



# Dean Moor Solar Farm

## Environmental Statement: Chapter 11 – Cumulative Effects and Residual Effects Summary on behalf of **FVS Dean Moor Limited**

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**DEAN MOOR SOLAR FARM  
ENVIRONMENTAL STATEMENT  
CHAPTER 11 – CUMULATIVE EFFECTS  
AND RESIDUAL EFFECTS SUMMARY  
PLANNING INSPECTORATE REFERENCE EN010155  
PREPARED ON BEHALF OF FVS DEAN MOOR LIMITED**

The Infrastructure Planning (Applications: Prescribed Forms and Procedure)  
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# 11 Environmental Statement (ES) Chapter 11: Cumulative Effects and Residual Effects Summary

## 11.1 Overview

- 11.1.1 This chapter of the Environmental Statement ('ES') outlines the approach taken for the cumulative effects assessment (intra-project and inter-project effects), as well as summarising the residual effects of the Proposed Development.
- 11.1.2 Appended to this Chapter is the Commitments Register (Appendix 11.1) **[REF: 6.3]** which lists the commitments to be adopted by the Proposed Development during the construction, operational, and decommissioning phases, and identifies where that mitigation is secured. The commitments listed would be delivered by the Applicant and/or contractor(s) appointed by the Applicant.
- 11.1.3 For ease of reference the Site is divided primarily into four areas referred to as Areas 'A', 'B', 'C', and 'D' as shown on ES Figure 3.1.
- Area A – Land south of Branthwaite Road (approximately 40.2ha);
  - Area B – Land south of Branthwaite Road and north of Gilgarran Road (approximately 19.9ha);
  - Area C – Land south of Gilgarran Road and north of Dean Cross Road (approximately 203ha);
  - Area D – Land connecting Areas A and B, including Potato Pot Wind Farm (the 'Wind Farm'), Gilgarran Road between Areas B and C, and Branthwaite Edge Road (approximately 13.4ha).

## 11.2 Cumulative Effects

### Intra-Project Effects

- 11.2.1 There is no published methodology for determining the significance of intra-project effects. Combining effects with respect to one environmental discipline with another is a qualitative exercise and is based on the conservative professional judgment from the Environmental Impact

Assessment ('EIA') coordinator having reviewed the technical assessments in other ES chapters.

- 11.2.2 During the construction and decommissioning phase of the Proposed Development, there is potential for ground conditions and biodiversity intra-project effects, in relation to surface water and/or groundwater becoming contaminated due to excavating arisings being stockpiled adjacent to surface water bodies or piling resulting in preferential pathways for contamination to reach groundwater.
- 11.2.3 This pollution could impact the Dean Moor County Wildlife Site ('CWS') located on-Site or the River Derwent and Bassenthwaite Lake Special Area of Conservation ('SAC') / River Derwent and Tributaries Site of Special Scientific Interest ('SSSI'), which is hydrologically connected to the Site via the Thief Gill watercourse which flows through Area C.
- 11.2.4 However, with measures set out in sections 5.4, 5.9, and 5.12 of the Outline Construction Environmental Management Plan ('OCEMP') (Appendix 5.1) **[REF: 6.3]** these effects would not be significant.
- 11.2.5 Construction and decommissioning may also result in intra-project effects between cultural heritage and landscape and visual. Construction and decommissioning activities could impact on the change of setting of The English Lake District World Heritage Site ('WHS'), and listed buildings near the Site.
- 11.2.6 However, these effects are not considered to be significant based on technical assessments provided in Chapter 6 – Cultural Heritage **[REF: 6.1]** and Chapter 7 – Landscape and Visual **[REF: 6.1]**, and the implementation of additional mitigation measures such as those provided by the Outline Construction Traffic Management Plan ('OCTMP'), Outline Construction Environmental Management Plan ('OCEMP'), and Outline Soil Management Plan ('OSMP'), and adherence to best practices measures.

- 11.2.7 The presence of peat on-Site, towards the northwest of Area C (the southern section of the Site, as shown on ES Appendix 10.3 [REF: 6.3], Figure 1.4) has the potential for intra-project effects between biodiversity, climate change, and ground conditions. However, impacts to peat deposits will be similarly managed through design, with the area of peat deposits mapped by the British Geological Society to be excluded from construction, including haul roads, compounds, cable routes etc. (i.e., areas of regular trafficking, heavier construction, or areas where excavation will be required).
- 11.2.8 Avoiding development of infrastructure (Work Nos. 1, 2, 4, and 5) on peat will maintain its baseline functionality as a source of carbon sequestration, as well as any biodiversity benefits that peatland on-Site currently provides. Intra-project effects will therefore not be significant.
- 11.2.9 The operational phase of the Proposed Development has the potential to result in a combined effect of visual impacts on residential receptors near the Site, and the change of settings on designated receptors such as The English Lake District WHS.
- 11.2.10 However, with the Landscape Strategy Plan in place, as set out in Chapter 7 – Landscape and Visual, and Figure 7.6.1-7.6.5, significant intra-project effects are not anticipated.

### Inter-Project Effects

- 11.2.11 As outlined in Chapter 2 – EIA Methodology [REF: 6.1], inter-project effects 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.’*
- 11.2.12 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 (2024) *Advice on Cumulative Effects Assessment*<sup>1</sup> is relevant to this ES.

- 11.2.13 Owing to the rural location of the Proposed Development, a 10km radius was chosen as a reasonable zone of influence to identify cumulative schemes to be assessed. In identifying cumulative schemes, a long list was created in collaboration with Cumberland Council (the ‘Council’). From this long list, 15 have been taken forward to be assessed within the ES, by virtue of their size, scale, and proximity to the Proposed Development.
- 11.2.14 It should be noted that technical ES Chapters (6-10) do not have to assess all schemes identified in the EIA Methodology. Technical chapters can only assess those schemes which are deemed likely to result in significant cumulative effects with respect to their discipline. Justification for including cumulative schemes is included in each technical chapter as appropriate.
- 11.2.15 Table 11.1 details the cumulative schemes that have been identified for the assessment of likely significant cumulative effects on the environment for the purposes of this ES. The location of these projects is shown on Figure 2.1, an extract of which is provided.

**Table 11.1: Cumulative Schemes assessed as part of the ES**

Project Ref	Description	Status	Approximate Distance and Direction from the Site
<b>Planning Inspectorate</b>			
EN0110004 <i>Lostrigg Solar</i>	A proposed solar farm with over 50MW capacity, Solar PV modules, and associated mounting structures, inverters, transformers, switch gear, and control equipment, a substation, point of connection, energy storage equipment, and underground on and off-road cabling.	Pre-application stage (Scoping Report submitted June 2024)	Adjacent to the north.

<sup>1</sup> HM Government (2024). Planning Inspectorate Guidance Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment

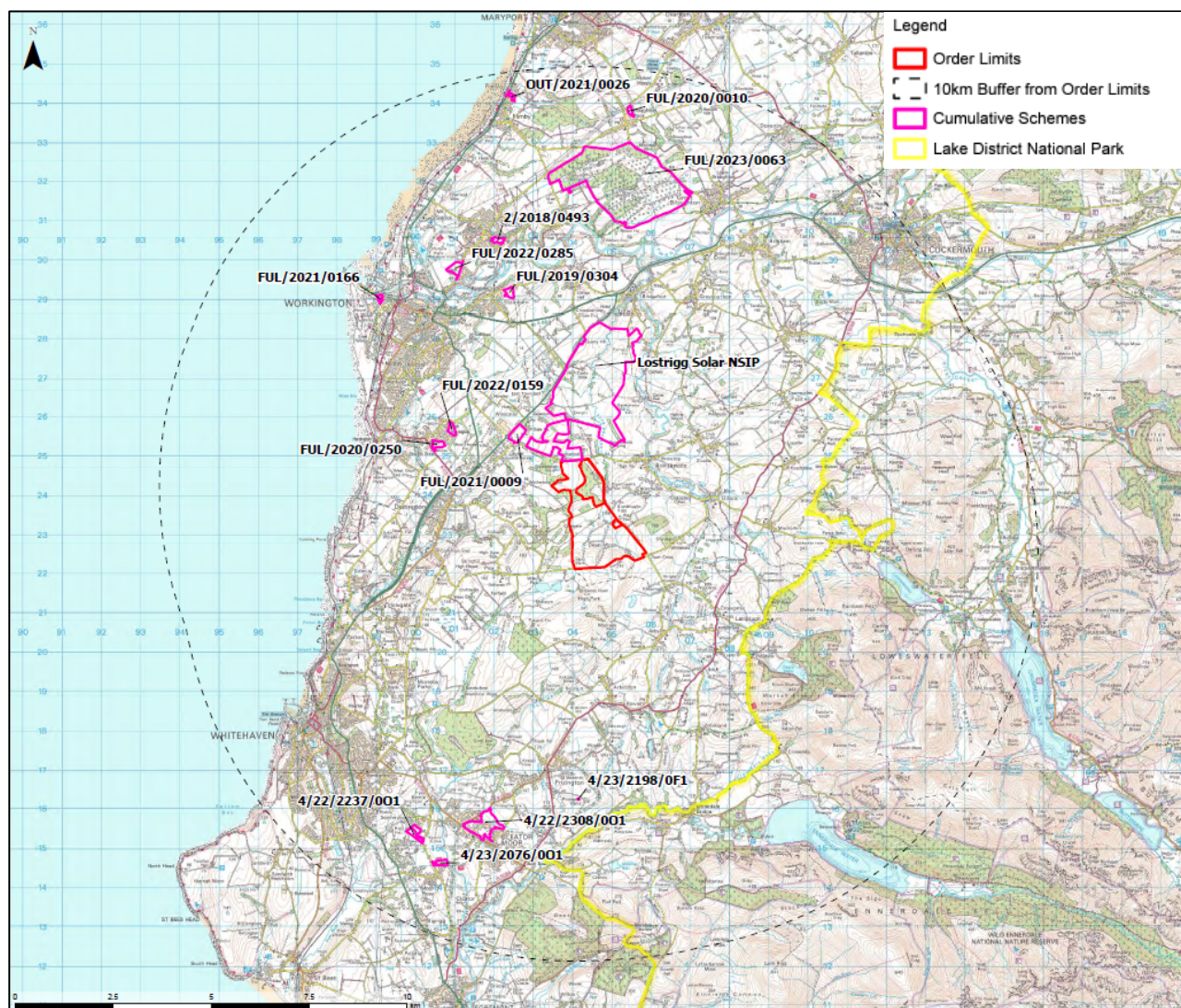
Project Ref	Description	Status	Approximate Distance and Direction from the Site
<b>Cumberland Council</b>			
FUL/2021/0009 <i>Land at Lillyhall North, Branthwaite Road, Winscales, Workington</i>	Hybrid application - Full planning permission is sought for the construction of a new roundabout, site access 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 (17/02/2021)	1.3km west
FUL/2022/0159 <i>Proposed Residential Development, Woodville Way, High Harrington</i>	Detailed application - Proposed residential development and associated infrastructure for 79 dwellings.	Pending	2.8km west
FUL/2020/0250 <i>Land East Of Main Road, High Harrington, Workington, Cumbria,</i>	Outline application for residential development with matters of estate layout, scale, appearance and landscaping reserved.	Approved (21/01/2022) Under Construction	3km west
FUL/2019/0304 <i>Land at Stainburn Hall Farm, Stainburn, Workington</i>	Detailed Application - Full planning for the erection of 81 dwellings and associated infrastructure.	Approved (23/12/2020) Under Construction	4.5km north
FUL/2022/0285 <i>Land at Yearl Rise, north east of Calva Farm, Seaton Road, Seaton</i>	Detailed Application - Residential development for up to 180 new dwellings and associated landscaping and infrastructure.	Approved (09/10/2024)	5.2km northwest
2/2018/0493 <i>Land east of Causeway Road, Seaton, Workington</i>	Outline application for residential development comprising up to 100 dwellings with details of access and associated works.	Approved (28/05/2021)	5.8km north



Project Ref	Description	Status	Approximate Distance and Direction from the Site
FUL/2021/0166 <i>Land off Curwen Road, Workington</i>	Detailed Application - 107-unit extra care development and associated infrastructure and parking.	Approved (07/02/2022)	6.5km northwest
FUL/2023/0063 <i>Land at Derwent Forest, Broughton Moor, Great Broughton</i>	Application for 71 residential units including access, New Visitor centre, and car parking	Pending	7.3km north
FUL/2020/0010 <i>Land to the east of Heatherfields, Broughton Moor, Maryport</i>	Residential development of 66 dwellings and associated infrastructure.	Approved (08/04/2021) Under Construction	8.8km north
OUT/2021/0026 <i>Land east of Station Road, Flimby, Maryport</i>	Outline application for erection of up to 59no. dwellings and associated infrastructure works including access.	Approved (27/09/2024)	9.3km north
<b>Copeland Borough Council</b>			
4/23/2198/0F1 <i>The Parks, Park Street, Frizington, Arlecdon and Frizington Parish</i>	Detailed application - Erection of 2 no.SD6 micro wind turbines (17.8m maximum tip height).	Pending	6.4km southwest
4/22/2308/0O1 <i>Leconfield Industrial Estate, Cleator Moor</i>	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.	Pending	7km south
4/23/2076/0O1	Outline application for residential development for up to 65	Approved (19/07/2024)	8.5km southwest

Project Ref	Description	Status	Approximate Distance and Direction from the Site
<i>Land off Dalzell Street, Moor Row, Egremont</i>	dwelling with details of proposed access & all other matters reserved.		
4/22/2237/001 <i>Land at Summergrove Park, Whitehaven</i>	Outline planning application including access for up to 30 no. Self-build dwellings.	Approved (24/03/2023)	8.5km southwest

**Figure 11.1: Cumulative Schemes within 10km of the Order Limits (Extract of ES Figure 2.1)**



11.2.16 The information contained within Table 2.6 of Chapter 2 is based upon information available on the Council's planning portal as of December 2024. The Applicant has sought to re-confirm this list with the Council. However, at the time of writing, formal confirmation has not yet been received.

### Potato Pot Wind Farm

11.2.17 There is an existing operational wind farm, 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 Area D, between Areas A and B (as shown on ES Figure 3.1).

- 11.2.18 The existing Wind Farm located in Area D of the Site became operational in 2016 and has a consented operational lifespan of *‘a period of 25 years from the date when electricity is first exported from any of the wind turbines to the electricity grid (“First Export Date”).’* Therefore, the Wind Farm will require decommissioning by 2041, which falls during the operational phase of the Proposed Development. Although the decommissioning of the Wind Farm has not been included in this cumulative assessment due to insufficient information available on the activities that would be undertaken at that time, decommissioning activities will require approval with the Council through a decommissioning management plan or similar, prior to the commencement of these works (condition 3 of 2/2012/0594).
- 11.2.19 The agreed management plan would be implemented during the Wind Farm's decommissioning phase to mitigate likely significant environmental effects. On this basis, likely significant cumulative environmental effects resulting from the Wind Farm's decommissioning phase with the operational phase of Proposed Development are not anticipated.

### **Lostrigg Solar**

- 11.2.20 Lostrigg Solar (EN0110004) is an adjacent Nationally Significant Infrastructure Project (‘NSIP’), which is expected to be submitted in July 2025 according to the project information on the Planning Inspectorate’s website<sup>2</sup>. Whilst this is not yet an approved scheme, due to its proximity to the Proposed Development (immediately adjacent to the north, as shown in Figure 11.1), it has been considered, as far as possible, within the cumulative effects assessment presented in this ES.
- 11.2.21 Due to the stage of the Lostrigg Solar application, there is limited publicly available information regarding this cumulative scheme. The known information about Lostrigg Solar has been taken from the EIA Scoping Report, which was submitted to the Planning Inspectorate in June 2024 and presents a worst-case scenario for the development. Information has

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<sup>2</sup> Planning Inspectorate. Lostrigg Solar – Project Information. Available at: <https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN0110004> Accessed January 2025.



also been gathered during ongoing discussions with the applicant of Lostrigg Solar, however there are many details of the scheme that are yet to be confirmed.

- 11.2.22 The anticipated construction programme for Lostrigg Solar is 24 months. The construction start date is currently unknown. Like the Proposed Development, its operational life is expected to be 40 years. The decommissioning phase is expected to take 6 – 12 months. For the purposes of the cumulative assessment in the ES, as a worst-case scenario, it has been assumed that the construction phases for the Proposed Development and Lostrigg Solar would overlap partially during both of their respective construction phases.
- 11.2.23 It is acknowledged that should the Proposed Development and the Lostrigg Solar be developed, there would be a substantial change to the local area due to the presence of the two nationally significant solar projects. Emphasis, therefore, has been placed on working collaboratively with the Lostrigg Solar and implementing best practice measures, where appropriate, to reduce potential cumulative effects and work to deliver schemes that provide benefits to the wider environment.

## 11.3 Cumulative Effects – Construction

### Cultural Heritage

- 11.3.1 Wythemoor Sough and Adjoining Barn and Stable is a Grade II listed building located approximately 160m to the northwest of the Site, situated in-between the Site and Lostrigg Solar. A **Moderate Adverse (significant)** effect is anticipated.
- 11.3.2 Concurrent construction of the Proposed Development and Lostrigg Solar will have indirect impacts on the setting of the listed building, albeit these impacts will be short-term and temporary. Notwithstanding the possibility that there could be an overlap in the construction activities of the two schemes, cumulative effects would be mitigated within a CTMP and CEMP for both developments. However, the effect experienced at the listed building is still anticipated to be significant during construction.

- 11.3.3 Cumulative effects on other cultural heritage assets assessed (The Stone Circle and Cairn, The English Lake District WHS, and Archaeological Remains) were not taken forward for assessment as significant cumulative effects are not considered likely.

### Landscape and Visual

- 11.3.4 A **Moderate Adverse (significant)** effect is anticipated for Landscape Character Type ('LCT') Sub-type 5a: Ridge and Valley. LCT sub-type 5a (as defined within the Cumbria Landscape Character Guidance and Toolkit<sup>3</sup>) covers the northern half of the Site and is defined by a series of ridges and valleys that rises gently toward the limestone fringes of the Lakeland Fells, well managed regular shaped medium to large pasture fields, and scattered farms and linear villages found along ridges, amongst other features.
- 11.3.5 The effect on this LCT will be significant during construction because of partial direct physical changes to key characteristics of its character due to the cumulative presence of the Proposed Development and Lostrigg Solar during their construction phases. Whilst the effect is significant, implementation of best practice measures will be in place to control and manage the effects, such as those in a CEMP, CTMP and SMP.
- 11.3.6 **Significant adverse** effects were also assessed for visual receptors at View Location Cumulative (VLC)1, VLC3, VLC4, VLC5, and View Location Sequential Cumulative (VLSC) 5 during construction. Further information is available from Appendix 7.4 [REF: 6.3].
- 11.3.7 Users of Branthwaite Road would experience **Moderate Adverse (significant)** effects because of the introduction of Lostrigg Solar in combination with the Proposed Development and Land at Lillyhall North, which would increase the visibility of construction activities and solar development within the landscape.

<sup>3</sup> Cumbria County Council (2011), Cumbria Landscape Character Guidance and Toolkit. Part One Landscape Character Guidance.

## **Biodiversity**

- 11.3.8 Whilst impacts to statutory and non-statutory sites as well as priority habitats and species have been considered within the assessment of the Proposed Development, this is yet to be completed for Lostrigg Solar. Specific mitigation during the construction phase of the Proposed Development will be included to reduce any negative effects, however, at the current stage of the Lostrigg Solar application, this level of detailed information is unavailable.
- 11.3.9 During construction there is the potential for cumulative effects from the Proposed Development and Lostrigg Solar in terms of pollution to the surrounding environment. Both developments will implement measures (included within respective management plans including a CEMP and CTMP) to reduce any potential negative effects, including but not limited to pollution and noise control during construction.
- 11.3.10 Regarding whether the Site is functionally linked to the Solway Firth Special Protection Area ('SPA'), based on the size of flocks of both herring gull and common gull (wintering birds), frequency of Site use over winter, and the behaviour of birds recorded, the Site is not considered to be functionally linked to the Solway Firth SPA. Natural England has confirmed that gulls which occupy Lillyhall, 1.5km to the west of the Site, travel south to roost on the Morecambe Bay and Duddon Estuary SPA and not north-westwards towards the Solway Firth SPA, which further confirms that the Proposed Development will not have an adverse effect on the integrity of the Solway Firth SPA when considered alone.
- 11.3.11 Following a review of other planning applications within 10km only Lostrigg Solar, contiguous with the northern boundary of the Site was considered appropriate for an in-combination effect. An assessment of wintering bird data received from the project ecologists responsible for the delivery of Lostrigg Solar to the north of the Site was undertaken. It is acknowledged that this data set is incomplete and surveys at the Lostrigg Solar site are ongoing.

- 11.3.12 Flock sizes at Lostrigg Solar tended to be smaller than those at the Site, although some peak counts recorded could suggest a functional link to the Solway Firth SPA alone. Again, flock size was variable over winter suggesting that birds are using suitable alternative habitat, which may also include land within the Site. The birds at Lostrigg Solar may also form part of the core population of the SPA or may be part of the core population of the Morecambe Bay and Duddon Estuary SPA further to the south.
- 11.3.13 Accounting for their gregarious nature; large ranges; their ability to utilise a wide range of habitats, and opportunistic feeding habitats it is concluded that the Proposed Development will not have an adverse effect on the integrity of the Solway Firth SPA in-combination with other developments, most notably, Lostrigg Solar.
- 11.3.14 There are no anticipated cumulative construction effects relating to biodiversity.

### Climate Change

- 11.3.15 Construction of the cumulative schemes is likely to result in Greenhouse Gas Emissions ('GHG') emissions owing to the scale and type of these schemes (energy, industrial, and employment uses).
- 11.3.16 It is assumed that all these schemes will be managed in accordance with a CEMP and/or CTMP (or equivalent), and the likelihood of all cumulative schemes being constructed concurrently is low. It is assumed that all cumulative schemes will adhere to best practice and policy requirements, in line with a net zero trajectory, therefore the cumulative effect will likely be **minor adverse** and **not significant** at the local level.

### Ground Conditions

- 11.3.17 Due to the location and nature of the developments and implementation of appropriate construction methods and measures implemented during construction, there are anticipated to be **negligible (not significant)** cumulative effects in relation to ground conditions (land stability and release of contamination to air).



## Non-ES Topics

### Transport

- 11.3.18 Whilst transport is scoped out of the ES, there has been consideration of the potential cumulative impact on Lillyhall Roundabout and A595. The results of the worst-case cumulative impact assessment identified that the impact on Lillyhall Roundabout and A595 is not anticipated to be significant. This was confirmed through engagement with the Lostrigg project team, where it was agreed that the cumulative impact was not significant and can be managed through cooperation during the construction phase. Further information is available from section 6.6 of the Transport Statement ('TS') (Appendix 2.5) [REF: 6.3].

## 11.4 Cumulative Effects – Operation

### Cultural Heritage

- 11.4.1 Should the Lostrigg Solar scheme be granted development consent, this would result in an increase in the amount of land covered by ground mounted solar panels within the setting of Wythemoor Sough and adjoining barn and stable. A permanent, **Moderate Adverse (significant)** cumulative effect has been assessed.

### Landscape and Visual

- 11.4.2 The **Moderate Adverse (significant)** effect remains during operation for LCT Sub-type 5a: Ridge and Valley because of partial direct physical changes to key characteristics, by virtue of two nationally significant solar farms in close proximity to one another.
- 11.4.3 During operation, the **significant** effects experienced at (VLC)1, VLC4, VLC5, and VLSC5 remain. The effects at VLC3 reduces to **not significant**.
- 11.4.4 Users of Branthwaite Road would remain to experience a **Moderate Adverse (significant)** cumulative effect due to the visibility of the Proposed Development, Lostrigg Solar, and Land at Lillyhall North.

- 11.4.5 Whilst there are some adverse effects, the remaining receptors will experience no cumulative impact, in part due to their location, and in addition to the implementation of the Landscape Strategy Plan (Figure 7.6.1-7.6.5) **[REF: 6.2]** that incorporates retaining existing hedgerows, landscape screening and sufficient setbacks to help further reduce the cumulative impact of the Proposed Development when considered with Lostrigg Solar.
- 11.4.6 Further to this, areas of elevated plateau, in the south of Area C, has been avoided for solar development to reduce the impact of the Proposed Development on the landscape and the surrounding visual receptors, this is shown as a large area of Green Infrastructure on the Parameter Plan (Figure 3.4) **[REF: 6.2]**.
- 11.4.7 Discussions were held with the Lostrigg Solar project team in respect to proposed mitigation measures. Due to the early stage of development for Lostrigg Solar, they were unable to share their proposed mitigation measures. However, it is anticipated that similar measures will be adopted within their Site to help reduce potential cumulative landscape and visual effects.

### **Biodiversity**

- 11.4.8 The Proposed Development and Lostrigg Solar will operate over a large area of land. Both developments will develop landscaping strategies that can provide a nature-focussed strategy to ensure sufficient habitat is provided throughout the developments to provide benefit to the local biodiversity, whilst also protecting the existing sensitive habitats on-Site.
- 11.4.9 In respect to River Derwent and Bassenthwaite Lake SSSI and SAC, consideration has been given to the effects and the proposed mitigation identified in ES Chapter 8 – Biodiversity **[REF: 6.1]**. The mitigation has been designed, in part, to protect watercourses during construction; to prevent spillages and the mobilisation of soil and sediments and to safeguard otters and other aquatic species which occupy the SAC. The mitigation for the Proposed Development has much wider aims which will

also benefit qualifying features during its operation. As such, the Proposed Development will not have an adverse effect on the integrity of the SAC.

- 11.4.10 It is considered there are no cumulative effects during operation on qualifying features of European sites which are common to both the Site and Lostrigg Solar. For this reason, there are anticipated to be **no significant** cumulative effects in relation to biodiversity.

### Climate Change

- 11.4.11 A **Moderate Beneficial (significant)** effect at the local level due to the generation of renewable energy from the Proposed Development and Lostrigg Solar's capacity to reduce carbon emissions from the operation of other identified cumulative schemes.
- 11.4.12 Both developments will work in parallel to meet the government targets in reaching net zero and reduce reliance on fossil fuels.

### Ground Conditions

- 11.4.13 **No significant** cumulative effects have been identified during the operational phase with respect to ground conditions receptors such as releases of contamination to groundwater, and air, as well as land stability.

## 11.5 Cumulative Effects – Decommissioning

- 11.5.1 If the decommissioning phases for the Proposed Development and Lostrigg Solar overlap, there is the potential for cumulative effects in relation to the identified topics. However, **no significant** cumulative effects have been identified for the decommissioning phase of the Proposed Development.
- 11.5.2 A Decommissioning Management Plan ('DMP') suite of documents will be implemented during the decommissioning phase to manage and control any potential impacts. These measures will be substantially in accordance with what is set out in the Framework Decommissioning Management Plan ('FDMP') (Appendix 5.4) [REF: 6.3]. It is assumed that Lostrigg Solar will also have a similar plan(s) in place during its decommissioning phase.

- 11.5.3 No other cumulative decommissioning effects were reported for the other identified schemes.

## 11.6 Summary of Residual Effects

- 11.6.1 Residual effects are defined as the effects following the implementation of additional mitigation measures, beyond those embedded into the design. Residual effects and mitigation measures are discussed in full in the relevant technical chapters in the ES (Chapters 6 – 10).
- 11.6.2 Each technical chapter contains detailed consideration of both the beneficial and adverse effects identified as likely to arise from the Proposed Development. The criteria applied to define the significance of residual effects are presented within ES within Chapter 2 – EIA Methodology and if required, within the technical chapters (6 – 10).
- 11.6.3 The EIA for the Proposed Development has been undertaken in parallel with the design process. Several measures have been implemented within the design of the Proposed Development and/or control documents, as agreed with the project team and stakeholders (where necessary), to control residual effects. Chapter 3 – Site and Proposed Development Description **[REF: 6.1]** and the technical chapters (6 – 10) outlines the embedded mitigation measures. Details of additional mitigation, including relevant management plans, is provided within each technical chapter (Chapters 6 – 10), enhancement measures are also discussed, where relevant.
- 11.6.4 Tables 11.2 – 11.4 below present the residual effects of the Proposed Development per topic and receptor for the construction, operation, and decommissioning phases, respectively. The permanence of the effect, as defined within Chapter 2 – EIA Methodology is also provided within the tables. Significant effects are reported in bold font.
- 11.6.5 The terminology used in the Biodiversity assessment of significance differs from the other technical ES topics, as it follows the Chartered Institute of

Ecology and Environmental Management guidance. Further information is available in ES Chapter 8 – Biodiversity.

**Table 11.2: Significance Table - Construction**

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
<b>Chapter 6: Cultural Heritage</b>		
Construction activities impact on the setting of the Large Irregular Stone Circle and a Round Cairn on Dean Moor	CEMP and CTMP to be substantially in accordance with the measures set out in the OCEMP and OCTMP.	<b>Moderate Adverse</b> (short-term)
Construction activities impact on the setting of Wythemoor Sough and Adjoining Barn and Stable		
Effect of construction activities on the setting of The English Lake District WHS.		Minor Adverse (No Change)
Effect of construction activities on Potential Below Ground Heritage Receptors (Archaeological Remains)	Archaeological fieldwork and mitigation detailed in the Archaeological Mitigation Strategy (Appendix 6.3).	<b>Moderate Beneficial</b> (permanent)
<b>Chapter 7: Landscape and Visual</b>		
Effects on Landscape Designations / Character	Implementation of best practice measures to be substantially in accordance with the construction phase management plans including the OCEMP, OCTMP, and OSMP.	No change – <b>Moderate Adverse</b> (short-term)
Effects on Landscape Features		Negligible Adverse – <b>Moderate Beneficial</b> (short-term)

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
Effects on Visual Receptors		Negligible – <b>Major to Substantial Adverse</b> (short-term)
<b>Chapter 8: Biodiversity</b>		
Effects on Statutory Designated Areas	<p>The implementation of mitigation measures set out in the OCEMP, in particular the implementation of pollution prevention and controls.</p> <p>The risks to statutory areas and the importance of pollution control, as outlined in the OCEMP, will be confirmed to the Principal Contractor.</p> <p>The Ecological Clerk of Works ('ECoW') will ensure compliance with measures set out in the CEMP.</p>	No significant residual effects (short-term)
Effects on Non-Statutory Designated Areas	<p>Implementation of the CEMP will ensure that the most sensitive habitats, including purple moor grass plant communities are not impacted by traffic, effected by pollution, dust, or noise.</p> <p>The ECoW will ensure compliance with measures set out in the CEMP.</p>	<b>Significant Negative effect at the Local Level</b> (short-term)
Effects on Habitats	CEMP to be substantially in accordance with the measures outlined in the OCEMP. The ECoW will ensure compliance with measures set out in the CEMP.	No significant residual effects (short-term)
Effects on Bats	A species protection plan within the CEMP will set out how bats will be protected from mortality, disturbance, and habitat fragmentation during construction.	
Effects on Otters	<p>Pre-construction surveys will be carried out.</p> <p>A species protection plan within the CEMP will set out how otters will be protected from mortality, disturbance, and habitat fragmentation during construction.</p> <p>Mammal gaps in perimeter fences will facilitate otter movement across the Site and into surrounding habitats.</p>	
Effects on Breeding birds	CEMP to be substantially in accordance with the measures outlined in the OCEMP.	

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
	<p>Species which will be impacted by construction works will be protected by sensitive working practices or pre-inspection vegetation clearance by the ECoW.</p> <p>A species protection plan within the CEMP will set out how breeding birds will be protected from mortality, disturbance, and habitat fragmentation during construction.</p> <p>Suitable buffers and/or protections for valuable habitats such as hedgerow and watercourses.</p>	
Effects on Wintering Birds	<p>CEMP to be substantially in accordance with the measures outlined in the OCEMP.</p> <p>A species protection plan within the CEMP will set out how wintering birds will be protected from mortality, disturbance, and habitat fragmentation during construction.</p>	
<b>Chapter 9: Climate Change</b>		
Construction Emissions effects	A CEMP and CTMP to be substantially in accordance with the measures in the OCEMP and OCTMP	Minor Adverse (permanent)
<b>Chapter 10: Ground Conditions</b>		
Construction effects on Human Health (permanent) through potential contamination through ground disturbance	<p>Design of the Proposed Development to be informed by ground investigation and interpretative assessment. Where necessary remediation / mitigation measures will be included as part of the design to break construction phase pollutant linkages.</p> <p>The CEMP to be substantially in accordance with the measures set out in the OCEMP. The CEMP will provide construction phase controls and following all appropriate legislative requirements during the construction phase.</p>	Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon Surface Water (temporary)		
Mobilisation of existing potential contamination through ground disturbance impacting upon Groundwater (temporary)		



Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
Buildings and Structures exposure to potential contamination (temporary)		
Loss of Soil Resource due to ground disturbance (permanent)	Outline Soil Management Plan ('OSMP') sets out how soils are to be managed. The SMP to be implemented will be substantially in accordance with the OSMP.	

**Table 11.3: Significance Table - Operation**

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
<b>Chapter 6: Cultural Heritage</b>		
Change of setting of the Large Irregular Stone Circle and a Round Cairn on Dean Moor	LEMP and OMP to be substantially in accordance with the measures set out in the OLEMP and OOMP.	<b>Moderate Adverse</b> (long-term, temporary)
Change of setting on the Wythemoor Sough and Adjoining Barn and Stable		
Change of setting on The English Lake District WHS		Minor Adverse (long-term, temporary)
Effects on Potential Below Ground Heritage Receptors (Archaeological Remains)	Maintenance and management of a comprehensive landscape mitigation strategy implemented in accordance with the OLEMP. The LEMP will be secured by DCO Requirement.	No Change
<b>Chapter 7: Landscape and Visual</b>		
Effects on Landscape Designations / Character	Maintenance and management of comprehensive landscape mitigation strategy implemented substantially in accordance with OLEMP.	No change – Negligible Adverse (medium to long-term)
Effects on Landscape Features		Negligible Adverse – <b>Moderate Beneficial</b> (medium to long-term)
Effects on Visual Receptors		Negligible – <b>Major Adverse</b> (medium to long-term)

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
<b>Chapter 8: Biodiversity</b>		
Effects on Statutory Designated Areas	No additional mitigation required	No significant residual effects
Effects on Non-Statutory Designated Areas	The OLEMP sets out how the CWS will be enhanced and managed by improved grassland management and seeding. It includes an Outline Grazing Management Plan ('OGMP') which sets out a grazing density and regime to promote sward diversity in CWS. The LEMP will be substantially in accordance with the OLEMP.	<b>Significant Positive effect at the Local Level</b> (long-term)
Effects on Habitats	<p>The LEMP, including GMP will be substantially in accordance with the OLEMP so that livestock access across the Site is controlled.</p> <p>Details of all habitat management interventions, including biosecurity measures, are included in the LEMP, which will be substantially in accordance with the OLEMP.</p> <p>The Landscape Strategy Plan (Figure 7.6.1-7.6.5) also indicates how landscape features will be improved and promote green infrastructure on-Site and connect to wider green networks.</p>	No significant residual effects (long-term)
Effects on Bats	<p>Appropriate timing of maintenance works will avoid impacts to species such as bats. If nighttime works are required, then lighting will be temporary and adopt ecologically sensitive lighting relying on low intensity bulbs and adopting cowls or hood to minimise light spill and be switch or motion activated.</p> <p>The OLEMP details habitat enhancements and management which have been designed to support species which occupy the Site, and which may commute across it, both along hedgerows and watercourses. The LEMP will be substantially in accordance with the measures set out in the OLEMP.</p>	
Effects on Otters	Any operational works will consider the presence of protected species, such as otter which may occupy the Site given habitat improvements to hedgerows, and other habitats. Protection of solar PV arrays and associated infrastructure which crosses watercourses will incorporate measures to allow otters to move unimpeded.	

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
	The OLEMP details habitat enhancements and management which have been designed to support species which occupy the Site, and which may commute across it, both along hedgerows and watercourses. The LEMP will be substantially in accordance with the measures set out in the OLEMP.	
Effects on Breeding birds	Habitat enhancement, including management of margins are set out in the OLEMP, will have a positive effect on a wide diversity of species. The LEMP will be substantially in accordance with the measures set out in the OLEMP.  Habitat enhancements and suitable management of grassland, in particular, Dean Moor CWS, will promote nesting opportunities for a range of species including those which rely on open habitats with reduced grazing disturbance.	
Effects on Wintering Birds	The LEMP will be substantially in accordance with the measures set out in the OLEMP.	
Chapter 9: Climate Change		
Effect of renewable energy generation on climate change mitigation.	N/A	<b>Major Beneficial (local level)</b>  Minor Beneficial (national level)  (permanent)
Effects of climate change on infrastructure	Design specifications of infrastructure including solar arrays, Grid Connection Infrastructure, cabling, etc. will be confirmed through DCO Requirements.  Drainage design to be secured by a DCO Requirement.	Negligible  (permanent)
Effects of climate change on future site users	Future Site users to adhere to health & safety procedures whilst working on-Site.  An Operational Management Plan to be secured by a DCO Requirement and be substantially in accordance with the OOMP.	

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
Effects of climate change on the natural environment (Ecology, Landscaping and Planting)	Implementation of a LEMP and a GMP, to be substantially in accordance with the measures outlined in the OLEMP and OGMP. Flood design specifications to be secured by DCO Requirement.	Negligible-Minor Adverse (permanent)
Effects of climate change on flood risk	Detailed drainage design to be secured by a DCO Requirement. A GMP to be secured by DCO Requirement.	Negligible (permanent)
Chapter 10: Ground Conditions		
Human Health exposure to potential contamination through ground disturbance (temporary)	The CEMP to be substantially in accordance with the measures in the OCEMP, to define what materials can / cannot be re-used and require that materials brought to the Site are suitable for use from the perspective of human health during the operational phase.	Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon Surface Water (temporary)	Whilst it is not anticipated that additional mitigation will be required for these receptors during the operational phase, any additional mitigation measures found to be necessary following ground investigation and subsequent assessment will be included.	
Mobilisation of existing potential contamination through ground disturbance impacting upon Groundwater (temporary)		
Buildings and Structures exposure to potential contamination (temporary)	Design, informed by ground investigation, such that the proposed structures are suitably located, geotechnically designed and constructed of appropriate materials.	
Loss of Soil Resource due to ground disturbance (permanent)	Adoption of additional mitigation measures at the construction phase will safeguard soil (resource) during the operational phase.	

**Table 11.4: Significance Table - Decommissioning**

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
<b>Chapter 6: Cultural Heritage</b>		
Effects of decommissioning activities on the Large Irregular Stone Circle and a Round Cairn on Dean Moor	Decommissioning Management Plan ('DMP') suite will be implemented, to be substantially in accordance with measures outlined in the FDMP.	Minor Adverse (short-term)
Effects of Decommissioning activities on the Wythemoor Sough and Adjoining Barn and Stable		
Effects of decommissioning activities on The English Lake District WHS		Minor Adverse (No change)
Effects on potential Below Ground Heritage Receptors (Archaeological Remains)	N/A	No Change
<b>Chapter 7: Landscape and Visual</b>		
Effects on Landscape Designations / Character	Implementation of best practice measures in accordance with a DMP document suite to be provided by a DCO Requirement to be substantially in accordance with the FDMP with this ES.	No change – <b>Moderate Adverse</b> (short-term)
Effects on Landscape Features		Negligible Adverse (short-term)
Effects on Visual Receptors		Negligible – <b>Major Adverse</b> (short-term)

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
<b>Chapter 8: Biodiversity</b>		
Effects on Statutory Designated Areas	<p>Prior to decommissioning, the DEMP will be followed and updated as necessary to prevent impacts to Statutory Designated Areas.</p> <p>Implementation of a DEMP, which will be substantially in accordance with the FDMP. The DEMP will set out how decommissioning works will reduce impacts on statutory designated areas which may be impacted by pollution; and how disturbance and habitat fragmentation will be avoided.</p>	No significant residual effects (short-term)
Effects on Non-Statutory Designated Areas	<p>Prior to decommissioning commencing, the DEMP will be followed and updated as necessary to prevent impacts to Non-Statutory Designated Areas.</p> <p>Implementation of a DEMP, which will be substantially in accordance with the FDMP. The DEMP will set out how decommissioning works will reduce impacts on non-statutory areas which may be impacted by pollution; and how disturbance and habitat fragmentation will be avoided.</p>	No significant residual effects (short-term)
Effects on Habitats	<p>Prior to decommissioning commencing, the DEMP will be followed and updated as necessary to prevent impacts to Habitats.</p> <p>Implementation of a DEMP, which will be substantially in accordance with the FDMP. The DEMP will set out how decommissioning works will reduce impacts to habitats and species; which may be impacted by pollution; and how disturbance and habitat fragmentation will be avoided.</p>	No significant residual effects (short-term)
Effects on Species	<p>Implementation of a DEMP, which will be substantially in accordance with the FDMP. The DEMP will be updated as necessary to prevent impacts to Species. The DEMP will set out how decommissioning works will reduce impacts to habitats and species which may be impacted by pollution; and how disturbance and habitat fragmentation will be avoided.</p>	No significant residual effects
<b>Chapter 9: Climate Change</b>		
N/A	N/A	N/A

Effect / Receptor	Additional / Tertiary Mitigation	Residual Effects (significant effects in bold)
<b>Chapter 10: Ground Conditions</b>		
Human Health exposure to potential contamination through ground disturbance (temporary)	Use of a DMP suite to provide decommissioning phase controls and following all appropriate legislative requirements during the construction phase, this will be substantially in accordance with the FDMP.	Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon Surface Water (temporary)		
Mobilisation of existing potential contamination through ground disturbance impacting upon Groundwater (temporary)		
Buildings and Structures exposure to potential contamination (temporary)		
Loss of Soil Resource due to ground disturbance (permanent)	Preparation of a Decommissioning Soil Management Plan ('DSMP'), to be substantially in accordance with the FDMP, which sets out how soils are to be managed during the decommissioning phase.	