and Communities Agency
HDD	Horizontal Directional Drilling
HE	Historic England
HEANS3	Advice Note 3: The Setting of Heritage Assets (2017)
HEBDA	Historic Environment Desk Based Assessment
HER	Historic Environment Record
HRA	Habitats Regulations Assessment
HDV	Heavy Duty Vehicle (>3.5 tonnes)
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
HVAC	Heating, Ventilation and Cooling
IBV	Ib Vogt

ICNIRP	International Commission on Non – Ionizing Radiation Protection
ICOMOS	International Council on Monuments and Sites
IEMA	Institute of Environmental Management and Assessment
Km	Kilometres
kV	Kilovolt
LB	Listed Building
LCT	Landscape Character Types
LCRM	Land Contamination Risk Management
LEMP	Landscape and Ecological Management Plan
LGS	Local Geological Sites'
LGV	Light Goods Vehicle
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
MAFF	Ministry of Agriculture, Fisheries and Food
MSA	Minerals Safeguarding
MW	Megawatts
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NSR	Noise Sensitive Receptors
NO_2	Nitrogen Dioxide

NVIA	Noise and Vibration Impact Assessment
oCEMP	Outline Construction Environmental Management Plan
oCTMP	Outline Construction Traffic Management Plan
oDEMP	Outline Demolition Environmental Management Plan
OHL	Overhead Lines
oLEMP	Outline Landscape and Ecological Management Plan
ONS	Office for National Statistics
OS	Ordnance Survey
PA 2008	Planning Act 2008 (as amended)
PBDE	Polybrominated diphenyl ethers
PC	Principal Contractor
PCIP	Pre-construction information pack
PCS	Power Conversion System
PD	Principal Developer
PIC	Personal Injury Crash
PIR	Project Independent Reviewer
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
PHS	Priority Hazardous Substances
POC	Point of Connection
PPG	Planning Practice Guidance
PPV	Peak Particle Velocity

PRoW	Public Rights of Way
PV	Photovoltaic
RAMS	Risk Assessments and Method Statements
RBMP	River Basin Management Plan
RHPG	Registered Parks of Special Historic Interest
RIGA	Regionally Important Geological Sites
SAC	Special Area of Conservation
SLA	Special Landscape Area
SM	Scheduled Monument
SMR no	Site and monument record number
SPA	Special Protection Area
SoCC	Statement of Community Consultation
SoCG	Statement of Common Ground
SoS	Secretary of State
SOAEL	Significant Observed Adverse Effect Level
SPA	Special Protection Area
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Urban Drainage Systems
TPO	Tree Preservation Order
UKCP	UK Climate Projections
UXO	Unexploded Ordnance
WFD	Water Framework Directive
WSI	Written Scheme of Investigation
WHS	World Heritage Site

ZTV	Zone of Theoretical Visibility
ZoI	Zones of Influence