SUNNICA ENERGY FARM

Preliminary Environmental Information Report

Chapter 5: EIA Methodology

Sunnica Ltd

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5. Environmental Impact Assessment Methodology

5.1 Introduction

General Assessment Approach

5.1.1 This PEI Report has been prepared to satisfy the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as 'the EIA Regulations') (Ref. 5-1).

5.1.2 In preparing this PEI Report, reference has been made to the following guidance:

- Planning Inspectorate Advice Note 3: EIA Consultation and Notification (Ref. 5-2);
- Planning Inspectorate Advice Note 7: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (Ref. 5-3);
- Planning Inspectorate Advice Note 9: Rochdale Envelope (Ref. 5-4);
- Planning Inspectorate Advice Note 11: Working with Public Bodies in the Infrastructure Planning Process (Ref 6-5); and
- Planning Inspectorate Advice Note 17: Cumulative Effects Assessment (Ref. 5-6).

5.1.3 Reference has been made to the Scoping Opinion received from the Secretary of State on 23 April 2019 (***PEI Report Volume 2: Appendix 1B***) and the advice contained within it regarding assessment methodology, topics and presentation of the PEI Report, together with responses received through consultation.

5.1.4 In response to the Scoping Opinion, the EIA and this PEI Report include assessments of the following environmental topics:

- **Chapter 6:** Climate Change;
- **Chapter 7:** Cultural Heritage;
- **Chapter 8:** Ecology;
- **Chapter 9:** Flood Risk, Drainage and Water Resources;
- **Chapter 10:** Landscape and Visual Amenity;
- **Chapter 11:** Noise and Vibration;
- **Chapter 12:** Socio-Economics and Land Use;
- **Chapter 13:** Transport and Access;
- **Chapter 14:** Air Quality; and
- **Chapter 15:** Human Health.

5.1.5 The EIA Scoping Report (***PEI Report Volume 2: Appendix 1B***) concluded that several topics did not require a full chapter within the PEI Report and

ES. These topics and (where relevant) the response in the Scoping Opinion are described in:

- **Chapter 16:** Other Environmental Topics. These include:
  - Glint and Glare;
  - Major Accidents and Disasters;
  - Ground Conditions;
  - Telecommunications, television reception and utilities; and
  - Waste.

5.1.6 Paragraph 4 within Schedule 4 of the EIA Regulations states that the ES should include *'a description of the factors […] likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape'.* These factors are addressed within the relevant chapters listed above.

5.1.7 This chapter is supported by the following figures in Volume 3:

- Figure 5-1: Cumulative Projects Scoped in

PEI Report

2.1.1 This PEI Report summarises the outcomes to date of the following ongoing EIA activities:

- Establishing baseline conditions;
- Consultation with statutory and non-statutory consultees;
- Consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to the EIA;
- Consideration of technical standards for the development of significance criteria and specialist assessment methodologies;
- Design review;
- Review of secondary information, previous environmental studies, publicly available information and databases;
- Expert opinion;
- Physical surveys and monitoring;
- Desk-top studies;
- Modelling and calculations; and
- Reference to current guidance.

2.1.2 Each technical chapter follows the same structure for ease of reference, as outlined below:

- Introduction;
- Legislation and Planning Policy;
- Assessment Assumptions and Limitations;
- Assessment Methodology;
- Stakeholder Engagement;
- Baseline Conditions;
- Embedded Design Mitigation;
- Likely Impacts and Effects;
- Assessment of Likely Impacts and Effects;
- Additional Mitigation and Enhancement Measures;
- Residual Effects;
- Cumulative Effects;
- References; and
- Figures

5.1.8 These are described in Section 5.5.1.

5.2 Rochdale Envelope

5.2.1 As discussed in ***Chapter 3: Scheme Description***, several technical parameters have yet to be finalised for the Scheme. This is important as the technology for solar PV and Battery Energy Storage Systems (BESS) advances and to maintain commercial flexibility to meet the changing demands of the UK market, prior to construction. The 'Rochdale Envelope' approach has therefore been applied within the EIA to ensure a robust assessment of the likely significant environmental effects of the Scheme, in accordance with the Planning Inspectorate's Advice Note 9: The Rochdale Envelope (Planning Inspectorate, 2012) (Ref. 5-4). This involves assessing the maximum (and where relevant, minimum) parameters for the elements where flexibility needs to be retained, recognising that the worst-case parameter for one technical assessment may differ from another. Where this approach is applied, this has been confirmed within the relevant chapters of this PEI Report.

5.2.2 As is relevant for each technical discipline, alternative designs under the Rochdale Envelope approach have been assessed, in order to predict worst-case overall impacts. These have been used in the assessment of significance of effects. Each of the **Chapters 6** to **16** describe the parameters applied in relation to the particular discipline. As the Scheme design evolves, key elements of the design may be fixed. However, it is likely that flexibility will need to be maintained for some aspects of the Scheme for the DCO application. Where flexibility is to be retained in the Application, any changes to design parameters will remain within the likely worst-case envelope. Justification for the need to retain flexibility in certain parameters is outlined in ***Chapter 3: Scheme Description*** of the PEI Report.

5.3 Spatial Scope: Geographical Area

5.3.1 The assessment chapters of this PEI Report (**Chapters 6** to **16**) describe their spatial scope, including their rationale for determining the specific area within which the assessment is focussed. The study areas are a function of the nature of the impacts and the locations of potentially affected environmental resources or receptors. Justification for the spatial scope considered appropriate is documented in each topic chapter (**Chapters 6** to **16**).

5.4 Determining the Baseline Conditions

5.4.1 In order to predict the potential environmental effects of the Scheme, it is important to determine the baseline environmental conditions that currently exist within the DCO Site and surrounding area, in the absence of any development.

5.4.2 Detailed, environmental baseline information has been collected and the methodology for the collection process is detailed within each technical chapter of the PEI Report. The baseline information has been gathered from various sources, including:

- Online/digital resources;
- Data searches, e.g. GroundSure, Historic Environment Record, etc.;
- Baseline site surveys; and
- Environmental information submitted in support of other planning applications for developments in the vicinity.

5.4.3 Consideration will also be given to how the baseline conditions would evolve in the absence of the Scheme, known as the ‘future baseline’.

5.5 Development Design, Impact Avoidance and Mitigation

5.5.1 The design process for the Scheme has been heavily influenced by the findings of early environmental appraisals and the EIA process. The Scheme has had several measures incorporated into the concept design to avoid or minimise environmental impacts. The key aspects where the design has evolved are described in ***Chapter 4: Alternatives and Design Evolution.*** These include measures needed for legal compliance, as well as measures that implement the requirements of good practice guidance documents. The initial assessment has been undertaken on the basis that these measures are incorporated in the design and construction practices (i.e. they are 'embedded mitigation').

5.5.2 Implementation of embedded mitigation relied upon in the assessment will be secured in the DCO, either through the setting of limits of deviation (e.g. development extents or specific maximum Above Ordnance Datum (AOD) heights) or specifying mitigation measures via a Requirement.

5.5.3 Consideration has been given to any ‘additional mitigation’ over and above the embedded mitigation that may be required to mitigate any significant adverse effects. The residual effects (after the implementation of mitigation) have then been assessed and are presented in each topic chapter. Significant residual effects are also be summarised in ***Chapter 18: Summary of Environmental Effects*** of the PEI Report. Where sufficient

embedded mitigation has been incorporated into the design, it may not be necessary to proposed additional mitigation.

5.6 Temporal Scope: Timescales and Assessment Years

Construction Phase Effects

5.6.1 For the purposes of the assessment, the construction phase effects are those effects that result from activities during enabling works, construction, and commissioning activities. This covers sources of effects such as construction traffic, noise and vibration from construction activities, dust generation, site runoff, mud on roads, risk of fuel/oil spillage, and the visual intrusion of plant and machinery on site. Some aspects of construction-related effects will last for longer than others. For example, impacts related to earth moving are likely to be relatively short in duration compared with the construction of energy infrastructure and landscaping activities, which are likely to persist throughout the entire construction period.

Operational Phase Effects

5.6.2 Operational effects are the effects that are associated with operational and maintenance activities during the generating lifetime of the Scheme. This includes the effects of the physical presence of the energy infrastructure, and its operation, use and maintenance. Timescales associated with these enduring effects are as follows:

- Short term – endures for up to 12 months;
- Medium term – endures for 1-5 years;
- Long term – endures for 5-15 years;
- Reversible Long-Term Effects – long-term effects, which endure throughout the lifetime of the Scheme but which cease once the Scheme has been decommissioned; and
- Permanent Effects – effects which cannot be reversed following decommissioning (e.g. where buried archaeology is permanently removed during construction).

Decommissioning Phase Effects

5.6.3 Decommissioning effects are changes resulting from activities beginning and ending during the decommissioning stage. This covers sources of effects such as decommissioning site traffic, noise and vibration from decommissioning activities, dust generation, site runoff, mud on roads, risk of fuel/oil spillage, and the visual intrusion of plant and machinery on site, for example. Typically, decommissioning phase effects are similar in nature to the construction phase, although may be of shorter duration and slightly less intensity.

Assessment Years

5.6.4 The assessment considers the environmental impacts of the Scheme at key stages in its construction and operation and, as far as practicable, its decommissioning.

5.6.5 The 'existing baseline' date is 2020 since this is the period in which the baseline studies for the EIA are being undertaken. As described above, 'future baseline' conditions are also predicted for each assessment scenario, whereby the conditions anticipated to prevail at a certain point in the future (assuming the Scheme does not progress) are identified for comparison with the predicted conditions with the Scheme. This can include the introduction of new receptors and resources into an area, or new development schemes that have the potential to change the baseline, where these form committed developments. Committed developments are those with current planning permission or allocated in adopted development plans.

5.6.6 The assessment scenarios that are being considered for the purposes of the EIA (and considered in this PEI Report) are as follows:

- Existing Baseline (2020) – this is the principal baseline against which environmental effects will be assessed;
- Future Baseline (No Development) in 2023, 2025, 2040 (for landscape, visual and heritage setting only (see paragraph 5.6.7) and 2065 (to assess construction, operation, and decommissioning impacts against). These assessment years are explained below.
- Construction (2023) (With Development):
  - The peak construction year for the purpose of the EIA is anticipated to be 2023; this assumes commencement of construction in late 2022 and that the Scheme is built out rapidly over a 24-month period, with all sites constructed concurrently. This is a likely worst case from a traffic generation point of view because it compresses the trip numbers into a shorter duration and represents the greatest impact on the highway network. A lengthened construction phase would likely result in lower traffic, air quality and noise impacts; therefore, the likely worst case scenario has been assessed within the PEI Report.
- Operation (2025) (With Development):
  - This is the opening year of the Scheme; this assumes that the Scheme will be operational by Spring 2025.
- Decommissioning (2065) – this is the proposed year when the design life of the Scheme has been achieved, albeit the assessment will be high level and qualitative and the operational life may extend beyond this date.

5.6.7 A future year of 2040 will also be considered for specific topics including landscape and visual amenity, in terms of the maturation of vegetation (i.e. 15 years after the operational assessment year to allow the consideration of mitigation planting).

5.7 Effect Significance Criteria

5.7.1 The evaluation of the significance of an effect is important; it is the significance that determines the resources that should be deployed in avoiding or mitigating a significant adverse effect, or conversely, the actual value of a beneficial effect. The overall environmental acceptability of the

Scheme is a matter for the Secretary of State to determine, having considered the environmental information set out in the ES. Where it has not been possible to quantify effects, qualitative assessments will be carried out based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant topic chapter.

5.7.2 The significance of residual effects will be determined by reference to criteria for each assessment topic. Specific significance criteria for each technical discipline has been developed, giving due regard to the following:

- Extent and magnitude of the impact (described as high, medium, low and very low);
- Effect duration (see Paragraph 5.6.2), and whether effects are temporary, reversible or permanent;
- Effect nature (whether direct or indirect, reversible or irreversible, beneficial or adverse);
- Whether the effect occurs in isolation, is cumulative or interacts with other effects;
- Performance against any relevant environmental quality standards;
- Sensitivity of the receptor (described as high, medium, low and very low); and
- Compatibility with environmental policies.

5.7.3 The significance of residual effects will be evaluated with reference to available definitive standards, accepted criteria and legislation. For issues where definitive quality standards do not exist, significance will be based on the:

- local, district, regional or national scale or value of the resource affected;
- number of receptors affected;
- sensitivity of these receptors; and
- duration of the effect.

5.7.4 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between effects upon different environmental topics, the following terminology is used in the PEI Report to define residual effects:

- **Adverse** – detrimental or negative effects to an environmental/socio-economic resource or receptor; or
- **Negligible** (also referred to as 'neutral' for some topics) – imperceptible effects to an environmental/socio-economic resource or receptor; or
- **Beneficial** – advantageous or positive effect to an environmental/socio-economic resource or receptor.

5.7.5 Where adverse or beneficial effects are identified, these will be assessed against the following scale:

- **Minor** – slight, very short or highly localised effect of no significant consequence;
- **Moderate** – noticeable effect (by extent, duration or magnitude) which may be considered significant; and
- **Major** – considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards; considered significant.

5.7.6 Each of the technical chapters provides the criteria, including sources and justifications, for quantifying the different categories of effect. Where possible, this will be based upon quantitative and accepted criteria (for example, noise assessment guidelines), together with the use of value judgment and expert interpretation to establish to what extent an effect is environmentally significant.

5.7.7 Table 5-1 illustrates an example of the classification of effects matrix.

Table 5-1 Example matrix to classify environmental effects

Sensitivity or value of resource /	*Magnitude of impact*			
	High	*Medium*	*Low*	*Very low*
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

5.7.8 Following the classification of an effect, clear statements will be made within the topic chapters as to whether that effect is significant or not significant. As a rule, major and moderate effects are considered to be significant (as shown by the shaded cells in Table 5-1 above), whilst minor and negligible effects are considered to be not significant. However, professional judgement will be applied, including taking account of whether the effect is permanent or temporary, its duration / frequency, whether it is reversible, and / or its likelihood of occurrence. Generic definitions for the classification of effects are shown in Table 5-2.

Table 5-2 Generic effect descriptions

Effect	*Generic description*
Major	These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.
Moderate	These effects, if adverse, are likely to be important at a local scale and on their own could have a material influence on decision making.

Minor	These effects may be raised as local issues and may be of relevance in the detailed design of the project but are unlikely to be critical in the decision-making process.
Negligible	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.

5.7.9 Where mitigation measures are identified to eliminate, mitigate or reduce adverse impacts, these have either been incorporated into the design of the Scheme; translated into construction commitments; or operational or managerial standards / procedures. The PEI Report will highlight 'residual' effects, which remain following the implementation of suitable mitigation measures, and classify these in accordance with the effect classification terminology given above.

5.7.10 It should be noted that some technical disciplines may utilise different criteria when undertaking assessments due to differences in industry accepted guidelines and specifications. Where this is the case, the technical topic will discuss how the assessment methodology or classification of effects differs for the general EIA methodology as described in this section and provide justification.

Assessment of Construction and Decommissioning Effects

5.7.11 The assessment of construction and decommissioning effects will be undertaken based on existing knowledge, techniques and equipment. A 'reasonable worst-case' scenario will be used with respect to the envisaged construction methods, location (proximity to sensitive receptors), phasing and timing of construction activities.

5.7.12 As described above, the assessment of construction and decommissioning effects assume the implementation of standard good practice measures, for example the use of dust suppression measures on haul roads, using container with 110% capacity to store fuel and other chemicals onsite, etc. The purpose of this is to focus on the Scheme specific effects, rather than generic construction effects that can be easily addressed using generic good practice mitigation measures. Construction and decommissioning assumptions, including what has been assumed in terms of good practice measures, will be set out within the PEI Report, and the Framework Construction Environmental Management Plan (CEMP). The PEI Report will identify and assess construction and decommissioning effects that are likely to remain after these mitigation measures are in place.

5.8 Interaction and Accumulation of Effects

5.8.1 In accordance with the EIA Regulations, 'cumulative effects' will be considered. These are effects that result from incremental changes caused by other past, present or reasonably foreseeable actions together (i.e. cumulatively) with the Scheme.

5.8.2 For the cumulative impact assessment, two types of impact are considered:

- The combined effect of individual impacts from the Scheme, for example noise or pollutants on a single receptor (these are referred to as 'effect interactions'); and
- The combined effects of several development schemes which may, on an individual basis be insignificant but, cumulatively with the Scheme, have a new or different likely significant effect.

Effect Interactions

5.8.3 There is no established 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 interactions *"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…"* (Ref. 5-7).

5.8.4 AECOM has reviewed these guidelines and has developed an approach which uses the defined residual effects of the Scheme to determine the potential for effect interactions that lead to combined effects.

5.8.5 The EIA predicts beneficial and adverse effects during construction, operation and decommissioning of the Scheme, which are classified as minor, moderate or major. Several effects on one receptor or receptor group could theoretically interact or combine to produce a combined significant overall effect.

5.8.6 An exercise which tabulates the effects on receptors or receptor groups will be undertaken to determine the potential for effect interactions and therefore any combined effects. Only adverse or beneficial residual effects classified as minor, moderate, or major will be considered in relation to potential effect interactions. Residual effects classified as negligible are excluded from the assessment of the effect interactions as, by virtue of their definition (see Table 5-2), they are considered to be imperceptible effects on an environmental / socio-economic resource or receptor.

Cumulative Effects with Other Developments

5.8.7 The Planning Inspectorate's Advice Note 17 on the assessment of cumulative effects (Ref. 5-6) identifies a four-stage approach as follows:

Stage 1 – Establish the National Significant Infrastructure Project's Zone of Influence and identify long list of 'other developments'

5.8.8 A review of other developments has been undertaken, initially encompassing a 'zone of influence' defined by the environmental topic specialists to prepare a long list of 'other developments'. The long list includes all committed developments within 10km of the DCO Site.

5.8.9 The long list of 'other developments' included in the assessment of cumulative effects are reviewed and developed in consultation with the local planning authorities, statutory consultees and other relevant organisations.

5.8.10 Developments included in the initial long-list are based on the following criteria:

a. Development currently under construction;

b. Approved applications which have not yet been implemented (covering the past five years and taking account of those that received planning consent over three years ago and are still valid but have not yet been implemented);

c. Submitted applications not yet determined;

d. Refused applications, subject to appeal procedures not yet determined;

e. On the National Infrastructure Planning Programme of Projects;

f. Development identified in the relevant Development Plan (and emerging Development Plans); and

g. Development identified in other plans and programmes which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

5.8.11 Criteria are developed and applied to filter developments which may be excluded from the initial long list, having regard to the size and spatial influence of each development. The long list has taken account of the criteria in the Planning Inspectorate's Advice Note 17 (Ref. 5-6).

5.8.12 A full long list of cumulative development has been discussed and agreed with WSC and ECDC. The long list will be reviewed and revised prior to submission of the ES.

Stage 2 – Identify shortlist of 'other developments' for Cumulative Effects Assessment

5.8.13 At Stage 2, any developments of a nature or scale without the potential to result in cumulative impacts are excluded, following discussion with the local planning authorities and consideration of the likely zone of influence for each environmental topic. The justification for including or excluding developments from the long list are provided in a matrix, modelled on the example given within Appendix E of the Planning Inspectorate's Advice Note 17 (Ref. 5-6).

5.8.14 A preliminary shortlist of cumulative developments has been prepared for the PEI Report based on the scale of the development, the development falling within the Zone of Influence (ZOI) of specialists topics and temporal overlap, as presented in Appendix 5A and shown in Figure 5-1. The final shortlist, along with inclusionary criteria and full justification will be presented within the ES to ensure a robust cumulative assessment is undertaken.

Stage 3 – Information gathering

5.8.15 Information relating to other developments have been collected from the appropriate source (which may include the local planning authorities, the Planning Inspectorate or directly from the applicant / developer) and include, but are not limited to:

a. Proposed design and location information;

b. Proposed programme of construction, operation and/or decommissioning; and

c. Environmental assessments that set out baseline data and effects arising from 'other developments'.

Stage 4 – assessment

5.8.16 The assessment includes a list of those developments considered to have the potential to generate a cumulative effect together with the Scheme, and this is documented in a matrix which includes the following:

a. A brief description of the development;

b. An assessment of the cumulative effect with the Scheme;

c. Proposed mitigation applicable to the Scheme including any apportionment; and

d. The likely residual cumulative effect.

5.8.17 The criteria for determining the significance of any cumulative effect are based upon:

a. The duration of effect, i.e. will it be temporary or permanent;

b. The extent of effect, e.g. the geographical area of an effect;

c. The type of effect, e.g. whether additive or synergistic;

d. The frequency of the effect;

e. The 'value' and resilience of the receptor affected; and

f. The likely success of mitigation.

5.9 References

Ref. 5-1 The Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2017). Available at: http://www.legislation.gov.uk/uksi/2017/572/pdfs/uksi_20170572_en.pdf

Ref. 5-2 Planning Inspectorate (2018) Advice Note 3: EIA Notification and Consultation. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/07/advice_note_3_v5.pdf [Date accessed: 11/07/2020]

Ref. 5-3 Planning Inspectorate (2020) Advice Note 7: EIA: Process, Preliminary Environmental Information and Environmental Statements. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2017/12/Advice-note-7.pdf [Date Accessed: 08/07/2020].

Ref. 5-4 Planning Inspectorate (2018); Advice Note 9: Using the Rochdale Envelope. Avaliable at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/05/Advice-note-9.-Rochdale-envelope-web.pdf [Date Accessed: 11/07/2020].

Ref. 5-5 Planning Inspectorate (2017); Advice Note 11: Working with Public Bodies in the Infrastructure Planning Process. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/ [Date Accessed: 19/08/2020]

Ref. 5-6 Planning Inspectorate (2019); Advice Note 17: Cumulative Effects Assessment. Cumulative effects assessment relevant to nationally significant infrastructure projects. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf [Date Accessed: 11/07/2020].

Ref. 5-7 European Commission (1999) Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions. Available at: http://ec.europa.eu/environment/archives/eia/eia-studies-and-reports/pdf/guidel.pdf [Date Accessed: 11/07/2020].