



One Earth Solar Farm

Volume 6.0: Environmental Statement [EN010159]

Volume 1: Introductory Chapters

Chapter 2: EIA Methodology

February 2025

Document Reference: EN010159/APP/6.2

Revision: 01

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
– Reg 5 (2) (a)



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2. EIA Methodology

2.1 Introduction

2.1.1 This Chapter of the Environmental Statement (ES) has been prepared by Logika Consultants Ltd and summarises the EIA process, the results of the EIA Scoping exercise, the purpose of the ES and the stages of EIA, outlining the general methodology undertaken for the assessments within the ES. Bespoke methodologies, limitations, and assumptions¹ are contained in the technical chapters (Volume 2, Aspect Chapters), where required.

2.1.2 This Chapter is supported by the following documents of the ES:

- > *ES Volume 3, Appendix 2.1: Scoping Report [EN010159/APP/6.21]*
- > *ES Volume 3: Scoping Opinion [EN010159/APP/6.23]*
- > *ES Volume 3, Appendix 2.2: ES Response to PINs Scoping Opinion [EN010159/APP/6.21]*
- > *ES Volume 3, Appendix 2.3: Materials and Waste Impact Assessment [EN010159/APP/6.21]*
- > *ES Volume 3, Appendix 2.4: Electro-Magnetic Fields Impact Report [EN010159/APP/6.21]*

2.2 Overview of the Environmental Impact Assessment Process

2.2.1 The purpose of EIA is to ensure that the likely significant environmental effects of the Proposed Development are understood and properly taken into account when decision-makers consider an application for development consent.

2.2.2 Through the EIA process, likely significant environmental effects (adverse and beneficial) arising from the construction, operation (including maintenance) and decommissioning phases of the Proposed Development are identified and assessed, with measures explored and proposed to mitigate or reduce any significant adverse effects on the environment caused by the Proposed Development. If likely significant adverse effects are identified, consideration is given to monitoring measures that may be required.

2.2.3 EIA must be impartial, providing relevant information to the decision-maker and not be a process that promotes the project. It should also be used to facilitate, as far as is possible, sustainable development. This is best done by using it as a tool

¹ In accordance Schedule 4, Section 6 of the EIA Regulations, the limitations and assumptions provide details on the difficulties (for example technical deficiencies) encountered, as well as the main uncertainties involved in undertaking the technical assessments.

to help inform the project evolution including its design, construction, operation (including maintenance) and where relevant, decommissioning.

- 2.2.4 At various points in the EIA process consultation can, or has to, occur. Particularly, this is focused on obtaining feedback from the decision-maker and statutory authorities but can also include seeking feedback from the members of the general public and non-statutory authorities.
- 2.2.5 EIA is a systematic process that comprises a number of key steps. Not all steps are mandatory requirements and there is an ever-greater emphasis on EIA being proportionate and well considered, so that an overly precautionary approach to the assessment is not undertaken. A key component of EIA is the Environmental Statement (ES), which documents the results of the detailed environmental assessment. EIA is often highly technical and therefore there should be an emphasis on ensuring that the ES, focuses on issues which are important to the decision maker. Government guidance supports this with the Ministry of Housing, Communities and Local Government (MHCLG) EIA Guidance (last updated 2020)² stating that:

“The Environmental Statement should be proportionate and not be any longer than is necessary to properly assess (those) effects. Where for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered.”

- 2.2.6 The requirement for EIA and addressing the requirements of the EIA Regulations, are set out in **ES Volume 1, Chapter 1: Introduction [EN010159/APP/6.1]** and are not therefore repeated here.

2.3 EIA Scoping

- 2.3.1 Although not a mandatory requirement, the EIA Regulations³ allow an applicant to, following the provision of appropriate and prescribed information, submit to the consenting authority a request for a formal ‘Scoping Opinion’. The consenting authority has then to, after consulting with prescribed environmental bodies, issue a Scoping Opinion which details specifically what aspects should be covered in the ES, including particularly the scope of environmental assessment that should be undertaken and the methods that should be used.

² Ministry of Housing, Communities and Local Government (2020) EIA Guidance, Available: <https://www.gov.uk/guidance/environmental-impact-assessment>

³ His Majesty’s Office (HMSO) (2017) Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

- 2.3.2 An EIA Scoping Report was submitted to the Planning Inspectorate in November 2023, which set out the likely significant environmental effects of the Proposed Development and the aspects on which the ES would focus, including the proposed assessment methodology. A copy of the EIA Scoping Report as submitted to the Planning Inspectorate is included in **ES Volume 3, Appendix 2.1: Scoping Report [EN010159/APP/6.21]**.
- 2.3.3 On the 22nd December 2023, the Planning Inspectorate (on behalf of the Secretary of State) issued their formal EIA Scoping Opinion, along with the responses from statutory consultees. The EIA Scoping Opinion from the Planning Inspectorate is included in **ES Volume 3: Scoping Opinion [EN010159/APP/6.23]**. The Scoping Opinion has been considered within the ES, in particular in Volume 2, Aspect Chapters within which Chapters 6 to 17 have been based on the elements scoped into the technical assessments. Further information is detailed in **ES Volume 3, Appendix 2.2: ES Response to PINs Scoping Opinion [EN010159/APP/6.21]**, which summarises the consultation issues raised as part of the EIA Scoping Opinion for the Proposed Development.
- 2.3.4 Any consultation elements which have been raised and addressed post-scoping, are detailed in Volume 5, Reports and Statements within the **Consultation Report [EN010159/APP/5.1]**. Where the consultations comments have resulted in inclusions to the technical assessment methodologies, these specific consultation details have also been included within Chapters 6 to 17 of Volume 2, Aspect Chapters.
- 2.3.5 There are a number of environmental aspects which have been scoped out of the EIA, as agreed in the EIA Scoping Opinion. This is because it is considered that there can be no likely significant effects occurring to any receptor as a result of effects arising. **Table 2.1** sets out each of the aspects that are scoped out, with justification provided on why this is the case.

Table 2.1 Technical Aspects Scoped Out of the ES

Technical Aspect	Justification
Glint and Glare	<p>The solar PV modules are designed to absorb as much of the sunlight that illuminates them as is possible, rather than reflecting sunlight. Any light reflecting from them results in the loss of energy output and therefore makes them less efficient. As a result, they are dark in colour, have anti-reflective coatings and are manufactured with low-iron, ultra-clear glass with specialised coatings and textures that enable maximum absorption. The metal frames are also treated with specialised coatings to minimise reflection.</p> <p>In addition, Proposed Development Design Principles were devised to further ensure that the potential for glint and glare effects do not occur. This includes imposing appropriate separation distances from the new infrastructure to any sensitive receptor and the introduction of new landscaping that will act as a screen (including evergreen vegetation to mitigate against any glint and glare from the solar PV modules).</p>

Technical Aspect	Justification
	<p>Detailed geometric analysis has been undertaken using a bespoke glint and glare model to ensure that any reflected sunlight that does still occur from the solar PV modules, despite all the measures implemented, will be directed away from locations that will make it noticeable to any sensitive receptors. The results of the geometric analysis are included in Volume 7, Other Documents, Glint and Glare Assessment [EN010159/APP/7.16] and show there is no potential likely significant effect for glint and glare occurring to sensitive receptors within the locality.</p> <p>The approach above is in accordance with PINS Technical Advice page for scoping solar development.⁴</p>
Risk of Major Accidents and Disasters	<p>‘Accidents’ are considered to be an occurrence resulting from uncontrolled events in the course of construction and operation of a development (e.g. major emission, fire or explosion). ‘Disasters’ are considered to be naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).</p> <p>Given the nature and type of development, it is considered that the Proposed Development is unlikely to result in any type of major accident/ disaster. There is a strict legislative framework that governs construction activities so as to ensure risks are clearly managed to an acceptable level. A variety of guidance, including to ensure pollution prevention, also exists. Bearing all these in mind, an outline Construction Environmental Management Plan (oCEMP) has been produced (Volume 7, Other Documents) Outline Construction Environmental Management Plan [EN010159/APP/7.4] (oCEMP), detailing the measures that will be implemented to ensure that major accidents are avoided. The oCEMP also takes into account the management of unknown risks, such as the provision of an Unexploded Ordnance (UXO) Risk Management Plan prior to construction.</p> <p>The Proposed Development will be designed and operated in accordance with all legislative requirements that relate to this type of facility. An outline Battery Safety Management Plan has been produced (Volume 7, Other Documents) Outline Battery Safety Management Plan [EN010159/APP/7.11], detailing the regulatory guidance reviewed and how these will be responded to, so as to ensure that all safety concerns around the BESS element of the Proposed Development are addressed in so far as is reasonably practicable.</p> <p>During operation, safety processes will be reviewed, and if required, updated to ensure that the operations do not increase the risk or result in a major accident. An outline Operational Environmental Management Plan (Volume 7, Other Documents) Outline Operational Environmental Management Plan [EN010159/APP/7.5] has been produced, detailing the measures that will be implemented to ensure that major accidents are avoided during operation and maintenance.</p>

⁴ Nationally Significant Infrastructure Projects: Technical Advice Page for Scoping Solar Development (September 2024). Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-technical-advice-page-for-scoping-solar-development>

Technical Aspect	Justification
	<p>Similar to the construction phase, during demolition the latest legislative framework that governs demolition activities will be adhered to so as to ensure risks are clearly managed to an acceptable level. At this stage, an outline Decommissioning Environmental Management Plan (oDEMP) has been produced (Volume 7, Other Documents) Outline Decommissioning Environmental Management Plan [EN010159/APP/7.6] that sets out the measures which will be implemented to ensure major accidents are avoided.</p> <p>The location of the Site is outside of an area where natural disasters have historically occurred. It is not an area at high risk from major earthquakes or subsidence, or because of the Site's flat nature, likely to suffer from landslides. Parts of the Site do flood, albeit the Proposed Development, including the way it is proposed to be constructed and operated, has been designed so as to withstand any flooding should it occur (see ES Volume 2, Chapter 7: Hydrology and Hydrogeology [EN010159/APP/6.7]).</p> <p>Furthermore, the infrastructure associated with solar is considered of low susceptibility to the impact of natural disasters. There is limited potential for a disaster occurring at a solar farm to create a hazardous pollution risk, with limited need for hazardous substances in solar farm operation. It is battery storage where the highest risk of such occurs, but with good design and simple measures implemented, the risk of such will be managed.</p>
Materials and Waste	<p>The DCO is seeking time limited consent and the Proposed Development will be operational for up to 60 years, after which time it will be decommissioned. Waste will inevitably be generated as a consequence of the construction, operational (including maintenance) and decommissioning works for the Proposed Development. A Materials and Waste Impact Assessment has been undertaken and show there is no potential likely significant effect (see ES Volume 3, Appendix 2.3: Materials and Waste Impact Assessment [EN010159/APP/6.21]).</p> <p>An outline Site Waste Management Plan is submitted as part of the DCO Application (see Volume 7 Outline Site Waste Management Plan [EN010159/APP/7.12]) which sets out the likely effects and commitments to reduce the generation of waste and to divert waste from landfill. This will ensure that waste arisings will be effectively controlled, and that good Site management practice will be implemented to minimise the generation of waste and maximise the reuse or recycling of waste materials that arise from all phases of the Proposed Development where practicable.</p>
Wind Microclimate	<p>The potential for likely significant effects in relation to Wind Microclimate is generally assessed in respect of the Lawson Comfort Criteria to determine the differing level of impact on assessed locations. The generation of significant Wind Microclimate effects is typically associated with taller developments in highly urbanised environments.</p> <p>Given the low-rise nature of the Proposed Development, the off-site wind conditions are likely to remain broadly similar, and as a result the construction and operation (including maintenance) of the Proposed Development is unlikely to affect any pedestrian comfort on the Public Rights of Way or safety exceedances due to the alteration of on-site wind conditions. As such, no technical assessment of Wind Microclimate is considered necessary in respect of the Proposed Development.</p>

Technical Aspect	Justification
Electro-Magnetic Fields (EMF)	In line with PINS Technical Advice page for scoping solar development ⁴ , Appendix 2.4 Electro-Magnetic Fields Impact Report has been produced which details the type and locations of proposed cables within the Proposed Development (including those over 132kV) (see ES Volume 3: Appendix 2.4: Electro-Magnetic Fields Impact Report [EN010159/APP/6.21]). This includes the location, routing and voltages of cables, along with a risk assessment to any human and ecological sensitive receptors. The assessment shows there are no likely significant effects from EMF associated with the Proposed Development.
Lighting	The effects of lighting have been considered where relevant within Chapters 6 to 17 of Volume 2, Aspect Chapters, including the landscape and visual, cultural heritage and ecology assessments where there is potential for a likely significant effect. ES Volume 1, Chapter 5: Description of the Proposed Development [EN010159/APP/6.5] provides further details on the specification of the lighting design, whilst the Outline Construction Environmental Management Plan [EN010159/APP/7.4] , Outline Operational Environmental Management Plan [EN010159/APP/7.5] and Outline Decommissioning Environmental Management Plan [EN010159/APP/7.6] sets out the management of lighting to ensure there are no likely significant effects. This approach is consistent with PINS Technical Advice page for scoping solar development ⁴ . The assessments show there are no likely significant effects from lighting associated with the Proposed Development.
Transboundary Effects	Regulation 32 of the EIA Regulations require the consideration of any likely significant effects in the environment of another European Economic Association (EEA) member state. Guidance from PINS on the consideration of transboundary effects is provided online ⁵ . Due to the nature and location of Proposed Development, it is not anticipated that the Proposed Development has the potential to result in any likely significant effects on the environment of another EEA State.

2.4 Purpose of the ES

2.4.1 The ES provides the baseline environmental information available for the study areas that are relevant for the environmental assessment undertaken, the description of the likely environmental effects arising from the Proposed Development, and the mitigation measures envisaged to mitigate or reduce adverse environmental effects for the Proposed Development, as well as any necessary monitoring measures. The information presented within this ES is based on the description of the Proposed Development as set out in **ES Volume 1, Chapter 5: Description of the Proposed Development [EN010159/APP/6.5]**.

2.4.2 In order to maintain flexibility in the design and layout at this stage in the process, the assessment of the Proposed Development in this ES has adopted the

⁵ Planning Inspectorate (PINS) (2024) Nationally Significant Infrastructure Projects: Advice on Transboundary Impacts and Process

Rochdale Envelope approach, as described in the PINS Advice Note 9⁶. It is the establishment of the maximum parameters which enables a robust assessment of likely significant effects to be undertaken within this ES, as detailed in **ES Volume 1, Chapter 5: Description of the Proposed Development [EN010159/APP/6.5]**. To further assist with the reader's interpretation of the Rochdale Envelope (but not forming the basis of assessment), the **Illustrative Masterplan [EN010159/APP/2.7]** has been created to provide a visual representation of the PV Arrays, within the Rochdale Envelope developed for the Proposed Development. The Illustrative Designs have been provided for illustration purposes only.

- 2.4.3 The likely effects that the Proposed Development may have on identified environmental receptors has been determined by both the sensitivity (or significance, value, importance, or geographic importance) of the receptor, where applicable the likely pathway, and the predicted magnitude of the impact (or change) compared to baseline conditions.
- 2.4.4 Each of the technical aspects of this ES provide more detailed information on the assessment methodology, which is explained further in the appendix of each technical chapter (see **Volume 2, Aspect Chapters**). Wherever possible, the assessment will rely on quantitative, widely accepted criteria (such as the Institute of Environmental Assessment and Management. Environmental Assessment of Traffic and Movement⁷ in relation to the transport assessment), alongside value judgment and expert interpretation to determine to what extent an effect is significant.
- 2.4.5 Each of the technical aspects of the ES provides details on how sensitivity and magnitude are combined to determine the significance of an effect. As a rule, Moderate or Major effects are deemed significant, while Minor and Negligible effects are considered not significant. However, professional judgment will, for the most part, be applied to each aspect, taking into consideration factors such as whether the effect is permanent or temporary, its duration and frequency, whether it is reversible, and the likelihood of its occurrence.

2.5 EIA Stages

- 2.5.1 This section provides an overview of the EIA process. It is important to note that the steps outlined below are overlapping and interconnected, and that continuous engagement with stakeholders has occurred throughout the entire process of preparing the ES.

⁶ Planning Inspectorate (PINS) (2018) Advice Note Nine: Rochdale Envelope.

⁷ Institute of Environmental Management and Assessment (2023) Environmental Assessment of Traffic and Movement.

Existing and Future Baseline Conditions

- 2.5.2 Appropriate and accurate baseline conditions (i.e. existing conditions on the Site and within its surrounds to an appropriately considered distance in the absence of the Proposed Development) are required to be established in order to assess the likely significant environmental effects of the Proposed Development and to identify the most appropriate environmental measures to be employed to minimise any likely significant adverse effects.
- 2.5.3 Baseline information regarding the existing environmental conditions has been gathered through a combination of fieldwork and desktop research. These baseline sources include, but are not limited to:
- > *Online and digital resources;*
 - > *Data searches, such as those from Local Biological Record Centres, Historic Environment Records, etc.;*
 - > *Baseline field surveys; and*
 - > *Existing environmental information submitted as part of other planning applications within the relevant study areas of the Order limits.*
- 2.5.4 The first stage in the design and EIA process is to gather baseline information. Environmental surveys within the Order Limits and study areas were carried out between 2023 and 2025 in order to establish a clear baseline against which the effects of the Proposed Development could be assessed. Further details of the baseline environment are provided at **ES Volume 1, Chapter 3: Description of the Site and Surrounding Area [EN010159/APP/6.3]** and within the individual technical chapters of this ES (**Volume 2, Aspect Chapters**).
- 2.5.5 The 'future baseline' scenario describes the changes from the existing baseline scenario as far as natural changes can be established i.e. how it will likely evolve in the future but without the Proposed Development in place. However, it is noted without the Proposed Development, the Site would likely continue to be managed in similar to fashion as to that which occurs now i.e. for agricultural purposes.
- 2.5.6 The 'future baseline' also considers changes to the local area as a result of other existing and, or approved projects. Further details on other projects are provided below under the Cumulative Effects section of this Chapter.
- 2.5.7 The potential effects arising as a result of the Proposed Development are assessed against the following baselines that represent differing points of the Proposed Development:
- > *Construction Phase – Existing and Future Baseline*
 - > *Operational Phase (including maintenance) – Future Baseline; and*

- > *Decommissioning Phase – Future Baseline.*

EIA Assessment Scenarios

- 2.5.8 The ES presents the assessment of effects of the following scenarios;
- > *Construction Phase (2027– 2029)*
 - > *Operational Phase (2030 – 2090)*
 - > *Decommissioning Phase (2090)*
- 2.5.9 The ES assesses the maximum development parameters (or the parameters that represent the reasonable worst case for likely significant environmental effects, should that be different).
- 2.5.10 For the Construction Phase, given the short duration of works, and that construction works will move quickly across the Order limits, the likely significant environmental effects of the Proposed Development are assessed for the reasonable worst-case scenario for each technical aspect. For example, for transport, air quality and noise, this includes the peak in traffic when there is the maximum movements of vehicles on the local road network; for landscape and visual impacts and cultural heritage, this includes construction works at the closest proximity to a sensitive receptor. The reasonable assumptions that have been made are detailed in **Volume 2, Aspect Chapters**.
- 2.5.11 The effects of the completed Proposed Development are assessed for the first full year of operation and for the landscape and visual impact assessment (as well as the first full year) in Year 15 as well, in accordance with the LVIA assessment methodology to take account of the maturity of the Green Infrastructure and the future change in the landscape (see **ES Volume 2, Chapter 11: Landscape and Visual [EN010159/APP/6.11]**). Each environmental aspect chapter describes the worst case year as appropriate (**Volume 2, Aspect Chapters**).
- 2.5.12 For the purposes of the EIA, the decommissioning assessment is based on an assumption that the Proposed Development will be operational for up to 60-years from final commissioning. It is noted that at the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered. Consequently, a Decommissioning Environmental Management Plan (DEMP) will be implemented. An outline DEMP is included in Volume 7; **Outline Decommissioning Environmental Management Plan [EN010159/APP/7.6]**.
- 2.5.13 During operation and maintenance, the ES assumes that there will be a need to repair or replace components of the Proposed Development that fail or break. It is anticipated that maintenance and servicing would include the inspection, removal, reconstruction, refurbishment or replacement of faulty or broken equipment, and adjusting and altering the components of the Proposed

Development. The maintenance activities are discussed in **ES Volume 1, Chapter 5: Description of the Proposed Development [EN010159/APP/6.5]**, and their activities are considered within the outline Operational Environmental Management Plan (oOEMP) in Volume 7, Other Documents **Outline Operational Environmental Management Plan [EN010159/APP/7.5]**.

Prediction of Likely Effects

- 2.5.14 The collection of baseline data and development of the initial design concept enabled the Applicant to carry out a preliminary assessment to forecast potential environmental impacts. The findings from this preliminary assessment were documented in the Preliminary Environmental Information Report (PEIR). Following publication of the PEIR as part of the Statutory Consultation, the next step in the EIA process involved further assessment and modelling. This was informed by feedback from the Statutory Consultation (see Volume 5, **Consultation Report [EN010159/APP/5.1]**), additional baseline surveys, and refinements to the design, aiming to identify the likely significant effects of the Proposed Development. The assessment within the ES describes the impacts attributable to the construction, operation (including maintenance) and decommissioning phases of the Proposed Development, which may be direct, indirect, secondary, short-term, medium-term and long-term, permanent and temporary, positive (beneficial) and negative (adverse) effects.
- 2.5.15 The methods of forecasting impacts vary aspect by aspect. These methodologies are detailed within the aspect specific chapters (**Volume 2: Aspect Chapters**) themselves.

Determining Significance

- 2.5.16 The following three stage approach has been used for determining significance for all technical chapters within the ES:
- > *Assigning the sensitivity of a resource or receptor:*
 - Assigning a level of magnitude of impact; and*
 - > *Assigning a level of significance.*
- 2.5.17 The approach to assessing and assigning significance to an environmental effect is derived from a variety of sources including legislative requirements, topic-specific guidance, standards and codes of practice, the EIA Regulations, advice from statutory consultees and other stakeholders and the expert judgement of the team undertaking the EIA. As a result, an aspect-specific approach is necessary, and these methodologies are outlined in detail within the corresponding chapters (**Volume 2: Aspect Chapters**) and their appendices (**ES Volume 3: Technical Appendices Supporting ES Volumes 1 and 2 [EN010159/APP/6.21]**).

Consideration of Alternatives

- 2.5.18 Regulation 14(2)(d) of the EIA Regulations requires an ES to include “a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the options chosen, taking into account the effects of the development on the environment”.
- 2.5.19 In addition, PINS Advice Note 7⁸ states that a good ES is one that “explains the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment”.
- 2.5.20 Alternatives in respect of site selection, including the location of the BESS and substation compounds and alternative design options are reported in **ES Volume 1, Chapter 4: Alternatives and Design Evolution [EN010159/APP/6.4]**.

Optionality

- 2.5.21 As set out in **ES Volume 1, Chapter 5: Description of the Proposed Development [EN01015/APP/6.5]** within the Order limits, both the eastern and western Battery Energy Storage Systems (BESS) and on-site Substation Compounds could include either (or a combination) of BESS, on-site substation and solar PV.
- 2.5.22 The environmental assessments as reported in Chapters 6 to 17 (in **Volume 2, Aspect Chapters**) have been based on the worst-case scenario and the likely significant effects have been reported. In all technical assessments this includes BESS and on-site substations only, and no solar PV will be located in the compounds. This is because of the following reasons:
- > *Biodiversity – the compound screening vegetation will be in place in either scenario. The BESS and substation options introduce larger areas of hardstanding which will result in lower habitat creation. In addition, vegetation, such as shade tolerant grass, will not be planted under or around the solar PV.*
 - > *Hydrology – the BESS and substation options introduce larger areas of hardstanding and as such detailed attenuation design is required to restrict runoff. Furthermore, appropriate discharge design is required to ensure contamination is not discharged to any watercourse. The BESS and substation are sensitive equipment and has been designed to ensure they will be located outside of the design flood extents, ensuring they remain operational even in times of flood.*

⁸ Planning Inspectorate (PINS) (2018) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements.

- > *Land, Soils, Groundwater- as above, the BESS and substation options introduce larger areas of hardstanding. Water will be required to be stored should a fire occur, and appropriate discharge design be considered to ensure contamination is not infiltrated to the ground.*
- > *Buried Heritage - the BESS and substation options introduce larger areas of hardstanding compared to the solar PV and therefore have a greater potential effect on the potential for unknown archaeology.*
- > *Cultural Heritage – the massing of the BESS and on-site substation are greater than that of the solar PV. As such the greatest change to the historic setting has been considered.*
- > *Landscape and Visual – as above, the massing of the BESS and on-site substation are greater than that of the solar PV. As such the greatest change to the visual setting has been considered.*
- > *Transport and Access - the massing of the BESS and on-site substation are greater than that of the solar PV. The transportation of these larger items has been considered as part of the Abnormal Indivisible Loads (AILs) assessment, which has the higher potential for off-site highway mitigation as well as larger access junction visual splays.*
- > *Air Quality – the assessment considers the AIL assessment, which includes the use of heavy-duty vehicles with higher emissions.*
- > *Carbon and Climate Change – the BESS and on-site substation equipment include more technical components as well as hardstanding, resulting in higher generation of greenhouse gas emissions. In addition, the BESS and on-site substation contains several critical components and as such are more sensitive to climate change.*
- > *Noise and Vibration – the BESS and on-site substation generate noise; the noise assessment therefore considers the greatest noise levels generated by the Proposed Development.*
- > *Human Health – as above, due to the BESS and on-site substation having a greater potential impact for other technical aspects (such as air quality, landscape and visual changes and climate change) these potential impacts have been considered.*
- > *Socio-Economics – based on details of the construction programme, predicted construction costs and operational activities, there would be no significant material difference to the assessment in either scenario.*

Environmental Measures

- 2.5.23 Key to ensuring that the Proposed Development (as presented in this ES) is the most appropriate in environmental terms possible, has been to ensure that its evolution has occurred whilst understanding and responding to identified environmental factors.

- 2.5.24 In accordance with Schedule 4(7) of the EIA Regs, the ES has been based on an EIA mitigation hierarchy which seeks to avoid, prevent, reduce and offset likely significant effects:

“A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.”

- 2.5.25 Specific environmental measures relevant to the technical aspects have been identified and have been considered as part of the assessments (i.e. the assessments of likely significant effects have been undertaken with the inclusion of the environmental measures, as these measures form part of the Proposed Development). The technical aspect specific design interventions can be found in the Environmental Measures sections of **Volume 2: Aspect Chapters**. As above, this includes:

Avoid

- 2.5.26 In the first instance, potential environmental and social impacts have been identified and avoided from the outset. This includes considering carefully, for example, the project need, scale, design, location and duration. Details on the design evolution are included in **ES Volume 1, Chapter 4: Alternatives and Design Evolution [EN010159/APP/6.4]**.
- 2.5.27 The locations of the solar modules have been considered in relation to existing communities and dwellings. Buffers and setbacks have been incorporated following visits to local residents' homes and meetings with Fledborough, South Clifton and Dunham Parish Councils. In addition, the Scheduled Monuments have been removed from the Order limits to ensure that there are no direct likely significant effects to buried heritage on these designated sites.

Prevent

- 2.5.28 Where impacts from the Proposed Development still pose risk of significant adverse effects, further measures have been undertaken to prevent those effects from occurring by taking action/s to either remove the impact at source or intervene in its pathway to prevent it affecting the receptor.
- 2.5.29 Site-specific environmental factors have been considered within the design of the Proposed Development, such as the inclusion of hedgerows to mitigate its visual impact, as well as the extents of ecological habitats to provide open space for skylarks.

- 2.5.30 This has also included where possible design options, which have been tested to ensure that elements of the Proposed Development do not result in likely significant environmental effects for sensitive receptors. This includes noise modelling of the BESS, substations and the Power Conversion Systems ('PCS') to ensure the locations do not result in adverse effects to residential properties and users of the Public Rights of Ways or Bridle Paths. The results of this modelling has been incorporated into the design principles, as set out in the Design Approach Document (see Volume 5 for **Design Approach Document [EN010159/APP/5.8]**) and included within the **Outline Design Parameters [EN010159/APP/5.9]** (in Volume 5).

Reduce

- 2.5.31 If further avoidance and/or prevention are not possible for any remaining aspects, all remaining impacts have been mitigated with guidance from a competent expert with the aim of minimising adverse effects (see **ES Volume 1, Chapter 1: Introduction [EN010159/APP/6.1]** with regards to professional accreditation). In particular, this has been considered in relation to the potential effects on Buried Heritage, where measures are included to reduce the likely effects of the Proposed Development through appropriate mitigation measures (see **ES Volume 2, Chapter 9: Buried Heritage [EN010159/APP/6.9]**).

Offset

- 2.5.32 Lastly, any remaining unmitigated or residual impacts should be offset and compensated for.

Commitments Register

- 2.5.33 To ensure clarity as to how the Environmental Measures are secured, a Commitments Register has been included within the submission (see Volume 7, Other Documents for **Commitments Register [EN010159/APP/7.15]**). This Register follows PINS Guidance⁹ and will identify how commitments will be secured and implemented, to ensure potential environmental effects arising from the project are mitigated as far as possible, in accordance with the mitigation hierarchy, and as set out in the technical assessments detailed in **Volume 2: Aspect Chapters**. It is noted that the Commitments Register is a 'live' document that will be updated throughout the NSIP planning process.

Cumulative Effects

Cumulative Effects with Other Developments

- 2.5.1 Schedule 4(5)(e) of the EIA Regulations states that the ES should include "*a description of the likely significant effects of the development on the environment*"

⁹ Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Commitments Register. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-commitments-register>

resulting from... 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”.

- 2.5.2 Following the above screening criteria, the potential cumulative effects will follow PINS Advice on cumulative effects assessment relevant to nationally significant infrastructure projects¹⁰. The staged approach detailed in the PINS guidance considers the level of certainty of surrounding projects and the need to assess development plans and future development consents; acknowledging that there will be limited information available on the relevant proposals to base such assessment on.
- 2.5.3 Details of the ‘*other existing and, or approved projects*’ to be considered within the detailed assessment have been identified based on information available on the local authorities planning registers and on PINS website and discussed during the consultation stages. The current criteria for inclusion in the study are as follows:
- > *other existing and, or approved projects within the local vicinity (at this stage assumed to be within 5km of the Proposed Development):*
 - > *that have planning permission (or development consent) but are not yet built; or*
 - > *schemes where a planning application (or DCO application) has been submitted but a decision not yet made; or*
 - > *major projects likely to occur due to existing policy.*
- 2.5.4 It should be recognised that many of the other existing and, or approved projects that will fall within the categories under the first two bullets above maybe so small that cumulative effects would be highly unlikely. An example of this would be a house extension or similar. Using professional judgement, other existing and, or approved projects will therefore be screened for their potential to act in a cumulative way with the Proposed Development with only those where such potential exists considered further.

Effect Interactions

- 2.5.5 In addition to the above cumulative effects, within EIA, an assessment should be made of the likely significant effect interactions of the Proposed Development, that is the likely combination of significant environmental effects generated by the

¹⁰ Planning Inspectorate (2024) Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment>

Proposed Development on a single receptor (i.e. the combination of individual effects for noise, air quality and visual on a single receptor).

- 2.5.6 Regulation 5(2) states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and the landscape. Regulation 5(2)(e) refers to the need to assess ‘*the interaction between those factors*’. The following types of cumulative effects will be considered in accordance with the EIA Regulations and best practice guidance:
- > *Combined effects occur when a similar type of effect, for example noise, occurs albeit from differing sources e.g. from both road traffic and aircraft noise. Within the ES, combined effects will be dealt with in the relevant technical aspect chapter.*
 - > *Interactive effects occur when a number of separate effects, for example noise and air quality, together interact to cause an effect to a particular receptor, for example a protected species. Interactive effects will be dealt with either in the relevant technical aspect chapter (such as the example for protected species would be included in the Biodiversity Chapter), or where they have the potential to affect human health, then within the Health Chapter.*
- 2.5.7 There is no single agreed EIA methodology for assessing and quantifying effect interactions that lead to combined effects on sensitive receptors, however, the European Commission (EC) has produced guidelines for assessing effect interactions¹¹ which “*are not intended to be formal or prescriptive but are designed to assist EIA practitioners in developing an approach which is appropriate to a project [...]*”.
- 2.5.8 These guidelines were reviewed, and an approach has been developed based upon professional judgement which uses the defined residual effects of the Proposed Development to determine the potential for effect interactions to lead to combined effects.
- 2.5.9 An exercise which tabulates the Proposed Developments effects on receptors or receptor groups has been undertaken and is presented in **ES Volume 2, Chapter 18: Cumulative Effects [EN010159/APP/6.18]** to determine the potential for effect interactions and therefore any combined effects.

¹¹ European Community (1999); Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.



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