

# **Green Hill Solar Farm Environmental Impact Assessment Scoping Report Revision A**

Prepared by: Lanpro Services

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## Issue Sheet

Report Prepared for: Green Hill Solar Farm

### Environmental Impact Assessment Scoping Report

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## 1 Introduction

### 1.1 Background

1.1.1 Green Hill Solar Farm Limited ('the Applicant') has commissioned this Environmental Impact Assessment ('EIA') Scoping Report (the 'Scoping Report'), relating to the proposed Green Hill Solar Farm ('the Scheme').

1.1.2 This Scoping Report is supported by appendices including figures and technical reports.

#### The Scheme

1.1.3 The Scheme consists of an electricity generating station with a capacity of over 50 megawatts ('MW') comprising ground mounted solar arrays and Associated Development, the latter comprising: energy storage, grid connection infrastructure and any other infrastructure and works integral to the construction, operation, maintenance and decommissioning of the Scheme.

1.1.4 The Scheme comprises the following two elements:

- The 'Sites' where the solar arrays and Associated Development (other than those parts of the grid connection cable to be located in the Cable Route Search Area) would be located; and
- The 'Cable Route Search Area' within which the underground cables connecting the Sites and Point of Connection could be located.

#### The Sites

1.1.5 The Sites are referred to as 'Green Hill A, B, C, D, E, F, G and BESS' and are described in detail in Chapter 3. A further land parcel, Green Hill A.2, is currently being reviewed by the Applicant for inclusion in the Scheme, as an extension to Green Hill A and, for completeness, has been included in this scoping exercise. The Sites are shown in detail in Figures 3.1.1-3.1.8.

1.1.6 Field boundaries and numbering within the Sites are set out within Figures 3.3.1-3.3.8.

#### The Cable Route Search Area

1.1.7 The Cable Route Search Area is shown in Figures 3.2.1-3.2.3. The area shown represents the area of search for a Cable Corridor within which the underground electrical cables would be located to connect the Sites to the Point of Connection. This will be refined as the design is developed and additional technical surveys are carried out. Within this search area, a narrow width (the Cable Corridor) will be required for the cable route and its construction together with a series of temporary construction compounds.

#### DCO application boundary

1.1.8 Figure 3.1, which shows the Sites and Cable Route Search Area, shows the proposed maximum extent, at this stage, of land to be included within the Development Consent Order ('DCO') application and includes all land currently being considered for the purposes of the Scheme. **Figure 3.1** provides a 'plan sufficient to identify the land' for the purposes of this Scoping Report (in accordance with Regulation 10(3) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations')). As the design and assessment work evolves, additional land may be included in the DCO application for mitigation works, such as highway improvement works, and ecological mitigation and enhancement measures.

1.1.9 The Sites and Cable Route Search Area are situated in an area of countryside within the administrative boundaries of North Northamptonshire, West Northamptonshire and Milton Keynes Councils.

1.1.10 The Applicant will undertake an Environmental Impact Assessment ('EIA') and provide an Environmental Statement ('ES') in respect of the Scheme as part of the application



for development consent. This EIA Scoping Report sets out the proposed scope of the EIA and forms a formal request for a Scoping Opinion under Regulation 10(1) of the EIA Regulations.

## 1.2 The EIA Regulations

- 1.2.1 As the Scheme comprises the construction of a generating station with a capacity of over 50MW it is defined as a Nationally Significant Infrastructure Project ('NSIP') under sections 14(1)(a) and 15(2) of the Planning Act 2008 ('the Act') and therefore must be consented by way of a DCO.
- 1.2.2 The EIA Regulations stipulate that developments listed under Schedule 1 must be subject to EIA, while Schedule 2 lists development which will be subject to EIA if considered "likely to have significant effects on the environment by virtue of factors such as its nature, size or location". The criteria on which this judgement should be made are set out in Schedule 3.
- 1.2.3 The Scheme is a Schedule 2 development under paragraph 3(a) as it constitutes 'Industrial installations for the production of electricity, steam, water and hot water'.
- 1.2.4 The Applicant confirms that they will be providing an ES to accompany their DCO application, and this Scoping Report therefore constitutes notice under Regulation 8(1)(b) of the EIA Regulations. Owing to the size, nature, and location of the Scheme, it is likely to have significant effects on the environment and is therefore considered to be EIA development.

## 1.3 Purpose of Scoping Report

- 1.3.1 In accordance with Regulation 10(1) of the EIA Regulations, a person who is minded to make an application for a DCO may ask the Secretary of State to state in writing their opinion as to the information to be provided in the ES (a 'Scoping Opinion').
- 1.3.2 Regulation 10(3) of the EIA Regulations states that a scoping request must be accompanied by:
  - A plan sufficient to identify the land (**Figure 3.1**);
  - A description of the proposed development, including its location and technical capacity (Chapters 3 and 4);
  - An explanation of the likely significant effects of the development on the environment (Chapters 6-23); and
  - Such other information or representations as the person making the request may wish to provide or make.
- 1.3.3 This Scoping Report has also taken into account the guidance published by the Planning Inspectorate in Advice Note 7: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (Version 7, Republished June 2020).
- 1.3.4 The table below sets out the topics that are considered in this Scoping Report. The Applicant is advised by a team of experienced and competent environmental consultants which has addressed each topic. The consultants are also identified below. A statement of competence will be provided within the ES for the authors of the various chapters in accordance with Regulation 14(4)(b) of the EIA Regulations.

**Table 1.1: EIA Topics and Project Consultants**

Discipline	Consultant
Chapter 1: Introduction	Lanpro
Chapter 2: Methodology	Lanpro
Chapter 3: The Development Site	Lanpro



Discipline	Consultant
Chapter 4: Scheme Description	Lanpro
Chapter 5: Legislative Context and Energy Policy	Lanpro
Chapter 6: Climate Change	Bureau Veritas
Chapter 7: Landscape and Visual Impact	Lanpro
Chapter 8: Ecology & Biodiversity	Clarkson & Woods
Chapter 9: Hydrology, Flood Risk and Drainage	Mabbett
Chapter 10: Ground Conditions & Contamination	Delta Simons/Lucion Group
Chapter 11: Minerals	Clover Planning
Chapter 12: Cultural Heritage	Lanpro
Chapter 13: Transport and Access	KMC
Chapter 14: Noise and Vibration	Tetra Tech
Chapter 15: Glint and Glare	Mabbett
Chapter 16: Electromagnetic Fields	Pager Power
Chapter 17: Air Quality	Arcadis
Chapter 18: Socio-Economics, Tourism and Recreation	Lanpro
Chapter 19: Human Health	Lanpro
Chapter 20: Arboriculture	Lanpro
Chapter 21: Soils and Agricultural Circumstances	Arcadis
Chapter 22: Other Environmental Matters	Lanpro
Chapter 23: Cumulative Effects	All of the consultants listed above

## 1.4 The Applicant

- 1.4.1 The Scheme is being developed by Green Hill Solar Farm Limited (the 'Applicant'), part of Island Green Power Limited ('IGP'), which is a leading international developer of renewable energy projects, established in 2013.
- 1.4.2 IGP has delivered 34 solar projects worldwide totalling more than 1GW of capacity. This includes 17 solar projects in the UK and Republic of Ireland. Its mission is to increase solar energy usage, making more renewable energy possible whilst drastically reducing carbon emissions. Recently, IGP has taken two NSIP solar projects (Cottam Solar Project and West Burton Solar Project) through the examination stage of the DCO process. The examination of the Cottam Solar Project closed on 6<sup>th</sup> March 2024 and the examination of the West Burton Solar Project closed on 8<sup>th</sup> May 2024.

## 1.5 Consultation and Engagement

- 1.5.1 The Applicant has sought to engage with key stakeholders from an early stage to brief them on the Scheme, focus the environmental studies and to identify specific issues. A number of meetings have been carried out with the following statutory consultees to



introduce the Scheme and commence discussions on detailed matters relating to the Scheme:

- North Northamptonshire, West Northamptonshire and Milton Keynes Councils (Officers and Members).
- Parish Councils
- The Planning Inspectorate
- Local Member of Parliament – Ms Gen Kitchen – MP for Wellingborough
- Historic England
- Natural England
- Local Council Highways Officers – West and North Northamptonshire
- Landscape Officer – North Northamptonshire
- Ecology Officer – North Northamptonshire
- Conservation Officer – North Northamptonshire
- Northamptonshire County Archaeologist
- Northamptonshire Fire Protection Officer

1.5.2 The Applicant will undertake on-going consultation with the host authorities, the stakeholders identified above and other relevant consultees and stakeholders, throughout the duration of the Scheme development and preparation of the ES. This will include complying with the consultation requirements set out in the Act and associated regulations and guidance. A Programme Document will be available on the Scheme website, setting out the timetable for the development of the Scheme, including key milestones and dates where formal consultation is planned, once this has been agreed with the Planning Inspectorate.

1.5.3 In respect of the local communities affected by the development, the Applicant has undertaken the first stage of (non-statutory) consultation in March and May 2024. This initial period of consultation has now concluded, and the Applicant is considering the feedback and responses received. The Applicant will continue to consult local communities, stakeholders and individual property owners as the Scheme is developed.

1.5.4 Prior to undertaking statutory consultation, the Applicant will prepare the Statement of Community Consultation ('SoCC') setting out how the Applicant will consult the local community, in consultation with the host authorities as required by Section 47 of the Act. Statutory consultation in accordance with the SoCC is anticipated to take place in late 2024. The Applicant will have regard to the responses to the consultations as part of the ongoing scheme development and design process. A consultation report will also be prepared as part of the DCO application, which will document the pre-Application consultation and engagement undertaken, and how the responses received have shaped the Applicant's proposals for the Scheme.



## 2 Methodology

### 2.1 Introduction

- 2.1.1 EIA is the process undertaken to identify and evaluate the likely significant effects of a proposed development on the environment and to identify measures to mitigate or manage any likely significant adverse effects. The EIA should be informed by consultation with statutory consultees, other interested bodies, and members of the public. The purpose of identifying the likely significant effects is to ensure decision makers can make an informed judgement on the environmental impacts of a proposal.
- 2.1.2 This chapter explains the approach that will be taken to assess and understand the likely significant effects of the Scheme. This chapter sets out relevant standard methodology used in the EIA. Where topic-specific methodologies are proposed, these will be introduced in the relevant technical chapter of this Scoping Report. A Preliminary Environmental Information Report ('PEIR') will be provided to enable stakeholders and the local community to develop an informed view of the potential impacts of the Scheme prior to the production of an Environmental Statement ('ES') and to provide feedback that will help to shape the Scheme design.
- 2.1.3 The ES must contain the information specified in Regulation 14(2) of the EIA Regulations and must meet the requirements of Regulation 14(3) of the EIA Regulations. It must also include any additional information specified in Schedule 4 of the EIA Regulations which is relevant to the specific characteristics of the particular development or type of development and the environmental features likely to be significantly affected.
- 2.1.4 The EIA is being undertaken based on a number of related activities which will include the following:
- Establishing existing baseline conditions;
  - Consultation with the relevant statutory and non-statutory consultees throughout the process;
  - Consideration of local, regional and national planning policies, legislation and guidelines as relevant to EIA;
  - Consideration of technical standards for the development of significance criteria;
  - Review of secondary sources, previous environmental studies and publicly accessible databases and information;
  - Physical surveys and monitoring;
  - Desk based assessment;
  - Computer modelling (where appropriate and proportionate); and
  - Expert opinion.
- 2.1.5 The following Advice Notes have been considered for the preparation of this report, and will be considered as the EIA progresses:
- Planning Inspectorate Advice Note 3: EIA Consultation and Notification August 2017 Version 7;
  - Planning Inspectorate Advice Note 7: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements June 2020 Version 7;
  - Planning Inspectorate Advice Note 9: Rochdale Envelope July 2018 Version 3;
  - Planning Inspectorate Advice Note 11: Working with Public Bodies in the Infrastructure Planning Process November 2017 Version 4; and



- Planning Inspectorate Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects August 2019 Version 2.

2.1.6 The main objective of the EIA process is to present a clear, impartial assessment of the likely significant beneficial and adverse environmental impacts of the Scheme, including direct and indirect effects, informing the design of the project and documenting the application of the mitigation hierarchy to minimise residual environmental effects.

## 2.2 Assessment of Impacts

2.2.1 Each environmental topic to be considered in the ES will be given a separate chapter.

2.2.2 Each of the technical assessments for the environmental topics will use the following approach and structure.

- Introduction;
- Legislation Policy and Guidance;
- Summary of consultation;
- Baseline Conditions;
- Assessment Methodology and significance criteria;
- Embedded Mitigation;
- Identification and Assessment of Effects;
- Assessment Methodology;
- Mitigation Measures;
- Residual Effects;
- In-Combination Effects;
- Conclusion;
- References.

2.2.3 The environmental topics to be scoped out in their entirety are considered within Chapter 22: Other Environmental Matters.

### Legislation, Policy and Guidance

2.2.4 Each of the chapters in this Scoping Report includes a section on legislation, policy and guidance relevant to the chapter topic. This ensures legal compliance and the setting of clear criteria and procedures for environmental assessments, as applicable to each topic.

### Baseline Conditions

2.2.5 To evaluate likely significant environmental effects, existing baseline conditions will be measured through a combination of desktop and physical surveys, and monitoring of the Sites and the surrounding area, including the Cable Route Search Area. Once the baseline conditions are established, this information is used to identify and assess the sensitivity of receptors on and near the Sites and Cable Route Search Area as well as changes that may take place during the construction, operation and decommissioning of the Scheme. Any identified likely significant effects on these receptors will be assessed and reported in the ES.

2.2.6 The data collected to establish the baseline conditions for the purposes of this Scoping Report have been gathered from a variety of sources, including the following:

- Physical surveys and monitoring;
- Publicly accessible records and databases; and





- Environmental survey information that has been submitted for other developments in the area.

2.2.7 The methods of data collection have been discussed with the relevant statutory and non-statutory consultees where appropriate. These discussions will continue through to submission of the DCO application as the EIA progresses.

2.2.8 It should be noted that baseline condition surveys for Green Hill A.2, the potential extension of the site at Green Hill A, have not been completed prior to the submission of this Scoping Report. Where baseline information is available for Green Hill A.2, at the time of writing, it is identified in each topic chapter. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purposes of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Green Hill A baseline will be identified and presented in the PEIR ahead of the submission of the completed ES.

### Spatial Scope

2.2.9 The individual topic chapters in this Scoping Report (Chapters 6-22) describe and identify the Study Areas, within which that assessment is focused. The Study Areas are in most cases defined by the nature of potential impacts and the location of potentially affected environmental resources or receptors.

### Temporal Scope: Assessment Years

2.2.10 Within this Scoping Report, the individual chapters assess the impacts over the project-specific time periods set out below. These timescales are indicative and are for use in the assessment of environmental effects only.

2.2.11 Construction Phase. These are effects that result from activities during preparation / enabling works, construction, and commissioning activities e.g. effects such as construction traffic, noise and vibration from construction activities, dust generation, runoff, mud on roads, and the visual intrusion of plant and machinery. Some aspects of construction will last longer than others.

2.2.12 Operational Phase. These are effects associated with operation and maintenance activities during the generating lifetime of the Scheme e.g. the effects of the physical presence of the solar arrays, battery energy storage system and substations, and their use and maintenance. Timescales associated with these effects will be defined. In EIA terms, effects can be defined as short term (lasting for up to 12 months); medium term (lasting for 1 - 5 years); long term (lasting more than 5 years); reversible long-term effects (long-term effects, which last for the lifetime of the Scheme, but cease once it has been decommissioned); and permanent effects (those which cannot be reversed following decommissioning).

2.2.13 Decommissioning Phase. These are effects arising from activities for the duration of the decommissioning stage and will likely be short term e.g. site traffic, noise and vibration from decommissioning activities, dust generation, runoff. These effects are typically no greater than those identified for construction and may not be assessed separately for some technical assessments reported in the ES.

2.2.14 Assessment Years. The EIA will consider the environmental impacts of the Scheme at all three phases described above. The operational phase of the Scheme is estimated to be up to 60 years and this time period will be assessed and reported in the ES.

2.2.15 The 'existing baseline' year for assessment will be 2023-2025 as this is the timeframe for which baseline studies for the Scheme are being undertaken. A future baseline will also be considered within the ES for certain assessments.

2.2.16 The assessment scenarios that are being considered for the purposes of the EIA are:

- Existing Baseline 2023-2025;



- Construction 2027 – 2029;
- Operation Year 1 2029. It has been assumed for the purposes of the EIA that the Scheme will be operational by the start of Q3 2029;
- Decommissioning 2089. This would be the year when decommissioning of the Scheme would commence and has been based on an up to 60-year operational lifetime for solar projects. It has therefore been assumed for the purposes of the EIA that the Scheme will be decommissioned no later than 2089;
- A future year of 2044 (15 years post-commissioning of the Scheme) will be considered for the landscape and visual assessment to identify residual effects i.e. 15 years after commissioning, which is the typical period for the maturation of landscape planting.

**Assessment of likely significant effects**

- 2.2.17 To provide for a consistent approach to the description of significance, a standard methodology is applied in instances where no specific criteria are required by technical discipline-specific guidance.
- 2.2.18 The significance of impacts is evaluated with reference to appropriate standards, accepted criteria, technical guidance or legislation where these exist, for each technical discipline.
- 2.2.19 Each technical chapter will assess the following:
  - Sensitivity of receptor/resource;
  - Extent and magnitude of impact;
  - Duration of effect;
  - Nature of effect i.e. is it direct, is it reversible?
  - Does the effect occur in isolation, or is it cumulative or in-combination?
- 2.2.20 The criteria for determining sensitivity are set out in **Table 2.1**.

**Table 2.1: Sensitivity Criteria**

Sensitivity	Definition
High	The receptor or resource has little ability to absorb the change without fundamentally altering its present character or it is of international or national importance.
Medium	The receptor or resource has moderate capacity to absorb the change without significantly altering its present character or is of high and more than local (but not national or international) importance.
Low	The receptor or resource is tolerant of change without detrimental effect, is of low or local importance.
Negligible	The receptor or resource can accommodate change without material effect, is of limited importance.

- 2.2.21 The criteria for determining the magnitude are set out in **Table 2.2**.



**Table 2.2: Magnitude Criteria**

Magnitude	Definition
High	The total loss or major change/substantial alteration to key elements/features of the baseline (pre-development) conditions, such that the post development character/composition/attributes will be fundamentally changed.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions, such that post development character/composition/attributes of the baseline will be materially changed.
Low	A minor shift away from baseline condition. As change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation.
Negligible	Very little change from baseline conditions. The change will be barely distinguishable and approximating to a non-change situation.
Neutral	No change from baseline conditions.

2.2.22 Significance will be characterised as adverse, beneficial, or neutral, and the scale of significance determined by reference to the general matrix in **Table 2.3**.

**Table 2.3: Degrees of Significance**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Moderate/Minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

2.2.23 Major Significance: This level indicates that the proposed project or activity is likely to cause severe, potentially irreversible, and widespread adverse impacts on the environment. Extensive assessment and mitigation measures, often leading to significant redesigns, may be necessary to minimise adverse effects.

2.2.24 Moderate Significance: This level indicates that the project or activity is likely to cause adverse impacts on the environment. These impacts may be localised, temporary, or reversible, requiring mitigation measures.

2.2.25 Minor Significance: This level indicates that the proposed project or activity is expected to have minimal adverse impacts on the environment, typically involving minor disturbances, they generally do not pose significant environmental risks.



- 2.2.26 Negligible Significance: This level indicates that the project or activity is not expected to have any discernible adverse impacts on the environment, with impacts so minor that they can be disregarded. Negligible significance impacts generally require no mitigation measures or further assessment.
- 2.2.27 Neutral Significance: The level of impact where the project/ activity has neither positive nor negative effects on the environment.
- 2.2.28 Impacts that are identified in the ES of a moderate significance or greater (as highlighted grey in Table 2.3 above) will be considered significant.
- 2.2.29 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event that any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and will be assessed in full and reported in the ES.

#### **In-combination effects and cumulative effects**

- 2.2.30 Paragraph (5) of Schedule 4 to the EIA Regulations states that the ES should include "*a description of the likely significant effects of the development on the environment resulting from... (e) 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*".
- 2.2.31 Planning Inspectorate Advice Note 17 on cumulative effects assessment relevant to nationally significant infrastructure projects sets out relevant guidance for practitioners. The staged approach detailed in Planning Inspectorate Advice Note 17 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.
- 2.2.32 Cumulative effects occur as a result of several actions on an environmental receptor which may overlap or act together. The following types of effects will be considered in accordance with the EIA Regulations and best practice guidance:

#### **In-Combination Effects**

- 2.2.33 The approach to the assessment of interactions of environmental effects identified within separate topic chapters of the ES (intra-project combined effects) will consider the changes in baseline conditions at common sensitive receptors (i.e., those receptors that have been identified as experiencing likely significant environmental effects due to the Scheme from multiple environmental topics). The assessment will be based upon residual (post-additional mitigation) effects of 'minor' or greater significance only ('negligible' residual effects will not be considered) and assess whether multiple effects could interact and combine to become significant. The Study Area for the assessment of intra-project combined effects will be informed by the Study Areas for the individual technical chapters.
- 2.2.34 The assessment of the intra-project combined effects will be undertaken using a two-stage approach, described below.

#### **Stage 1 - Screening**

- 2.2.35 Screening will be undertaken to determine whether a sensitive receptor is exposed to more than one type of residual effect during the construction, operation and decommissioning phases of the Scheme. Those sensitive receptors that could experience two or more types of residual effects, with significance of 'minor' or greater, will be taken forward to Stage 2 of the assessment.



2.2.36 If there is only one type of effect on a sensitive receptor (i.e., only one environmental factor assessment chapter has identified effects on that sensitive receptor), then it will be considered that there are no potential intra-project combined effects and the sensitive receptor will not be taken forward to Stage 2 of the assessment. This screening assessment will form an appendix to the ES.

**Stage 2 – Assessment of intra-project combined effects**

2.2.37 Where likely intra-project effects are identified at Stage 1, these will be assessed based on technical information provided in the technical assessment chapters and supporting appendices. This assessment will likely form a tabulated, comparative assessment of the effects identified in the relevant technical chapters to determine the likely combined effect on the identified receptor. As this assessment will likely compare both qualitative and quantitative assessment outcomes, professional judgement will be applied to determining the significance of each intra-project effect.

2.2.38 The evaluation at the receptor level will consider: the magnitude of change at the common receptor; previously identified sensitivity; duration and reversibility of interaction. The focus will be on determining a change in the level of effect likely to be experienced and whether this is significant or not.

**Cumulative Effects**

2.2.39 The ES will contain an assessment of cumulative effects generated by the Scheme and other projects and developments proposed in an area of influence agreed with PINS and the host local authorities. The PINS Advice Note 17 on the assessment of cumulative effects identifies a four-stage approach as follows:

- Stage 1 - Establishing the long list of ‘other existing development and/or approved development’;
- Stage 2 - Establishing a shortlist of ‘other existing development and/or approved development’;
- Stage 3 - Information Gathering; and
- Stage 4 – Assessment.

*Stage 1 – Establishing the long list of ‘other existing development and/or approved development’*

2.2.40 Details of the cumulative schemes to be considered within the detailed assessment will be identified based on information available on the Council’s planning register and on PINS website and discussed during the consultation stages. Cumulative developments are categorised into three tiers as described in **Table 2.4** below, as prescribed by PINS Advice Note 17. These tiers are based on the level of certainty of an identified development coming forward or being built out, and the level of published detail of proposed developments or projects at the time of the ES’s production.

**Table 2.4: Categories of certainty for existing/approved development**

<b>Tier 1 (most certain)</b>	<ul style="list-style-type: none"> <li>• Under construction;</li> <li>• Permitted application(s), whether under the Act or other regimes, but not yet implemented;</li> <li>• Submitted application(s) whether under the Act or other regimes but not yet determined.</li> </ul>
<b>Tier 2</b>	<ul style="list-style-type: none"> <li>• Projects on the Planning Inspectorate’s Programme of Projects where a scoping report has been submitted.</li> </ul>



<b>Tier 3 (least certain)</b>	<ul style="list-style-type: none"><li>• Projects on the Planning Inspectorate’s Programme of Projects where a scoping report has not been submitted.</li><li>• Identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption) recognising that there will be limited information available on the relevant proposals;</li><li>• Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.</li></ul>
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2.2.41 It should be recognised that many of the projects that will fall within the Tier 3 categories may be so small that cumulative effects would be highly unlikely. An example of this would be a home extension or minor commercial development. Using professional judgement, projects will therefore be screened for their potential to result in inter-project effects with the Scheme with only those where such potential exists will be considered further. This screening exercise will be detailed within the ES and will also be consulted upon as part of pre-application discussions with North Northamptonshire, West Northamptonshire and Milton Keynes Councils.

Stage 2 – Establishing a shortlist of ‘other existing development and/or approved development’

2.2.42 At Stage 2, any developments of a nature or scale without the potential to result in cumulative impacts will be 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 will be provided in a matrix, modelled on the example given within Matrix 1 (Appendix 1) of the Planning Inspectorate’s Advice Note 17.

Stage 3 – Information Gathering

2.2.43 Information relating to other developments will be collected from the appropriate source (which may include the local planning authorities, the Planning Inspectorate or directly from the relevant applicant/developer) and will include, but not be limited to:

- Proposed design and location information;
- Proposed programme of demolition, construction, operation and/ or decommissioning; and
- Environmental assessments that set out baseline data and effects arising from ‘other development’.

Stage 4 – Assessment

2.2.44 The assessment will include a list of those developments considered to have the potential to generate a cumulative effect together with the Scheme, and this will be documented in a matrix, in line with Appendix 2 of the Planning Inspectorate’s Advice Note 17 which includes the following:

- A brief description of the development;
- An assessment of the cumulative effect(s) with the Scheme;
- Proposed mitigation applicable to the Scheme including any apportionment; and
- The likely residual cumulative effect(s).



- 2.2.45 The criteria for determining the significance of any cumulative effect will be based upon:
- The duration of effect, i.e. will it be temporary or permanent;
  - The extent of effect, e.g. the geographical area of an effect;
  - The type of effect, e.g. whether additive or synergistic;
  - The frequency of the effect;
  - The 'value' and resilience of the receptor affected; and
  - The likely success of mitigation.

2.2.46 In reporting the overall significance of cumulative effects, it is appropriate to also acknowledge the relative contributions different projects make to a cumulative effect and carefully consider whether the cumulative effect is significant. For example, where a large-scale project is predicted to result in significant effects and a smaller proposed development would not have significant effects, the cumulative assessment should only conclude there is a significant cumulative effect if effects from both projects together are of greater significance than the larger project in isolation. Consequently, care will be taken to not simply define such effects as being cumulative, but rather to focus on the nature and scale to which genuine cumulative effects might result.

2.2.47 Where significant cumulative effects are identified, the assessment will identify any mitigation measures to avoid or reduce these, as well as any necessary monitoring arrangements.

**Summary**

2.2.48 **Table 2.5** summarises how cumulative and in-combination effects will be reported in the ES.

**Table 2.5 Reporting of cumulative and in-combination effects**

Effect	Assessment within the ES:
<b>In-Combination Effects – The interaction and combination of different environmental residual (post-additional mitigation) effects from within the Scheme affecting a single receptor</b>	Will be assessed within the technical chapters within the ES
<b>Cumulative Effects – The combined residual (post additional mitigation) effects of the Scheme and another project or projects on a single receptor</b>	Will be assessed within a separate chapter of the ES

**Mitigation Measures**

2.2.49 Paragraph 7 of Schedule 4 of the EIA Regulations notes that an ES should include "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."



- 2.2.50 The mitigation measures specified can relate to both methods of construction and particular design elements that are to be incorporated within the completed Scheme. Many mitigation measures are accepted good practice for the construction and operation of schemes such as this, are required as part of the current regulatory context, and therefore will be integral to the design of the Scheme (and are referred to as 'embedded mitigation'). These measures will be described within the ES but taken account of as part of Scheme when carrying out the assessment of likely effects of the Scheme.
- 2.2.51 Where the EIA identifies any potential adverse impacts, and those impacts cannot be avoided, additional mitigation measures will be identified to reduce these effects to acceptable levels where practicable. Any effects that endure following the implementation of additional mitigation measures are defined as 'residual effects'.
- 2.2.52 Embedded mitigation measures could include, for example:
- Sustainable Drainage Systems (SuDS);
  - Incorporation of buffer distances from environmental receptors;
  - Designing the layout of the Scheme to minimise impacts on sensitive receptors;
  - Amendments to the size and scale of the Scheme, taking into account particular receptors and the potential impacts to them;
  - Provision of and compliance with an environmental management plan.
- 2.2.53 The following management plans are typically submitted as part of the DCO application and secure the implementation of embedded mitigation measures:
- Outline Construction Environmental Management Plan;
  - Outline Operational Environmental Management Plan;
  - Outline Decommissioning Statement;
  - Outline Landscape and Ecological Management Plan;
  - Outline Battery Storage Safety Management Plan;
  - Outline Soil Management Plan;
  - Outline Ecological Protection and Mitigation Strategy;
  - Outline Construction Traffic Management Plan;
  - Outline Public Rights of Way Management Plan.
- 2.2.54 Additional mitigation measures could include for example:
- Provision of bunding to reduce noise impacts;
  - Fencing to reduce glint and glare impacts;
  - Additional planting and hedgerow improvements to reduce visual impacts.

### Residual Effects

- 2.2.55 Each technical chapter of the ES will have a residual effects section that will outline the significance of each environmental effect resulting, after the implementation of the embedded and additional mitigation measures.

### Consideration of Alternatives

- 2.2.56 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".





- 2.2.57 Moreover, paragraph 2 of Schedule 4 of the EIA Regulations notes that an ES should include: *"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*
- 2.2.58 Furthermore, the relevant policy tests are also set out within Chapter 5 of this report.
- 2.2.59 To ensure compliance with the policy and legal requirements as identified above, the ES will include a chapter setting out the alternatives considered and the main reasons for selecting the chosen option. The chapter will focus on the following aspects of option selection:
- Site selection;
  - Alternative technologies;
  - The layout of the Scheme;
  - Cable Corridor options;
  - The location of supporting infrastructure.
- 2.2.60 The consideration of "no development" as an alternative to the Scheme will not be explored in the ES. This is due to the consideration of "no development" being unreasonable as it would not deliver the generation of renewable electrical power and energy storage proposed, which is designated as critical national priority infrastructure by the UK government.
- Rochdale Envelope**
- 2.2.61 Planning Inspectorate Advice Note 9 sets out advice on the use of the 'Rochdale Envelope' as a way of assessing a proposed development comprising EIA development where uncertainty exists and necessary flexibility is sought. The note sets out that there are key points and documents required where the implications of seeking that flexibility need to be addressed:
- during pre-application consultation process;
  - within the ES; and
  - within the description of the project in the application documents, particularly the DCO but also other application documents identified elsewhere in this note.
- 2.2.62 The Applicant will look to utilise developments in technology as these become available, and the assessment reported in the ES will be sufficiently broad as to enable this flexibility to be provided for within the DCO.



## 3 The Site and its Wider Context

### 3.1 Introduction

3.1.1 This chapter describes the Sites, the Cable Route Search Area and the wider context. This chapter is supported by figures contained in **Appendix 3**.

3.1.2 For ease of reference, the Scheme has been split into the following Sites which is where built development will be located:

- Green Hill A (including A.2) (shown in **Figure 3.1.1, Appendix 3**)
- Green Hill B (shown in **Figure 3.1.2, Appendix 3**)
- Green Hill C (shown in **Figure 3.1.4, Appendix 3**)
- Green Hill D (shown in **Figure 3.1.5, Appendix 3**)
- Green Hill E (shown in **Figure 3.1.6, Appendix 3**)
- Green Hill F (shown in **Figure 3.1.7, Appendix 3**)
- Green Hill G (shown in **Figure 3.1.8, Appendix 3**)
- Green Hill BESS (shown in **Figure 3.1.3, Appendix 3**)

3.1.3 The above Sites are described in Section 3.3.

3.1.4 The Cable Route Search Area, described in Section 3.4, represents the area of search for a Cable Corridor to connect the Sites to Grendon Substation. The search area will be refined as the design of the Scheme is developed and additional technical surveys are carried out. A narrow width within the search area (the 'Cable Corridor') will be required for the cable connection and its construction, including the siting of temporary construction compounds. **Figures 3.2.1-3.2.3** show the Cable Route Search Area.

### 3.2 Wider Context

3.2.1 The Scheme is located in an area of countryside to the west and south of Wellingborough and north and south-east of Northampton.

3.2.2 The Sites have an area of approximately 2,952.3 acres (1,194.8 hectares) and are located within the administrative boundaries of North Northamptonshire, West Northamptonshire and Milton Keynes Councils. The Cable Route Search Area will be subject to refinement and is not included in the area total at this stage.

### 3.3 Sites for Built Development

3.3.1 The Sites identified for built development, namely, solar panels, substations and energy storage for the Scheme are located within a 20km radius of the grid connection at the Grendon National Grid 400kV Substation and are described below.

3.3.2 This section is to be read in conjunction with the Figures in **Appendix 3**.

#### Green Hill A and A.2

##### Site areas

- Green Hill A – 173.58ha
- Green Hill A.2 – 65.20ha

##### Use

- Green Hill A and A.2 are in agricultural use.



### **Features**

- 3.3.3 Green Hill A and A.2 consist of two distinct groups of agricultural fields and are located in the parishes of Old and Walgrave. Green Hill A and A.2 lie entirely within West Northamptonshire, although the eastern boundary of Green Hill A.2 runs alongside the authority boundary of North Northamptonshire.
- 3.3.4 The land at Green Hill A and A.2 is characterised by agricultural fields separated by hedgerows and scattered trees. The land in Green Hill A generally slopes gently down from the north to the south, ranging from approx. 105-135m AOD. A shallow valley is found in the centre-west of Green Hill A formed by a small tree-lined stream. Green Hill A.2 generally slopes gently down from the east to west, ranging from approx. 110-135m AOD (above Ordnance Datum, or mean sea level). Green Hill A and A.2 benefit from existing agricultural access from the adjacent roads.
- 3.3.5 An 11kV overhead power line (OHL) crosses north-south through the centre of Green Hill A to the west of, and parallel to, Newland Road. A small, apparently ruined agricultural building can be found in the north of Green Hill A.
- 3.3.6 A separate 11kV OHL crosses north-south over the easternmost field of Green Hill A.2. Green Hill A.2 also contains a small telecoms tower to the north of Rectory Farm.

### **Settlements**

- 3.3.7 The village of Walgrave is located 600m to the south, and the village of Old is 300m to the west of Green Hill A. There is also a small hamlet known as Cherry Hill developed in the early 2000s to the southwest of Green Hill A. The nearest properties in the village of Old are located approximately 80m west of the most western field of Green Hill A. A small number of isolated properties can be found adjacent to the boundaries of Green Hill A outside the villages of Old and Walgrave.
- 3.3.8 Green Hill A.2 is located approximately 800m to the southeast of Green Hill A, approximately 900m east of Walgrave and 900m northeast of the village of Hannington. Rectory Farm and New Lodge Farm border Green Hill A.2.

### **Roads**

- 3.3.9 Broughton Road runs north-east from the village of Old, bounding the north of Green Hill A before meeting Newland Road at the most northern part of Green Hill A. Newland Road runs south from the northern part of Green Hill A to the village of Walgrave. Walgrave Road is situated southwest of Green Hill A, becoming Old Road which connects Old to Walgrave.
- 3.3.10 Green Hill A.2 is bounded to the north by Kettering Road, while the eastern boundary lies alongside the A43 (also known as Kettering Road).

### **Public Rights of Way (PRoW)**

- 3.3.11 There are no public rights of way passing through Green Hill A. The nearest, footpath DF4, runs from close to the westernmost point of Green Hill A in a northeast direction to the village of Mawsley. In contrast, bridleway CT4 runs along the outside of the southern boundary of Green Hill A.2, whereafter crossing the A43, further bridleways towards Broughton and Pytchley can be accessed.

### **Airfields**

- 3.3.12 No airfields immediately border Green Hill A. Pitsford Airstrip lies approximately 4.4km southwest of Green Hill A. Hold Farm Airstrip lies approximately 500m southeast of Green Hill A.2.
- 3.3.13 Both airfields are private and unpaved. The larger, paved Sywell Aerodrome is located 3.7km south of Green Hill A.2.



### **Rivers**

- 3.3.14 There are no main rivers present within the boundaries at Green Hill A or A.2. A series of land drains is shown to run throughout the two parts of Green Hill A. The nearest main river to Green Hill A is an unnamed river, 800m to the west, that runs into the Scaldwell Arm of Pitsford Water.

### **Historic designations**

- 3.3.15 The extent of historic environment designations within the boundaries of Green Hill A and A.2 are shown on Figure 12.1 and summarised below.

### **Conservation Areas**

- 3.3.16 There are no Conservation Areas within 2km of Green Hill A or Green Hill A.2.
- 3.3.17 Scaldwell Conservation Area is the nearest, located approximately 2km to the west of Green Hill A.
- 3.3.18 Broughton Conservation Area is located approximately 2.3km to the north-west of Green Hill A and A.2.
- 3.3.19 Cransley Conservation Area is located approximately 2.5km to the north-west of Green Hill A.

### **Listed Buildings**

- 3.3.20 There is a cluster of 17 listed buildings at Old to the west of Green Hill A, the nearest being the Grade II listed Jasmine Cottage (NHLE 1376865), approximately 130m from Green Hill A's western extent. These are all Grade II listed buildings apart from the Church of St Andrew (NHLE 1376651) which is Grade I.
- 3.3.21 There is a cluster of 10 listed buildings at Walgrave to the south of Green Hill A, the nearest being the Grade II listed North Hall (NHLE 1203361), approximately 615m from Green Hill A's southern boundary. These are all Grade II listed buildings apart from the Church of St Peter (NHLE 1281745) which is Grade I.
- 3.3.22 White Lodge Farmhouse, approximately 320m to the east of Green Hill A is a Grade II listed building (NHLE 1203302). The Grade II listed Pytchley Lodge (NHLE 1213833) is located 1.0km northeast of Green Hill A.2.

### **Archaeological Features**

- 3.3.23 Walgrave Moated Site Scheduled Monument (NHLE 1011036) is located approximately 490m to the south of Green Hill A.
- 3.3.24 Two parcels of the Abandoned areas of Walgrave Medieval village Scheduled Monument (NHLE 1418583) are located approximately 865m to the south, and 900m to the south-east of Green Hill A respectively. The easternmost parcel of the Schedule Monument is also no more than 500m from Green Hill A.2.

### **Landscape designations**

- 3.3.25 The extent of landscape designations within the boundaries of Green Hill A and A.2 are shown on **Figure 7.6** Landscape Receptors.
- 3.3.26 There are no Registered Parks and Gardens within Green Hill A or Green Hill A.2.
- 3.3.27 Lamport Hall, Grade II (List Entry 1001036) is the nearest Registered Park and Garden, located 2.8km west of Green Hill A. This is the only Registered Park and Garden within 5km of Green Hill A and Green Hill A.2.
- 3.3.28 There is no Ancient Woodland within Green Hill A or Green Hill A.2.
- 3.3.29 The nearest block of Ancient Woodland is Badsaddle Wood (Ancient & Semi-Natural Woodland), located 300m southeast of Green Hill A.2. Withmale Park Wood (A mix of



Ancient & Semi-Natural Woodland and Ancient Replanted Woodland); and Hardwick Wood (A mix of Ancient & Semi-Natural Woodland and Ancient Replanted Woodland) are both also within 2km of Green Hill A.2.

- 3.3.30 There are five further blocks of Ancient Woodland located between 2 and 5km of Green Hill A and A.2 which include: Cransley Wood (predominantly Ancient and Semi-Natural Woodland); Faxton Corner (Ancient Replanted Woodland); Mawsley Wood (Ancient and Semi-Natural Woodland); Short Wood (a mix of Ancient & Semi-Natural Woodland and Ancient Replanted Woodland); and Sywell Wood (predominantly Ancient Replanted Woodland).
- 3.3.31 Green Hill A is located within two of the National Character Areas (NCA's) as illustrated on **Figure 7.5** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527), and NCA Profile: 95 Northamptonshire Uplands (NE565). Green Hill A.2 is located entirely within NCA Profile: 89 Northamptonshire Vales (NE527).
- 3.3.32 Green Hill A and A.2 are located within one Landscape Character Type (LCT), LCT 5 Clay Plateau which contains one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 3.3.33 There are a further three LCTs located between 2 and 5km of Green Hill A and A.2 being; LCT Profile: 4 Rolling Ironstone Valley Slopes north and west of the Sites LCT 13 Undulating Hills and Valleys and LCT Profile: 17 River Valley Floodplain.
- 3.3.34 These LCTs are broken down further into Landscape Character Areas (LCA) and include; LCA Profile: 4e Pitsford Water; LCA Profile: 4d Hanging Houghton; LCA Profile 4f Kettering and Wellingborough Slopes; LCA Profile: 17c Brampton Valley Floodplain and LCA Profile: 13d Cottesbrooke and Arthingworth.
- 3.3.35 The nearest green spaces are playing fields located in Walgrave, 370m south of Green Hill A, and playing fields located in Old, 390m west of Green Hill A. The Hannington Allotments are approximately 850m southwest of Green Hill A.2.

#### **Ecological designations**

- 3.3.36 The extent of ecological designations within the boundaries of Green Hill A and A.2 are shown on **Figure 8.2** and are explained below.

#### **Internationally Designated Sites**

- 3.3.37 The Upper Nene Valley Gravel Pits SPA and Ramsar site is approx. 10km south-east from Green Hill A and A.2. The globally important site comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of Thrapston. An extensive mosaic of wetland habitats, the site is regularly used by over 20,000 wildfowl and wading birds and support major overwintering bird assemblages. Qualifying features of this site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

#### **Nationally Designated Sites**

##### *Sites of Special Scientific Interest (SSSI)*

- 3.3.38 Badsaddle, Withmale Park and Bush Walk Woods SSSI is located between 300m and 900m east and south-east of Green Hill A.2. This is ancient coppice woodland with oak and ash on wet calcareous soils.
- 3.3.39 Pitsford Reservoir SSSI is located approx. 1.5km (at the closest point) south-west of Green Hill A. The reservoir and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded.



3.3.40 Birch Spinney and Mawsley Marsh SSSI is located just over 2km north of Green Hill A. It is a rare type of ash-maple woodland, partly on peat with notable marshes and also includes a stretch of a dismantled railway line.

3.3.41 Hardwick Lodge Meadow SSSI is located 2.2km to the south-east of Green Hill A.2. This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates.

### **Locally Designated Sites**

#### *Local Wildlife Sites (LWS)*

3.3.42 Walgrave East Meadow LWS is located 150m west of Green Hill A.2 and 600m south-east of Green Hill A. The neutral grassland meadow, which also contains two streams fringed with rush pasture, supports a diverse range of meadow plants and indicator species.

3.3.43 Highcroft Farm Meadow LWS is located 500m north of Green Hill A.2. The neglected meadow, although predominately species poor having declined due to lacking appropriate management, hosts an excellent invertebrate assemblage with supporting habitats.

3.3.44 Broughton Green Lane LWS is located 700m east of Green Hill A. This site comprises a green lane, which forms a good wildlife corridor, with ancient woodland indicators and diverse range of invertebrates recorded.

3.3.45 Old Pools Gorse LWS is located 900m north of Green Hill A and comprises a woodland approx. 9.5 hectares in area.

#### *Wildlife Trust Reserves (WTR)*

3.3.46 Pitsford Water WTR is located 1.5km south-west of Green Hill A. Four main streams enter the reserve and form large bays of shallow water across connected valleys. During winter these provide excellent feeding and sheltering areas for wildfowl, whereas lowered water levels in summer expose stretches of mud and foraging areas for migrating waders.

#### *Mineral designations*

3.3.47 The majority of both Green Hill A and A.2 lie within two Minerals Safeguarding Areas (Sand and Gravel) as defined in the adopted Northamptonshire Minerals and Waste Local Plan (2017).

### **Flood Risk and Drainage Designations**

#### *Fluvial Flood Risk*

3.3.48 A network of land drainage ditches is located within Green Hill A and A.2. Flows within the ditches are expected to flow generally in a south-westerly (Green Hill A) and westerly (Green Hill A.2) direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.

3.3.49 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.

3.3.50 The entirety of Green Hill A and A.2 is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding.

3.3.51 The EA 'Historical Flood Map' indicates that neither Green Hill A or Green Hill A.2 have historically flooded and neither has the area immediately surrounding either site.

#### *Surface Water Flood Risk*

3.3.52 The EA 'Flood Risk from Surface Water' map indicates that the land at Green Hill A and A.2 ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).



3.3.53 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches which flow throughout both Green Hill A and A.2.

3.3.54 The location of flood risk and drainage designations in relation to Green Hill A and A.2 are shown on **Figure 9.1** in **Appendix 9**.

### Green Hill B

#### Site Area

- Green Hill B – 64.70ha

#### Use

- The entirety of Green Hill B is in agricultural use.

#### Features

3.3.55 Green Hill B is the most western of the Sites and is located south-southeast of Green Hill A. Green Hill B lies entirely within West Northamptonshire, in the civil parish of Holcot and bordering the parish boundary of Overstone.

3.3.56 Green Hill B is characterised by agricultural fields separated by hedgerows, with some woodland in the wider western area. The eastern part of Green Hill B is relatively flat, with the western part sloping gently down to the southwest corner. The elevation of Green Hill B is from approximately 120-130m AOD. A small pond is located in the easternmost field. Green Hill B is accessed by an existing access from Moulton Road and a proposed access from Sywell Road.

#### Settlements

3.3.57 Green Hill B is situated 850m south from its nearest village, Holcot; and 1.2km north-east of Moulton village. Green Hill B surrounds Tithe Farm Barns, a series of former agricultural barns that have been converted into commercial units. There are also some residential properties scattered nearby to the north and south of Green Hill B.

#### Roads

3.3.58 Holcot Road runs to the west of Green Hill B. This road runs north and turns into Moulton Road (at the parish boundary) nearing the northern boundary of Green Hill B. There is a private entrance for access to Tithe Farm Barns to the northwest which adjoins Green Hill B to Moulton Road. There is also an existing entrance to Green Hill B from Sywell Road, which runs northwest-southeast from Holcot past the east of Green Hill B towards the A43 at New Inn Spinney.

3.3.59 The A43 Kettering Road itself runs 600m southeast of the eastern end of Green Hill B.

#### Public Rights of Way (PRoW)

3.3.60 Footpath CW1 passes through the easternmost part of Green Hill B heading north to the village of Holcot and south where it is redesignated DG2 (where it crosses into Overstone parish) before it joins footpath DG3 from Moulton.

#### Airfields

3.3.61 No airfields are located within or immediately border Green Hill B.

3.3.62 Hold Farm Airstrip lies approximately 1.9km northwest, Sywell Aerodrome lies approximately 2.5km east and Hold Farm Airstrip lies approximately 4.8km northeast of Green Hill B.



### **Rivers**

3.3.63 There are no Main Rivers present at Green Hill B, or within its boundaries. There are two nearby land drains, one located to the south and one to the east.

### **Historic designations**

3.3.64 The extent of historic environment designations in the area of Green Hill B are shown on Figure. 12.1.

### **Conservation Areas**

3.3.65 There are no conservation areas in the immediate area of Green Hill B.

3.3.66 The nearest Conservation Area is Moulton Conservation Area, approximately 1.5km to the south-west of Green Hill B.

### **Listed Buildings**

3.3.67 There is a cluster of eight listed Buildings at the village of Holcot, the nearest being Pollys Cottage (NHLE 1067007) which is listed at Grade II and is approximately 725m to the north-east of Green Hill B. All of the listed buildings in the village are grade II apart from the Church of St Mary and All Saints (NHLE 1045863) which is grade I and is approximately 750m to the north-east of Green Hill B.

3.3.68 The Old Farmhouse and Attached Stables approximately 500m to the south-east of Green Hill B is a Grade II listed building (NHLE 1354758).

3.3.69 Overstone Old Rectory approximately 275m to the south-east of Green Hill B is a Grade II listed building (NHLE 1075355).

3.3.70 Rectory Farmhouse, approximately 70m to the south-east of Green Hill B, is a grade II listed building (NHLE 1025896)

### **Archaeological Features**

3.3.71 There are no Scheduled Monuments within 2km of Green Hill B.

### **Landscape designations**

3.3.72 The extent of Landscape Designations within the boundaries of Green Hill B are shown on Figure.7.6 Landscape Receptors.

3.3.73 There are no Registered Parks and Gardens on or within 2km of Green Hill B. The closest Registered Park and Garden is Boughton Hall located approximately 3.3km to the west in the village of Boughton.

3.3.74 There is no Ancient Woodland on Green Hill B.

3.3.75 The nearest block of Ancient Woodland is Badsaddle Wood (Ancient & Semi-Natural Woodland), located 1.8km southeast of Green Hill B.

3.3.76 There are three blocks of Ancient Woodland located between 2 and 5km of Green Hill B which include: Sywell Wood (Ancient Replanted Woodland); Hardwick Wood (Ancient Replanted Woodland); and Withmale Park Wood (A mix of Ancient & Semi-Natural Woodland & Ancient Replanted Woodland).

3.3.77 Green Hill B is located within two of the National Character Areas (NCA's) as illustrated on **Figure 7.5** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527), and NCA Profile: 95 Northamptonshire Uplands (NE565)

3.3.78 Green Hill B is located within one Landscape Character Type (LCT), LCT Profile: 5 Clay Plateau and one Landscape Character Area, LCA Profile: 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.





- 3.3.79 There are a further two LCT's located within 2km and 5km south of Green Hill B including; LCT Profile: 4 Rolling Ironstone Valley Slopes and LCT Profile: 17 River Valley Floodplain.
- 3.3.80 These are broken down further as Landscape Character Areas (LCA) and include; LCA Profile: 4b Moulton Slopes; LCA Profile: 4c Ecton and Earls Barton Slopes; LCA Profile: 4d Hanging Houghton; LCA Profile: 4e Pitsford Water; LCA Profile: 5b Sywell Plateau; and RLCA Profile: 17c Brampton Valley Floodplain.

### **Ecological designations**

- 3.3.81 The extent of ecological designations within the boundaries of Green Hill B is shown on Figure 8.1.

### **Internationally Designated Sites**

#### *Special Protection Areas (SPA/RAMSAR)*

- 3.3.82 The Upper Nene Valley Gravel Pits SPA/Ramsar is located approx. 10km east of Green Hill B. The globally important site comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of Thrapston. An extensive mosaic of wetland habitats is regularly used by over 20,000 wildfowl and wading birds and support major overwintering bird assemblages. Qualifying features of the site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

### **Nationally Designated Sites**

#### *Sites of Special Scientific Interest (SSSI)*

- 3.3.83 Pitsford Reservoir SSSI is located 800m north-east (at the closest point) of Green Hill B. The reservoir and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded.
- 3.3.84 Hardwick Lodge Meadow SSSI is located 3.7km to the north-east of Green Hill B. This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates
- 3.3.85 Badsaddle, Withmale Park and Bush Walk Woods SSSI is located approx. 5km north-east of Green Hill B. This is ancient coppice woodland with oak and ash on wet calcareous soils.

### **Locally Designated Sites**

#### *Local Nature Reserves (LNR)*

- 3.3.86 Crowfields Common LNR is located 2km south of Green Hill B. This site comprises three fields, adjacent to the village of Moulton, comprised of rough grassland and wildflower meadow, well-established hedgerows and few mature trees.

#### *Local Wildlife Sites (LWS)*

- 3.3.87 Hog Hole Spinney LWS is located approx. 1.1km south-west of Green Hill B. A large woodland in the locality, the predominantly broadleaved woodland lies on sandy soils with oak, ash and a dense scrub understorey.
- 3.3.88 Cowpasture Spinney LWS is located 1.5km south-east of Green Hill B and comprises a long, narrow shelterbelt spinney with a stream, and associated emergent vegetation, running through the centre. A number of ancient woodland indicator species have been recorded amongst the variable tree cover.



### Wildlife Trust Reserves (WTR)

- 3.3.89 Pitsford Water WTR is located 1.5km north of Green Hill B. Four main streams enter the reserve and form large bays of shallow water across connected valleys. During winter these provide excellent feeding and sheltering areas for wildfowl, whereas lowered water levels in summer expose stretches of mud and foraging areas for migrating waders.

### Mineral designations

- 3.3.90 The western half of Green Hill B lies within a Minerals safeguarding areas (sand and gravel) as defined in the adopted Northamptonshire Minerals and Waste Local Plan (2017).

### Flood Risk and Drainage Designations

#### Fluvial Flood Risk

- 3.3.91 There are two land drainage ditches located immediately to the south and southeast Green Hill B. Flows within the ditches are expected to flow in a south-westerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.
- 3.3.92 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 3.3.93 The entirety of Green Hill B is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding.
- 3.3.94 The EA 'Historical Flood Map' indicates that Green Hill B has not historically flooded and neither has the area immediately surrounding Green Hill B.

#### Surface Water Flood Risk

- 3.3.95 The EA 'Flood Risk from Surface Water' map indicates that Green Hill B ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 3.3.96 As describe in the fluvial section above, the surface water flooding extents largely match the courses of the and drainage ditches.
- 3.3.97 The location of flood risk and drainage designations in relation to Green Hill B are shown on **Figure 9.2** in **Appendix 9**.

### Green Hill C

#### Site areas

- Green Hill C – 56.31ha;

#### Use

- Green Hill C is predominantly in agricultural use, with fields CF7-CF10 cleared and left fallow.

#### Features

- 3.3.98 Green Hill C consists predominantly of agricultural fields, whilst also containing a cleared area and access road associated with the neighbouring pre-existing solar farm (Sywell Solar farm). Green Hill C sits across both Sywell parish and Mears Ashby parish in North Northamptonshire.
- 3.3.99 The land is characterised by medium-sized fields separated by hedgerows and in some instances substantial tree belts. Green Hill C also lies immediately adjacent to Sywell Wood. The topography of Green Hill C is defined by a shallow valley caused by a small stream running north-south through the centre, with the elevation of Green Hill C ranging



from approx. 110-120m AOD. Green Hill C benefits from a number of well-established existing internal agricultural tracks, which access from the pre-existing access track to Sywell Solar Farm.

### **Settlements**

3.3.100 Green Hill C is located some 1.5km northeast of the village of Sywell and approximately 1.3km to the north of Mears Ashby. There are no defined settlements in the immediate area, though there is a garden centre named Beckworth Emporium opposite the southern part of Green Hill C. Wood Lodge Farm is situated on the western site boundary and can be access via Sywell Road.

3.3.101 Green Hill C is also located near to Sywell Aerodrome, which features a well-established employment area, museum, aerodrome facilities, and hotel.

### **Roads**

3.3.102 The southern boundary of Green Hill C runs along Wellingborough Road. From its junction with Glebe Road, there is gated access into Sywell Solar Farm. The existing access road to the existing solar farm runs through Green Hill C.

### **Public Rights of Way (PRoW)**

3.3.103 Bridleway TN7 runs along a tree belt through the centre-west of Green Hill C whereafter it turns north and follows the perimeter of Sywell Wood. This route also forms part of the Northamptonshire Round long-distance walking route.

### **Airfields**

3.3.104 Sywell Aerodrome directly neighbours Green Hill C. The aerodrome and its accompanying facilities are situated to the west and southwest of Green Hill C and are accessed from Wellingborough Road. The airfield is largely open for recreational aviation purposes with a 900m paved runway (03L/21R), and three smaller grass runways. Notably, approach to grass runway 23 is taken directly over the western half of Green Hill C, with a distance of no more than 120m between the boundary of Green Hill C and the runway end.

### **Rivers**

3.3.105 Whilst there are no Main Rivers on Green Hill C, there is a land drain which runs through the centre in a southwards direction and runs south under Wellingborough Road.

### **Historic designations**

3.3.106 The extent of historic environment designations within the boundaries of Green Hill C are shown on Figure 12.1.

### **Conservation Areas**

3.3.107 Sywell Conservation Area is located approximately 1km to the south-west of Green Hill C.

### **Listed Buildings**

3.3.108 There are no listed buildings within or within 1km of Green Hill C.

### **Archaeological Features**

3.3.109 There are no Scheduled Monuments within 2km of Green Hill C.

### **Landscape designations**

3.3.110 The extent of Landscape Designations within the boundaries of Green Hill C are shown on Figure 7.6.



- 3.3.111 There are no Registered Parks and Gardens on or within 2km of Green Hill C. The closest Registered Park and Garden is the Great Harrowden Hall located 4.6km northeast of Green Hill C. There are no other Registered Parks and Gardens are within 5km of Green Hill C.
- 3.3.112 There is no Ancient Woodland on Green Hill C.
- 3.3.113 The nearest block of Ancient Woodland to Green Hill C is Sywell Wood (Ancient Replanted Woodland), which is located directly north of the northern boundary of Green Hill C. There is only one other block of Ancient Woodland within 2km of Green Hill C, Hardwick Wood (Ancient Replanted Woodland) which is located 1.5km north of Green Hill C.
- 3.3.114 There are a further two blocks of Ancient Woodland between 2km to 5km north of Green Hill C which include Withmale Park Wood (Ancient Replanted Woodland) and Badsaddle Wood (Ancient & Semi-Natural Woodland).
- 3.3.115 Green Hill C is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 3.3.116 Green Hill C is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.
- 3.3.117 Green Hill C is located within one Landscape Character Type (LCT), LCT Profile: 5 Clay Plateau and one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 3.3.118 There are a further two LCT's located between 2km and 5km south of Green Hill C these include; LCT Profile: 4 Rolling Ironstone Valley Slopes; and LCT Profile: 18 Broad River Valley Floodplain.
- 3.3.119 These LCT's are broken down further as Landscape Character Area (LCA) LCA Profile: 4b Moulton Slopes; LCA Profile: 4C Ecton and Earls Barton Slopes; LCA Profile: 4e Pitsford Water; LCA Profile: 4f Kettering and Wellingborough Slopes; and LCA Profile: 18d The Nene - Billing Wharf to Woodford Mill.

#### **Ecological designations**

- 3.3.120 The extent of ecological designations within the boundaries of Green Hill C are shown on Figure 8.1.

#### **Internationally Designated Sites**

- 3.3.121 The Upper Nene Valley Gravel Pits SPA and Ramsar site is approx. 6.5km south-east from Green Hill C. The globally important site comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of Thrapston. An extensive mosaic of wetland habitats is regularly used by over 20,000 wildfowl and wading birds and support major overwinter
- 3.3.122 ng bird assemblages. Qualifying features of the designated site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

#### **Nationally Designated Sites**

##### *Sites of Special Scientific Interest (SSSI)*

- 3.3.123 Hardwick Lodge Meadow SSSI is located 1.5km north of Green Hill C. This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates.
- 3.3.124 Badsaddle, Withmale Park and Bush Walk Woods SSSI is located approx. 3km north of Green Hill C. This is ancient coppice woodland with oak and ash on wet calcareous soils.



- 3.3.125 Pitsford Reservoir SSSI is located approx. 4.5km (at the closest point) west of Green Hill C. The reservoir and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded.

#### **Locally Designated Sites**

##### *Local Wildlife Sites (LWS)*

- 3.3.126 Hardwick Wood LWS is approx. 1.6km north of Green Hill C and comprises an ancient woodland replanted with oak and spruce. At least 20 ancient woodland indicators and neutral grassland indicators were recorded on site.
- 3.3.127 Sywell Reservoir and Country Park LWS is located 1.8km south of Green Hill C. In addition to SSSI status, the Country Park consists of a reservoir and a mosaic of other habitats, including neutral grassland, scrub woodland and swamp edge habitat.
- 3.3.128 Vivians Covert LWS is located 1.8km east of Green Hill C, a small woodland in which at least seven ancient woodland indicators are present.
- 3.3.129 Cowpasture Spinney LWS is located approx. 2km south-west of Green Hill C. It comprises a long, narrow shelterbelt spinney with a stream, and associated emergent vegetation, running through the centre. A number of ancient woodland indicator species have been recorded amongst the variable tree cover.
- 3.3.130 Hardwick Road Verge LWS is located 2km northeast of Green Hill C. Bounding the north and south of Hardwick Road, the grassland communities on the road verges and indicative of neutral grassland habitats.

#### **Mineral designations**

- 3.3.131 There are no minerals safeguarding areas covering Green Hill C.

#### **Flood Risk and Drainage Designations**

##### *Fluvial Flood Risk*

- 3.3.132 There is one land drainage ditch which runs through the centre of Green Hill C. Flows within the ditches are expected to flow in a south-westerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.
- 3.3.133 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 3.3.134 The entirety of Green Hill C is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding.
- 3.3.135 The EA 'Historical Flood Map' indicates that Green Hill C has not historically flooded and neither has the area immediately surrounding it.

##### *Surface Water Flood Risk*

- 3.3.136 The EA 'Flood Risk from Surface Water' map indicates that Green Hill C ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 3.3.137 As describe in the fluvial section above, the surface water flooding extents largely match the courses of the and drainage ditches.
- 3.3.138 The location of flood risk and drainage designations in relation to Green Hill C are shown on **Figure 9.3** in **Appendix 9**.



## Green Hill D

### Site areas

- Green Hill D – 42.06ha

### Use

- The entirety of Green Hill D is in agricultural use.

### Features

3.3.139 Green Hill D is located only 240m from the most eastern part of Green Hill C. This site is a slim row of fields stretching north to south some 1.6km and is roughly 300-400m wide. Green Hill D lies entirely within Mears Ashby parish in North Northamptonshire. The northeastern boundary of Green Hill D abuts the parish boundaries of Wilby and Wellingborough.

3.3.140 Green Hill D is characterised by agricultural fields separated by hedgerows and scattered trees, with a more established tree belt along its western boundary. The land generally slopes gently down from the east to the west, where a stream (a tributary of Swanspool Brook) defines the boundary of Green Hill D. The elevation of Green Hill D ranges from approx. 100-120 AOD. Access to Green Hill D is taken from a number of existing agricultural access from Highfield Road.

### Settlements

3.3.141 The southern corner of Green Hill D lies immediately to the north of the village of Mears Ashby. Three farmsteads lie dispersed around Green Hill D, including The Grange, which features a relatively prominent water tower which can be seen along the length of Highfield Road.

### Roads

3.3.142 Highfield Road covers the entire eastern boundary of Green Hill D, meeting Moonshine Gap and Wellingborough Road, the latter of which also briefly borders the northern boundary of Green Hill D.

### Public Rights of Way (PRoW)

3.3.143 Footpath TN3 runs north-south from the southernmost point of Green Hill D, running directly through the centre of Green Hill D to its meeting point with Wellingborough Road. Hereon TN3 continues north to Hardwick, where it is redesignated as Footpath TG4.

### Airfields

3.3.144 No airfields are located within or immediately border Green Hill D.

### Rivers

3.3.145 There is an unnamed Ordinary Watercourse which is located along the western boundary of Green Hill D, flowing in a southerly direction, where it later becomes a Main River Swanspool Brook approximately 2.6km south-east of Green Hill D.

### Historic designations

3.3.146 The extent of historic environment designations within the boundaries of Green Hill D are shown on **Figure 12.1**.

### Conservation Areas

3.3.147 Mears Ashby Conservation Area is located approximately 115m to the south-west of Green Hill D at its nearest point.



### **Listed Buildings**

- 3.3.148 There is a cluster of 29 listed buildings at Mears Ashby, the nearest being the grade II listed Manor Farmhouse (NHLE 1040695), approximately 175m south-west of Green Hill D. These are all grade II listed buildings apart from the Church of All Saints (NHLE 1040692) and Mears Ashby Hall which are both grade II\*.

### **Archaeological Features**

- 3.3.149 There are no Scheduled Monuments within the boundaries of or within 2km of Green Hill D.

### **Landscape designations**

- 3.3.150 The extent of Landscape Designations within the boundaries of Green Hill D are shown on Figure 7.6 Landscape Receptors.
- 3.3.151 There are no Registered Parks and Gardens on or within 2km of Green Hill D. The closest Registered Park and Garden is Great Harrowden Hall located 4.2km northeast of Green Hill D. There are no other Registered Parks and Gardens are within 5km of Green Hill D.
- 3.3.152 There is no Ancient Woodland on Green Hill D.
- 3.3.153 The nearest block of Ancient Woodland is Sywell Wood (Ancient Replanted Woodland), which is located 770m northeast of Green Hill D. There is one block of Ancient Woodland within 2km of Green Hill D, Hardwick Wood (Ancient Replanted Woodland) which is located 2km northeast of Green Hill D.
- 3.3.154 There are a further two blocks of Ancient Woodland between 2km to 5km north of Green Hill D which include Withmale Park Wood (Ancient Replanted Woodland) and Badsaddle Wood (Ancient & Semi-Natural Woodland).
- 3.3.155 Green Hill D is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 3.3.156 Green Hill D is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.
- 3.3.157 Green Hill D is located within one Regional Landscape Character Type (LCT), LCT Profile: 5 Clay Plateau and one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 3.3.158 There are a further two LCT's located between 2km and 5km south of Green Hill D; LCT Profile: 18 Broad River Valley Floodplain; and LCT Profile: 4 Rolling Ironstone Valley Slopes.
- 3.3.159 These LCT's are broken down further as Landscape Character Area (LCA) and include; LCA Profile: 4b Moulton Slopes; LCA Profile: 4c Ecton and Earls Barton Slopes; LCA Profile: 4f Kettering and Wellingborough Slopes and LCA Profile: 18d The Nene - Billing Wharf to Woodford Mill.

### **Ecological designations**

- 3.3.160 The extent of ecological designations within the boundaries of Green Hill Ds are shown on Figure 8.1.

### **Internationally Designated Sites**

- 3.3.161 The Upper Nene Valley Gravel Pits SPA and Ramsar site is approx. 6km east and southeast of Green Hill D. The globally important site comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of the village of Thrapston. An extensive mosaic of wetland



habitats is regularly used by over 20,000 wildfowl and wading birds and support major overwintering bird assemblages. Qualifying features of the designated site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

### **Nationally Designated Sites**

#### *Sites of Special Scientific Interest (SSSI)*

- 3.3.162 Hardwick Lodge Meadow SSSI is located 1.7km north-west of Green Hill D. This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates.
- 3.3.163 Badsaddle, Withmale Park and Bush Walk Woods SSSI is located approx. 2km north-west of Green Hill D. This is ancient coppice woodland with oak and ash on wet calcareous soils.

### **Locally Designated Sites**

- 3.3.164 Sywell Reservoir and Country Park LWS is located 1.2km south of Green Hill D. The Country Park comprises reservoir and a mosaic of other habitats, including neutral grassland, scrub woodland and swamp edge habitat.
- 3.3.165 Vivians Covert LWS is located 1.4km northeast of Green Hill D, a small woodland in which at least seven ancient woodland indicators are present with the site considered a good candidate for improvements.
- 3.3.166 Park Farm Industrial Estate LWS is located 1.7km east of Green Hill D. Green Hill D contains a mosaic of grassland, scrub and woodland habitats.
- 3.3.167 Hardwick Wood LWS is approx. 1.8km north of Green Hill D and comprises an ancient woodland replanted with oak and spruce. At least 20 ancient woodland indicators and neutral grassland indicators were recorded on site.

### **Mineral designations**

- 3.3.168 There are no minerals safeguarding areas covering Green Hill D.

### **Flood Risk and Drainage Designations**

#### *Fluvial Flood Risk*

- 3.3.169 There is an Unnamed Ordinary Watercourse located along the western boundary of Green Hill D, flowing in a south-westerly direction. Fluvial flooding could occur if the Ordinary Watercourse overtopped its banks during or following an extreme rainfall event.
- 3.3.170 The majority of Green Hill D is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding. However, a limited area to the south-western boundary is identified as being in Flood Zone 3, associated with the Unnamed Ordinary Watercourse.
- 3.3.171 The EA 'Historical Flood Map' indicates that Green Hill D has not historically flooded and neither has the area immediately surrounding it.

#### *Surface Water Flood Risk*

- 3.3.172 The EA 'Flood Risk from Surface Water' map indicates that Green Hill D ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 3.3.173 As describe in the fluvial section above, the surface water flooding extents largely match the courses of the
- 3.3.174 and drainage ditches and ordinary watercourses.





3.3.175 The location of flood risk and drainage designations in relation to Green Hill D are shown on **Figure 9.4** in **Appendix 9**

### Green Hill E

#### Site areas

- Green Hill E –308.11ha.

#### Use

- Green Hill E is predominantly in agricultural use. Small sections of Green Hill E include woodland, whilst a gas pumping station is present off Wilby Road within the eastern side of Green Hill E.

#### Features

3.3.176 Green Hill E is the largest of the Sites for the Scheme. It is situated 300m to the east of Green Hill D. It spans a distance of 3.2 kilometres from its northernmost to southernmost points. The Green Hill E is located within Mears Ashby and Wilby parishes in North Northamptonshire.

3.3.177 Green Hill E is characterised by agricultural fields separated by hedgerows and scattered trees. A small number of woodland parcels are present within and adjacent to Green Hill E. These include Wilby Spinney along the eastern boundary of Green Hill E site. The topography of Green Hill E is defined by a central plateau bordered on both the east and west by small but relatively steep valleys which feed Swanspool Brook. As a result, the elevation of the site ranges from approx. 75-115m AOD. Green Hill E benefits from a number of existing agricultural access from the adjacent roads.

3.3.178 An 11kV overhead power line (OHL) crosses east-west through the centre of Green Hill E to the south of and parallel to Wilby Road.

#### Settlements

3.3.179 Green Hill E is located between a number of settlements. Mears Ashby is located immediately to the west, while Earls Barton is located no more than 500m from the southern boundary of Green Hill E. To the east of Green Hill E are the village of Wilby (1.3km) and the western edge of the town of Wellingborough (2km). There are furthermore a small number of isolated or dispersed properties near to Green Hill E, including The Grange, and Wilby Hall.

3.3.180 There is a gas pumping station on the on the south side of Wilby Road, which is surrounded by the eastern side of Green Hill E. This complex also contains a visually prominent transmission tower.

#### Roads

3.3.181 Wilby Road runs through the middle of Green Hill E from east to west.. The road connects the village of Mears Ashby to Wellingborough. The road name changes to Mears Ashby Road where it crosses into the parish of Wilby.

3.3.182 To the west of Green Hill E, there is a separate road also named Mears Ashby Road. This road originates from the western edge of Mears Ashby and runs south to Earls Barton. This road runs down the western boundary of Green Hill E. Mears Ashby Road meets the A4500 Main Road, which runs near to the southern boundary of Green Hill E. The A4500 is a partially-dualled secondary A-route between Wellingborough and Northampton via Wilby and Earls Barton.

#### Public Rights of Way (PRoW)

3.3.183 Footpath TN1 is routed through Green Hill E extending from Mears Ashby Road heading north to the village of Mears Ashby. Together with the adjacent Footpath TN2, these



provide foot access from Mears Ashby to the nearby Sywell Country Park and Reservoir. These footpaths also form part of the Northamptonshire Round long-distance route. Footpath TU3/UL23/UL24 is located within Green Hill E at its northern most point, linking Wilby Hall to Cromwell Spinney on the outskirts of Wellingborough. A dead-end byway TN10 runs for only 200m from Mears Ashby towards Green Hill E but terminated short of the Green Hill E boundary.

#### **Airfields**

- 3.3.184 The William Pitt Airstrip at The Grange is a private grass airstrip immediately to the west of Green Hill E. An extension to the grass runway in 2018-2020 has meant the southern end of the runway intrudes beyond the Green Hill E boundary into field EF9.
- 3.3.185 Sywell Aerodrome is situated 2km north-west and Hold Farm Airstrip lies approximately 4.9km north of Green Hill E.

#### **Rivers**

- 3.3.186 There is an Unnamed Ordinary Watercourse which flows through Green Hill E southwards along the western boundary and then follows around to the southern boundary in an easterly to north easterly direction. A second Unnamed Ordinary Watercourse flows along the whole eastern boundary of Green Hill E before converging with the first Unnamed Ordinary Watercourse 130m south-east of Green Hill E. Once converged, the watercourse becomes Swanspool Brook as it passes under the A4500 Main Road and makes its way past the village of Wilby into Wellingborough where it adjoins the River Nene.

#### **Historic designations**

- 3.3.187 The extent of historic environment designations within the boundaries of Green Hill E are shown on Figure 12.1.

#### **Conservation Areas**

- 3.3.188 Mears Ashby Conservation Area is located approximately 45m to the south-west of Green Hill E at its nearest point.
- 3.3.189 Earls Barton Conservation Area is located approximately 700m to the south of Green Hill E.

#### **Listed Buildings**

- 3.3.190 There is a cluster of 29 listed buildings at the village of Mears Ashby, the nearest being the grade II listed The Old Farmhouse (NHLE 1371722) approximately 80m west of Green Hill E, and the grade II listed 5, Duchess End (NHLE 1191195) approximately 85m south of Green Hill E. These are all grade II listed buildings apart from the Church of All Saints (NHLE 1040692) and Mears Ashby Hall which are both grade II\*.
- 3.3.191 There is a cluster of 35 listed buildings at the village of Earls Barton, the nearest being the grade II listed Rose Cottage (NHLE 171677), and the grade I listed Church of All Saints (NHLE 1294226) approximately 800m and 900m to the south of Green Hill E respectively. Apart from the latter, all of these are grade II listed buildings.
- 3.3.192 Sandpit Barn (NHLE 1040780) approximately 450m to the east of Green Hill E is a grade II listed building.

#### **Archaeological Features**

- 3.3.193 The Earls Barton motte castle Scheduled Monument (NHLE 1009510) is located approximately 860m to the south of Green Hill E.



### **Landscape designations**

- 3.3.194 The extent of landscape designations within the boundaries of Green Hill E are shown on Figure 7.6 Landscape Receptors.
- 3.3.195 There are no Registered Parks and Gardens on or within 2km of Green Hill E. The closest Registered Park and Garden is the Castle Ashby Estate which is located 3.6km south of Green Hill E. There are no other Registered Parks and Gardens are within 5km of Green Hill E.
- 3.3.196 There is no Ancient Woodland on Green Hill E.
- 3.3.197 The nearest block of Ancient Woodland is Sywell Wood (Ancient Replanted Woodland), which is located 1.5km northeast of Green Hill E. There are two blocks of Ancient Woodland between 2km and 5km of Green Hill E which include Hardwick Wood (Ancient Replanted Woodland) which is located 2.9km northeast of Green Hill E and Withmale Park Wood (Ancient Replanted Woodland) located 4km north of Green Hill E.
- 3.3.198 Green Hill E is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 3.3.199 Green Hill E is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.
- 3.3.200 Green Hill E is located within two Landscape Character Types (LCT), LCT Profile: 5 Clay Plateau; and LCT Profile: 4 Rolling Ironstone Valley Slopes, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**. These are broken down further into Landscape Character Areas (LCA) LCA Profile: 5b Sywell Plateau and LCA Profile: 4c Ecton and Earls Barton Slopes.
- 3.3.201 There are a further two LCT's located between 2km and 5km south of Green Hill E; LCT Profile: 18 Broad River Valley Floodplain; and LCT Profile 12 Limestone Valley Slopes.
- 3.3.202 These are broken down further into LCAs and include; LCA Profile: 4b Moulton Slopes; LCA Profile: 4e Pitsford Water; LCA Profile: 4f Kettering and Wellingborough Slopes; LCA Profile: 12a Wollaston to Irchester and LCA Profile: 18d The Nene - Billing Wharf to Woodford Mill.

### **Ecological designations**

- 3.3.203 The extent of ecological designations within the boundaries of Green Hill E are shown on Figure 8.1.

### **Internationally Designated Sites**

- 3.3.204 The Upper Nene Valley Gravel Pits SPA and Ramsar site is located 2.6km south-east of Green Hill E. The globally important designated site comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of the village of Thrapston. An extensive mosaic of wetland habitats is regularly used by over 20,000 wildfowl and wading birds and support major overwintering
- 3.3.205 bird assemblages. Qualifying features of the site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

### **Nationally Designated Sites**

#### *Sites of Special Scientific Interest (SSSI)*

- 3.3.206 Hardwick Lodge Meadow SSSI is located 2.5km north-west of Green Hill E. This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates.



3.3.207 Wollaston Meadows SSSI is located 4km east of Green Hill E. This SSSI is on the banks of the River Nene and is composed of two species-rich hay meadows with overgrown hedgerows and ditch habitats.

**Locally Designated Sites**

3.3.208 Sywell Reservoir and Country Park LWS is located 300m west of Green Hill E. The Country Park comprises reservoir and a mosaic of other habitats, including neutral grassland, scrub woodland and swamp edge habitat.

3.3.209 Wilby Meadows Stream LWS is located 700m east of Green Hill E. This is a section of the Wilby Brook that flows through farmland habitats connected to the watercourses bounding the south of Green Hill E and is designated for its water vole colony.

3.3.210 Park Farm Industrial Estate LWS is located 1km north-east of Green Hill E. The site contains a mosaic of grassland, scrub and woodland habitats.

3.3.211 Vivians Covert LWS is located 1.3km north-east of Green Hill E, a small woodland in which at least seven ancient woodland indicators are present.

3.3.212 Wilby Bay Meadows LWS is located 1.9km to the east of Green Hill E and comprised a neutral grassland lowland meadow. Although poor management has comprised the LWS site, species- rich grassland patches and neutral indicator species remain.

**Mineral designations**

3.3.213 There are no minerals safeguarding areas covering Green Hill E.

**Flood Risk and Drainage Designations**

*Fluvial Flood Risk*

3.3.214 A network of land drainage ditches is located within Green Hill E. Flows within the ditches are expected to flow in a south-westerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.

3.3.215 The majority of Green Hill E is situated in Flood Zone 1. However, an area to the western boundary, southern boundary and the south-eastern boundary are within the extents of Flood Zone 3. The EA 'Historical Flood Map' indicates that Green Hill E has not historically flooded and neither has the area immediately surrounding it.

*Surface Water Flood Risk*

3.3.216 The EA 'Flood Risk from Surface Water' map indicates that Green Hill E ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).

3.3.217 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches and ordinary watercourses.

3.3.218 The location of flood risk and drainage designations in relation to Green Hill E are shown on **Figure 9.5** in **Appendix 9**

**Green Hill F**

**Site areas**

- Green Hill F –291.20ha.

**Use**

- The entirety of Green Hill F is in agricultural use.



### **Features**

- 3.3.219 Green Hill F consists of agricultural fields and is located in the parishes of Easton Maudit and Bozeat. Green Hill F lies entirely within North Northamptonshire. The northwestern boundary of Green Hill F follows the parish boundary of Grendon.
- 3.3.220 The shape of Green Hill F is irregular with salients at both the northeastern and southern ends. The largest extent of Green Hill F is approximately 3.8km from its northernmost to southernmost points. Green Hill F is characterised by irregularly shaped and sized agricultural fields bounded by hedgerows and few scattered trees. The topography of the area is characterised by gently rolling hills separated by small streams. Green Hill F generally slopes up towards the east and to the south. The elevation of Green Hill F ranges from approx. 55-105m AOD. Green Hill F benefits from a number of existing agricultural access from the adjacent roads.
- 3.3.221 A number of overhead electricity transmission lines cross Green Hill F. In the north of Green Hill F, a 132kV OHL crosses the northernmost field northwest to southeast, passing to the north of both the nearby villages of Grendon and Bozeat. A 400kV OHL briefly crosses over the southernmost corner of Green Hill F, although no pylons are situated within the site boundary.

### **Settlements**

- 3.3.222 Green Hill F “wraps” around the north, east and south of the village of Easton Maudit. Green Hill F is located less than 300m west of the village of Bozeat, being separated by the A509. A small number of dispersed properties lie within close proximity of Green Hill F boundary including Slype House, Oakfield, Home Farm, and Low Farm.

### **Roads**

- 3.3.223 The most western field of Green Hill F is separated from the rest of Green Hill F by Grendon Road, which connects Grendon to Easton Maudit. This route continues as Easton Lane, running east-west between Easton Maudit and Bozeat, once again crossing Green Hill F between the villages. The A509 runs to the east of Green Hill F and in three distinct places borders Green Hill F.

### **Public Rights of Way (PROW)**

- 3.3.224 The area around Green Hill F hosts a network of PROWs. A number of these cross through Green Hill F in two distinct areas. In the north, Footpaths TA1, TA3, TA4, TD2, TD3, TF5, and TF11 all cross Green Hill F and intersect. Some of these references refer to the same route where they cross into different parishes (namely Bozeat, Easton Maudit, and Grendon).
- 3.3.225 Footpath TA4 enters Green Hill F at the southern point of Field FF6 before turning northeast and exiting Green Hill F through FF4. Footpath TA1/TF11 branches off TA4 in the centre of Green Hill F and continues north then west towards Lower End, Grendon. Footpath TD3 also meets TA4 in the centre of Green Hill F on a southwesterly heading towards Easton Maudit village. Footpath TA3/TD2/TF5 provides a direct walking route between Grendon and Bozeat, and crosses through Green Hill F through fields FF8, FF11 and FF19. This path also intersects Footpath TD3.
- 3.3.226 In the southern portion of Green Hill F, Footpath TD5 cuts in a consistent direction from Oakfield, Easton Maudit towards Lavendon. TD5 is met by TD7 which tracks west towards Yardley Hastings. Finally, Bridleway TD8 crosses through the site at field FF28 into Horn Wood, before crossing Green Hill F again at Field FF33, where it crosses the route of Footpath TD5. The bridleway thereafter goes southwest towards Warrington via Old Pastures woodland.

### **Airfields**

- 3.3.227 Easton Maudit Airfield is a private grass strip associated with Home Farm, immediately adjacent to the boundary of Green Hill F. The runway is situated no less than 50 meters



north-northwest of fields FF29 and FF30. Due to the runway orientation and the shape of Green Hill F, approach to the runway from either direction involves flying over Green Hill F.

- 3.3.228 Tower Farm Airstrip lies approximately 3.2km northeast of Green Hill F.

#### **Rivers**

- 3.3.229 There is a network of land drainage ditches located within Green Hill F, as well as three tributaries of an Unnamed Main River which run through the centre in a northerly direction based on local topography towards the confluence of Grendon Brook (to the north of Green Hill F), then gradually making its way to the River Nene.

#### **Historic designations**

- 3.3.230 The extent of historic environment designations within the boundaries of Green Hill F are shown on Figure 12.1.

#### **Conservation Areas**

- 3.3.231 Easton Maudit Conservation Area is located approximately 10m east of Green Hill F at its nearest point.
- 3.3.232 Grendon Conservation Area is located approximately 850m to the north-west of Green Hill F.

#### **Listed Buildings**

- 3.3.233 There is a cluster of 13 listed buildings in the village of Easton Maudit, the nearest being the grade II listed The Old Vicarage (NHLE 1040782) approximately 150m west of Green Hill F. These are all grade II listed buildings apart from the Church of St Peter and St Paul (NHLE 1189610) which is grade I, and 22 High Street (NHLE 1040784) which is grade II\*. To the south of the village, Home Farmhouse (NHLE 1040785) is approximately 25m to the north-west of Green Hill F at its nearest point. This Grade II Listed Building has an incorrect grid reference in its NHLE entry which places it approximately 620m further to the north, towards the centre of the village of Eastern Maudit.
- 3.3.234 There is a cluster of 29 listed buildings in Grendon, the nearest being the grade II listed 29, Chequers Lane (NHLE 1040738) approximately 700m north-west of Green Hill F. These are all grade II listed buildings apart from the Church of St Mary (NHLE 1190552) and Grendon Hall (NHLE 1040746) which are grade II\*.
- 3.3.235 There is a cluster of 16 listed buildings in the village of Bozeat, the nearest being the grade II listed Bozeat War Memorial (NHLE 1428093) approximately 350m to the east of Green Hill F. These are all grade II listed buildings apart from the Church of St Mary (NHLE 1040795) which is grade I.
- 3.3.236 There is a cluster of four grade II listed buildings at the eastern edge of Castle Ashby Park, the nearest comprising East or Nevitts Lodge (NHLE 1189903), Left Gate pier at East or Nevitt's Lodge (NHLE 1189913) and Right Gate pier at East or Nevitt's Lodge (NHLE 1041611) all approximately 900m to the west of Green Hill F.
- 3.3.237 Low Farmhouse (NHLE 1371681) is approximately 110m to the south-west of Green Hill F at its nearest point and is a grade II listed building.
- 3.3.238 Greenfield Lodge (NHLE 1040669) is approximately 635m to the north-east of Green Hill F and is a grade II listed building.

#### **Archaeological Features**

- 3.3.239 Aerial photography indicates that Easton Lodge Scheduled Monument (NHLE 1003876) is approximately 25m to the south of Green Hill F.



### **Registered Parks and Gardens**

- 3.3.240 There are no Registered Parks and Gardens on Green Hill F. The closest Registered Park and Garden is the Castle Ashby Grade I Registered Park and Garden (NHLE 1000385) is located 750m west. Other Registered Parks and Gardens within 5km include Hinwick House located 3km northeast of Green Hill F and Hinwick Hall located 3.4km northeast.

### **Landscape designations**

- 3.3.241 The extent of landscape designations within the boundaries of Green Hill F are shown on Figure 7.6 Landscape Receptors.
- 3.3.242 There is no Ancient Woodland on Green Hill F.
- 3.3.243 The nearest block of Ancient Woodland is Horn Wood (Ancient & Semi-Natural Woodland), which is adjacent to the southeastern extent of Green Hill F.
- 3.3.244 There are a further nine blocks of Ancient Woodland within 2km of Green Hill F including; Cold Oak Copse (Ancient Replanted Woodland) to the west; Nun Wood (Ancient & Semi-Natural Woodland) to the south east; Three Shrine Wood (Ancient & Semi-Natural Woodland) to the south east; The Slipe (Ancient & Semi-Natural Woodland) to the south east; Templegrove Spiney (Ancient & Semi-Natural Woodland) to the east; and four smaller Spinneys which are unnamed blocks of Ancient and Semi-Natural Woodland to the south.
- 3.3.245 Green Hill F is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 54 Yardley-Whittlewood Ridge (NE501).
- 3.3.246 The site is located at the northern portion of the NCA Profile: 91 Yardley-Whittlewood Ridge. A further two NCA's are located within 2km of Green Hill F and include NCA Profile: 89 Northamptonshire Vales to the north and NCA Profile: 88 Bedfordshire and Cambridgeshire Claylands to the south.
- 3.3.247 Green Hill F is located within three Landscape Character Types (LCT), LCT Profile: 12 Limestone Valley Slopes; LCT Profile: 6 Undulating Claylands and LCT Profile: 8 Low Wooded Clay Ridge, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 3.3.248 These are broken down further into Landscape Character Area's (LCA) and include; LCA Profile: 12a Wollaston to Irchester; LCA Profile: 6c Bozeat Claylands; LCA Profile: 8b Salcey Forest and Yardley Chase.
- 3.3.249 There are a further eight LCT's located between 2km and 5km south of Green Hill F; LCT Profile: 4 Rolling Ironstone Valley Slopes; LCT Profile: 18 Broad River Valley Floodplain; LCT Profile: 1 Clay Farmland; LCT Profile: 2 Wooded Wolds; LCT Profile: 3 Limestone Valleys; LCT Profile: 1 Clay Plateau Farmland; LCT Profile: 2 River Valley and LCT Profile: 5 Undulating Clay Farmland.
- 3.3.250 These are broken down further into LCAs and include; LCA Profile: 18d The Nene - Billing Wharf to Woodford Mill; LCA Profile: 4c Ecton and Earls Barton Slopes; LCA Profile: 6b Hackleton Claylands; LCA Profile: 2A Hinwick; LCA Profile: 1B Riseley; LCA Profile: 3A Harrold - Great Ouse; LCA Profile: 1a Yardley Clay Plateau Farmland; and LCA Profile: 5a Ouse Northern Undulating Valley Slopes.

### **Ecological designations**

- 3.3.251 The extent of ecological designations within the boundaries of and nearby Green Hill F are shown on Figure 8.1.

### **Internationally Designated Sites**

- 3.3.252 The Upper Nene Valley Gravel Pits SPA and Ramsar site is located approx. 2km north-west of Green Hill Site F. The globally important site comprises a chain of exhausted sand and



gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of Thrapston. An extensive mosaic of wetland habitats is regularly used by over 20,000 wildfowl and wading birds and support major overwintering bird assemblages. Qualifying features of the designated site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

### **Nationally Designated Sites**

#### *Sites of Special Scientific Interest (SSSI)*

- 3.3.253 Bozeat Meadow SSSI is located 75m east of Green Hill F, beyond the A509. This protected site comprises unimproved grassland on well drained clay and loam soils. Diverse botanical communities are present across medieval ridge and furrows.
- 3.3.254 Dungee Corner Meadow SSSI is located 2.2km east of Green Hill F. The well drained hay meadow on boulder clay is traditionally managed, including no use of artificial fertilisers or herbicides, and with diverse flora. A population of locally rare green-winged orchids are also present
- 3.3.255 Odell Great Wood SSSI is located 4.8km east of Green Hill F. This is a large wet ash-maple woodland with exceptionally rich flora. The extensive and well-developed system of rides is another important feature, adding greatly to the value of the site for flowering plants, butterflies and other invertebrates.
- 3.3.256 Yardley Chase SSSI is approx. 3.8km south-west of Green Hill F. Military use of the site has resulted in a long absence of intensive agriculture, supporting the retention of diverse semi-natural habitats (woodland and unimproved grassland) present and increased value for invertebrates. This includes 30 breeding butterfly species records.
- 3.3.257 Wollaston Meadows SSSI is located approx. 4km north-east of Green Hill F. This site on the banks of the River Nene is composed of two species-rich hay meadows with overgrown hedgerows and ditch habitats.

### **Locally Designated Sites**

#### *Nature Reserves (LNR)*

- 3.3.258 Summer Leys LNR is located 2.7km north of Green Hill F. This is an excellent nature reserve easily qualifying as a LWS with fen, swamp and marsh indicators recorded within the gravel pits and neutral grassland indicators in the surrounding grasslands.

#### *County Wildlife Sites (CWS)*

- 3.3.259 Nun Wood CWS is located 1.2km north-west of Green Hill F. This is a broadleaved ancient woodland, neutral grassland and a pond, which is directly connected to Threshire Wood.
- 3.3.260 Templegrove Spinney CWS is located 1.8km to the west of Green Hill F. This is a broadleaved, semi-natural, ancient woodland.
- 3.3.261 The Slipe CWS is located 1.2km east of Green Hill F. This is a broadleaved, semi-natural, ancient woodland.

#### *Local Wildlife Sites (LWS)*

- 3.3.262 Bozeat Cemetery LWS is located 280m to the east of Green Hill F. This cemetery contains areas of species rich meadow.
- 3.3.263 Bozeat Glebe Meadow LWS is located 510m to the east of Green Hill F. This is a former hay meadow that has still retained a decent meadow flora, in particular on the slopes.
- 3.3.264 Bozeat Verge LWS is located 15m to the south of Green Hill F. This is a species rich wildflower verge formed on the road cutting of the A509 to the west of Bozeat.





- 3.3.265 Bozeat Wood LWS is located 620m to the south-east of Green Hill F. This is a small oak-ash woodland, possibly ancient in origin, with an interesting ground flora.
- 3.3.266 Castle Ashby Parkland LWS is located 1.3km west of Green Hill F. Situated centrally within the Castle Ashby parkland, this woodland extends between the church, ponds and boathouse. A large variety of parkland and semi-natural species, and a largely semi-natural ground flora but with several ancient woodland species have been recorded, alongside some unusual parkland additions.
- 3.3.267 Castle Ashby Woodland LWS is located 2km north-west of Green Hill F. This area of old woodland, probably originating from the establishment of Castle Ashby parkland, is well-established and supports some unusual flora and range of invertebrates.
- 3.3.268 Cold Oak Copse LWS is located 310m to the west of Green Hill F. This site is listed on the Northants Ancient Wood inventory, with six ancient woodland indicators recorded.
- 3.3.269 Grendon Quarter Pond LWS is located 1.5km north-west of Green Hill F, and comprises a large fishing lake with a fringe of marginal vegetation and a surround of tall trees.
- 3.3.270 Horn Wood LWS is adjacent to the south-eastern boundary of Green Hill F. This site qualifies as a LWS with 14 ancient woodland indicators recorded.
- 3.3.271 Long Furlong and Old Pastures LWS is located 490m to the south-west of Green Hill F. This is a large area of replanted ancient woodland, with 16 ancient woodland indicators recorded.
- 3.3.272 Menagerie Pond LWS is located 1.2km west of Green Hill F. Areas of thick fringing emergent vegetation and occasional aquatic plants support diverse invertebrate communities associate with the lake situated within Castle Ashby parkland.
- 3.3.273 Par Pond LWS is located 1.1km west of Green Hill F. This is a long lake on the edge of Castle Ashby Park, well-vegetated with emergent and marginal vegetation and surrounded by parkland habitats.
- 3.3.274 Scotland Pond LWS is located 1.7km west of Green Hill F. This is a large angling lake fringed with marginal and emergent vegetation.
- 3.3.275 The Basin LWS is located 1.9km north-west of Green Hill F. This is a narrow lake within the Castle Ashby Estate, with a good cover of emergent and marginal vegetation providing habitat for birds and amphibians.
- 3.3.276 Threshire Wood LWS is located 1.6km south-east of Green Hill F. This is an ancient semi-natural woodland with a good range of ground flora species.
- 3.3.277 Warren Ponds LWS is located 1.3km to the west of Green Hill F. These ponds extend the habitat of Par Pond LWS and provide cover for birds and amphibians. Some of the ponds within Warren Ponds LWS are of significance as an extension to the wetland habitat corridor network.
- 3.3.278 Yardley Brook Field LWS is located 590m to the west of Green Hill F. This field has areas of species rich calcareous grassland associated with the old earthworks.

#### **Geological designations**

- 3.3.279 Green Hill F lies within a Minerals Safeguarding Area (sand and gravel) as defined in the adopted Northamptonshire Minerals and Waste Local Plan (2017). In addition, Green Hill F abuts an allocation for future mineral extraction associated with Bozeat Quarry. Green Hill F is within a Minerals Consultation Zone associated with the allocation for future mineral extraction.



## **Flood Risk and Drainage Designations**

### *Fluvial Flood Risk*

- 3.3.280 A network of land drainage ditches is located within Green Hill F, as well as three tributaries of an Unnamed Main River flows within the ditches are expected to flow in a northerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain, whereas the Main Rivers are the responsibility of the EA to maintain.
- 3.3.281 The majority of Green Hill F is situated in Flood Zone 1. However, the northern and north-western boundary are shown to be
- 3.3.282 within Flood Zone 3, as well as sections of the Unnamed Main River Tributaries within Green Hill F are within the extents of Flood Zone 3. The EA 'Historical Flood Map' indicates that Green Hill F has historically flooded in the north, due to flooding at the River Nene in March 1947.
- 3.3.283 As areas of Green Hill F are within Zone 3 (High risk) of flooding. EA modelling can detail the flood risk depths and extents from the River Nene; however this data response is currently awaited. A comprehensive hydraulic modelling exercise is ongoing to refine the flood extents and depths and inform the masterplanning exercise, this will be included within the relevant ES Chapter.

### *Surface Water Flood Risk*

- 3.3.284 The EA 'Flood Risk from Surface Water' map indicates that the site ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 3.3.285 As describe in the fluvial section above, the surface water flooding extents largely match the courses of the course of land drainage ditches and ordinary watercourses.
- 3.3.286 The location of flood risk and drainage designations in relation to Green Hill F are shown on **Figure 9.6** in **Appendix 9**.

## **Green Hill G**

### **Site areas**

- Green Hill G – 168.80ha.

### **Use**

- The entirety of Green Hill G is in agricultural use.

### **Features**

- 3.3.287 Green Hill G consists of agricultural fields and is located in the parishes of Warrington and Lavendon. Green Hill G lies entirely within Milton Keynes. The northeast corner of Green Hill G is immediately adjacent to the tripoint of North Northamptonshire, Milton Keynes, and Bedford Borough.
- 3.3.288 Green Hill G is characterised by relatively open agricultural fields separated by some hedgerows and few scattered trees. It is however bordered by more substantial woodland to the northeast called Threshire Wood. The land generally slopes gently down from the north to the south, ranging from approx. 70-105 AOD. A shallow valley runs through the centre of Green Hill G formed by a small stream. Green Hill G benefits from a well defined main access from the A428.
- 3.3.289 A 400kV overhead power line (OHL) crosses northwest-southeast across the southern half of Green Hill G.



### **Settlements**

- 3.3.290 The village of Lavendon is approximately 600m southeast from Green Hill G, while the hamlet of Warrington consists of a small number of loosely dispersed properties to the west and south. The village of Bozeat is situated 2.7km north and Olney is situated approximately 2.6km to the southwest of Green Hill G. In addition to a small number of isolated properties, including Northey Farm which is situated immediately to the northwest, there is a petrol service station to the south-west, accessible via the Warrington Toll Bar Roundabout.

### **Roads**

- 3.3.291 Green Hill G is bordered to the west by the A509 London Road, and to the south by the A428 Northampton Road. The A509 and the A428 meet at Warrington Toll Bar Roundabout, moving southeast to the Village of Lavendon. These routes form major links between urban centres in the area: the A428 links Bedford to Northampton, whilst the A509 links Wellingborough to Milton Keynes. The limited access Tinick Lane comes off the A428 into Green Hill G some 750m along its southern boundary.

### **Public Rights of Way (PROW)**

- 3.3.292 Bridleway Lavendon/BW2 and Lavendon/BW15 form a continuous north-south route along most of the eastern boundary of Green Hill G, including the length of Tinick Lane. The bridleway continues in both directions beyond Green Hill G towards Hinwick to the north, and Clifton Reynes to the south. This route forms part of the Three Shires Way. Bridleway Lavendon/BW14 links Tinick Lane to Castle Road along the northern boundary of field GF13, while Bridleway Lavendon/BW4 links Lavendon/BW2 to Castle Road via the north of field GF9. Originating from Northey Farm, Footpath Lavendon/FP5 cuts through the centre of Green Hill G from the northwest corner to the centre-east of Green Hill G where it meets Bridleway Lavendon/BW2 and Lavendon/BW15. This section forms part of the Milton Keynes Boundary Walk. The footpath continues on as Lavendon/FP1 into the village of Lavendon.

### **Rivers**

- 3.3.293 There is a network of land drains (Ordinary Watercourses) which join and flow southwards through the centre of Green Hill G, the land drains become a more rational watercourse flowing through Lavendon to the south and ultimately discharges to the River Great Ouse (Main River).

### **Airfields**

- 3.3.294 Easton Maudit Airfield lies approximately 2.4km from the boundary of Green Hill G. No other airstrips are located within 5km of Green Hill G.

### **Historic designations**

- 3.3.295 The extent of historic environment designations within the boundaries of Green Hill G are shown on Figure 12.1.

### **Conservation Areas**

- 3.3.296 The Lavendon Conservation Area is located approximately 575m to the south-east of Green Hill G. There are no other Conservation Areas within 2km.

### **Listed Buildings**

- 3.3.297 There is a cluster of 13 listed buildings with the village of Lavendon, all of which are located within the Conservation Area, the nearest being at 33, Northampton Road (NHLE 1212621) which is located approximately 600m to the south-east of Green Hill G. These are all grade II listed buildings apart from the Church of St Peter and St Michael (NHLE 1212619) which is grade I.



- 3.3.298 There is also a cluster of five grade II listed buildings at Lavendon Grange, the nearest being Lavendon Grange itself which is approximately 845m to the south-east of Green Hill G.
- 3.3.299 Home Farmhouse (NHLE 128918) is approximately 700m to the south-west of Green Hill G, and is a grade II Listed Building.
- 3.3.300 Warrington House Farm (NHLE 1289233) is located approximately 800m to the south-west of Green Hill G and is a grade II listed building.

#### **Archaeological Features**

- 3.3.301 The Lavendon Castle: a motte and bailey and associated enclosures at Castle Farm Scheduled Monument (NHLE 1009542) is located approximately 300m to the east of Green Hill G.
- 3.3.302 *The Bury: a ringwork and associated earthworks 100m north of Lavendon Church* Scheduled Monument (NHLE 1011295) is located approximately 600m to the south-east of Green Hill G.
- 3.3.303 *The Lavendon Abbey: the site of a Premonstratensian abbey, fishponds and field system at Lavendon Grange* Scheduled Monument (NHLE 1011309) is located approximately 550m to the south of Green Hill G.

#### **Registered Parks and Gardens**

- 3.3.304 There are no Registered Parks and Gardens within 2km of Green Hill G, the nearest being *Historic Park and Garden to Turvey House* (NHLE 1431122) which is approximately 2.6km to the south-east and registered at grade II, and *Castle Ashby* (NHLE 100385) which is located approximately 4.3km to the north-east and which is registered as Grade I listed.

#### **Landscape Designations**

- 3.3.305 The extent of landscape designations within the boundaries of Green Hill G are shown on Figure 7.6 Landscape Receptors.
- 3.3.306 There is no Ancient Woodland on Green Hill G.
- 3.3.307 The northern extent of the eastern boundary of Green Hill G is directly bordered by two blocks of Ancient Woodland which include Three Shire Wood and Nun wood.
- 3.3.308 There are a further eight blocks of Ancient Woodland within 2km of Green Hill G. The closest of which include Barslay Spinney located 15m west of Green Hill G, Broadlane Spinney, Nuniron Spinney and Newland Spinney located between 400 and 800m west of Green Hill G. Other larger blocks of Ancient Woodland within 2km include, the Slipe located 500m to the north, Lavendon Wood located 720m east and Snip Wood located 1.2km southeast of Green Hill G.
- 3.3.309 Green Hill G is located within two National Character Areas (NCA's) as illustrated on **Figure 7.5** and defined by Natural England as NCA Profile: 91 Yardley-Whittlewood Ridge (NE501) and NCA Profile: 88 Bedfordshire and Cambridgeshire Claylands (NE555).
- 3.3.310 Green Hill G is located within two Landscape Character Types (RLCT), LCT Profile: 1 Clay Plateau Farmland and LCT Profile: 5 Undulating Clay Farmland, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 3.3.311 These are broken down further into Landscape Character Area's (LCA) and include; LCA Profile: 1a Yardley Clay Plateau Farmland; LCA Profile: 5a Ouse Northern Undulating Valley Slopes.
- 3.3.312 There are a further eight LCT's located between 2km and 5km south of Green Hill G; LCT Profile: 6 Undulating Claylands; LCT Profile: 8 Low Wooded Clay Ridge; LCT Profile: 12 Limestone Valley Slopes; LCT Profile: 1 Clay Farmland; LCT Profile: LCT 2 Wooded Wolds;



LCT Profile: 3 Limestone Valleys; LCT Profile: 2 River Valley and LCT Profile: 5 Undulating Clay Farmland.

- 3.3.313 These are broken down further into Landscape Character Areas (LCA) and include; LCA Profile: 6b Hackleton Claylands; LCA Profile: 6c Bozeat Claylands; LCA Profile: 8b Salcey Forest and Yardley Chase; LCA Profile: 12a Wollaston to Irchester; LCA Profile: 1A Cranfield to Stagsden; LCA Profile: 2A Hinwick; LCA Profile: 2B Pavenham; LCA Profile: 3A Harrod - Great Ouse; LCA Profile: 2b Ouse Rural River Valley; and LCA Profile: 5b Ouse Southern Undulating Valley Slopes.

#### **Ecological Designations**

- 3.3.314 The extent of ecological designations within the boundaries of Green Hill G are shown on **Figure 8.1**.

#### **Internationally Designated Sites**

- 3.3.315 The Upper Nene Valley Gravel Pits SPA and Ramsar is located approx. 6.2km north of Green Hill G. The globally important site comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of Thrapston. An extensive mosaic of wetland habitats is regularly used by over 20,000 wildfowl and wading birds and support major overwintering bird assemblages. Qualifying features of the designated site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

#### **Nationally Designated Sites**

##### *Sites of Special Scientific Interest (SSSI)*

- 3.3.316 Bozeat Meadow SSSI is located 2.9km north of Green Hill G. This protected site comprises unimproved grassland on well drained clay and loam soils. Diverse botanical communities are present across medieval ridge and furrows.
- 3.3.317 Dungee Corner Meadow SSSI is located 4.2km north-east of Green Hill G. The well drained hay meadow on boulder clay is traditionally managed, including no use of artificial fertilisers or herbicides, and with diverse flora. A population of locally rare green-winged orchids are also present.
- 3.3.318 Yardley Chase SSSI is approx. 3.8km west of Green Hill G. Military use of the SSSI site has resulted in a long absence of intensive agriculture, supporting the retention of diverse semi-natural habitats (woodland and unimproved grassland) present and increased value for invertebrates. This includes 30 breeding butterfly species records.

#### **Locally Designated Sites**

##### *Nature Reserves (LNR)*

- 3.3.319 Harrod Odell Country Park LNR is located 4.5km to the north-east of Green Hill G. This site is on the edge of the River Ouse, and contains two lakes, seasonally flooded woodland, osier beds and water meadows.

##### *County Wildlife Sites (CWS)*

- 3.3.320 Nun Wood CWS is located adjacent to the north-eastern boundary of Green Hill G. This is a broadleaved ancient woodland, neutral grassland and a pond, which is directly connected to Threeshire Wood.
- 3.3.321 Templegrove Spinney CWS is located 1.6km to the north-east of Green Hill G. This is a broadleaved, semi-natural, ancient woodland.
- 3.3.322 The Slipe CWS is located 500m to the north-east of Green Hill G. This is a broadleaved, semi-natural, ancient woodland.



### Local Wildlife Sites (LWS)

- 3.3.323 In Bozeat Wood is located 300m to the north of Green Hill G. This is a small oak-ash woodland, possibly ancient in origin, with an interesting ground flora.
- 3.3.324 Horn Wood is located 1.4km to the north of Green Hill G. This site qualifies as a LWS with 14 ancient woodland indicators recorded.
- 3.3.325 Lavendon Wood is located 700m to the east of Green Hill G. This is an ancient semi-natural woodland with a good range of ground flora species.
- 3.3.326 Long Furlong and Old Pastures is located 900m to the west of Green Hill G. This is a large area of replanted ancient woodland, with 16 ancient woodland indicators recorded.
- 3.3.327 Threshire Wood is located adjacent to the north-eastern boundary of Green Hill G. This is an ancient semi-natural woodland with a good range of ground flora species.

### Mineral Designations

- 3.3.328 The southern edge of Green Hill G lies within two mineral safeguarding area shown in the Milton Keynes Minerals Local Plan one for sand and gravel and the other for limestone.

### **Flood Risk and Drainage Designations**

#### Fluvial Flood Risk

- 3.3.329 There is a network of land drains which join and flow southwards through the centre of Green Hill G, the land drains become a more rational watercourse flowing through Lavendon to the south and ultimately discharges to the River Great Ouse. Flows within the ditches are expected to flow in a south-westerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.
- 3.3.330 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 3.3.331 The majority of Green Hill G is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding. However, a limited area to the southern boundary is identified as being in Flood Zone 3, associated with the land drain and unnamed Ordinary watercourse. The EA 'Historical Flood Map' indicates that Green Hill G has not historically flooded and neither has the area immediately surrounding Green Hill G.

#### Surface Water Flood Risk

- 3.3.332 The EA 'Flood Risk from Surface Water' map indicates that Green Hill G ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 3.3.333 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches.
- 3.3.334 The location of flood risk and drainage designations in relation to Green Hill G are shown on **Figure 9.7** in **Appendix 9**.

### Green Hill BESS Site

#### **Site areas**

- Green Hill BESS – 24.8 ha.



### **Use**

- Green Hill BESS includes Grendon Substation and 3 fields which are in agricultural use.

### **Features**

- 3.3.335 The three agricultural fields on Green Hill BESS are bounded by substantial hedgerows and tree belts. Green Hill BESS is entirely within the parish of Grendon, North Northamptonshire.
- 3.3.336 The land is situated at the edge of the valley floor of the River Nene, and so is largely flat at approx. 50m AOD. The character of Green Hill BESS is dominated by the Grendon National Grid Substation and its associated tree planting, whilst the land to the north of Green Hill BESS is that of the flooded remnants of gravel and sand quarries.
- 3.3.337 Green Hill BESS includes the National Grid Grendon Substation and a number of OHLs cross Green Hill BESS. The northern field contains a 400kV National Grid OHL and a 132kV distributor OHL. Two further 132kV OHLs cross the proposed access to the northern field near Pastures Farm. A final 132kV OHL crosses over the southern field.

### **Settlements**

- 3.3.338 The village of Grendon is located approximately 600m southeast of Green Hill BESS. Pastures Farm is located to the west of Green Hill BESS which includes the existing farm access as a potential access to the north of Green Hill BESS.

### **Roads**

- 3.3.339 Station Road runs from the northwest of Green Hill BESS into Grendon. The road runs along the southwestern side of Green Hill BESS. Station Road provides the existing entrance into the National Grid substation, and existing agricultural accesses to Pastures Farm.

### **Public Rights of Way (PRoW)**

- 3.3.340 The only public right of way in Green Hill BESS is Footpath TF3. It originates northwest of the substation at Station Road near to the bridge over the River Nene, passing directly through field BESS 3 enroute to Lower End, Grendon. This is shown in **Figure 7.7.4** Visual Receptors.

### **Rivers**

- 3.3.341 There is an Unnamed Main River which runs along the north-western boundary and a second Unnamed Main River which runs along the south-eastern boundary of Green Hill BESS. The rivers run from the west and south respectively to Grendon Lakes which are immediately to the northeast..

### **Historic designations**

- 3.3.342 The extent of historic environment designations within the boundaries of Grendon BESS are shown on Figure 12.1.

### **Conservation Areas**

- 3.3.343 Grendon Conservation Area is located approximately 490m to the west of Grendon BESS at its nearest point.

### **Listed Buildings**

- 3.3.344 There is a cluster of 29 listed buildings in Grendon, the nearest being the grade II listed Gates and Gatepiers approximately 10m east of Grendon Hall (NHLE 1190676) approximately 590m east of Green Hill BESS. These are all grade II listed buildings apart from the Church of St Mary (NHLE 1190552) and Grendon Hall (NHLE 1040746) which are grade II\*.



3.3.345 Station Lodge (NHLE 1294156) approximately 200m to the west of Green Hill BESS is a grade II listed building.

**Archaeological Features**

3.3.346 Medieval Cross 170m west of Hall Farm Scheduled Monument (NHLE 1016320) is approximately 770m to the east of Green Hill BESS.

**Registered Parks and Gardens**

3.3.347 Castle Ashby Grade I Registered Park and Garden (NHLE 1000385) is approximately 10m to the south-west of Green Hill BESS at its nearest point. There are no registered parks and gardens within Green Hill BESS.

**Landscape designations**

3.3.348 The extent of landscape designations within the boundaries of Green Hill BESS are shown on Figure 7.6 Landscape Receptors.

3.3.349 There is no Ancient Woodland on Green Hill BESS.

3.3.350 The nearest block of Ancient Woodland is Cold Oak Copse (Ancient Replanted Woodland), which is located 3km south of Green Hill BESS. There is only one other block of Ancient Woodland within 5km of Green Hill BESS, Horn Wood (Ancient & Semi-Natural Woodland) which is located 3.6km southeast of Green Hill BESS.

3.3.351 Green Hill BESS is located within one National Character Areas (NCA's) as illustrated on **Figure 7.5** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).

3.3.352 Green Hill BESS is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.

3.3.353 Green Hill BESS is located within two Landscape Character Types (LCT), these include; LCT Profile: 18 Broad River Valley Floodplain; and LCT Profile 12 Limestone Valley Slopes as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**. These are broken down into two Landscape Character Areas (LCA), LCA Profile:18d The Nene - Billing Wharf to Woodford Mill; and LCA Profile: LCA 12a Wollaston to Irchester.

3.3.354 There are four further LCT's within the 5km Study Area which include; LCT Profile: 4 Rolling Ironstone Valley Slopes; LCT Profile: 5 Undulating Claylands; LCT Profile: 8 Low Wooded Clay Ridge; and LCT Profile: 6 Undulating Claylands. These are broken down further into Landscape Character Areas (LCA) and include; LCA Profile: 4c Ecton and Earls Barton Slopes; LCA Profile: 6b Hackleton Claylands; LCA Profile: 6c Bozeat Claylands; LCA Profile: 8b Salcey Forest and Yardley Chase; LCA Profile: 18c The Nene – Duston Mill to Billing Wharf.

**Ecological designations**

3.3.355 The extent of ecological designations within the boundaries of Green Hill BESS are shown on Figure 8.1.

**Internationally Designated Sites**

3.3.356 The Upper Nene Valley Gravel Pits SPA and Ramsar shares the northern boundary of Green Hill BESS. The globally important site comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to the village of Thorpe Waterville north of the village of Thrapston. An extensive mosaic of wetland habitats is regularly used by over 20,000 wildfowl and wading birds and support major overwintering bird assemblages. Qualifying features of the designated site





include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).

### **Nationally Designated Sites**

#### *Sites of Special Scientific Interest (SSSI)*

- 3.3.357 Wollaston Meadows SSSI is located 3km north-east of Green Hill BESS. Green Hill BESS is on the banks of the River Nene and is composed of two species-rich hay meadows with overgrown hedgerows and ditch habitats.
- 3.3.358 Bozeat Meadow SSSI is located 3km south-east of Green Hill BESS and comprises unimproved grassland on well drained clay and loam soils. Diverse botanical communities are present across medieval ridge and furrows.
- 3.3.359 Dungee Corner Meadow SSSI is located 5km east of Green Hill BESS. The well drained hay meadow on boulder clay is traditionally managed, including no use of artificial fertilisers or herbicides, and supports diverse flora. A population of locally rare green-winged orchids are also present.
- 3.3.360 Yardley Chase SSSI is located 5km south-west of Green Hill BESS. Military use of the site has resulted in a long absence of intensive agriculture, supporting the retention of diverse semi-natural habitats (woodland and unimproved grassland) present and increased value for invertebrates. This includes 30 breeding butterfly species records.

### **Locally Designated Sites**

#### *Nature Reserves (LNR)*

- 3.3.361 Summer Leys LNR is located 2km north-east of Green Hill BESS. This is an excellent nature reserve easily qualifying as a LWS with fen, swamp and marsh indicators recorded within the gravel pits and neutral grassland indicators in the surrounding grasslands.

#### *Local Wildlife Sites (LWS)*

- 3.3.362 Grendon Lakes LWS is located 200m north of Green Hill BESS. This is a mosaic of wetland habitats of huge importance to over-wintering birds.
- 3.3.363 Grendon Lakes North LWS is located 500m north of Green Hill BESS. This is also a mosaic of wetland habitats including a number of small gravel pits, fragments of wet grassland and mire and good aquatic vegetation.
- 3.3.364 Grendon Quarter Pond LWS is located 500m south of Green Hill BESS and comprises a large fishing lake with a fringe of marginal vegetation and a surround of tall trees.
- 3.3.365 Earls Barton Meadow LWS is located 700m north-west of Green Hill BESS. This floodplain meadow site is adjacent to the River Nene, near to gravel extraction, and features neutral grassland indicators and many elements of MG4 grassland communities indicative of well-drained permanent pasture and meadows.
- 3.3.366 Earls Barton Carr LWS is located 800m north-west of Green Hill BESS. This large area of wet woodland on former gravel workings adjacent to the Nene supports at least 10 indicator species of fen, swamp and marsh habitats, despite declining habitat condition.
- 3.3.367 Earls Barton Lock Lake LWS is located 800m north of Green Hill BESS and comprises another Nene Valley gravel pit with abundant marginal vegetation.
- 3.3.368 Scotland Pond LWS is located 800m south of Green Hill BESS. This is a large angling lake fringed with marginal and emergent vegetation.
- 3.3.369 The Basin LWS is located 1km south of Green Hill BESS. This is a narrow lake within the Castle Ashby Estate, with a good cover of emergent and marginal vegetation providing habitat for birds and amphibians.



- 3.3.370 Menagerie Pond LWS is located 1.3km south of Green Hill BESS. Areas of thick fringing emergent vegetation and occasional aquatic plants support diverse invertebrate communities associate with the lake situated within Castle Ashby parkland.
- 3.3.371 Castle Ashby Woodland LWS is located 1.4km south-west of Green Hill BESS. This area of old woodland, probably originating from the establishment of Castle Ashby parkland, is well-established and supports some unusual flora and range of invertebrates.
- 3.3.372 Castle Ashby Parkland LWS is located 1.7km south-west of Green Hill BESS. Situated centrally within the Castle Ashby parkland, this woodland extends between the church, ponds and boathouse. A large variety of parkland and semi-natural species, and a largely semi-natural ground flora but with several ancient woodland species have been recorded, alongside some unusual parkland additions.
- 3.3.373 Par Pond LWS is located 1.5km south of Green Hill BESS. This is a long lake on the edge of Castle Ashby Park, well-vegetated with emergent and marginal vegetation and surrounded by parkland habitats.
- 3.3.374 Ecton Gravel Pits LWS is located 1.7km north-west of Green Hill BESS. This site comprises three gravel pits alongside the River Nene. The pits vary in size and shape and provide a mixture of wildlife habitats.
- 3.3.375 Engine Pond LWS is located 1.9km south-west of Green Hill BESS. This is a well-established pond, with emergent vegetation and abundant dragonflies and damselflies.
- 3.3.376 Hardwater Meadows LWS is located 2km north-east of Green Hill BESS and comprises a network of fields adjacent to the River Nene. Species-rich wetland vegetation surrounds the pond and old river channels.
- 3.3.377 Warren Ponds LWS is located 2km south of Green Hill BESS. These ponds extend the habitat of Par Pond LWS and provide cover for birds and amphibians. Some of the ponds within Warren Ponds LWS are of significance as an extension to the wetland habitat corridor network.

#### **Mineral designations**

- 3.3.378 Green Hill BESS lies within a Minerals safeguarding areas (sand and gravel) as defined in the adopted Northamptonshire Minerals and Waste Local Plan (2017).

#### **Flood Risk and Drainage Designations**

##### *Fluvial Flood Risk*

- 3.3.379 There is an Unnamed Main River (responsibility of the EA to maintain) which runs along the north-western boundary. There is a second Unnamed Main River which runs along the south-eastern boundary of Green Hill BESS. There is also an unnamed Ordinary Watercourse (responsibility of the LLFA to maintain) located to the east and the south of field BESS 2.
- 3.3.380 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 3.3.381 The EA 'Historical Flood Map' indicates that fields BESS 1 and BESS 3 have historically flooded in March 1947 due to the River Nene.
- 3.3.382 All fields within Green Hill BESS are within Flood Zone 3 (High risk) of flooding. EA modelling can detail the flood risk depths and extents from the River Nene, however this data response is currently awaited. A comprehensive hydraulic modelling exercise is ongoing to refine the flood extents and depths and will be reported in the ES.

##### *Surface Water Flood Risk*

- 3.3.383 The EA 'Flood Risk from Surface Water' map indicates that Green Hill BESS ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of



surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).

3.3.384 As described in the fluvial section above, the surface water flooding extents largely match the courses of the watercourses and land drainage ditches.

3.3.385 The location of flood risk and drainage designations in relation to the Sites are shown on **Figure 9.8** in **Appendix 9**.

### **3.4 Cable Route Search Area**

3.4.1 The Cable Route Search Area is shown in the plans provided in **Appendix 3**. The Cable Route Search Area consists of areas that have been identified as potential areas for the Cable Corridor. The extent of the Cable Corridor to Grendon Substation and connecting the Sites will be determined by the electrical design and decisions on the location of the 33-132kV and 400kV substations as the scheme design progresses. The Cable Route Search Area will be refined as the design of the Scheme is developed and additional technical surveys of the Cable Route Search Area are carried out to establish the Cable Corridor. Temporary construction compounds will also be required.

3.4.2 The current Cable Route Search Area includes three broad options for the Cable Corridor:-

- A route heading north from Green Hill C, either east or west of Sywell Wood providing connectivity to Green Hill A and Green Hill B;
- North of the A45, the Cable Route Search Area allows for a Cable Corridor either west of the village of Earls Barton up to the western site of Green Hill E or to the south and east of the village of Earls Barton up to the eastern side of Green Hill E; and
- A route from Green Hill F which extends either north or south of the village of Grendon to Green Hill BESS.

3.4.3 All routes converge on Grendon Substation at the Point of Connection into the National Grid.



## 4 Scheme Description

### 4.1 Scheme Summary

- 4.1.1 This chapter provides a description of the Scheme and the anticipated programme for construction. The key activities that will be undertaken during construction, operation and decommissioning are included in this chapter and inform the approaches to technical assessments included in this report.
- 4.1.2 The operational life of the Scheme is anticipated to be up to 60 years. Once the Scheme ceases to operate, it will be decommissioned. A 60-year period for the operational phase of the Scheme will be assessed in the EIA and reported in the ES accompanying the DCO application.
- 4.1.3 The Scheme consists of a series of Solar Arrays within Green Hill A, A.2, B, C, D, E, F and G, a BESS, two 400kV substations and a number of 132kV and 33kV substations. Two 400kV Substations will be required which, depending on the location of the BESS, could be located on Green Hill C, E, F or Green Hill BESS. The voltage and number of 132kV and 33kV substations will be determined as the Scheme design progresses.
- 4.1.4 Green Hill BESS is currently identified as the preferred location for the BESS, however if further investigation shows that this site is not suitable for the development or if further space is required to meet the Scheme’s requirements, then a BESS may also be located on Green Hill A, B, C, E, F and G.
- 4.1.5 The point of connection for the Scheme to the National Grid would be at the existing 400kV Grendon substation located to the north-west of the village of Grendon. The Scheme will be linked to Grendon Substation via underground cables within a Cable Corridor. The proposed location of the Cable Corridor within the Cable Route Search Area is under consideration and will be refined through environmental assessments, landowner negotiations and consultation input.
- 4.1.6 Cables, ranging in voltages from 11-400kV will be necessary within the Sites and the Cable Corridor. Cable trenches, with widths typically varying between 1m to 7m, will accommodate these cables, and there will be instances where multiple cables run along the same route and separation distances between them are required. However, the width and spacing of the cable trenches may differ depending on environmental constraints, engineering requirements, or if crossing third-party apparatus (e.g., utilities). The maximum Cable Corridor working width is anticipated to be 50m.
- 4.1.7 The substations, cables, cable connections, and BESS will be required for the duration of the Scheme. The substations and BESS will be removed as part of the decommissioning of the Scheme. The underground cable, cable ducts and joint bays will be decommissioned in accordance with the applicable guidance and regulations at the time. The cables may be removed as part of decommissioning with the cable ducts and joint bays left in situ to minimize environmental impacts. The decommissioning of the Scheme will be addressed within the Outline Decommissioning Environmental Management Plan (‘ODEMP’).

### 4.2 Maximum Design Parameters

- 4.2.1 The DCO application will incorporate flexibility into the design of the Scheme to allow the latest technology to be installed at the time of construction. This approach is supported by the National Policy Statements for Energy and in the Planning Inspectorate’s Advice Note 9: Rochdale Envelope. The ES will consider the use of fixed and tracker panels for the Solar Arrays.
- 4.2.2 The ES will adopt a maximum design scenario approach, assessing the Scheme on the basis of the maximum project design parameters relevant to the technical discipline i.e. the worst-case scenario for impacts (known as the “Rochdale Envelope”). This ensures that all likely significant effects (beneficial or adverse) of the Scheme will have been assessed, providing the flexibility required to take advantage of technological



improvements that may occur between the application being submitted and construction being commenced.

4.2.3 As the design evolves in response to the environmental assessment and consultation processes (which run in parallel), the maximum (or minimum) parameters may be updated from those set out in this Scoping Report in order to minimise the environmental impacts of the Scheme. The maximum (or minimum) parameters assessed in the ES will be set out in a concept design parameters and principles document submitted with the DCO application and secured in the DCO.

4.2.4 **Table 4.1** sets out the parameters that have been used for assessment by each of the technical topics in the Scoping Report to explain the likely significant effects of the Scheme on the environment, and set out the proposed approach and methodology for further assessment. These parameters have also been used to identify the environmental assessment topics that the Applicant proposes to scope out of further assessment within the ES, and to explain the reasons for this.

**Table 4.1: Design parameters used for the Scoping Report**

Scheme Component	Parameter Type	Maximum Design Parameter
<b>Solar Arrays</b>		
Option A Tracking Panels	Maximum height of solar panels above ground level	4.5m when at greatest inclination 2.5m when horizontal
	Minimum height of the lowest part of the solar panel above the ground level	0.4m
	Indicative orientation and slope	Solar panels aligned in north-south rows. The panels will rotate to the east and west and tilt up to a maximum inclination of 60° from horizontal.
	Solar Panel mounting structure	Metal frames that hold solar panels in rows, either secured via metal posts driven into ground to a depth of 1.5-3.5m (dependant on ground conditions) or, in areas where archaeological protection is required, weighed down using concrete feet or other non-ground penetrative techniques.
	Solar panel type	Bifacial monocrystalline panels
	Separation distance between rows	Separation distance between rows of tracking panels will be a minimum



Scheme Component	Parameter Type	Maximum Design Parameter
		of 2.5m at the closest point, and a maximum distance of 15.0m.
Option B Fixed Panels	Maximum height of solar panels above ground level	3.5m
	Minimum height of the lowest part of the solar panel above the ground level	0.4m
	Indicative orientation and slope	Solar panels aligned in east-west rows with panels facing south at a fixed tilt angle of between +10 to 35° from horizontal.
	Solar panel mounting structure	Metal frames that hold solar panels in rows, either secured via metal posts driven into ground to a depth of 1.5-3.5m (dependant on ground conditions) or, in areas where archaeological protection is required, weighed down using concrete feet or other non-ground penetrative techniques.
	Solar panel type	Bifacial monocrystalline panels
	Separation distance between rows	Separation distance between rows of fixed panels will be a minimum of 2.5m at the closest point, and there will be a maximum distance of 14m.
Conversion Units/Inverters	Maximum dimensions	15m by 5m with a maximum height of 3.5m  Electrical infrastructure associated with the panels will be elevated by the mounting structures so that it is no less than 0.6 m above the 0.1% Annual Exceedance Probability (AEP) flood level or, where this is not



Scheme Component	Parameter Type	Maximum Design Parameter
		possible as high as practicable).
	Materials	Units are housed in a container sitting on a concrete base or concrete feet.
Fencing and Security	Compound Fencing	Palisade fencing around the compound with a maximum height of 3m.
	Perimeter Fencing	Deer type wire and mesh and wooden post fencing with a maximum height of 2.5m
	Security	CCTV camera poles with a maximum height of 3m. Poles to be galvanized steel painted green
<b>Substations</b>		
400kV Substations	Maximum compound area	3.5ha
	Maximum height	13m to the top of the busbars
	Compound perimeter	3m high palisade fencing around the compound 2.5m high deer type wire mesh and wooden post fencing outside of the palisade fencing
	Access Track	Maximum 6m wide constructed of hardcore or gravel over a levelling layer of substrate
	Relay and Control Rooms – maximum dimensions	Maximum dimensions of 7m by 19m and maximum height of 4m
	132kV Switch Room – maximum dimensions	Maximum dimensions of 6m by 13m and maximum height of 4m
	33kV Switch Room	Maximum dimensions of 7m by 19m and maximum height of 4m
	Housing	Maximum height 6m
132kV Substations	Maximum compound area	0.5ha



Scheme Component	Parameter Type	Maximum Design Parameter
	Maximum height	7m to the top of the busbars
	Compound perimeter	3m high palisade fencing around the compound 2.5m high deer type wire mesh and wooden post fencing outside of the palisade fencing
	Relay and Control Rooms – maximum dimensions	Maximum dimensions of 6m by 11m and maximum height of 4m
	33kV Switchgear	Maximum dimensions of 5m by 9m and maximum height of 4m
33kV Substations	33kV Substation Maximum dimensions	Maximum dimensions of 4m by 14m and maximum height of 4m
	Maximum height	4m
	Compound perimeter	3m high palisade fencing around the compound 2.5m high deer type wire mesh and wooden post fencing outside of the palisade fencing
BESS	Maximum compound area	10.5 Ha (this is the overall BESS compound area, this could be split over multiple locations)
	BESS Units	16m by 3m and maximum height of 3.2m
	Compound perimeter	3m high palisade fencing around the compound. CCTV cameras will be installed (number to be confirmed)
	Access	Maximum 6m wide constructed of hardcore or gravel over a levelling layer of substrate. Parking bays will be provided (number to be confirmed).





Scheme Component	Parameter Type	Maximum Design Parameter
Cable Corridor	Cable route working corridor - Maximum typical width	50m
	Cable trench - Maximum width	Typically 1-7m width. This includes separation distances where multiple cables are running in parallel within the same trench or within multiple trenches.
	Cable trench -Maximum depth	Typically 2m subject to design and ground conditions
Point of Connection	Point of connection	Connection at the existing Grendon Substation.

### 4.3 Description of the Scheme

4.3.1 The Scheme will consist of the infrastructure as described above and in further detail below. Given the nature of the Scheme being made up of different Sites and the Cable Route Search Area, there are variations to the proposed built development to reflect the constraints and context. These variations are set out below.

#### Solar Arrays

4.3.2 The solar photovoltaic (PV) panels will convert sunlight/daylight into electrical current. They are made up of a series of photovoltaic cells beneath a layer of toughened glass. Other PV technology is developing rapidly and may be available at the time of construction.

4.3.3 There are two options for solar panels being considered: Tracking Panels (A) and Fixed Panels (B). The use and distribution of these across the Sites will be subject to further consideration as the design of the Scheme progresses.



**Option A (Tracking Panels)**

Image 4.1: Typical Tracking Panels



**Option B (Fixed Panels)**

Image 4.2: Typical Fixed Panels (with Conversion Unit/Inverter)





### **Solar Panel Mounting Structure**

- 4.3.4 The mounting structure is a metal frame that holds the solar panels in place and secures them to the ground via metal posts driven into ground between 1.5 to 3.5m in depth (dependant on ground conditions).
- 4.3.5 In areas where archaeological protection is required, concrete feet or other non-ground penetrative techniques will be considered as an archaeological mitigation option to secure the mounting structures to the ground.

### **Conversion Units/Inverters**

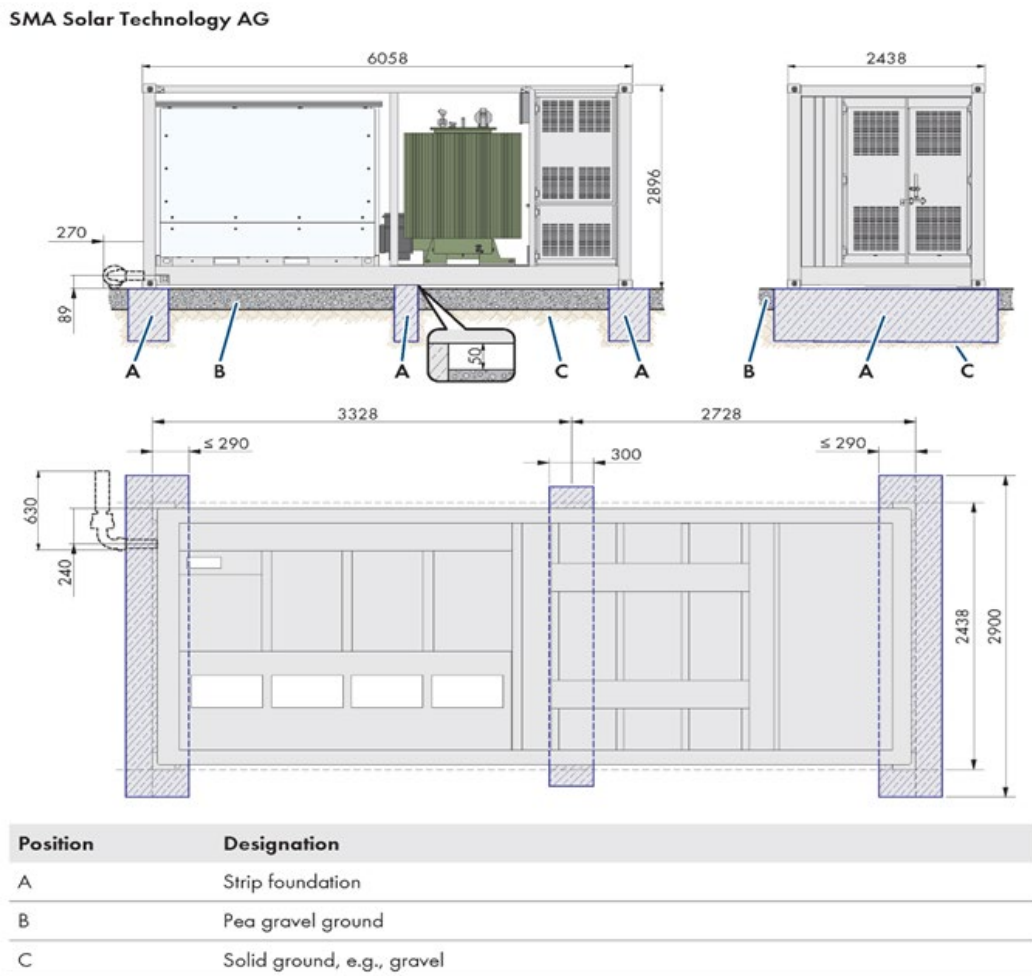
- 4.3.6 Conversion units contain the inverters, transformers and associated equipment to convert the Direct Current ('DC') electricity produced by the arrays into Alternating Current ('AC') electricity required for export on to the national grid. **Image 4.3** below shows a typical conversion unit.

**Image 4.3: Typical Conversion unit**





Image 4.4 Typical Conversion Unit details



### Substations

- 4.3.7 There are different types of substations required across the Scheme as noted in Table 4.1. There will be two 400kV substations. These substations are likely to be located within Green Hill BESS and within Green Hill C, E or F. The locations will be determined through further assessment and consultation. These will either be air insulated switchgear ('AIS') or gas insulated switchgear ('GIS') substations. An example of an AIS substation is shown in **Image 4.5**.
- 4.3.8 On Green Hill A, A.2, B and G, there will be the need for a 132kV substation on each of the Sites. On Green Hill F there will be the need for a 132kV substation, in the event that a 400kV substation is not proposed on Green Hill F. In the event that a 400kV Substation is not proposed on either Green Hill C or Green Hill E, there will be a requirement for 33kV substations, the number of which is to be confirmed as the Scheme design progresses. Green Hill D will require a 33kV substation.



Image 4.5 Typical (large 400kV power transformer)



Image 4.6 Typical 132kV substation compound





### Battery Energy Storage System (BESS)

- 4.3.9 The Scheme will include a Battery Energy Storage System. This is designed to provide peak generation and grid balancing services to the electricity grid. It will allow excess electricity generated from the solar PV panels to be stored in the batteries and exported to the grid when required. Excess energy from the grid can also be imported to the batteries. The energy storage facility will therefore provide flexibility and enhance grid reliability.

**Image 4.7 Typical BESS Units**



- 4.3.10 The BESS will require heating, ventilation and cooling systems to ensure the efficiency of the technology. These features are integrated into the units within which they are housed. The battery system will comprise bi-directional AC/DC inverters to control the charge of the batteries from the solar PV energy output or the charge of the batteries when drawing energy from the grid.
- 4.3.11 The preferred location for the BESS at the time of writing is Green Hill BESS as shown on **Figure 3.1**, however BESS may also be located on Sites A, B, C, E, F and G. The location of BESS will also influence the type of substations required on these Sites as described in paragraphs 4.3.7-4.3.8 above. Ongoing technical studies will determine which Site(s) is/are most appropriate. **Image 4.7** shows an example of a BESS arrangement with associated infrastructure.

### Fencing and Security

- 4.3.12 During operation, perimeter fencing will be in place. The location of the fencing will be identified as the design develops so that it can be assessed within the ES and finalised as part of the detailed design of the Scheme post-consent. The design principles of the fencing within the Sites will be deer wire mesh and wooden post fencing with a maximum height of 2.5m as illustrated in **Image 4.8**. Other fencing may be used around the substations and energy storage. Fencing during the construction phase will also be required, the details of which will be confirmed as part of the detailed design post consent.



Image 4.8 Typical Deer Fencing



4.3.13 For example, there will be palisade fencing around the substations which will have a maximum height of 3m.

4.3.14 Pole mounted internal facing CCTV systems will be used around the perimeter of the operational elements of the Sites. It is anticipated that these will be galvanised steel painted green poles with a maximum height of 3m.

#### Lighting

4.3.15 Lighting is not required within the Solar Arrays for the operational phase. Motion sensing security lighting will be provided within substations and within the BESS to be used only for maintenance and security purposes.

4.3.16 Temporary site lighting during construction will be required to enable safe working during construction during hours of darkness and will be designed as far as reasonably practicable to minimise potential for light spillage outside the Sites and Cable Corridor, particularly towards houses, traffic and ecological habitats. Standard good practice measures would be employed to minimise light spill, including glare during construction.

#### Cable Corridor

4.3.17 The electricity generated by the Scheme will be exported to the National Grid at the existing Grendon Substation. The Sites will be linked to Grendon Substation via underground cables within a Cable Corridor. The proposed location of the Cable Corridor within the Cable Route Search Area is under consideration and will be refined through environmental assessments, landowner negotiations and consultation input.

4.3.18 The underground cables will also facilitate the import of electricity from National Grid to the BESS.

4.3.19 The voltage of the cables and the number of circuits will affect the width and number of cable trenches required. The range of typical cable trench widths is from 1m-7m, with either one or two trenches anticipated to be required along the majority of the Cable Corridor. However, the width and spacing of the cable trenches may differ depending on environmental constraints, engineering requirements or if crossing third party apparatus.



4.3.20 In addition to the trenches, land will be required in the Cable Corridor for access and soil and cable 'lay down'. Construction compounds along this route will also be required. The typical working area for the Cable Corridor is anticipated to be 50m wide but a wider area may be required in some locations.

#### District Network Operator Connections

4.3.21 It is envisaged that local grid connections to the distribution network (operated by National Grid Electricity Distribution ('NGED')) will be made for the 400kV substation.

4.3.22 These will allow the generating station to connect to the local grid network to obtain short-term auxiliary power to the substations to maintain operation in the event that there is a technical problem with the connection to the National Grid. Consideration is being given to the best place for these connections for each of the Sites.

4.3.23 If auxiliary power supplies cannot be gained through the local grid network, then back-up generators will be considered.

#### Site Access

4.3.24 The majority of the proposed access points into the Sites and Cable Corridor will be designed to accommodate an articulated HGV with a maximum length of 16.5m. Existing access points will be proposed to be used wherever possible with visibility splays of 2.4m x 215m. There may be some variation on visibility splays based on site specific conditions.

4.3.25 The transformers will be classified as an Abnormal Indivisible Load ('AIL') and therefore an additional assessment will be undertaken by an Abnormal and Indivisible Loads specialist to identify suitable routes and access points. The routing and access points used for the AIL deliveries will be determined through the design process and in consultation with the appropriate statutory consultees.

#### Ecological Mitigation and Enhancement

4.3.26 The Sites and Cable Route Search Area currently comprise predominantly arable and pastoral fields. There are features within the Sites such as hedgerows, field margins, ditches and watercourses which are considered to have some ecological value.

4.3.27 A Preliminary Ecological Appraisal ('PEA') has been undertaken on the Sites along with protected species surveys which have been carried out at the seasonally appropriate time of year. There will be further surveys carried out in the 2024 and 2025 ecological survey windows, namely breeding, wintering and nocturnal bird surveys, bat surveys, Great Crested Newt surveys and otter and water vole surveys and further surveys in the Cable Route Search Area as the Cable Corridor is refined. Once the full suite of species surveys has been carried out any new habitat land and/or mitigation that is required will be identified and included in the DCO application. Further detail is provided in **Chapter 8** of this Report.

4.3.28 As a general principle the Scheme is likely to utilise the following ecological mitigation and enhancement measures typically used on solar projects:

- Land between and under the arrays to be sown as grassland and meadow management with limited cutting and a mix of some areas being grazed and others not;
- Gaps within existing hedgerows will be filled with additional native species to increase diversity, and hedgerows will be managed on a rotational basis to enable wildlife to benefit from them year-round;
- Appropriate vegetated buffers will be maintained comprising native planting; and
- Installation of bird nest and bat boxes on trees located around the Sites to provide opportunities for a range of species recorded within the local area.

4.3.29 Prior to the commencement of any phase of development, a Landscape and Ecological Management Plan ('LEMP') will be prepared and submitted to and approved by the





relevant planning authority, and this will be secured by a Requirement in the DCO. This will ensure the potential construction and operational impacts are minimised and that, where possible, opportunities for beneficial effects are secured as part of the Scheme. The LEMP will be in accordance with the Outline LEMP which will be submitted as part of the DCO application.

#### Surface Water Drainage

- 4.3.30 A Flood Risk Assessment and a Drainage Strategy are being developed as part of the design process for the Scheme. The assessments will identify how the Scheme will manage surface water and not increase flood risk. The Drainage Strategy will detail the measures to manage the surface water drainage from the Scheme and any required changes needed to existing land drainage.

#### Landscaping

- 4.3.31 As a general principle, the Scheme is likely to utilise the following landscape enhancements and mitigation typically used on solar projects:
- The creation of new woodland blocks and belts;
  - Planting new hedgerows;
  - Reinforcing existing boundary hedgerows; and
  - New tree planting.

- 4.3.32 The proposed LEMP will seek to increase the green infrastructure and link up ecological networks. This may include enhancing Public Rights of Way to improve access to the countryside or the creation of new permissive paths.

## **4.4 Construction, Operation and Decommissioning**

### Construction and Phasing

- 4.4.1 The Scheme currently has a grid connection date of 2029. The construction of the Scheme is proposed to be phased over a two-year period and subject to the DCO consenting process, the earliest construction may start is 2027.
- 4.4.2 The construction period will vary across the Sites and Cable Corridor and for the larger Sites there will be opportunities for having multiple construction crews working at the same time.
- 4.4.3 There will be temporary construction compounds required for the Sites and the grid connection works (installation of the underground cables). The temporary construction compounds will comprise:
- Temporary portacabins for construction operatives (the dimension of the portacabins would vary and the maximum size for individual units is expected to be 10m by 3m with a typical maximum height of 3m);
  - Perimeter security fencing with a typical maximum height of 3m;
  - Parking area for construction and workers vehicles;
  - Secure compound for storage;
  - Temporary hard standing;
  - Wheel washing facilities;
  - Storage bins for recyclables and other waste; and
  - Lighting will be required during construction periods but will be temporary in nature and normal working hours will be adhered to except in specified circumstances (as set out below).



4.4.4 Construction activities are likely to be carried out Monday to Friday 07:00-18:00 and between 08:00 and 13:30 on Saturdays. However, some activities may be required outside of these times (such as the delivery of abnormal loads, concrete pours for foundations, nighttime working for cable construction works in public highways or horizontal direction drilling activities). Where possible, construction deliveries will be coordinated to avoid HGV movements during the traditional AM peak hour (08:00-09:00) and PM peak hour (17:00-18:00).

#### Construction Environmental Management Plan

4.4.5 Prior to the commencement of any phase of development a Construction Environmental Management Plan ('CEMP') will be submitted to and approved by the relevant planning authority, and this will be secured by a requirement in the DCO. The CEMP for each phase will be in accordance with the Outline CEMP which will be submitted as part of the DCO application. This will ensure the potential construction impacts are minimised.

4.4.6 The CEMP will outline the allocated responsibilities, procedures and requirements for site environmental management of the construction sites. It will include relevant site-specific method statements, operating practices, and arrangements for monitoring and liaison with local authorities and stakeholders.

4.4.7 The main contractor(s) undertaking the construction of the Scheme will need to adopt and comply with the CEMP, allocate environmental management responsibilities to a site manager and ensure that all sub-contractors' activities are effectively managed in accordance with the CEMP.

#### Operation

4.4.8 Once the Scheme is operational, traffic generated by it will be limited to that associated with maintenance work and the replacement of panels and batteries.

4.4.9 The Scheme will operate for up to 60 years. The components of the Scheme are anticipated to have the following approximate lifespans:

- Photovoltaic Panels –40 years
- Batteries –20 years

4.4.10 It is therefore estimated that the solar panels could require replacement once and the batteries twice during the operation of the Scheme. The replacement of these elements of the Scheme will be considered within the assessment of operational impacts of the Scheme in the ES.

4.4.11 For routine maintenance purposes, movement within the Sites will typically be by way of quad bike or small, farm utility vehicle. Personnel will visit the Scheme from time to time to check the apparatus. No on-site staff will be required to operate the Scheme but there will be limited staff facilities located in the Control Rooms associated with the substations. Some permanent equipment for monitoring the Scheme will be located in the Relay and Control Room. Whilst this would typically be accessed remotely, it would be available for occasional physical access during routine visits.

4.4.12 There would be a small amount of noise generated by the vehicle movements across the Sites coupled with the installation of equipment during routine maintenance activities. There will be some noise transmitted from the transformers, substations, the motors required for Option A tracking panels and BESS, but these levels are predicted to be low and will be confirmed through further design work and reported and assessed within the ES.

#### Decommissioning

4.4.13 The decommissioning of the Scheme is expected to take 12-24 months and is anticipated to be undertaken in phases. A Decommissioning Statement will be prepared and will be submitted to and approved by the relevant planning authority prior to decommissioning, and this will be secured by a requirement in the DCO. The Decommissioning Statement



for each part of the Scheme will be in accordance with the Outline Decommissioning Statement which will be submitted as part of the DCO application. This will ensure the potential decommissioning impacts are minimised.

- 4.4.14 The Solar Arrays and related built infrastructure, ancillary infrastructure, substations and energy storage will be removed and recycled or disposed of in accordance with good practice and market conditions at that time.
- 4.4.15 The underground ducting and joint bays within the Cable Corridor will be decommissioned in accordance with the latest regulations and good practice at that time, but are anticipated to be left in-situ to minimise adverse environmental effects. It may be possible to remove the cable itself by extracting it at the joint bays from within the ducting, so that the cable can be recycled. This will be considered further in the ES.
- 4.4.16 Whilst decommissioning typically has fewer effects than construction, it will be assessed to be the same as construction effects due to the uncertainty around the legal and policy requirements and the engineering and technologies that may be in place at decommissioning time.

**Site Reinstatement**

- 4.4.17 Following the removal of the panels, substations, converter units/inverters and the BESS (as outlined above), the land within the Scheme will be returned to its original use as far as possible as part of the decommissioning of the Scheme.

**Waste**

- 4.4.18 Waste will be generated during all phases of the Scheme. Solid waste materials generated during construction and decommissioning will be segregated and stored on the Sites and Cable Corridor prior to transport to an approved, licensed third party recycling facility or, if it cannot be recycled, an authorised disposal facility. Energy From Waste (EFW) Centres will be considered for waste disposal, this will be addressed further within the Outline Site Waste Management Plan to be submitted with the DCO. Waste arisings will be assessed as appropriate in the ES. Further detail is provided in **Chapter 22** of this Report.



## 5 Legislative Context and Energy Policy

### 5.1 Introduction

5.1.1 The ES will contain a chapter on Legislative Context and Energy Policy. Regard will be made to primary legislation and Energy Policy, national planning policies and guidance, and local planning policies in establishing receptors, likely effects and potential mitigation.

5.1.2 A summary of key legislative and policy provisions is provided below and considered in more detail in **Appendix 5**.

### 5.2 Primary Legislation

5.2.1 The Planning Act 2008 sets out the process for the consenting of NSIPs and the basis for the decision whether to grant development consent.

### 5.3 Energy Policy

5.3.1 National Policy Statements (NPS) set out the policy basis for NSIPs. They form the basis for determination of decisions on DCO applications by the Secretary of State. In accordance with section 104 of the Planning Act 2008, where an NPS has effect in relation to development of the description to which the application relates, a DCO application must be decided in accordance with that relevant NPS. The NPSs that are relevant to the Scheme are:

- National Policy Statement for Energy (EN-1);
- National Policy Statement for Renewable Energy Infrastructure (EN-3); and
- National Policy Statement for Electricity Networks (EN-5)

5.3.2 These NPSs were designated by the Secretary of State in January 2024. Compared to the previous NPSs that were designated in 2011, these NPSs set out a new category of “critical national policy infrastructure” (which includes ground mounted solar, as a type of onshore generation that does not involve fossil fuel combustion – see paragraph 4.2.5 of EN-1). They also address provision for Biodiversity Net Gain (BNG) (see section 4.6 of EN-1).

5.3.3 In addition to the NPSs, the following government publications are also considered to be relevant:-

- Energy White Paper: Powering Our Net Zero Future, 2020
- Government Net Zero Strategy: Build Back Greener, 2022
- British Energy Security Strategy, 2022
- Powering Up Britain, 2023

5.3.4 Regulation 18(3)(d) of the EIA Regulations requires an ES to include *“a description of the reasonable alternatives studied by the developer, 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”*.

5.3.5 NPS EN-1 (designated January 2024) confirms that there is no general requirement to consider alternatives or to establish whether a development represents the best option, stating (at paragraph 4.3.9) that: *“as in any planning case, the relevance or otherwise to the decision-making process of the existence (or alleged existence) of alternatives to a proposed development is in the first instance a matter of law”*.

5.3.6 Paragraph 4.3.17 of NPS EN-1 states *“where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements”*.



- 5.3.7 NPS EN-1 at 4.3.22 states that *"the consideration of alternatives in order to comply with policy requirements should be carried out in a proportionate manner" and "only alternatives that can meet the objectives of the proposed development need to be considered"*.
- 5.3.8 Section 2.10 of NPS EN-3 sets out national policy in relation to solar photovoltaic generation. This notes the following relevant site selection considerations for solar photovoltaic development:
- Agriculture land classification and land type
  - Accessibility
  - Public rights of ways
  - Security and lighting
  - Proximity of a site to dwellings
  - Site layout design, and appearance
  - Project lifetime
  - Decommissioning
  - Flexibility in the project details
  - Irradiance and site topography
  - Network connection
  - Capacity of a site
  - Biodiversity, ecological, geological conservation and water management
  - Landscape, visual and residential amenity
  - Glint and glare
  - Cultural Heritage
  - Construction including traffic and transport noise and vibration
- 5.3.9 NPS EN-5 sets out specific considerations that should be taken into account when considering infrastructure such as a Cable Corridor. These are:
- Biodiversity and Geological Consideration
  - Landscape and Visual Impact
  - Undergrounding
  - Noise and Vibration
  - Electric and Magnetic Fields (EMFs)
  - Sulphur Hexafluoride
- National Planning Policy**
- 5.3.10 The national planning policies considered relevant to the Scheme are identified below and will be considered as part of the assessment:
- National Planning Policy Framework (NPPF) (as amended December 2023).
  - Planning Practice Guidance (PPG) (as amended March 2015):  
Paragraph 013 ID: 5-013-20150327 – Renewable and low carbon energy: What are the particular planning considerations that relate to large scale ground-mounted solar photovoltaic farms?



5.3.11 The Written Ministerial Statement of 15<sup>th</sup> May 2024 ‘*Solar and protecting our Food Security and Best and Most Versatile (BMV) Land*’ which reiterates the approach to the consideration of solar farms and food security as set out in EN-3 is also considered to be of relevance.

## 5.4 Local Planning Policy

5.4.1 The local planning policies considered relevant to the Scheme are identified below and will be considered as part of the assessment.

- North Northamptonshire Joint Core Strategy 2011-2031 (Adopted 2016)
- Wellingborough Local Plan Part 2 (Adopted 2019)
- West Northamptonshire Joint Core Strategy Local Plan Part 1 (Adopted 2014)
- Daventry Local Plan 2011-2029 Part 2 (Adopted 2020)
- Northamptonshire Minerals and Waste Local Plan (Adopted 2017)
- Milton Keynes Council Core Strategy (Adopted 2013)
- Milton Keynes Council Minerals Local Plan (Adopted 2017)
- Earls Barton Neighbourhood Plan 2011-2031 (Made 2016)
- Lavendon Neighbourhood Plan (Made 2020)

5.4.2 Emerging Local Plans are listed below:

- West Northamptonshire Local Plan - 2041 (Regulation 18) Consultation Draft April 2024



## 6 Climate Change

### 6.1 Introduction

6.1.1 In accordance with the requirements of the EIA Regulations and Institute of Environmental Management (IEMA) Guidance for assessing climate mitigation and adaptation, this chapter considers effects arising as a result of the Scheme, including prior to and post mitigation, in relation to:

- Greenhouse gas emissions (GHG);
- In-combination Climate Change Impact (ICCI) Assessment; and
- Climate Change Resilience.

### 6.2 Legislation, Policy and Guidance

6.2.1 The assessment will include reference to the following:

- United Nations Kyoto Protocol
- National Policy Statements for Energy (November 2023); EN-1; EN-3; EN-5
- National Planning Policy Framework (NPPF);
- Planning Policy Guidance (PPG);
- Climate Change Act 2008; inclusive of Climate Change Act 2008 (2050 target amendment) Order 2019; and
- Carbon Budgets Order 2021 and previous iterations thereof;
- Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance, IEMA, 2022;
- Climate Change Adaptation Practitioner Guidance, IEMA, 2022;
- North Northamptonshire Carbon Management Plan, August 2023;
- West Northamptonshire Environmental Policy (Version 1.0), March 2023;
- An Environmental Framework for the West Northamptonshire Unitary Authority, West Northamptonshire Environment Task and Finish Group, January 2021; and
- Northamptonshire Climate Change Strategy 2020 - 2023.

### 6.3 Baseline Conditions

#### The Scheme and Context

6.3.1 The Scheme is expected to provide a substantial source of renewable electricity for the country. Compared to a conventional gas-fired power station, the Scheme is anticipated to result in the generation of substantially less GHG emissions. This will be assessed by the change in emissions of Carbon Dioxide and equivalent gases (CO<sub>2</sub>e).

6.3.2 The current use of the Sites and Cable Route Search Area predominantly consists of arable land and managed trees and hedgerows. The baseline agricultural GHG are dependent on the soil and vegetation types present and the fuel used for the operation of any plant and machinery on the Sites and Cable Route Search Area.

6.3.3 The assessment will establish the baseline which will consider the factors above and will then consider the GHG emissions over the Scheme's lifetime.



6.3.4 Consideration will be given to the wider impacts of the Scheme including in the context of the carbon budget targets developed for the United Kingdom, and the Scheme’s overall contribution to climate change.

6.3.5 There has been no formal consultation on the scope of the Climate Change Chapter. Consultation will be undertaken with statutory bodies (for example, LPAs) on Climate Change targets that impact on, or contribute to, baseline data as well as cumulative development.

#### **In-combination Climate Change Impact (ICCI) Assessment**

6.3.6 The ICCI receptors are those receptors that are within the surrounding environment that will be impacted by the Scheme in combination with future climatic conditions. Baseline Conditions for the ICCI Assessment will be determined using the climate change projections data.

6.3.7 An initial review of the UK Climate Projections 2018 (UKCP18)<sup>1</sup> data for the 12km grid square where the Scheme located (based on nearby postcode of NN6 0HQ) suggests that, on average, by the 2050s time period the area could experience the:

- hottest summer day temperature of around 37.8°C if global warming increases by 2°C. If global temperatures rise by 4°C it could increase to around 41.6°C. The hottest summer day of the last 30 years has been 36.4°C; and
- warmest winter day temperature of around 18.8°C if global warming increases by 2°C. If global temperatures rise by 4°C it could increase to around 19.9°C. The warmest winter day of the last 30 years has been 18.4°C.

#### **Climate change resilience**

6.3.8 The potential impacts of climate change that the Scheme must be resilient to are:

- increased average temperatures and incidence of heatwaves;
- increased frequency of heavy precipitation events;
- increased risk of flooding in respect of sea level rises;
- increase in strong wind events.

6.3.9 These are relevant factors for consideration, together with particular consideration of future climate change conditions data from the UKCP18. Some of these matters, such as flood risk, are considered in detail in other technical topics within the ES. The summary findings from these other chapters will be included within the Climate Change ES Chapter.

## **6.4 Assessment Methodology**

6.4.1 It is anticipated that the assessment will include three aspects of Climate Change Assessment:

1. Lifecycle GHG Impact Assessment: the impact of the Scheme by considering all GHG emissions associated with its entire lifecycle;
2. ICCI Assessment: considering combined effects of the Scheme contributing to climate change, their interactions and cumulative impact on the environment; and
3. Climate Change Resilience: the resilience of the Scheme to climate change impacts.

#### **Lifecycle GHG Impact Assessment**

6.4.2 The assessment will establish the baseline scenario (no development) and the GHG emissions over the Scheme lifetime. For the baseline scenario, the GHG emissions from the land use, current methods of generating power (emissions savings due to the





Scheme), and available baseline information will be considered to the extent possible. For the Scheme operation, direct GHG emissions arising from activities involved during construction, operation (inclusive of replacement of panels and batteries) and decommissioning, inclusive of embedded GHG in the construction materials, and emissions from transport of materials, waste and workers will be considered.

6.4.3 The study will include activities that might be prevented or changed due to the Scheme, such as existing power production methods. The assessment will also consider the emissions avoided as a result of the Scheme, for example, the soil not being cultivated through arable processes and the reduction in national reliance on coal and gas fired peaking plants.

6.4.4 With reference to the GHG Kyoto Protocol guidelines, the following GHG emissions will be considered within the assessment over the Scheme’s lifecycle:

- carbon dioxide;
- methane;
- nitrous oxide;
- sulphur hexafluoride;
- hydrofluorocarbons;
- perfluorocarbons; and
- nitrogen trifluoride.

6.4.5 In line with good industry practice, GHG emissions created over the Scheme’s lifecycle will be calculated using an appropriate assessment method which is aligned with the GHG protocol. The method of assessment is still yet to be finalised pending confirmation with stakeholders.

6.4.6 It is anticipated that the below potential sources of GHG emissions will be scoped in as part of each stage of the development:

**Table 6.1 Possible Sources of GHG Emissions**

Lifecycle Stage	Activity	Primary Emission Sources
Construction Stage	The extraction of raw materials and manufacturing of products necessary to make equipment.	GHG emissions that are embodied within the product.
	This stage is anticipated to contribute significantly to GHG emissions, due to the materials that contain high levels of embodied carbon, complex manufacturing processes and equipment design.	GHGs that are produced during manufacturing
	Construction materials that are transported and not integrated in embodied GHG emission. Equipment required is likely to require shipment due to overseas origin.	Transportation of materials to the sites and the amount of fuel consumed.



Lifecycle Stage	Activity	Primary Emission Sources
	Construction workers that would need transportation to the site.	Transportation of workers to the sites and resulting GHG emissions.
	Construction activity on-site.	Energy consumption on-site. Commuting construction workers.
	Waste produced during the construction process that needs to be disposed.	GHG emissions produced from the transportation and removal of waste materials
	Water use	Treatment of wastewater and supply of potable water
Operation Stage	Scheme operation	Emissions from routine maintenance are expected to be negligible. However, the periodic replacement of components has the potential to have significant impacts given the complexity of the equipment involved.
	Scheme maintenance	
	Replacement materials (i.e. batteries and replacement panels)	
	Water use on-site for fire suppression and cleaning panels	
Decommissioning Stage	Decommissioning activity	Energy consumption of vehicles and generators.
	Removal and transportation of any waste materials	GHG emissions generated from the transportation and disposal of waste materials. This has the potential to be significant given the complexity of the design of the equipment, and the use of materials with high associated waste treatment emissions.
	Workers that would need to be transported to the Scheme	Transportation of workers to the Scheme and resulting GHG emissions

6.4.7 The receptor for the GHG assessment is the global climate. This will be defined as ‘high’ sensitivity as any additional GHG impacts could compromise the UK’s ability to reduce its GHG emissions and therefore meet its future 5-year carbon budgets and Net Zero by 2050 target. The extreme importance of limiting global warming to below 2°C this century is broadly asserted by the International Paris Agreement, the United Nations Climate Change Conferences (COP27) and the climate science community.

6.4.8 Standard GHG accounting and reporting practices have been followed to assess the effect of the Scheme. The IEMA guidance states that ‘it is up to the GHG practitioner’s professional judgement to decide which tool is most appropriate for the project at hand with regard to assessing the magnitude of GHG impacts’. The GHG accounting method is deemed most appropriate for this part of the assessment.



- 6.4.9 The significance of the Scheme’s GHG emissions and potential impact to the climate can be investigated with reference to national carbon budgets. Local carbon budgets and climate action strategies will also be reviewed in determining the likely potential significance of impact from the Scheme.
- 6.4.10 Emission sources that are <1% of a given emissions inventory will be excluded through the concept of ‘de minimis’ contribution. This has been supported by both the Department for Business, Energy and Industrial Strategy and Publicly Available Specification PAS:2050 (2011) (Ref 7.25).
- 6.4.11 It is expected that the construction stage of the Scheme will occur spanning the 4th (2023-2027) and 5th (2028-2032) national carbon budgets. The operational stages of the Scheme will occur during the 5th (2028 – 2032) and 6th (2033 – 2037) carbon budgets. As the current carbon budgets are only available up to 2037 and the Scheme is expected to be operational past that year, all assumptions beyond 2037 will use the 6th carbon budget. Using professional judgement, the significance of the impacts associated with GHG emissions produced by the Scheme will be determined.

**In-combination Climate Change Impact Assessment**

- 6.4.12 An ICCI Assessment identifies how identified receptors in the surrounding environment are affected by the Scheme in combination with future climate change conditions. Climate change impacts relevant to the Scheme will be assessed through the other relevant topics of the ES. For example, how an increase in rainfall may lead to a higher risk of flooding, will be covered in the Hydrology, Flood Risk and Drainage Chapter. These in-combination effects will be summarised within the Climate Change Chapter.
- 6.4.13 The factors in **Table 6.2** will be considered in the ICCI Assessment.

**Table 6.2: Climate Change Factors for ICCI Assessment**

Factor	Scoped In/Out	Justification
Temperature change	In	The anticipated increase in temperature will be summarised within the locality, and any impacts from the Scheme discussed within the Climate Change Chapter with regards to the effect of localised heat island effects
Precipitation change	In	This will be considered in the Hydrology, Flood Risk and Drainage Chapter and summarised within the climate change assessment
Extreme weather conditions (wind)	In	The anticipated increase in extreme wind/hailstorm and other events within the locality will be summarised and any impacts on the Scheme discussed within the Climate Change Chapter
Sea level rise	Out	The Scheme is not located in an area that is susceptible to sea level rise

**Climate Change Resilience Assessment**

- 6.4.14 A Climate Change Resilience Assessment will be undertaken to inform the ES. The assessment will consider future climate conditions and the impact this will have on the Scheme. The following factors will be included in the assessment of the Scheme’s resilience to climate change:
  - increased average temperatures and incidence of heatwaves;



- increased frequency of heavy precipitation events; and
- increased in strong wind events.

6.4.15 The assessment will be carried out in conjunction with the project team and other environmental disciplines by considering climate projections for the geographical area and the operational lifetime of the Scheme.

6.4.16 The Climate Change Chapter will describe how the Scheme has been designed to be as resilient as is reasonably practicable to future climate change. As with the ICCI Assessment, **Table 6.3** below factors have been scoped in or out of the Climate Change Resilience Assessment.

**Table 6.3: Climate Change Factors for Climate Change Resilience Assessment**

Factor	Scoped In/Out	Justification
Temperature Change	In	Assessed as part of the design process for any potential for heat to damage materials
Precipitation Change	In	Assessed as part of the design process with reference to Hydrology, Flood Risk and Drainage Chapters
Extreme weather conditions (wind)	In	Assessed as part of the design process to protect the Scheme from extreme winds
Sea level rise	Out	The Scheme is not located in an area that is susceptible to sea level rise.

**Cumulative and In-Combination Effects**

6.4.17 The Cumulative Effects Chapter of the ES will consider the additional impacts of the Scheme that arise cumulatively with other developments and future climate conditions. Any in-combination effects identified will be considered within the Climate Change Chapter of the ES

6.4.18 It should be noted that there are limitations in considering localised cumulative effects with regards to a development's effect on climate change, as any effects would generally apply at a national and international level rather than specific localised effects.

**6.5 Assumptions and Limitations**

6.5.1 Every endeavour will be made to calculate proposed GHG emissions from products and activities associated with the development. However, due to the assessment being completed at the early design stages it is likely that some assumptions will have to be made around, for example, transport of materials, exact product types to be used etc.

6.5.2 Climate change projections are subject to uncertainties due to: the complexity of the climate system and uncertainty over future greenhouse gas emission levels, and modelling uncertainties used to develop the Met Office's predictions.

6.5.3 To address these uncertainties, UKCP18 provides a range of likely climate changes to give a lower and upper estimate. This allows for provision of a greater level of confidence for the magnitude and impact of climate change effects.

**6.6 Conclusions on Scoping**

6.6.1 GHG emissions will be created over the lifetime of the Scheme (from production to decommissioning) and therefore are scoped in. Any amount of GHG emissions produced will result in impacts to both the local microclimate and global climate. To comply with



the UK’s carbon budgets, it is necessary to scope GHG emissions in, as this is important for reaching net-zero emissions by 2050. There will be negative effects, including from construction, movement, import of materials etc. Notwithstanding, given the nature of solar farm developments, the carbon impact will be offset by the overall beneficial impacts of the Scheme. It is anticipated that effects are likely to be beneficial in this regard.

6.6.2 In terms of climate change resilience of the Scheme, increased average temperatures and incidence of heatwaves, increased frequency of heavy precipitation events and increase in strong wind events will need to be scoped in. The Scheme is vulnerable to extreme weather events, including heatwaves, flooding events and strong winds, as these factors have the potential to damage the Scheme and reduce its efficiency. Therefore, adaptation measures using projections from UKCP18 will be further addressed in the ES. Sea Level rise has been scoped out of the assessment due to the distance of the scheme from the coast.

6.6.3 The ES will include a proportionate Climate Change Chapter given that it is unlikely the Scheme in-combination with projected changes, will cause significant adverse impacts. Overall, the Scheme’s contribution to climate change is likely to be a positive one.

6.6.4 **Table 6.4** below summarises the proposed scope of the Climate Change Assessment which lists those elements that have been scoped in and out.

**Table 6.4 Summary of Climate Change Scoping**

Factor	Sub-element	Scoped In/Out
GHG Emissions	Construction emissions	In
	Operational emissions	In
	Decommissioning emissions	In
ICCI Assessment	Temperature change	In
	Precipitation change	In
	Extreme weather conditions (wind)	In
	Sea level rise	Out
Climate Change Resilience	Temperature change	In
	Precipitation change	In
	Extreme weather conditions (wind)	In
	Sea level rise	Out

## 6.7 References

Ref.1 UK Climate Impacts programme (UKCIP) (2018) UK Climate Projections 2018 (UKCP18). Available at: <https://www.metoffice.gov.uk/weather/climate-change/climate-change-in-the-uk> (Date Accessed: 25/04/2024).

Ref.2 UN Climate Change. Kyoto Protocol. Available at: [https://unfccc.int/kyoto\\_protocol](https://unfccc.int/kyoto_protocol) (Date Accessed: 25/04/2024).

Ref.3 HMSO (2008). Climate Change Act 2008. Available at: [http://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga\\_2008027\\_en.pdf](http://www.legislation.gov.uk/ukpga/2008/27/pdfs/ukpga_2008027_en.pdf) (Date Accessed: 25/04/2024)

Ref.4 The Carbon Budgets Order 2021. Available at: <https://www.legislation.gov.uk/ukdsi/2021/9780348222616> (Date Accessed: 25/04/2024)



- Ref.5 National Policy Statements for Energy (January 2024): EN-1; EN-3; EN-5. Available at: <https://www.gov.uk/government/collections/national-policy-statements-for-energy-infrastructure> (Date Accessed: 22/05/24).
- Ref.6 National Planning Policy Framework (NPPF). Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> (Date Accessed: 25/04/2024).
- Ref.7 Planning Policy Guidance (PPG). Available at: <https://www.gov.uk/government/collections/planning-practice-guidance> (Date Accessed: 25/04/2024).
- Ref.8 Climate Change Act 2008; inclusive of Climate Change Act 2008 (2050 target amendment) Order 2019. Available at: <https://www.legislation.gov.uk/ukpga/2008/27/contents> (Date Accessed: 25/04/2024).
- Ref.9 Carbon Budgets Order 2021 and previous iterations thereof. Available at: <https://www.legislation.gov.uk/ukdsi/2021/9780348222616> (Date Accessed: 25/04/2024).
- Ref.10 Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance, Institute of Environmental Management (IEMA), 2022.
- Ref.11 Climate Change Adaption Practitioner Guidance, IEMA, 2022.
- Ref.12 North Northamptonshire Carbon Management Plan, August 2023. Available at: <https://www.northnorthants.gov.uk/climate/carbon-management-plan> (Date Accessed: 25/04/2024).
- Ref.13 West Northamptonshire Environmental Policy (Version 1.0), March 2023..
- Ref.14 An Environmental Framework for the West Northamptonshire Unitary Authority, West Northamptonshire Environment Task and Finish Group, January 2021.
- Ref.15 Northamptonshire Climate Change Strategy 2020 - 2023. Available at: <https://cape.mysociety.org/media/data/plans/west-northamptonshire-council-f944abc.pdf> (Date Accessed: 25/04/2024).



## 7 Landscape and Visual Impact

### 7.1 Introduction

7.1.1 The Landscape and Visual Impact chapter of the Environmental Statement (ES) will consider the likely significant effects of the Scheme on Landscape and Visual receptors during the associated construction, operation and decommissioning phases. The chapter will describe the methodology used in the Landscape and Visual Impact Assessment (LVIA), the existing baseline scenario within a defined Study Area, and the nature of change. It will identify the effects upon receptors arising as a result of the Scheme and the significance associated with identified effects based on the sensitivity of these receptors to change and the magnitude of any change that will likely occur. It also defines whether an effect is beneficial, adverse or neutral.

7.1.2 The LVIA will be undertaken in accordance with the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) 2013 which defines the meaning of Landscape and Visual receptors as:

- Assessment of landscape effects - assessing effects on the landscape as a resource in its own right;
- Assessment of visual effects - assessing effects on specific views and on the general visual amenity experienced by people (Ref 1)

7.1.3 Due to the large scale of the Scheme, it will firstly be considered as one large entity in entirety, before being broken down into smaller / individual Sites and the Cable Route Search Area. These individual Sites are to be referred to as:

- Green Hill A
- Green Hill A.2
- Green Hill B
- Green Hill C
- Green Hill D
- Green Hill E
- Green Hill F
- Green Hill G
- Green Hill BESS

#### Figures and Appendices

7.1.4 This scoping report is supported by a series of figures and supporting technical documents in the following Appendices:

#### **Appendix 7.1 - Figures**

7.1.5 This Chapter is supported by the following Figures contained in **Appendix 7.1**:

- 7.1 Study Area
  - 7.1.1 Study Area Green Hill A and A.2
  - 7.1.2 Study Area Green Hill B
  - 7.1.3 Study Area Green Hill C, D and E
  - 7.1.4 Study Area Green Hill F and BESS
  - 7.1.5 Study Area Green Hill G



- 7.2 Aerial Photography
- 7.3 Landform
- 7.4 Provisional Agricultural Land Classification
- 7.5 Landscape Character Areas
- 7.6 Landscape Receptors
  - 7.6.1 Landscape Receptors Green Hill A and A.2
  - 7.6.2 Landscape Receptors Green Hill B
  - 7.6.3 Landscape Receptors Green Hill C, D and E
  - 7.6.4 Landscape Receptors Green Hill F and BESS
  - 7.6.5 Landscape Receptors Green Hill G
- 7.7 Visual Receptors
  - 7.7.1 Visual Receptors Green Hill A and A.2
  - 7.7.2 Visual Receptors Green Hill B
  - 7.7.3 Visual Receptors Green Hill C, D and E
  - 7.7.4 Visual Receptors Green Hill F and BESS
  - 7.7.5 Visual Receptors Green Hill G
- 7.8 Bare Earth ZTV
  - 7.8.1 Bare Earth ZTV Green Hill A & A.2
  - 7.8.2 Bare Earth ZTV Green Hill B
  - 7.8.3 Bare Earth ZTV Green Hill BESS
  - 7.8.4 Bare Earth ZTV Green Hill C
  - 7.8.5 Bare Earth ZTV Green Hill D
  - 7.8.6 Bare Earth ZTV Green Hill E
  - 7.8.7 Bare Earth ZTV Green Hill F
  - 7.8.8 Bare Earth ZTV Green Hill G
- 7.9 Augmented ZTV
  - 7.9.1 Augmented ZTV Green Hill A and A.2
  - 7.9.2 Augmented ZTV Green Hill B
  - 7.9.3 Augmented ZTV Green Hill BESS
  - 7.9.4 Augmented ZTV Green Hill C
  - 7.9.5 Augmented ZTV Green Hill D
  - 7.9.6 Augmented ZTV Green Hill E
  - 7.9.7 Augmented ZTV Green Hill F
  - 7.9.8 Augmented ZTV Green Hill G
- 7.10 Viewpoint Locations
  - 7.10.1 Viewpoint Locations Green Hill A and A.2
  - 7.10.2 Viewpoint Locations Green Hill B





- 7.10.3 Viewpoint Locations Green Hill C, D and E
- 7.10.4 Viewpoint Locations Green Hill F and BESS
- 7.10.5 Viewpoint Locations Green Hill G

#### **Appendix 7.2 - LVIA Methodology**

- Appendix 7.2.1 LVIA Methodology
- Appendix 7.2.2 CIA Methodology
- Appendix 7.2.3 RVAA Methodology
- Appendix 7.2.4 ZTV Methodology

#### **Appendix 7.3 - Viewpoint Photography**

#### **Appendix 7.4 - Landscape Receptor Scoping Sheets**

#### **Appendix 7.5 - Visual Receptor Scoping Sheets**

#### **Appendix 7.6 - LVIA Visual Receptors Figures**

- 7.11 Residential Receptors
  - 7.11.1 Residential Receptors Green Hill A and A.2
  - 7.11.2 Residential Receptors Green Hill B
  - 7.11.3 Residential Receptors Green Hill C, D and E
  - 7.11.4 Residential Receptors Green Hill F and BESS
  - 7.11.5 Residential Receptors Green Hill G
- 7.12 Transport Receptors
  - 7.12.1 Transport Receptors Green Hill A and A.2
  - 7.12.2 Transport Receptors Green Hill B
  - 7.12.3 Transport Receptors Green Hill C, D and E north
  - 7.12.4 Transport Receptors Green Hill E south and BESS
  - 7.12.5 Transport Receptors Green Hill F north
  - 7.12.6 Transport Receptors Green Hill F
  - 7.12.7 Transport Receptors Green Hill G
- 7.13 PRoW Receptors
  - 7.13.1 PRoW Receptors Green Hill A and A.2
  - 7.13.2 PRoW Receptors Green Hill B
  - 7.13.3 PRoW Receptors Green Hill C, D and E
  - 7.13.4 PRoW Receptors Green Hill F and BESS
  - 7.13.5 PRoW Receptors Green Hill G

#### **Study Area**

- 7.1.6 GLIVA3 states that the Study Area must be reasonable and proportionate and must ensure that the focus when defining the appropriate Study Area is on where likely significant effects upon Landscape and Visual receptors may occur, together with likely



significant cumulative effects. The extent of the preliminary Study Areas will be further assessed as part of the iterative design process and through consultation with the Local Planning Authority's Landscape officers and consultants.

7.1.7 The Study Areas have been informed through a combination of desktop study, as well as professional judgement on similar scale projects. They have been established through consideration of the existing landform and vegetation, as well as the scale of the Scheme and heights of the proposed infrastructure and focus on significant effects. The Study Areas consider the depleting nature of visual perception which diminishes as distance from visual receptors increases. As a result, the proposed Study Areas for visual receptors are less than the proposed Landscape Study Areas, which considers the interconnectivity of the wider landscape context. The proposed Study Areas for the Local Study Area (1km), the Wider Study Area (2km) and the Outer Study Area (5km) are illustrated on **Figure 7.1, Appendix 7.1**. The Cable Corridor (0.5km) is yet to be refined and determined and so Study Area for the Cable Corridor is not currently shown.

7.1.8 The four Study Areas are described below.

7.1.9 It should be noted that early baseline conditions surveys for Green Hill A.2, a potential extension of Green Hill A that is currently being explored by the Applicant, have not been completed prior to the submission of this Scoping Report. Baseline conditions for Green Hill A.2 will therefore be completed and presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

7.1.10 In light of early baseline conditions surveys for Green Hill A.2 not being completed prior to the submission of this Scoping Report, likely significant environmental effects from Green Hill A.2 are proposed to be assessed in the same manner as those scoped for Green Hill A. Any characteristics of Green Hill A.2 that are found to differ from those of Green Hill A upon completion of baseline surveys, will be assessed in full in the ES.

#### **The 0.5km Study Area for the Cable Route (The Cable Corridor Study Area):**

7.1.11 A Study Area of 0.5km is proposed from the outer boundary of the Cable Corridor. The 0.5km radius is considered appropriate for the Cable Corridor, since this involves the construction phase only, which is short term and temporary. Beyond this distance, even with good visibility, it is deemed that this element of the Scheme would be barely perceptible. Within the assessment, this parameter is referred to as the '0.5km Study Area'.

7.1.12 At this stage the route of the Cable Corridor is yet to be determined and so the Study Area (0.5km) is not currently shown on figures. Once determined, all Landscape and Visual receptors within this Study Area will be identified and scoped into the construction phase LVIA.

#### **The 1km Study Area (The Local Study Area):**

7.1.13 This is the 1km area extending as a radius from the outer boundary of Green Hill A-G and BESS and is considered reasonable and proportionate as the Local Study Area for the LVIA.

7.1.14 The Local Study Area focuses on impacts upon both Landscape and Visual receptors.

7.1.15 All Landscape Receptors within the Local 1km Study Area will be included in the LVIA. This includes the landscape fabric of the Sites and the local landscape character (informed by all relevant landscape character assessments).

7.1.16 All Visual Receptors within the 1km Study Area would be included within the LVIA. However, Visual receptors within the 1km Study Area with no intervisibility of the Sites are proposed to be scoped out of the LVIA.

7.1.17 Within the assessment, this parameter is referred to as the 'Local 1km Study Area'.



### **The 2km Study Area (The Wider Study Area):**

- 7.1.18 This is the 2km area extending as a radius from the outer boundary of the Sites and is considered reasonable and proportionate as the Wider Study Area for the LVIA.
- 7.1.19 The Wider Study Area focuses on impacts upon both Landscape and Visual receptors.
- 7.1.20 Effects to landscape character within the Wider 2km Study Area will be included within the LVIA (Informed by all relevant landscape character assessments).
- 7.1.21 Visual receptors located outside of the Local 1km Study Area that are identified as having direct, extensive and/or open views towards the Scheme (particularly larger and taller elements or large open expanses of PV arrays) will be separately identified and included within this 2km Study Area and scoped into the LVIA. Otherwise, all other Visual receptors located beyond the Local 1km Study Area are proposed to be scoped out of the LVIA as beyond this point, receptors without direct, extensive and/or open views towards the Scheme are unlikely to experience significant effects.
- 7.1.22 Within the assessment, this parameter is referred to as the 'Wider 2km Study Area'.

### **The 5km Study Area (The Outer Study Area):**

- 7.1.23 This is for the area extending as a radius from the outer boundary of the Sites that is considered appropriate as the extent of the Outer Study Area for the LVIA. Any Landscape or Visual receptors beyond the Outer 5km Study Area are not Included within the LVIA.
- 7.1.24 Effects to landscape character within the Outer 5km Study Area will be included within the LVIA (Informed by all relevant landscape character assessments).
- 7.1.25 The Outer Study Area focuses on impacts upon landscape receptors only, with all visual receptors beyond the Wider 2km Study Area scoped out of the LVIA. It is considered that within the Outer Study Area, even with excellent visibility it is deemed that the Scheme would be barely perceptible and that it would not lead to any significant Visual effects, either independently or cumulatively. **Figures 7.8.1-7.9.8** demonstrate potential visibility of the Scheme considering landform and vegetation.
- 7.1.26 Within the assessment, this parameter is referred to as the 'Outer 5km Study Area'.

## **7.2 Methodology**

### **Assessment Methodology**

- 7.2.1 The LVIA will be undertaken in line with the following guidance which represents the standard approach and guidance relevant to LVIA for renewable energy developments within the UK:
- Landscape Institute and Institute of Environmental Management and Assessment 'Guidelines for Landscape and Visual Effect Assessment', 2013, Third Edition (GLVIA3) (Ref 2);
  - An Approach to Landscape Character Assessment (Ref 3);
  - Landscape Institute Technical Guidance Note 06/19, Visual Representation of Development Proposals (Ref 4);
  - Landscape Institute Technical Guidance Note 02/19, Residential Visual Amenity Assessment (RVAA) (Ref 5); and
  - Landscape Institute Technical Guidance Note 02/21, Assessing landscape value outside national designations (Ref 6).
- 7.2.2 The proposed LVIA methodology is set out in **Appendix 7.2**.



### **Residential Visual Amenity Assessment**

7.2.3 Current guidance on Residential Visual Amenity Assessment (RVAA) is contained within the Landscape Institute’s Technical Guidance Note (TGN) 2/19.

7.2.4 Steps 1-3 of RVAA guidance align with the standard LVIA based approach defined in GLVIA3 to assess the effects on residential amenity as follows:

- Step 1 – Definition of Study Area and scope of the assessment
- Step 2 – Evaluation of Baseline Visual Amenity
- Step 3 – Assessment of likely change to visual amenity of properties
- Step 4 – Forming the RVAA judgement

7.2.5 Step 4 of the RVAA is defined as being required as follows:

7.2.6 “In this final step, and only for those properties where the largest magnitude of effect has been identified, a further judgement is required.”

7.2.7 It is therefore proposed to undertake steps 1-3 as part of the LVIA for the Scheme and if following assessment of affects upon residential properties at year 15 there remain significant effects at the highest magnitude of significance (major) then a full RVAA would be undertaken for those properties affected.

### **Glint and Glare**

7.2.8 The LVIA will consider the conclusions of the Glint and Glare Assessment in association with an assessment of the magnitude of Landscape and Visual impacts using the methodology prescribed above.

### **Lighting**

7.2.9 The LVIA will consider the construction, operational and decommissioning lighting strategy for the Scheme including details of directionality, intermittent lighting. It will also describe any landscape measures necessary to avoid or mitigate lighting effects.

7.2.10 Construction lighting would be of a temporary nature and lighting associated with the Scheme would be based on a passive infrared (PIR) system and sensory lighting associated with the BESS. Embedded design would be considered to minimise light pollution and there are no lighting designations in the Study Area such as dark sky areas.

### **Cultural Heritage**

7.2.11 The LVIA will consider the findings of the Cultural Heritage chapter of the ES. The LVIA will focus on likely significant effects of views from heritage assets (where accessible) but would not comment upon the setting of such assets. This would be undertaken as part of the Cultural Heritage chapter of the ES. However, consultation would be undertaken with the cultural heritage consultant through the LVIA process to help inform landscape character.

### **Arboriculture**

7.2.12 The LVIA will consider the findings of any tree surveys undertaken and consider any effects upon Landscape and Visual receptors should vegetation removal be required as part of the Scheme. Due to the nature of the Scheme, it is considered that existing vegetation on site would be retained (where possible) and any removal to accommodate elements associated with construction or access would be subject to a BS5837:2012 tree survey and associated Arboricultural Impact Assessment which would inform the LVIA. Mitigation associated with any such tree loss associated with the Scheme would be included in the landscape mitigation plans forming part of the LVIA. We would work closely with the arboricultural consultant throughout the application process to



ensure local arboreal assets and character inform the LVIA and associated mitigation plans.

### **Ecology**

7.2.13 The LVIA will consider the findings of the ecological reports and close liaison with the ecology consultant would form a key part of the LVIA mitigation strategy. Whilst ecological effects would be dealt with wholly in the Ecology and Biodiversity chapter of the ES, this approach ensures that the landscape mitigation proposed is considered holistically with ecological requirements to maximise the benefits of the Scheme in terms of green infrastructure, habitat creation and ecological mitigation.

### **Cumulative and In-Combination Effects**

7.2.14 Due to the dispersed nature of the Sites within the Scheme, an assessment of the in-combination landscape and visual effects of the Sites will be undertaken to determine the effects of the Scheme as a whole.

7.2.15 A cumulative assessment will be undertaken, assessing both the cumulative landscape and visual effects of the Scheme in conjunction with other local developments.

7.2.16 This will be provided within the Cumulative Effects chapter of the ES.

7.2.17 Cumulative landscape effects, are either additional or combined (as agreed in scoping), and are likely to include effects on:

- the fabric of the landscape;
- the aesthetic aspects of the landscape; and
- the overall character of the landscape.

7.2.18 Cumulative visual effects can be caused by combined visibility, which “occurs where the observer is able to see two or more developments from one viewpoint and/or sequential effects which occur when the observer has to move to another viewpoint to see different developments” as set out in GLVIA3 (Table 7.1) which states ‘Combined’ visual effects are:

7.2.19 “Where two or more developments are or would be within the observer’s arc of vision at the same time without moving her/his head”.

7.2.20 The full methodology is set out in **Appendix 7.2 (part 7.2.2) Cumulative Assessment Methodology**.

## **7.3 Legislation, Policy and Guidance**

7.3.1 The following policy provisions are relevant to the Landscape and Visual Assessment.

### **National Planning Policy**

#### **National Policy Statements (NPS)**

7.3.2 National Policy Statements for Nationally Significant Infrastructure Projects are produced by government. They give reasons for the policy set out in the statement and include an explanation of how the policy takes account of government policy relating to the mitigation of, and adaptation to, climate change. The Energy NPS, dated November 2023 and updated in June 2024, provides NPS EN-1 to 5 which were designated on 17 January 2024. The following policies are relevant to the proposals:

- NPS EN-1 Overarching NPS for energy;
- NPS EN3 for renewable energy infrastructure; and
- NPS EN-5 for electricity networks infrastructure.



### **National Planning Policy Framework (NPPF)**

7.3.3 The NPPF was last updated in December 2023. Key policies relating to Landscape and Visual issues include:

- Paragraph 104 in respect of protecting and enhancing public rights of way (PRoW) and access, including taking opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails;
- Paragraph 135 b) visually attractive as a result of good architecture, layout and appropriate and effective landscaping and Paragraph 135 c) which requires development to be sympathetic to local character and setting;
- Paragraph 136 which recognises the important contribution trees make to the character and quality of the environment, that appropriate measures are in place to secure the long-term maintenance of newly-planted trees, and that existing trees are retained wherever possible.
- Paragraph 180 in relation to enhancing the natural environment and local environment–
- Paragraph 180 a) - protecting and enhancing valued landscapes and Paragraph 180 b) to recognise the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; and
- Paragraph 186c in relation to the principle of development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons (for example, infrastructure projects (including nationally significant infrastructure projects), where the public benefit would clearly outweigh the loss or deterioration of habitat) and a suitable compensation strategy exists.

### **Planning Practice Guidance**

7.3.4 The following are relevant:

- Planning Practice Guidance (PPG), Natural Environment (Landscape), paragraph 036 Reference ID: 8-036-20190721.
- Planning Practice Guidance, Renewable and Low Carbon Energy (as amended March 2015) Paragraph 013 ID: 5-013-20150327 – Impacts of Solar Farms.

### **Local Planning Policy**

7.3.5 The eight (8) Sites which make up the Scheme are located within the administrative boundaries of: West Northamptonshire, North Northamptonshire and Milton Keynes. Green Hill A and B are located within the administrative boundary of West Northamptonshire, Green Hill C to F and Green Hill BESS Site are located within the administrative boundary of North Northamptonshire and Green Hill G is located within the administrative boundary of Milton Keynes.

7.3.6 Local Planning policies are considered from the following documents:

- West Northamptonshire Joint Core Strategy Local Plan Part 1 (Adopted 2014)
  - Policy BN1 - Green Infrastructure Connections
  - Policy BN2 - Biodiversity
  - Policy BN3 - Woodland Enhancement and Creation
  - Policy BN5 - The Historic Environment and Landscape



- North Northamptonshire Joint Core Strategy 2011-2031 (Adopted 2016)
  - Policy 4 - Biodiversity and Geodiversity
  - Policy 19 The Delivery of Green Infrastructure
- Wellingborough Local Plan Part 2 (Adopted 2019)
  - Policy GI 1 - Local Green Infrastructure Corridors
- Milton Keynes Local Plan - Plan:MK (Adopted 2019)
  - Policy NE3 - Biodiversity and Geological Enhancement
  - Policy NE4 - Green Infrastructure
  - Policy NE5 - Conserving and Enhancing Landscape Character
  - Policy NE7 - Protection of the best and most versatile agricultural land
  - Policy D1 - Designing a high quality place
  - Policy D2 - Creating a positive character
  - Policy SC2 - Community energy networks and large scale renewable energy schemes

#### **Landscape Planning Designations**

- 7.3.7 Designations within the outer 5km Study Area are listed within **Appendix 7.4** Landscape and Visual Receptor Scoping Sheets and are identified on a site-by-site basis in section 7.4 of the Landscape and Visual chapter.
- 7.3.8 The Study Area of the Scheme does not contain any National or Local Landscape specific designations such as National Parks, National Landscapes or Areas of Great Landscape Value.
- 7.3.9 All designations have been recorded on **Figure 7.6** Landscape Receptors in **Appendix 7.1**.

### **7.4 Preliminary Landscape Baseline**

- 7.4.1 The Sites cover an area of approximately 1,194.8 hectares (ha) within a rural landscape setting of Northamptonshire and Buckinghamshire, located between the towns of Northampton, Wellingborough and Bedford.
- 7.4.2 As shown on **Figure 7.1, Appendix 7.1**, the Scheme is located across a large geographic area of just under 23km. This area extends from the northern extent of Green Hill A located near to the settlement of Old, to the southern extent of Green Hill G located near to the settlement of Lavendon. Each of the Sites is separated by varying distances therefore, from a Landscape and Visual perspective, each of the Sites is considered to vary in terms of interconnecting relationships. The individual fields within the Sites have been described from a general wider landscape context within the text below and will be described in detail within **Section 7.5**.
- 7.4.3 The Sites and Cable Route Search Area primarily comprise agricultural land delineated by low hedgerows, treed hedgerows, scattered woodland and woodland blocks. The landform primarily consists of gently undulating topography which often provides enclosure and limits expansive views. Due to the nature of this landform alongside the extensive existing vegetation in the form of hedgerows, trees, and woodland the Scheme is relatively well contained. Views are available across the landscape immediately surrounding the Scheme but due to the containment provided by the landform and vegetation are likely be limited to localised short distance views rather than wide ranging or panoramic.



- 7.4.4 Green Hill E, F and G contain greater topographical height difference when compared to remaining Sites. Green Hill E and F are located either side of the Nene Valley where topography falls from north to south on land associated with Green Hill E and from south to north on land at Green Hill F. Green Hill G is located on the southern slopes of the Yardley - Whittlewood Ridge, a plateau which separates the Nene Valley to the north and Ouse Valley to the south.
- 7.4.5 Green Hill BESS is located on the lower land (approximately 50m AOD) within the Nene Valley, and includes the Grendon Substation. Green Hill BESS includes agricultural land, directly southwest of extensive areas of wetlands that run parallel to the River Nene. Features such as overhead pylons associated with Grendon Substation are prominent locally and compromise the rural character and detract from the local landscape context of the surrounding wetlands.
- 7.4.6 The existing substation and surrounding land parcels are screened, with mature existing bands of woodland, screening from Station Road and woodland planting to the extents of the substation boundary.
- 7.4.7 Green Hill A, A.2, B, F, G and Green Hill BESS are more rural when compared to the remaining three (3) Sites. Green Hill C, D and E are located closer to the urban fringe of larger conurbations, located between Northampton and Wellingborough, and skirt the edge of an aerodrome and in proximity to an industrial estate on the western edge of Wellingborough.
- 7.4.8 **Figure 7.1, Appendix 7.1**, illustrates the proposed Sites and Cable Route Search Area comprising the Scheme and the suggested Study Area for the LVIA which has been defined based on the Scheme's setting described in this section.
- 7.4.9 Landscape designations will be assessed for the Scheme and within the outer 5km Study Area. All relevant designations to the Scheme are shown on **Figure 7.6, Appendix 7.1**. A description of key designations within the outer 5km Study Area has also been included within the Site Characters described in Paragraph 7.4.31 onwards of Section 7.4, to provide a more rounded assessment of designations within the wider landscape. The exception is the listed buildings, due to the high number of listed buildings within the 2km and outer 5km Study Area, only those closest to the Sites have been described. All the listed buildings have been recorded on **Figure 7.6 (Appendix 7.1)**.
- 7.4.10 The Study Area of the site does not contain any national landscape designations such as National Parks or National Landscapes.
- Landscape Character Areas**
- 7.4.11 The character of the landscape evolves over time as a result of the interaction of human activity and the natural environment (people and place). Attributes used less landscape character include:
- Physical – geology, landform, climate, soils, land cover;
  - Cultural and Social – land use, settlement, enclosure and history; and,
  - Aesthetics – colour, texture, pattern, form and perception.
- 7.4.12 The published National Character Areas (NCAs), Landscape Character Types (LCTs) and Landscape Character Areas (LCAs) within the Study Area from National to District level are described below and are shown on **Figure 7.5 (Appendix 7.1)**.
- National Landscape Character**
- 7.4.13 The Sites and Cable Route Search Area are located within four of the National Character Areas (NCAs) as defined by Natural England and as illustrated on **Figure 7.5 (Appendix 7.1)**:
- NCA Profile: 95 Northamptonshire Uplands (NE565);
  - NCA Profile: 89 Northamptonshire Vales (NE527);





- NCA Profile: 91 Yardley-Whittlewood Ridge (NE501); and
- NCA Profile: 88 Bedfordshire and Cambridgeshire Claylands (NE555).

7.4.14 Green Hill A, A.2, C, D, E and Green Hill BESS are located wholly within NCA 89 Northamptonshire Vales. Green Hill A and B are predominantly located within NCA 89 Northamptonshire Vales, with some of the western extents of both Sites located within NCA 95 Northamptonshire Uplands.

7.4.15 Green Hill F is located wholly within 91 Yardley-Whittlewood Ridge.

7.4.16 Green Hill G is located within both 91 Yardley-Whittlewood Ridge and 88 Bedfordshire and Cambridgeshire Claylands.

7.4.17 The NCAs are a national scale assessment and though they provide a useful broad scale overview of landscape character, the detail of more local scale landscape character assessment studies is more relevant to LVIA for development proposals of this scale.

#### **Regional Landscape Character**

7.4.18 The Sites and Cable Route Search Area are located within eight (8) Regional Landscape Character Types (LCT) as defined by Northamptonshire Council Current Landscape Character Assessment 2010 (Ref 7) and Milton Keynes Landscape Character Assessment 2016 (Ref 8) as illustrated on **Figure 7.5 (Appendix 7.1)**:

- Northamptonshire LCT 5 Clay Plateau;
- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes;
- Northamptonshire LCT 18 Broad River Valley Floodplain;
- Northamptonshire LCT 12 Limestone Valley Slopes;
- Northamptonshire LCT 8 Low Wooded Clay Ridge
- Northamptonshire LCT 6 Undulating Claylands
- Milton Keynes LCT 1 Clay Plateau Farmland; and
- Milton Keynes LCT 5 Undulating Clay Farmland.

7.4.19 These regional LCTs are broken down further into nine (9) Landscape Character Areas (LCA). The Sites and Cable Route Search Area are located in the following LCAs:

- Northamptonshire LCA 5b Sywell Plateau;
- Northamptonshire LCA 4c Ecton and Earls Barton Slopes;
- Northamptonshire LCA 18d The Nene - Billing Wharf to Woodford Mill;
- Northamptonshire LCA 12a Wollaston to Irchester;
- Northamptonshire LCA 8b Salcey Forest and Yardley Chase;
- Northamptonshire LCA 8c Hackleton Claylands
- Northamptonshire LCA 6c Bozeat Claylands;
- Milton Keynes LCA 1a Yardley Clay Plateau Farmland; and
- Milton Keynes LCA 5a Ouse Northern Undulating Valley Slopes.

7.4.20 Green Hill A, A.2, B, C and D are located wholly within Northamptonshire LCA 5b Sywell Plateau. The majority of Green Hill F is also located within Northamptonshire 5b Sywell Plateau, with the exception of parts of the southern, eastern and western edges which are partly located within the Northamptonshire LCA 4c Ecton and Earls Barton Slopes.

7.4.21 Green Hill BESS is located primarily within Northamptonshire LCA 18d The Nene - Billing Wharf to Woodford Mill. A small portion of the southern extent of Green Hill BESS is located



within the Northamptonshire LCA 18d The Nene - Billing Wharf to Woodford Mill along with the northern portion of Green Hill F.

7.4.22 The remaining extent of Green Hill F is located primarily within Northamptonshire LCA 8b Salcey Forest and Yardley Chase, with only a very small portion of Green Hill F within Northamptonshire LCA 6c Bozeat Claylands.

7.4.23 Green Hill G is located primarily within Milton Keynes LCA 5a Ouse Northern Undulating Valley Slopes, with only a small portion of the northern extent of Green Hill G located within Milton Keynes LCA 1a Yardley Clay Plateau Farmland.

7.4.24 The outer 5km Study Area is located within a further six (6) LCTs defined by the Northamptonshire Landscape Character Assessment 2010, Milton Keynes Landscape Character Assessment 2016 (Ref 8) and Bedford Borough Landscape Character Assessment 2020 (Ref 9), listed below:

- Northamptonshire LCT 13 Undulating Hills and Valleys;
- Northamptonshire LCT 17 River Valley Floodplain;
- Milton Keynes LCT 2 River Valley;
- Bedfordshire LCT 1 Clay Farmland;
- Bedfordshire LCT 2 Wooded Wolds; and
- Bedfordshire LCT Limestone Valleys.

7.4.25 These are divided into a further fifteen (15) LCAs listed below:

- Northamptonshire LCA 4b Moulton Slopes;
- Northamptonshire LCA 4d Hanging Houghton;
- Northamptonshire LCA 4e Pitsford Water;
- Northamptonshire LCA 4f Kettering and Wellingborough Slopes;
- Northamptonshire LCA 13d Cottesbrooke and Arthingworth;
- Northamptonshire LCA 17c Brampton Valley Floodplain;
- Northamptonshire LCA 17d River Ise Floodplain;
- Northamptonshire LCA 18C The Nene - Duston Mill to Billing Wharf;
- Milton Keynes LCA 5b Ouse Southern Undulating Valley Slopes;
- Milton Keynes LCA 2b Ouse Rural River Valley;
- Bedfordshire LCA 1A Cranfield to Stagsden;
- Bedfordshire LCA 1B Riseley;
- Bedfordshire LCA 2A Hinwick;
- Bedfordshire LCA 2B Pavenham; and
- Bedfordshire LCA 3A Harrold - Great Ouse

7.4.26 The Study Area contains areas defined as 'Urban' which is associated with large settlements including Wellingborough and Northampton.

7.4.27 Given the distance between the Scheme and those LCTs and LCAs that are peripheral to the Study Area, effects upon key landscape characteristics are predicted to be limited effect upon key landscape characteristics and LCTs and LCAs overall. As such it is proposed the following LCTs and LCAs are scoped out of the LVIA:

- Bedfordshire LCT 1 Clay Farmland;
- Northamptonshire LCA 4f Kettering and Wellingborough Slopes;



- Northamptonshire LCA 4d Hanging Houghton;
- Northamptonshire LCA 18C The Nene - Duston Mill to Billing Wharf;
- Milton Keynes LCA 5b Ouse Southern Undulating Clay Farmland;
- Bedfordshire LCA 1A Cranfield to Stagsden;
- Bedfordshire LCA 1B Riseley;
- Bedfordshire LCA 2B Pavenham; and
- Bedfordshire LCA 3A Harrold - Great Ouse.

7.4.28 The Scheme is not located within any Local Landscape Character (LLC) Assessment however part of the eastern extent of the Study Area is located within LLC areas identified in the Northampton Urban Fringe Landscape Character & Sensitivity Study produced by Northampton Borough Council in 2018 (Ref 10).

7.4.29 The purpose of the report is to provide a detailed understanding of the character and sensitivity of the landscapes within and surrounding Northampton to inform allocation of sites for housing development for the Northampton Local Plan Part 2. As the report focuses on the development of Northampton’s urban fringe in relation to housing as opposed to renewable energy infrastructure, it is proposed the landscape effects upon the defined LLC areas are scoped out of the LVIA.

#### Site Character

7.4.30 The Sites and Cable Route Search Area are situated within a series of land parcels across a large geographic area. Each of the Sites, is separated by varying distances and therefore from a landscape and visual perspective each of the Sites is considered to have varying interconnecting effects on the local landscape. The landscape baseline for the individual Sites and Cable Route Search Area are shown in **Figures 7.6.1 - 7.6.5, Appendix 7.1**. The following sets out the landscape baseline for the former, as the Cable Route Search Area lies within the areas described for each Site it is not described separately.

#### Green Hill A

7.4.31 Green Hill A is located within a rural setting of Northamptonshire, 5.3km southwest of Kettering. The closest settlements to Green Hill A include the village of Old, approximately 300m to the west and the village of Walgrave, approximately 600m to the south. These two villages sit within the wider context of smaller villages scattered throughout the wider rural landscape, connected by local ‘B’ and narrow roads, connecting smaller urban nodes within the wider landscape.

7.4.32 Green Hill A covers an area of approximately 171.77ha and is currently being used for agricultural purposes, predominantly arable. Green Hill A is divided into twenty nine (29) field parcels which are divided centrally by Newland Road which runs through Green Hill A north to south. Other surrounding roads in close proximity include Broughton Road which runs adjacent to the northern extent of Green Hill A, and Walgrave Road which runs parallel to the southern boundary of Green Hill A at a distance of 300m.

7.4.33 Green Hill A is located on rolling landform with gently sloping undulation which varies between 104m to 136m AOD and roughly rise and fall in a northwest, southeast orientation. The surrounding farmland comprises a similar pattern of rolling landform.

7.4.34 Green Hill A comprises a series of medium scale regular shaped agricultural field parcels, defined by extensive hedgerows and hedgerow trees. It also contains a mature native woodland block which meanders north to south, parallel to Newland Road and forms a strong landscape feature in the local context.



- 7.4.35 Surrounding Green Hill A, the landscape is similar to the agricultural farmland contained within Green Hill A itself, delineated by low hedge lines and treed hedgerows, with the occasional scattered wooded block.
- 7.4.36 Nearby properties in close proximity to Green Hill A include farmstead type buildings, one to the south of Newlands Road, The Acorn, Educational Centre and a further farmstead with outbuildings, Walgrave lodge to the north, again along Newlands Road. There are also several larger isolated properties dotted throughout the wider surrounding countryside.
- 7.4.37 There is a greater concentration of properties and housing located south of Green Hill A within the villages of Old and Walgrave and a small residential development along Walgrave Road located directly between the two villages.
- 7.4.38 **Registered Parks and Gardens:** There are no Registered Parks and Gardens within Green Hill A.
- 7.4.39 Lamport Hall, Grade II (List Entry 1001036) is the nearest Registered Park and Garden, located approximately 2.8km west of Green Hill A. This is the only Registered Park and Garden within 5km of Green Hill A.
- 7.4.40 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill A and three (3) Scheduled Monuments within the wider 2km Study Area.
- 7.4.41 The closest Scheduled Monuments are within the village of Walgrave; Abandoned areas of Walgrave Medieval Village (List Entry Number: 1418583), located directly south, it also encompasses Walgrave moated site (List Entry Number:1011036) these are approximately between 500m to 1km from Green Hill A.
- 7.4.42 **Listed Buildings:** There are no Listed Buildings on Green Hill A. Within 2km there are two Grade I Listed Buildings and 36 Grade II Listed Buildings.
- 7.4.43 **Conservation Areas:** There are no Conservation Areas located on Green Hill A or within the wider 2km Study Area. The closest Conservation Area is Scaldwell approximately 2.1km to the west.
- 7.4.44 **Ancient Woodland:** There is no Ancient Woodland on Green Hill A.
- 7.4.45 The nearest block of Ancient Woodland is Badsaddle Wood (Ancient & Semi-Natural Woodland), located 1.8km southeast of Green Hill A.
- 7.4.46 There are seven blocks of Ancient Woodland located between 2 and 5km of Green Hill A which include: Withmale Park Wood (A mix of Ancient & Semi-Natural Woodland and Ancient Replanted Woodland); Faxton Corner; Cransley Wood (Ancient and Semi-Natural Woodland); Hardwick Wood (Ancient Replanted Woodland); Sywell Wood (Ancient Replanted Woodland) and two unnamed Ancient Semi-Natural Woodland blocks.
- 7.4.47 **Sites of Special Scientific Interest (SSSI):** There are no SSSIs on Green Hill A.
- 7.4.48 There are three SSSIs on the outer edge of the wider 2km Study Area: Pitsford Reservoir to the southwest; Badsaddle and Withmale Park Bush Walk Woods to the east; and Birch Spinney and Mawsley Marsh to the north.
- 7.4.49 **National Character Area:** Green Hill A is located within two of the National Character Areas (NCA's) as illustrated on **Figure 7.5** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527), and NCA Profile: 95 Northamptonshire Uplands (NE565).
- 7.4.50 **Regional Landscape Character:** Green Hill A is located within one Landscape Character Type (LCT), LCT 5 Clay Plateau which contains one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 7.4.51 There are a further four LCTs located within 2km and 5km of Green Hill A including;



- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes;
- Northamptonshire LCT 17 River Valley Floodplain; and
- Northamptonshire LCT 13 Undulating Hills and Valleys.

7.4.52 These are broken down into further LCAs between 2km and 5km and localised as:

- Northamptonshire LCA 4e Pitsford Water;
- Northamptonshire LCA 4d Hanging Houghton;
- Northamptonshire LCA 4f Kettering and Wellingborough Slopes;
- Northamptonshire LCA 17c Brampton Valley Floodplain; and
- Northamptonshire LCA 13d Cottesbrooke and Arthingworth.

7.4.53 **Green Space:** The nearest Green Spaces are playing fields located in Walgrave, approximately 370m south of Green Hill A and playing fields located in Old, approximately 390m west of Green Hill A.

### **Green Hill A.2**

7.4.54 Green Hill A.2 is located within a rural setting of Northamptonshire, 5.17km southwest of Kettering. The closest settlements to Green Hill A.2 include the village of Walgrave, located approximately 900m to the west and Hannington located approximately 950m southeast of Green Hill A.2. These two villages sit within the wider context of smaller villages scattered throughout the wider rural landscape, connected by local 'B' and narrow roads, connecting smaller urban nodes within the wider landscape.

7.4.55 Green Hill A.2 covers an area of approximately 65.20ha and is currently being used for agricultural purposes, predominantly arable. Green Hill A.2 comprises four (4) large scale field parcels divided by native hedgerows with scattered hedgerow trees.

7.4.56 Roads in close proximity to Green Hill A.2 include the A43 which runs north to south, directly east and Kettering Road which joins the A43 at the northeast corner of Green Hill A.2 and runs directly parallel to the northern boundary.

7.4.57 Green Hill A.2 is located on gently rolling landform which varies between 110m to 136m AOD and roughly falls from east to west. The surrounding farmland comprises a similar pattern of rolling landform.

7.4.58 Green Hill A.2 comprises a mix of two medium, slightly irregular shaped field parcels and two large scale regular shaped agricultural field parcels, defined by extensive hedgerows and hedgerow trees. Other extensive tree planting in close proximity includes a woodland block which runs parallel to the southern boundary, directly southeast of Green Hill A.2.

7.4.59 Surrounding Green Hill A.2, the landscape is similar to the agricultural farmland contained within Green Hill A.2 itself, delineated by low hedge lines and treed hedgerows, with the occasional scattered wooded block particularly to the south.

7.4.60 Nearby properties in close proximity include farmstead type buildings along Kettering Road which includes several properties associated with New Lodge Farm, located 14m north of Green Hill A.2 and Bridge Field Farm located 230m west. There is also a series of buildings directly south associated with Rectory Farm located west of the A43. Residential property Gibb Wood (Promise Land) is located opposite, on the far side of the A43.

7.4.61 **Registered Parks and Gardens:** There are no Registered Parks and Gardens within 5km of Green Hill A.2.

7.4.62 Lamport Hall, Grade II (List Entry 1001036) is the nearest Registered Park and Garden, located approximately 5.45km north west of Green Hill A.2.



- 7.4.63 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill A.2, there are two (2) Scheduled Monuments within the wider 2km Study Area.
- 7.4.64 The closest Scheduled Monuments are within the village of Walgrave; Abandoned areas of Walgrave Medieval Village (List Entry Number: 1418583) and encompasses Walgrave moated site (List Entry Number:1011036) located approximately between 700m to 1.6km east of Green Hill A.2.
- 7.4.65 **Listed Buildings:** There are no Listed Buildings on Green Hill A.2. Within 2km there are two Grade I Listed Buildings and 21 Grade II Listed Buildings.
- 7.4.66 **Conservation Areas:** There are no Conservation Areas located on Green Hill A.2 or within the wider 2km Study Area. The closest Conservation Area is Broughton approximately 2.3km to the north east.
- 7.4.67 **Ancient Woodland:** There is no Ancient Woodland on Green Hill A.2.
- 7.4.68 The nearest block of Ancient Woodland is Badsaddle Wood (Ancient & Semi-Natural Woodland), located 308m east of Green Hill A.2.
- 7.4.69 There are a further five blocks of Ancient Woodland located between 1 and 5km of Green Hill A.2 which include: Withmale Park Wood (A mix of Ancient & Semi-Natural Woodland and Ancient Replanted Woodland); Cransley Wood (Ancient and Semi-Natural Woodland); Hardwick Wood (Ancient Replanted Woodland); Sywell Wood (Ancient Replanted Woodland) and one unnamed Ancient Semi-Natural Woodland blocks.
- 7.4.70 **Sites of Special Scientific Interest (SSSI):** There are no SSSIs on Green Hill A.2.
- 7.4.71 There are three SSSIs within the 5km Study Area: the closest are Badsaddle and Withmale Park Bush Walk Woods located between 308m and 930m to the southeast. Pitsford Reservoir is located 2.5km southwest of Green Hill A.2.
- 7.4.72 **National Character Area:** Green Hill A.2 is located within one National Character Areas (NCA's) as illustrated on **Figure 7.5** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 7.4.73 **Regional Landscape Character:** Green Hill A.2 is located within one Landscape Character Type (LCT), LCT 5 Clay Plateau which contains one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 7.4.74 There are a further four LCTs located within 2km and 5km of Green Hill A.2 including;
- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes;
- 7.4.75 These are broken down into further LCAs between 2km and 5km and localised as:
- Northamptonshire LCA 4e Pitsford Water;
  - Northamptonshire LCA 4f Kettering and Wellingborough Slopes;
- 7.4.76 **Green Space:** The nearest Green Spaces are playing fields and play space located in Walgrave, approximately 1.4km west of Green Hill A.2.

### **Green Hill B**

- 7.4.77 Green Hill B is located 1.3km north of the Northampton suburb of Moulton, in the rural setting of Northamptonshire. The closest settlements to Green Hill B is the small village of Holcot located approximately 850m south. Holcot sits at the outer edge of a wider context of smaller villages scattered throughout the wider rural landscape, connected by local 'B' roads. Other settlements within 2km of Green Hill B are limited to farmsteads and larger isolated properties dotted within the wider landscape and associated with the local road network.



- 7.4.78 Green Hill B covers an area of 63.61ha of gently undulating landform which varies between 117m to 128m AOD and generally falls from north to south. The land is currently being used for agricultural purposes, predominantly arable. The surrounding farmland comprises a similar pattern of rolling landform.
- 7.4.79 Green Hill B comprises a series of five (5) medium scale regular shaped agricultural field parcels defined by extensive hedgerows and hedgerow trees. Boundary treatment comprises of a mix of taller hedgerows allowed to grow up to 2.5 meters and lower maintained hedgerows up to 2 meters in height. The hedgerows which define the western perimeter of Green Hill B contain a greater concentration of mature trees and provide a dense vegetative boundary. Green Hill B also contains a large pond which is heavily screened by mature tree and shrub planting in the most eastern field parcel.
- 7.4.80 A Public Right of Way (PRoW) crosses the most eastern field parcel from north to south diagonally, passing the edge of the pond.
- 7.4.81 Tithe Farm Road is located at the entrance to Green Hill B and runs halfway into Green Hill B in north to south direction.
- 7.4.82 Surrounding Green Hill B, the landscape is similar to the agricultural farmland contained within Green Hill B itself, delineated by a mix of low hedge lines, outgrown and treed hedgerows, and the occasional scattered wooded block. There are five (5) buildings within the proximity of Green Hill B comprising of farmsteads, detached properties, cottages and a converted farm building. Tithe Farm which lies adjacent to Green Hill B, has several old farm buildings/barns which have been converted into commercial office spaces and are occupied by a number of independent businesses, a car park is also associated with the buildings but its heavily screened on the north, east and south by scattered woodland blocks. A large, detached property, Hillcrest lies approximately 300m to the northwest, situated between Holcot Road the northern boundary of Green Hill B. There are also several larger buildings located approximately 200 to 500m to the south of Green Hill B, they comprise of; Rectory Farm which has a large footprint of outbuildings, Overstone Old Rectory, a mix of outbuildings and a property and several cottages and Overstone Grange. There are also several farmsteads and commercial storage yards dotted in the wider surrounding countryside towards the east, which are associated with Sywell Road.
- 7.4.83 Towards the northwest at approximately 1.4km from Green Hill B is Pitsford Water Reservoir which sits approximately 30m AOD below Green Hill B, Pitsford Water provides a location for walking, cycling, fishing, sailing, water sports and birdwatching.
- 7.4.84 **Registered Parks and Gardens:** There are no Registered Parks and Gardens on or within 2km of Green Hill B. The closest Registered Park and Garden is Boughton Hall located approximately 3.3km to the west in the village of Boughton.
- 7.4.85 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill B.
- 7.4.86 The closest Scheduled Monument is beyond the wider 2km Study Area, located south of the village of Walgrave: Abandoned areas of Walgrave Medieval Village.
- 7.4.87 **Listed Buildings:** There are no Listed Buildings on Green Hill B and 54 Listed Buildings within the wider 2km Study Area comprising two Grade I Listed Buildings, 53 Grade II Listed Buildings.
- 7.4.88 **Conservation Areas:** Green Hill B is not located within a Conservation Area, the closest at the edge of the wider 2km Study Area is Moulton Conservation Area located approximately 1.6km to the southwest. Located to the west within the outer 5km Study Area is Boughton Conservation Area, located approximately 3.3km from Green Hill B and Pitsford Conservation Area located approximately 3km west.
- 7.4.89 **Ancient Woodland:** There is no Ancient Woodland on Green Hill B.
- 7.4.90 The nearest block of Ancient Woodland is Badsaddle Wood (Ancient & Semi-Natural Woodland), located approximately 1.8km southeast of Green Hill B.



- 7.4.91 There are three blocks of Ancient Woodland located between 2 and 5km of Green Hill B which include: Sywell Wood (Ancient Replanted Woodland); Hardwick Wood (Ancient Replanted Woodland); and Withmale Park Wood (A mix of Ancient & Semi-Natural Woodland & Ancient Replanted Woodland).
- 7.4.92 **Sites of Special Scientific Interest (SSSI):** There are no SSSI's on Green Hill B.
- 7.4.93 Located within the wider 2km Study Area to the northwest approximately 800m from Green Hill B is Pitsford Reservoir which covers a large area of 413.07m<sup>2</sup>. Located within the outer 5km Study Area to the northeast is Hardwick Lodge Meadow which is located approximately 3km distance from Green Hill B and Badsaddle, Withmale Park and Bush Walk Woods at an approximate distance of 4.3km to the northeast.
- 7.4.94 **Local Nature Reserve (LNR):** There are no LNR on Green Hill B.
- 7.4.95 On the edge of the wider 2km Study Area to the south is Crowfields Common. Within the wider outer 5km Study Area is Lings Wood approximately 4km and Scrub Field approximately 4.6km to the southwest.
- 7.4.96 **National Character:** Green Hill B is located within two of the National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527), and NCA Profile: 95 Northamptonshire Uplands (NE565).
- 7.4.97 **Regional Landscape Character:** Green Hill B is located within one Landscape Character Type (LCT), LCT 5 Clay Plateau which contains one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 7.4.98 There are two LCTs located between 2km and 5km of Green Hill B including;
- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes; and
  - Northamptonshire LCT 17 River Valley Floodplain.
- 7.4.99 These are broken down into further LCAs between 2km and 5km and localised as:
- Northamptonshire LCA 4b Moulton Slopes;
  - Northamptonshire LCA 4c Ecton and Earls Barton Slopes;
  - Northamptonshire LCA 4e Pitsford Water;
  - Northamptonshire LCA 4d Hanging Houghton; and
  - Northamptonshire LCA 17c Brampton Valley Floodplain.

### **Green Hill C**

- 7.4.100 Green Hill C is located 2km west of Wellingborough, in the rural setting of Northamptonshire. The closest settlement is the small village of Sywell, located approximately 1km southwest of Green Hill C.
- 7.4.101 Green Hill C comprises of a series of medium scale, irregular agricultural field parcels defined by a combination of hedgerows and hedgerow trees, a block of ancient woodland to the north, Sywell Aerodrome to the west and an existing solar farm to the north.
- 7.4.102 Green Hill C covers an area of 55.02 ha and is currently being used for agricultural purposes, predominantly arable with the field south of the existing solar farm, currently fallow.
- 7.4.103 Green Hill C is divided into eight (8) land parcels, bound along the southern perimeter by Sywell Road, also referred to as Moonshine Gap. The current entrance to Green Hill C is an existing gate and access track that runs northwards into Green Hill C, which is located in close proximity of Beckworth Emporium and Garden Centre directly to the south.





- 7.4.104 Green Hill C is located on rolling landform with gently sloping undulation which varies between 109m to 123m AOD and roughly rise and fall in a northwest, southeast orientation.
- 7.4.105 The access track within Green Hill C is located along a high point within Green Hill C at 118m AOD. The surrounding landform falls in northwest direction before rising again to the western extent of Green Hill C. The land east of the access track falls to 111 AOD to the southeastern corner of Green Hill C.
- 7.4.106 Green Hill C is largely contained with treed hedgerows, along the east and southern perimeter. There are two linear blocks of woodland to the north of Green Hill C, one consisting of a mature conifer hedgerow. The northwestern field parcel is contained within mature hedgerows and larger trees, which connect with the dense block of mature ancient woodland to the north of Green Hill C.
- 7.4.107 A bridleway traverses north to south in the western extent of Green Hill C and connects the ancient woodland to the north with Sywell Road.
- 7.4.108 **Registered Parks and Gardens:** There are no Registered Parks and Gardens on or within 2km of Green Hill C. The closest Registered Park and Garden is the Great Harrowden Hall located 4.6km northeast of Green Hill C. There are no other Registered Parks and Gardens within 5km of Green Hill C.
- 7.4.109 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill C.
- 7.4.110 The closest Scheduled Monument is Earls Barton motte castle (List Entry Number: 1,009,510), located approximately 2.8km to the south of Green Hill C.
- 7.4.111 **Listed Buildings:** There are no Listed Buildings located on Green Hill C.
- 7.4.112 Within the combined wider 2km Study Area of Green Hill C, D and E there is one Grade I Listed Building, 10 Grade II\* Listed Buildings, 98 Grade II Listed Buildings which are primarily associated with the villages of Sywell and Mears Ashby.
- 7.4.113 **Conservation Areas:** There are no Conservation Areas located on Green Hill C.
- 7.4.114 There are several Conservation Areas within the wider 2km Study Area, the closest are Sywell Conservation Area located 1km to the west and Mears Ashby Conservation Area located 1.1km south of Green Hill C.
- 7.4.115 **Ancient Woodland:** There is no Ancient Woodland on Green Hill C.
- 7.4.116 The nearest block of Ancient Woodland is Sywell Wood (Ancient Replanted Woodland), which is adjacent to the northern boundary of Green Hill C. There is only one other block of Ancient Woodland within 2km of Green Hill C, Hardwick Wood (Ancient Replanted Woodland) which is located 1.5km north of Green Hill C.
- 7.4.117 There are a further two blocks of Ancient Woodland between 2km to 5km which include Withmale Park Wood (Ancient Replanted Woodland) and Badsaddle Wood (Ancient & Semi-Natural Woodland).
- 7.4.118 **Sites of Special Scientific Interest (SSSI):** There are no SSSI's on Green Hill C. The closest SSSI is Hardwick Lodge Meadow approximately 1.3km north of Green Hill C.
- 7.4.119 **National Character Areas:** Green Hill C is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 7.4.120 Green Hill C is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.
- 7.4.121 **Regional Landscape Character:** Green Hill C is located within one Landscape Character Type (LCT), LCT 5 Clay Plateau which contains one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.



- 7.4.122 There are two further LCTs located between 2km and 5km of Green Hill C including;
- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes; and
  - Northamptonshire LCT 18 River Valley Floodplain.

- 7.4.123 LCAs located between 2km and 5km from Green Hill C include;
- Northamptonshire LCA 4b Moulton Slopes;
  - Northamptonshire LCA 4c Ecton and Earls Barton Slopes;
  - Northamptonshire LCA 4e Pitsford Water;
  - Northamptonshire LCA 4f Kettering and Wellingborough Slopes; and
  - Northamptonshire LCA 18d The Nene - Billing Wharf to Woodford Mill.

#### **Green Hill D**

- 7.4.124 Green Hill D is located 250m east of Green Hill C and 1.3km west of Wellingborough, in the rural setting of Northamptonshire. The closest settlement is the village of Mears Ashby which is directly south of Green Hill D.
- 7.4.125 Green Hill D comprises of a distinctive linear shaped series of agricultural fields which are located between Green Hill C and E, orientated north to south. Green Hill D covers an area of 42.06 ha and is currently being used for agricultural purposes, predominantly arable.
- 7.4.126 Green Hill D is divided into four (4) land parcels of approximately equal size which are connected in a longitudinal arrangement and bound to the east by the neighbouring B-Road, Highfield Road and Sywell Road to the north. Highfield Road links Sywell Road to the village of Mears Ashby to the south.
- 7.4.127 The field parcels can be accessed from a series of openings that have been formed along Highfield Road. Green Hill D is located on gently falling land, with a high point of 118m AOD at the corner of Sywell Road (northeast corner of Green Hill D) which falls to 102m AOD at the southwest corner of Green Hill D towards Mears Ashby. The field parcels generally fall westwards from Highfield Road by approximately 10m.
- 7.4.128 Green Hill D is delineated by treed hedgerows which separate each land parcel in an east to west direction. The western perimeter of Green Hill D is more substantial in part, the treed hedgerows providing greater screening. However, the change in the elevation towards the west associated with Glebe Road which sits at similar height as Highfield Road allows mid-distant views into Green Hill D.
- 7.4.129 A PRoW footpath crosses Green Hill D in a north to south direction along the western boundary, which connects Sywell Road/ Moonshine Gap with the Village of Mears Ashby.
- 7.4.130 **Registered Parks and Gardens:** There are no Registered Parks and Gardens on or within 2km of Green Hill D. The closest Registered Park and Garden is Great Harrowden Hall located 4.2km northeast of Green Hill D. There are no other Registered Parks and Gardens are within 5km of Green Hill D.
- 7.4.131 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill D.
- 7.4.132 The closest Scheduled Monument is Earls Barton motte castle (List Entry Number: 1,009,510), located 2.3km to the south of Green Hill D.
- 7.4.133 **Listed Buildings:** There are no Listed Buildings located on site.
- 7.4.134 Within the combined wider 2km Study Area of Green Hill C, D and E there is one Grade I Listed Building, 10 Grade II\* Listed Buildings, 98 Grade II Listed Buildings which are primarily associated with the villages of Sywell and Mears Ashby.
- 7.4.135 **Conservation Areas:** There are no Conservation Areas located on Green Hill D.



- 7.4.136 There are several Conservation Areas within the wider 2km Study Area, the nearest is Mears Ashby Conservation Area located 113m south of Green Hill D.
- 7.4.137 **Country Park:** There are no Country Parks on Green Hill D and the nearest is Sywell Country Park located 1.1km southwest of Green Hill D.
- 7.4.138 **Ancient Woodland:** There is no Ancient Woodland on Green Hill D.
- 7.4.139 The nearest block of Ancient Woodland is Sywell Wood (Ancient Replanted Woodland), which is located 770m northeast of Green Hill E. There is one block of Ancient Woodland within 2km of Green Hill D, Hardwick Wood (Ancient Replanted Woodland) which is located 2km northeast of Green Hill D.
- 7.4.140 There are a further two blocks of Ancient Woodland between 2km to 5km which include Withmale Park Wood (Ancient Replanted Woodland) and Badsaddle Wood (Ancient & Semi-Natural Woodland).
- 7.4.141 **Sites of Special Scientific Interest (SSSI):** There are no SSSI's on Green Hill D. The closest SSSI is Hardwick Lodge Meadow approximately 1.7km north of Green Hill D.
- 7.4.142 **National Character Area:** Green Hill D is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 7.4.143 Green Hill D is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.
- 7.4.144 **Regional Landscape Character:** Green Hill D is located within one Landscape Character Type (LCT), LCT 5 Clay Plateau which contains one Landscape Character Area (LCA), LCA 5b Sywell Plateau, as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 7.4.145 There are two further LCTs located between 2km and 5km of Green Hill D including;
- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes; and
  - Northamptonshire LCT 18 River Valley Floodplain.
- 7.4.146 Additional LCAs located between 2km and 5km from Green Hill D include;
- Northamptonshire LCA 4b Moulton Slopes;
  - Northamptonshire LCA 4c Ecton and Earls Barton Slopes;
  - Northamptonshire LCA 4f Kettering and Wellingborough Slopes; and
  - Northamptonshire LCA 18d The Nene - Billing Wharf to Woodford Mill.

### **Green Hill E**

- 7.4.147 Green Hill E is located 330m east of Green Hill D and 600m west of the western extent of Wellingborough, in a rural setting of Northamptonshire.
- 7.4.148 Green Hill E is one of the larger Sites and covers an area of 304.72 ha. From north to south Green Hill E is approximately 3.18km and 1.9km at its widest point.
- 7.4.149 Green Hill E comprises a series of agricultural land parcels which vary from medium to small in size and are fairly regular in shape.
- 7.4.150 The closest settlements are the village of Mears Ashby which is directly west, Earls Barton located directly south, and Wilby located 920m east of Green Hill E.
- 7.4.151 A series of A and B roads in close proximity to Green Hill E connecting the surrounding villages include: Mears Ashby Road, west of Green Hill E (B-road), the A4500 Main Road, south of Green Hill E (A-Road) and Wilby Road which runs through Green Hill E from east to west.



- 7.4.152 Approximately one third of the northern extent of Green Hill E is divided by Wilby Road, which connects the villages of Mears Ashby and Wilby. The southern portion of Green Hill E then extends 1.95km to the south from Wilby Road until it reaches the A4500 Main Road. The western extent of Green Hill E extends to Mears Ashby Road at its widest point.
- 7.4.153 The northern extent of Green Hill E (north of Wilby Road) comprises twelve (12) field parcels. Landform within this portion of Green Hill E generally rises from Wilby Road in a north / northwestern direction from an average of 100 AOD up to 115 AOD. Landform also rolls within this extent of Green Hill E in an east to west direction.
- 7.4.154 The field parcels south of Wilby Road comprises twenty (22) land parcels. Landform within this portion of Green Hill E generally falls in a southerly direction from Wilby Road with a high point of 109 AOD in the north western field parcel. The landform slopes gently at first before becoming steeper to the southern and eastern extents of Green Hill E. Topography falls to the eastern and southern extents of Green Hill E at 71 AOD as well as dropping west to a water course that runs parallel to Mears Ashby Road to a low of 85 AOD. The landform then rises from east to west in the two most westerly field parcels, from 84 AOD at the watercourse up to 102 AOD along Mears Ashby Road.
- 7.4.155 Existing vegetation cover across the northern and southern portions of Green Hill E is similar, with varying treed hedgerows of differing heights and widths which delineate each field parcel as well as scattered blocks of deciduous tree planting and small wooded areas. The northern portion of Green Hill E contains many bands of dense tree planting both within Green Hill E and along the northern boundary. These tree lines connect to several woodland blocks northeast of Green Hill E.
- 7.4.156 Substantial woodland blocks associated with the southern portion of Green Hill E are located along extensive lengths of the eastern and western boundaries and include Wilby Spiney and woodland which runs parallel to a water course that runs south from Mears Ashby.
- 7.4.157 There are two (2) PRoWs that cross Green Hill E, one the runs parallel to the most northern boundary and a second that dissects one of the most western field parcels, parallel to Mears Ashby Road.
- 7.4.158 The surrounding landscape setting is similar in appearance to the agricultural farmland contained within Green Hill E however this is framed by surrounding urban settlements such as Wellingborough and the northern eastern suburbs of Northampton.
- 7.4.159 **Registered Parks and Gardens:** There are no Registered Parks and Gardens on or within 2km of Green Hill E. The closest Registered Park and Garden is the Castle Ashby located 3.6km south of Green Hill E. There are no other Registered Parks and Gardens are within 5km of Green Hill E.
- 7.4.160 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill E.
- 7.4.161 The closest Scheduled Monument is Earls Barton motte castle (List Entry Number: 1,009,510), located 1.5 km to the west of Green Hill E.
- 7.4.162 **Listed Buildings:** There are no Listed Buildings located on Green Hill E.
- 7.4.163 Within the combined wider 2km Study Area of Options C, D and E there is one Grade I Listed Building, 10 Grade II\* Listed Buildings, 98 Grade II Listed Buildings which are primarily associated with the villages of Mears Ashby, Wilby and Earls Barton.
- 7.4.164 **Conservation Areas:** There are no Conservation Areas located on Green Hill E.
- 7.4.165 There are several Conservation Areas within the wider 2km Study Area, the nearest is Mears Ashby Conservation Area located 67m west of Green Hill E.
- 7.4.166 **Country Park:** There are no Country Parks on Green Hill E however the nearest, Sywell Country Park, is located 360m west of Green Hill E.
- 7.4.167 **Ancient Woodland:** There is no Ancient Woodland on Green Hill E.



- 7.4.168 The nearest block of Ancient Woodland is Sywell Wood (Ancient Replanted Woodland), which is located 1.5km northeast of Green Hill E. There are two blocks of Ancient Woodland between 2km and 5km of Green Hill E which include Hardwick Wood (Ancient Replanted Woodland) which is located 2.9km northeast of Green Hill E and Withmale Park Wood (Ancient Replanted Woodland) located 4km north of Green Hill E.
- 7.4.169 **Sites of Special Scientific Interest (SSSI):** There are no SSSI's on Green Hill E.
- 7.4.170 The closest SSSI is the Upper Nene Valley Gravel Pits SSSI, located approximately 2.6km southeast of Green Hill E, and stretches over a distance of 4.6km in a southwest to northeast direction.
- 7.4.171 **Ramsar Sites:** There are no RAMSAR's on Green Hill E.
- 7.4.172 The closest Ramsar Site is the Upper Nene Valley Gravel Pits Ramsar Site, located approximately 2.6km southeast of Green Hill E.
- 7.4.173 **National Character Area:** Green Hill E is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 7.4.174 Green Hill E is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.
- 7.4.175 **Regional Landscape Character:** Green Hill E is located within two LCTs and two LCAs. These include LCT 5 Clay Plateau which contains LCA 5b Sywell Plateau, and LCT 4 Rolling Ironstone Valley which contains LCA 4c Ecton and Earls Barton Slopes as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**.
- 7.4.176 There are two further LCTs located between 2km and 5km of Green Hill E including;
- Northamptonshire LCT 12 Limestone Valley Slopes; and
  - Northamptonshire LCT 18 Broad River Valley Floodplain
- 7.4.177 Additional LCAs located between 2km and 5km from Green Hill E include;
- Northamptonshire LCA 4b Moulton Slopes;
  - Northamptonshire LCA 4e Pitsford Water;
  - Northamptonshire LCA 4f Kettering and Wellingborough Slopes;
  - Northamptonshire LCA 12a Wollaston to Irchester; and
  - Northamptonshire LCA 18d The Nene - Billing Wharf to Woodford Mill.

#### **Green Hill F**

- 7.4.178 Green Hill F is located 200m west of the village of Bozeat and 740m east of village of Grendon, in the rural setting of Northamptonshire.
- 7.4.179 Green Hill F comprises a series of medium scale irregular shaped agricultural fields.
- 7.4.180 Green Hill F is one of the larger of the Sites covering an area of 288 ha and at its longest point is approximately 3.8km long from north to south and 2.5km wide from east to west.
- 7.4.181 The field parcels which make up Green Hill F run parallel to the A509 Wollaston Road and run north to south between Grendon and Bozeat. Other roads in close proximity include the A428, Bedford Road East located 1.4km south of Green Hill F as well as Easton Lane and Easton Way which traverse the centre of Green Hill F east to west connecting neighbouring villages Grendon, Easton Maudit and Bozeat.
- 7.4.182 The landform differs greatly in height with a low point of 53 AOD to the northern extent of Green Hill F. Topography then generally rises to the southern extent of Green Hill F to an



- AOD of 103. Landform undulates throughout Green Hill F and rises to the east and west towards the A509 and Grendon.
- 7.4.183 Field parcels within Green Hill F are delineated by native hedgerows of varying quality often with few hedgerows trees which results in a fairly open aspect when viewed from within Green Hill F. As well as hedgerows there are few bands of denser shrub and tree planting that run centrally to Green Hill F and border the three of the most northern field parcels. There is also substantial scattered tree and shrub planting associated with the restored quarry land located directly east of Green Hill F. A combination of landform and vegetation in this location limits views of Green Hill F to the east.
- 7.4.184 Woodland cover within the immediate context of Green Hill F is primarily located in the southern extent of Green Hill F where there are 3 large woodland blocks. Cold Oak Copse (Ancient Woodland), Horn Wood (Ancient Woodland) are located east and west of the most southerly field parcels within Green Hill F. A third large block of native woodland located 500m southwest of Green Hill F just north of the A428, Bedford Road East, provides additional screening of Green Hill F when viewed from the south.
- 7.4.185 There is a network of PRoW located in and around Green Hill F. These are concentrated in the northern and southern areas of Green Hill F. A series of six (6) PRoW traverse the northern portion of Green Hill F from east to west and north to south. These include:
- Footpath NN | TA | 4#1;
  - Footpath NN | TA | 1;
  - Footpath NN | TA | 4#3;
  - Footpath NN | TA | 4#2;
  - Footpath NN | TD | 3; and
  - Footpath NN | TD | 2.
- 7.4.186 There are two footpaths and one Bridleway which traverse the southern portion of Green Hill F northeast to southwest and northwest to southeast. These include:
- Footpath NN | TD | 5;
  - Footpath NN | TD | 7; and
  - Bridleway NN | TD | 8.
- 7.4.187 **Registered Parks and Gardens:** There are no Registered Parks and Gardens on Green Hill F. The closest Registered Park and Garden is the Castle Ashby located 750m west of Green Hill F. Other Registered Parks and Gardens within 5km include Hinwick House located 3km northeast of Green Hill F and Hinwick Hall located 3.4km northeast.
- 7.4.188 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill F.
- 7.4.189 There are three (3) Scheduled Monuments within the wider 2km Study Area, the closest of which is located 25m south of the southern extent of Green Hill F.
- 7.4.190 **Listed Buildings:** There are no Listed Buildings located on Green Hill F.
- 7.4.191 Within the wider 2km Study Area there are four Grade I Listed Buildings, five Grade II\* Listed Buildings, 91 Grade II Listed Buildings.
- 7.4.192 **Conservation Areas:** There are no Conservation Areas located on Green Hill F.
- 7.4.193 There are three Conservation Areas (Easton Maudit, Castle Ashby and Grendon) within 2km of Green Hill F, the nearest of which, Easton Maudit is located adjacent to the eastern boundary of Green Hill F.
- 7.4.194 **Ancient Woodland:** There is no Ancient Woodland on Green Hill F.



- 7.4.195 The nearest blocks of Ancient Woodland are Horn Wood (Ancient & Semi-Natural Woodland), which is adjacent to the south eastern extent of Green Hill F and Cold Oak Copse located 304m west of Green Hill F.
- 7.4.196 There are a further nine blocks of Ancient Woodland within 2km of Green Hill F including; Cold oak Copse (Ancient Replanted Woodland); Nun Wood (Ancient & Semi-Natural Woodland); Three Shrine Wood (Ancient & Semi-Natural Woodland); The Slipe (Ancient & Semi-Natural Woodland); Templegrove Spiney (Ancient & Semi-Natural Woodland); and four smaller Spinneys which are unnamed blocks of Ancient and Semi-Natural Woodland to the south.
- 7.4.197 **Sites of Special Scientific Interest (SSSI):** There are no SSSI's on Green Hill F.
- 7.4.198 The closest SSSI is the Bozeat Meadow, located 71m east of the eastern boundary of Green Hill F.
- 7.4.199 **National Character Area:** Green Hill F is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 54 Yardley-Whittlewood Ridge (NE501).
- 7.4.200 Green Hill F is located at the northern portion edge of the NCA Profile: 54 Yardley-Whittlewood Ridge and borders NCA Profile: 89 Northamptonshire Vales and NCA Profile: 88 Bedfordshire and Cambridgeshire Claylands, both within 2km of Green Hill F.
- 7.4.201 **Regional Landscape Character:** Green Hill F is located within three LCTs which contain three LCAs as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**. These include; LCT 12 Limestone Valley Slopes, which contains LCA 12a Wollaston to Irchester; LCT 6 Undulating Claylands which contains 6c Bozeat Claylands; and LCT 8 Low Wooded Clay Ridge, which contains LCA 8b Salcey Forest and Yardley Chase.
- 7.4.202 Further LCTs located between 2km and 5km of Green Hill F include;
- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes;
  - Northamptonshire LCT 18 Broad River Valley Floodplain;
  - Bedfordshire LCT 1 Clay Farmland;
  - Bedfordshire LCT 2 Wooded Wolds;
  - Bedfordshire LCT 3 Limestone Valleys;
  - Milton Keynes LCT 1 Clay Plateau Farmland;
  - Milton Keynes LCT 2 River Valley; and
  - Milton Keynes LCT 5 Undulating Clay Farmland;
- 7.4.203 Further LCAs located between 2km and 5km from Green Hill F include;
- Northamptonshire LCA 18d The Nene - Billing Wharf to Woodford Mill;
  - Northamptonshire LCA 4c Ecton and Earls Barton Slopes;
  - Northamptonshire LCA 6b Hackleton Claylands;
  - Bedfordshire LCA 2A Hinwick;
  - Bedfordshire LCA 1B Riseley;
  - Bedfordshire LCA 3A Harrold - Great Ouse;
  - Milton Keynes LCA 1a Yardley Clay Plateau Farmland;
  - Milton Keynes LCA 5a Ouse Northern Undulating Valley Slopes;
  - Milton Keynes LCA 5b Ouse Southern Undulating Valley Slopes; and



- Milton Keynes LCA 2b Ouse Rural River Valley.

### **Green Hill G**

- 7.4.204 Green Hill G is located approximately 500m northwest of the village of Lavendon and 2.4km south of the village of Bozeat, in the rural setting of Buckinghamshire.
- 7.4.205 Green Hill G covers an area of 169 ha and its longest point is approximately 2km long from north to south and 1.4km wide from east to west.
- 7.4.206 Green Hill G comprises rolling agricultural land which generally slopes down from north to south. Green Hill G drops from a high point of 105 AOD in the north west corner, down to 75 AOD in the south east corner. Within this there are undulations within the topography that roll in an east to west direction. These undulations result in the land feeling fairly contained with the exception of some of the more elevated locations to the north where the landscape comprises a more open aspect.
- 7.4.207 Field parcels are primarily large scale and of a regular shape with few small irregular shaped parcels divided by a mix of open ditches and native hedgerows.
- 7.4.208 Green Hill G is bordered to the west by A509 which connects Wellingborough, 10km north of Green Hill G, to Olney, 2.4km southwest of Green Hill G. The southern boundary of Green Hill G runs parallel to the A428 connecting Lavendon, 500m southeast of Green Hill G, to Yardley Hastings approximately 3.7km west of Green Hill G. Both A roads are separated from Green Hill G by dense native hedgerows which extend the full length of the western and southern boundaries limiting views across Green Hill G.
- 7.4.209 There is a network of PRoW located in and around the site. These comprise of three (3) PRoW which cross Green Hill G from north to south and from northwest to the southeast in a diagonal manner. These include:
- Footpath MK | Lavendon | 005
  - Bridleway MK | Lavendon | 002; and
  - Bridleway MK | Lavendon | 015#2.
- 7.4.210 These PRoW are sections of two wider long-distance routes which include the Three Sires Way and the Milton Keynes Boundary Walk.
- 7.4.211 There are three further PRoW which Boarder Green Hill G. These include:
- Bridleway MK | Lavendon | 004;
  - Bridleway MK | Lavendon | 014; and
  - Bridleway MK | Lavendon | 002.
- 7.4.212 Vegetation cover across Green Hill G consist primarily of arable fields defined by native hedgerows of mixed quality with few hedgerow trees.
- 7.4.213 The presence of denser planting within Green Hill G is limited to corridors of mixed native shrubs and trees which run north to south, parallel to the both the Milton Keynes Boundary Walk and Three Shires Way Long Distance Routes.
- 7.4.214 Although there is limited denser vegetation within Green Hill G, there are large blocks of broadleaf woodland (Threshire Wood, The Oaks Wood, Nun Wood, Lavendon Wood) directly north and north east of Green Hill G, which provide a wooded backdrop to Green Hill G within the wider landscape setting.
- 7.4.215 **Registered Parks and Gardens:** There are no Registered Parks and Gardens on Green Hill G. The closest Registered Parks and Garden is the Historic Park and Garden to Turvey House, located 2.6km southeast of Green Hill G. Other Registered Parks and Gardens within the 5km is Castle Ashby located 4.28km to northwest of Green Hill G.
- 7.4.216 **Listed Buildings:** There are no Listed Buildings within Green Hill G.





- 7.4.217 Within the wider 2km Study Area there are one Grade I Listed Buildings, no Grade II\* Listed Buildings, 26 Grade II Listed Buildings.
- 7.4.218 **Conservation Areas:** There are no Conservation areas within Green Hill G.
- 7.4.219 The only Conservation Area within the 2km Study Area is Lavendon, located approximately 580m southeast of Green Hill G.
- 7.4.220 **Ancient Woodland:** There are no Ancient Woodlands within Green Hill G. The northern extent of the eastern boundary of Green Hill G is directly bordered by two blocks of Ancient Woodland which include Three Shire Wood and Nun wood.
- 7.4.221 There are a further eight (8) blocks of Ancient Woodland within 2km of Green Hill G. The closest of which include Barslay Spinney located 15m west of Green Hill G, Broadlane Spinney, Nuniron Spinney and Newland Spinney located between 400 and 800m west of the site. Other larger blocks of Ancient Woodland within 2km include, the Slipe located 500m to the north, Lavendon Wood located 720m east and Snip Wood located 1.2km south east of Green Hill G.
- 7.4.222 **Sites of Special Scientific Interest (SSSI):** There are no SSSI's on Green Hill G. There are no SSSI's within the 2km Study Area.
- 7.4.223 The closest SSSI is Yardley Chase 3.75km southwest of Green Hill G.
- 7.4.224 **National Character Area:** Green Hill G is located two National Character areas:
- 91 Yardley-Whittlewood Ridge; and
  - 88 Bedfordshire and Cambridgeshire Claylands.
- 7.4.225 **Regional Landscape Character:** Green Hill G is located within two LCTs as defined by Milton Keynes Landscape Character Assessment 2016. These include;
- Milton Keynes LCT 1 Clay Plateau Farmland; and
  - Milton Keynes LCT 5 Undulating Clay Farmland
- 7.4.226 These are broken down further into LCAs and localised as:
- LCA 1a: Yardley Clay Plateau Farmland; and
  - LCA 5a: Ouse Northern Undulating Valley Slopes.
- 7.4.227 Further LCTs located between 2km and 5km of Green Hill G include;
- Northamptonshire LCT 6 Undulating Claylands;
  - Northamptonshire LCT 8 Low Wooded Clay Ridge;
  - Northamptonshire LCT 12 Limestone Valley Slopes;
  - Bedfordshire LCT 1 Clay Farmland;
  - Bedfordshire LCT 2 Wooded Wolds;
  - Bedfordshire LCT 3 Limestone Valleys;
  - Milton Keynes LCT 2 River Valley; and
  - Milton Keynes LCT 5 Undulating Clay Farmland.
- 7.4.228 Further LCAs located between 2km and 5km from Green Hill G include;
- Northamptonshire LCA 6b Hackleton Claylands;
  - Northamptonshire LCA 6c Bozeat Claylands;
  - Northamptonshire LCA 8b Salcey Forest and Yardley Chase;
  - Northamptonshire LCA 12a Wollaston to Irchester;



- Bedfordshire LCA 1A Cranfield to Stagsden;
- Bedfordshire LCA 2A Hinwick;
- Bedfordshire LCA 2B Pavenham;
- Bedfordshire LCA 3A Harrold - Great Ouse;
- Milton Keynes LCA 2b Ouse Rural River Valley; and
- Milton Keynes LCA 5b Ouse Southern Undulating Valley Slopes.

### **Green Hill BESS**

- 7.4.229 Green Hill BESS is located 530m to the northwest of the village of Grendon in rural Northamptonshire and is located on the agricultural land surrounding the Grendon Substation.
- 7.4.230 Green Hill BESS is dominated by the Grendon Substation, which has a large footprint in the landscape. The substation is formed by a collection of primary power lines, transformers, circuit breakers, control buildings, security fencing and secondary power lines. The height of the substation is approximately 15m, the perimeter of the structure has been mitigated with mature mixed deciduous tree planting, however the structure is still partially visible, and the influence of the overhead pylons dominate that part of the skyline.
- 7.4.231 Green Hill BESS includes three separate field parcels (as shown on **Figure 3.3.3** Field Numbering Green Hill BESS) one southeast of the substation (BESS1), a second located west of the substation (BESS2) and the third directly north of the substation (BESS3). All three fields are currently being used for agricultural purposes.
- 7.4.232 Field BESS1 covers an area of approximately 11.42ha, BESS2 covers an area of approximately 6.33ha and BESS3 covers an area of approximately 7.53ha.
- 7.4.233 Green Hill BESS is bound on the southwestern boundary by Station Road which connects the A45 to the north through to the village of Grendon to the east.
- 7.4.234 The proposed access track to the northern extent of Green Hill BESS, extends from Station Road and through the yard of a neighbouring Farm, Pastures Farm, located 330m west of Grendon Substation.
- 7.4.235 The fields BESS2 & BESS3, west and north of Grendon Substation are located on predominately flat land with localised undulations between an AOD of between 44 and 48.
- 7.4.236 The field BESS1, southeast of the substation has slight undulation, with a high point at the centre of the land parcel at 52m AOD which falls to 48m AOD towards the northern and eastern extents of Green Hill BESS.
- 7.4.237 The southwestern extent of the western field BESS2 is defined by a linear block of predominately mature ash and oak tree planting, which screens views from Station Road. The land parcel is also heavily bound by a further linear block of mature tree planting along the southeast and east boundary which screens views of Grendon substation. The western boundary is defined by an established native hedgerow, lined by a belt of deciduous tree planting and an open ditch which adds to the enclosure of Green Hill BESS.
- 7.4.238 The parcel to the southeast of the substation is heavily bound along the east perimeter of Green Hill BESS, with a mix of hedgerow and, mature deciduous trees which helps to screen the west elevation of the substation. The block of woodland continues around the perimeter of the Substation and is also bound by an open ditch.
- 7.4.239 The field BESS3 is bound by native tree planting to the north, west and south which provide separation from the Upper Nene Valley Gravel Pits located directly north Green



- Hill BESS. The eastern edge of the field BESS3 is bound by an intermittent lower hedgerow and scattered trees.
- 7.4.240 Green Hill BESS is also dominated by the large pylon which traverses with the overhead cables connecting to the substation and travelling southeast into the landscape, with further pylons seen towards the mid-distant views.
- 7.4.241 The setting of the village of Grendon is also visible from within Green Hill BESS, the St Mary Parish Church tower can be seen on the hill as mid-distant views and the edge of the village is also visible at different degrees throughout Green Hill BESS.
- 7.4.242 Surrounding Green Hill BESS to the southwest, located on opposite side of the Station Road is the edge of the Registered Park and Gardens of Castle Ashby. The formal landscape grounds of the park, with distinctive arboretum type mature trees can be seen against the backdrop of an undulating grassland and parkland. The Castle Ashby House and the formal gardens are located approximately 1.6km to the southwest, elevated in the landscape at approximately 80m AOD, however the Castle is not visible from Green Hill BESS or from the section of Station Road directly adjacent to Green Hill BESS.
- 7.4.243 Located approximately 600m to the northwest of Green Hill BESS is an open mineral and aggregate site, an open cast gravel pit and associated conveyor equipment and the storage of the aggregate piles, which are clearly visible from Green Hill BESS.
- 7.4.244 Located to the north and northeast of Green Hill BESS is the Upper Nene Valley Gravel Pits Ramsar site, coupled with the Upper Nene Valley Gravel Pits, Sites of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Local Nature Reserve (LNR) and a series of wetlands and extensive water courses.
- 7.4.245 **Registered Parks and Gardens:** There are no Registered Parks and Gardens on Green Hill BESS.
- 7.4.246 Located within the 2km and outer 5km Study Area and in close proximity to Green Hill BESS, is the perimeter of Castle Ashby, located 30m from the edge of Green Hill BESS to the southwest.
- 7.4.247 **Scheduled Monuments:** There are no Scheduled Monuments on Green Hill BESS.
- 7.4.248 There are three (3) Scheduled Monuments within the wider 2km Study Area, the closest of which is a Medieval cross located 770m east of Green Hill BESS.
- 7.4.249 **Listed Buildings:** There are no Listed Buildings located on Green Hill BESS.
- 7.4.250 Within the wider 2km Study Area there are three Grade I Listed Buildings, four Grade II\* Listed Buildings, 69 Grade II Listed Buildings
- 7.4.251 **Conservation Areas:** There are no Conservation Areas on Green Hill BESS. The nearest Conservation Areas are Grendon Conservation Area, located approximately 530m southeast of Green Hill BESS and Castle Ashby Conservation Area approximately 1.5km to the southwest.
- 7.4.252 Located within the outer 5km Study Area is Cogenhoe Conservation Area, approximately 3km from Green Hill BESS, Brafield on the Green Conservation Area approximately 4.5km from Green Hill BESS and Denton Conservation Area approximately 3.8km towards the west of Green Hill BESS. To the south of Green Hill BESS are Yardley Hastings Conservation Area approximately 3.5km from Green Hill BESS and Easton Maudit Conservation Area approximately 2.3km from Green Hill BESS. To the east of Green Hill BESS is Wollaston Conservation Area approximately 3.8km from Green Hill BESS and in a northern direction is Great Doddington Conservation Area approximately 3.5km and Earls Barton conservation area approximately 2.5km from Green Hill BESS.
- 7.4.253 **Ancient Woodland:** There is no Ancient Woodland on Green Hill BESS.
- 7.4.254 The nearest block of Ancient Woodland is Cold Oak Copse (Ancient Replanted Woodland), which is located 3km south of Green Hill BESS. There is only one other block



of Ancient Woodland within 5km of Green Hill BESS, Horn Wood (Ancient & Semi-Natural Woodland) which is located 3.6km southeast of Green Hill BESS.

- 7.4.255 **Ramsar Sites:** There are no Ramsar on Green Hill BESS however the nearest Ramsar site is the Upper Nene Valley Gravel Pits located directly north of Green Hill BESS.
- 7.4.256 **Sites of Special Scientific Interest (SSSI):** There are no SSSI's on Green Hill BESS however the nearest SSSI is the Upper Nene Valley Gravel Pits located directly north of Green Hill BESS.
- 7.4.257 **Special Protection Areas (SPA):** There are no SPA's on Green Hill BESS however the nearest SPA is the Upper Nene Valley Gravel Pits located directly north of Green Hill BESS.
- 7.4.258 **Local Nature Reserve (LNR):** There are no LNR on Green Hill BESS. The closest LNR is Summer Leys, located 1.9km northeast of Green Hill BESS, which is linked to the Upper Nene Valley Gravel Pits Ramsar, SSSI and SPA.
- 7.4.259 **National Character Area:** Green Hill BESS is located within one National Character Areas (NCA's) as illustrated on **Figure 7.4** and defined by Natural England as NCA Profile: 89 Northamptonshire Vales (NE527).
- 7.4.260 Green Hill BESS is located at the southeastern edge of the NCA Profile: 89 Northamptonshire Vales and borders NCA Profile: 91 Yardley Whittlewood Ridge.
- 7.4.261 **Regional Landscape Character:** Green Hill BESS is located within two LCTs as defined by Northamptonshire Council Current Landscape Character Assessment 2010 and illustrated on **Figure 7.5**. These include:
- Northamptonshire LCT 18 Broad River Valley Floodplain; and
  - Northamptonshire LCT 12 Limestone Valley Slopes.
- 7.4.262 These are broken down further into LCAs and localised as:
- LCA 18d The Nene - Billing Wharf to Woodford Mill; and
  - LCA 12a Wollaston to Irchester.
- 7.4.263 Within the 2km and 5km Study Area this extends to a further LCTs include:
- Northamptonshire LCT 4 Rolling Ironstone Valley Slopes;
  - Northamptonshire LCT 5 Undulating Claylands;
  - Northamptonshire LCT 6 Undulating Hills and Valleys; and
  - Northamptonshire LCT 8 Low Wooded Clay Ridge.
- 7.4.264 These are broken down further between 2km and 5km and localised as:
- Northamptonshire LCA 4c Ecton and Earls Barton Slopes;
  - Northamptonshire LCA 6b Hackleton Claylands;
  - Northamptonshire LCA 6c Bozeat Claylands;
  - Northamptonshire LCA 8b Salcey Forest and Yardley Chase; and
  - Northamptonshire LCA 18c The Nene - Duston Mill to Billing Wharf.

## 7.5 Preliminary Visual Baseline

### Visual Amenity

- 7.5.1 General visual amenity is experienced by people and notably the views that people have and their visual amenity, can be defined as the overall pleasantness or attractiveness of a place and the views they enjoy of their surroundings. Amenity is



something considered to benefit a location, contribute to its enjoyment, and thereby increase its value.

7.5.2 The visual amenity experienced by people (visual receptors) in the locality of the Sites and Cable Route Search Area differs according to many factors. Visual receptors of higher sensitivity with limited susceptibility to change include residents at home (private viewpoints), people engaged in outdoor recreation (including use of PROWs), visitors to heritage assets and other attractions, travellers on recognised scenic routes (public viewpoints) and people at their workplace where views are an important contributor to the setting and quality of their working life.

7.5.3 The following section outlines visual amenity and identifies viewpoints to be carried through into the final LVIA assessment. The following sets out the visual baseline for the former, as the Cable Route Search Area lies within the areas described for each Site, it is not described separately.

### **Visual Amenity Green Hill A**

#### *Settlements*

7.5.4 The nearest settlements are the two small villages of Walgrave and Old, located immediately to the south and southwest of Green Hill A and located, 600m and 300m from the edge of Green Hill A. There are a series of similar size villages dotted throughout the surrounding landscape, which contributes to the wider visual amenity. The villages of Hannington, approximately 3km to the south, Scaldwell 2.3km approximately west, Hanging Houghton and Lampport approximately 3.5km to the west. There are further smaller villages towards the edge of the Study Area, Pytchley approximately 4.5km east and Orlingbury approximately 5km to the west. There are larger villages, Mawsley approximately 1.5km north, Broughton approximately 2.5km northeast and Brixworth approximately 4.7km to the southwest. The edge of Pitsford Water lies approximately 1.7km to the southwest and Lampport House and Gardens lies approximately 3.5km to the west, they both greatly contribute to the visual amenity of the surrounding landscape.

#### *Highways*

7.5.5 Newland Road which extends north from Walgrave, divides Green Hill A centrally and connects to surrounding B-Roads, Old Road/Walgrave Road to the south and Broughton Road to the north. The surrounding landscape is connected by smaller B-roads which meander throughout, connecting the smaller villages. These roads are often lined with treed hedgerows intermittent woodland, offering broken views. This allows for a more intimate interaction with the landscape and contributing greatly to the visual amenity experienced by the user. As well local B-roads, the A43, Kettering Road, which runs through the landscape in a south to north direction is located 1km east of Green Hill A.

#### *PRoW*

7.5.6 There are no Public Rights of Way (PRoW) that cross Green Hill A, however there are numerous PRoWs that run throughout the wider landscape within wider 2km of Green Hill A.

7.5.7 Public Footpath associated with the village of Old:

- Footpath NN | DF | 8;
- Footpath NN | DF | 7;
- Footpath NN | DF | 9;
- Footpath NN | DF | 10;
- Footpath NN | DF | 3;
- Footpath NN | DA | 7;
- Footpath NN | DA | 6.



- Footpath NN | DF | 2;
- Footpath NN | DF | 11;
- Bridleway NN | DF | 6
- Footpath NN | DM | 3 stretches out to the west; and
- Footpath to the south NN | DF | 1 connects with NN | DF | 13 and NN | DT | 2 towards Walgrave.

7.5.8 Public Rights of Way (PRoW) associated with Walgrave:

- Footpath NN | DT | 11;
- Footpath NN | DT | 13;
- Footpath NN | DT | 14;
- Footpath NN | DT | 3;
- Footpath NN | DT | 7; and
- Footpath NN | DT | 6.

7.5.9 PRoW to the south of Walgrave include:

- Footpath NN | DT | 5;
- Footpath NN | DT | 4;
- Footpath NN | CT | 2;
- Footpath NN | CT | 1;
- Footpath NN | DT | 9#2; and
- Footpath NN | CT | 4.

7.5.10 PRoW to the west of Green Hill A include:

- Footpath NN | DF | 4;
- Footpath NN | DA | 7;
- Footpath NN | DA | 6; and
- Byway open to all traffic NN | DF | 12.

7.5.11 PRoW to the east of Green Hill A include:

- Footpath NN | DT | 9#1; and
- Footpath NN | DT | 8.

7.5.12 PRoW to the north of Green Hill A include:

- Bridleway NN | DF | 5
- Bridleway NN | GD | 14;
- Bridleway NN | DF | 5;
- Footpath NN | GG | 19;
- Bridleway NN | GG | 9;
- Bridleway NN | HK | 1; and
- Bridleway NN | GG | 11.



## **Visual Amenity Green Hill A.2**

### *Settlements*

- 7.5.13 The nearest settlements to Green Hill A.2 are the two small villages of Walgrave, located 900m west and Hannington, located 950m south of Green Hill A.2. There are a series of similar size villages dotted throughout the surrounding landscape, which contributes to the wider visual amenity. These include the villages of Old, approximately 2.8km to the west, Broughton, located 2km north, Mawsley located approximately 2.7km to the north and Scaldwell located 4.5km west of Green Hill A.2.

### *Highways*

- 7.5.14 The closest roads to Green Hill A.2 include Kettering Road directly north of Green Hill A.2 and the A43 directly east. The surrounding landscape is connected by smaller B-roads which meander throughout, connecting the smaller villages such as Walgrave and Hannington. These roads are often lined with treed hedgerows intermittent woodland, offering broken views of the wider landscape.

### *PRoW*

- 7.5.15 There are no Public Rights of Way (PRoW) that cross Green Hill A.2, however bridleway NN|CT|3 runs east to west directly south of Green Hill A.2. There are numerous PRoWs that run throughout the wider landscape within wider 2km of Green Hill A.2.
- 7.5.16 Public Footpath north of Green Hill A.2 include:
- Footpath NN|DT|8;
  - Bridleway GD/014;
  - Footpath GD/002;
  - Footpath GD/003;
  - Footpath GW/014; and
  - Bridleway GW/018.
- 7.5.17 Public Rights of Way east of Green Hill A.2 include:
- Bridleway TR/008;
  - Bridleway TR/009;
  - Bridleway GW/017; and
  - Bridleway TR/007.
- 7.5.18 Public Rights of Way (PRoW) associated with Walgrave:
- Footpath NN|DT|9#1;1;
  - Footpath NN|DT|11;
  - Footpath NN|DT|13;
  - Footpath NN|DT|14;
  - Footpath NN|DT|3;
  - Footpath NN|DT|7; and
  - Footpath NN|DT|6.
- 7.5.19 PRoW to the south of Walgrave Include:
- Footpath NN|DT|5;
  - Footpath NN|DT|4;



- Footpath NN | CT | 2;
- Footpath NN | CT | 1; and
- Footpath NN | CT | 4.

### **Visual Amenity Green Hill B**

#### *Settlements*

- 7.5.20 The nearest settlement is the small village of Holcot located 400m north of Green Hill B. The village sits within the wider context of smaller inter-connected villages, which demonstrates visually a more intimate landscape amenity. The village of Moulton, Moulton Collage Campus and the surrounding suburbs, approximately 1.5km to the south, marks a change in the type of visual amenity to a more urban context.

#### *Highways*

- 7.5.21 Green Hill B sits within a network of smaller inter-connecting B-roads which spread out in a web type formation from the village of Holcot. The roads are lined with treed hedgerows, and scattered blocks of woodland, the undulating landform offers a pleasant visual amenity to the user. The Holcot Road to the west of Green Hill B which traverses though the Pitsford Reservoir offers a greatly enhanced landscape experience and contributes greatly to the area's visual amenity. In contrast to the smaller B-roads are the A43 Kettering Road and the A508 Harborough Road dual carriageways which run north to south.

#### *PRoW*

- 7.5.22 The Public Footpath NN | CW | 1 is the only PRoW that crosses Green Hill B and runs in a north to south direction in the most eastern field parcel.

- 7.5.23 PRoW south of Green Hill B within the wider 2km Study Area Include:

- Footpath NN | DG | 2#2;
- Footpath NN | DG | 2#1;
- Footpath NN | DG | 3;
- Footpath NN | DG | 4;
- Footpath NN | DD | 1; and
- Footpath NN | DG | 1.

- 7.5.24 PRoW that extend from the village of Holcot, north of Green Hill B include;

- Footpath NN | CW | 2;
- Footpath NN | CW | 11;
- Footpath NN | CW | 10
- Footpath NN | CW | 4;
- Footpath NN | CW | 3#1;
- Footpath NN | CW | 3#2;
- Footpath NN | DD | 6#1;
- Footpath NN | CW | 7; and
- Footpath NN | CT | 7.





## **Visual Amenity Green Hill C, D & E**

### *Settlements*

- 7.5.25 The nearest settlement is the small village of Mears Ashby located immediately to the west of Green Hill D & E and the edge of the village of Earls Barton is 200m to the south. Within the wider surroundings is Sywell village 1.2km to the west. The urban edge of larger conurbations, Wellingborough 1km to the east and the outer suburbs of Northamptonshire approximately 2.5km to the west.

### *Highways*

- 7.5.26 Smaller B-Roads Sywell Road and Moonshine Gap which connect the village of Sywell and the town of Wellingborough, run parallel to the southern boundary of Green Hill C and the northern boundary of Green Hill D. Similarly, Highfield Road which runs parallel to the full extent of the eastern boundary of Green Hill D, connects the village of Mears Ashby to Wellingborough. Wilby Road is the only road to run through Green Hill C, D and E and dissects Green Hill E centrally, connecting Mears Ashby west of Green Hill E to Wilby located east of Green Hill E. Other roads in close proximity to Green Hill C, D and E include Mears Ashby Road which runs directly west of Green Hill E and connects Mears Ashby to Earls Barton to the south. The busier A45, Main Road runs south of Green Hill E and connects into the larger infrastructure of A509 skirts the western edge of Wellingborough.

### *PRoW*

- 7.5.27 There are several PRoWs that cross Green Hill C, D and E these include:

- Bridleway NN | TN | 7 crosses Green Hill C;
- Footpath NN | TN | 3#1, crosses Green Hill D;
- Footpath NN | TU | 3, crossing the north of Green Hill E; and
- Footpath NN | TN | 1 crossing the west of Green Hill E.

- 7.5.28 PRoW within the wider 2km Study Area north of Green Hill C include:

- Footpath NN | TN | 3#2;
- Footpath NN | TG | 4;
- Footpath NN | TG | 5;
- Footpath NN | UL | 24;
- Bridleway NN | UL | 25;
- Bridleway NN | TG | 9;
- Bridleway NN | TG | 8; and
- Bridleway NN | TG | 7.

- 7.5.29 To the east connecting Park Farm Industrial Estate

- Footpath NN | UL | 23;
- Footpath NN | TU | 2;
- Footpath NN | UL | 22;
- Footpath NN | TU | 1; and
- Footpath NN | TB | 1.

- 7.5.30 PRoW south of Green Hill E associated with Earls Barton include:

- Footpath NN | TC | 5;
- Footpath NN | TC | 10;



- Footpath NN | TC | 18;
- Footpath NN | TC | 4;
- Footpath NN | TC | 7;
- Footpath NN | TC | 6;
- Footpath NN | TC | 19;
- Footpath NN | TC | 1#1; and
- Footpath NN | TC | 8.

7.5.31 PRow west of Earls Barton include:

- Footpath NN | TC | 3#1;
- Footpath NN | TE | 1; and
- Footpath NN | TE | 7.

7.5.32 PRow West of Green Hill E include:

- Footpath NN | TN | 2;
- Footpath NN | TN | 6,
- Footpath NN | TN | 8#1;
- Footpath NN | TN | 8#2;
- Footpath NN | TN | 9; and
- Footpath NN | TN | 11.

7.5.33 PRow Associated with Sywell:

- Footpath NN | TN | 4;
- Footpath NN | TT | 1;
- Footpath NN | TT | 4;
- Footpath NN | TT | 2; and
- Footpath NN | TT | 3.

### **Visual Amenity Green Hill F**

#### *Settlements*

7.5.34 The nearest settlements to Green Hill F are Easton Maudit located directly east of Green Hill F, Bozeat located 200m to the east and Grendon located 740m to the west.

7.5.35 There are a series of other settlement within the wider 2km Study Area which contributes to the wider visual amenity. These include the hamlet of Strixton, located 1.1 km to the north, Yardley Hastings located 2km to the southwest, the village Castle Ashby located 1.75km to the west and Wollaston located 1.85 km north of Green Hill F.

7.5.36 As well as settlements there are a several isolated properties and farmsteads scattered within the wider 2km Study Area which will be considered as part of the LVIA.

#### *Highways*

7.5.37 Green Hill F runs parallel to a section of the A509, Wollaston Road with runs north to south and connects Wollaston to Warrington and beyond. Sections of Green Hill F e are directly adjacent to Wollaston Road and provide access to Green Hill F. Other roads in close proximity to Green Hill F include the A428, Bedford Road East located 1.4km south of



Green Hill F as well as Easton Lane and Easton Way which traverse the centre of Green Hill F east to west connecting neighbouring villages Grendon, Easton Maudit and Bozeat.

7.5.38 Other roads within the wider 2km Study Area are primarily associated with Grendon, including Yardley Road, Station Road, Chequers Lane and the Main Road to Grendon, as well as those associated with Bozeat including Harrold Road and London Road.

PRoW

7.5.39 There is a series of PRoW which travel through Green Hill F. These include:

- Footpath NN | TA | 4#1;
- Footpath NN | TA | 1;
- Footpath NN | TA | 4#3;
- Footpath NN | TA | 4#2;
- Footpath NN | TD | 3;
- Footpath NN | TD | 2;
- Footpath NN | TD | 5;
- Footpath NN | TD | 7; and
- Bridleway NN | TD | 8.

7.5.40 PRoW within the wider 2km Study Area which travel towards Easton Maudit include:

- Bridleway NN | LE | 26;
- Bridleway NN | TD | 9; and
- Footpath NN | TD | 1.

7.5.41 Associated with the village of Grendon a wide reaching series PRoWs radiate from the village in all directions. PRoW within 2km of Green Hill F include;

- Footpath NN | TF | 5;
- Footpath NN | TF | 8#1;
- Footpath NN | TF | 9;
- Footpath NN | TF | 13;
- Footpath NN | TF | 8#2;
- Bridleway NN | TF | 12;
- Footpath NN | TF | 7#2;
- Footpath NN | TF | 14;
- Footpath NN | TF | 11;
- Footpath NN | TF | 7#1; and
- Byways open to all traffic NN | TF | 15.

7.5.42 PRoW north of Green Hill F which travel towards Wollaston include:

- Byways open to all traffic NN | TS | 4;
- Footpath NN | TS | 1#1;
- Footpath NN | TS | 2#2;
- Footpath NN | TS | 2#1;
- Footpath NN | TV | 7;



- Footpath NN | TV | 6;
- Footpath NN | TV | 18;
- Footpath NN | TS | 3; and
- Footpath NN | TV | 21.

7.5.43 PRoW east of Green Hill F which travel towards Bozeat include:

- Footpath NN | TA | 7;
- Footpath NN | TA | 18;
- Footpath NN | TA | 6;
- Footpath NN | TA | 9#2;
- Footpath NN | TA | 9#1;
- Footpath NN | TA | 19;
- Footpath NN | TA | 14;
- Footpath NN | TA | 3;
- Footpath NN | TA | 17#2;
- Footpath NN | TA | 17#1;
- Footpath NN | TA | 2;
- Footpath NN | TA | 12;
- Footpath NN | TA | 22#2;
- Footpath NN | TA | 21;
- Footpath NN | TA | 22#1;
- Footpath NN | TA | 15 and
- Footpath NN | TA | 23.

7.5.44 PRoW south and southeast of Green Hill F within 2km Study Area include:

- Bridleway NN | TA | 8;
- Footpath BF | HARROLD | 10;
- Bridleway MK | Lavendon | 002;
- Footpath MK | Lavendon | 005;
- Footpath NN | TA | 20;
- Footpath MK | Warrington | 007;
- Footpath MK | Warrington | 005;
- Footpath MK | Warrington | 002; and
- Footpath NN | LE | 24.

7.5.45 PRoW south of Green Hill F which travels towards Yardley Hastings include:

- Footpath NN | LE | 1#2;
- Footpath NN | LE | 1#1
- Footpath NN | LE | 9;
- Footpath NN | LE | 11#2;



- Footpath NN | LE | 11#1; and
- Footpath NN | LE | 2.

### **Visual Amenity Green Hill G**

#### *Settlements*

7.5.46 The nearest settlement to Green Hill G is the village of Lavendon located 500m east of Green Hill G. Settlements beyond 2km include Olney located approximately 2.5km to the southwest of Green Hill G and Bozeat, located approximately 2.4km to the north of Green Hill G connected by A509.

7.5.47 As well as these settlements, there are several isolated properties and farmsteads scattered within the wider 2km Study Area which will be considered as part of the LVIA.

#### *Highways*

7.5.48 The nearest roads to Green Hill G include the A509 which traverses north to south, parallel to a large portion of the western boundary of Green Hill G and the A428 which traverses in a northwest to southeast direction parallel to the southern boundary of Green Hill G. These roads intersect at a roundabout west of the south western corner of the site and connect the villages of Lavendon, Yardley Hastings, Olney, Bozeat and the larger towns of Northampton and Wellingborough beyond. Other roads in close proximity to Green Hill G include Castle Road which runs from the north of Lavendon to Castle Farm and Lower Farm to the east of Green Hill G.

7.5.49 Other roads within the wider 2km Study Area are primarily associated with the settlement of Lavendon, including Olney Road, High Street, Harold Road, Joiners Way and The Glebe.

#### *PRoW*

7.5.50 There is a network of PRoW located in and around Green Hill G. These comprise of three (3) PRoW which cross Green Hill G from north to south and from northwest to the southeast in a diagonal manner. These include:

- Footpath MK | Lavendon | 005
- Bridleway MK | Lavendon | 002; and
- Bridleway MK | Lavendon | 015#2.

7.5.51 These PRoW are sections of two wider long-distance routes which include the Three Sires Way and the Milton Keynes Boundary Walk.

7.5.52 There are three further PRoW which border Green Hill G. These include:

- Bridleway MK | Lavendon | 004;
- Bridleway MK | Lavendon | 014; and
- Footpath MK | Lavendon | 001.

7.5.53 PRoW within the wider 2km Study Area which travel towards Lavendon include:

- Footpath MK | Lavendon | 003
- Footpath MK | Lavendon | 013
- Footpath MK | Lavendon | 017
- Footpath MK | Lavendon | 010
- Footpath MK | Lavendon | 009#1
- Footpath MK | Lavendon | 008A



- 7.5.54 Other PRoW within the 2km Study Area include:
- Footpath MK | Lavendon | 011
  - Footpath MK | Lavendon | 013
  - Footpath MK | Lavendon | 009#2
  - Bridleway MK | Lavendon | 015#1
  - Bridleway NN | TD | 8
  - Bridleway NN | TA | 8
  - Bridleway NN | TA | 19
  - Footpath MK | Warrington | 001
  - Footpath MK | Warrington | 002
  - Footpath MK | Warrington | 004
  - Footpath NN | LE | 24
  - Footpath MK | Warrington | 005
  - Footpath MK | Warrington | 007
  - Footpath NN | TA | 20
  - Footpath NN | TD | 5
  - Footpath BF | HARROLD | 10
  - Footpath BF | HARROLD | 16
  - Footpath MK | Olney | 005#1
  - Footpath MK | Olney | 005#2
  - Footpath MK | Olney | 006#1
  - Footpath MK | Olney | 006#2

### **Visual Amenity Green Hill BESS**

#### *Settlements*

- 7.5.55 The nearest settlement is the small village of Grendon located immediately to the southeast of Green Hill BESS at approximately 550m from the edge of Green Hill BESS. There are series of villages dotted throughout the surrounding landscape which contributes to the wider visual amenity. These villages include; Wollaston located approximately 4.0km to the west, Bozeat approximately 3.5km to the southeast, Yardley Hastings approximately 3.5km to the south, Earls Barton approximately 2.7km to the northwest, Great Doddington approximately 3.6km to the northwest and smaller villages of Whiston approximately 1.5km west and Lower End approximately 850m to the east. Castle Ashby House and Gardens located approximately 1.7km to the southwest greatly contribute which amenity and its enjoyment experienced by the House and Garden's visitors.

#### *Highways*

- 7.5.56 Station Road, a B-road is the closest road to Green Hill BESS, immediately to the southwest which connects the village of Grendon to the east and The Nene Valley Way, A45 a busier dual carriageway approximately 1.6km to the northwest. The remaining connecting roads within the surrounding landscape are predominantly smaller B-roads which weave through their way through the surrounding area, often lined with woodland



or hedgerows, consisting of Whiston Road to the west, Easton Way and Main Road to east of Grendon which links into A509 between the villages of Wollaston and Bozeat. Smaller roads and tracks associated with the Ashby Castle estate, which meander through a wooded landscape, offer visual amenity at local scale.

PRoW

7.5.57 The is one PRoW located on Green Hill BESS, Footpath NN | TF | 3 which crosses the northern field parcel BESS3 from east to west

7.5.58 There are numerous PRoWs that run within 2km of Green Hill BESS. These include the following.

7.5.59 PRoW associated with the village of Grendon include;

- Footpath NN | TF | 1;
- Footpath NN | TF | 10;
- Footpath NN | TF | 4;
- Footpath NN | TF | 8#1;
- Footpath NN | TF | 9;
- Footpath NN | TF | 13;
- Footpath NN | TF | 5;
- Footpath NN | TF | 8#2;
- Footpath NN | TF | 7#2; and
- Footpath NN | TF | 14.

7.5.60 PRoW to the north of Green Hill BESS include:

- Footpath NN | TC | 11;
- Footpath NN | TF | 17;
- Footpath NN | TF | 2; and
- Bridleway NN | TF | 12.

7.5.61 Further PRoWs and a bridleway are located towards the extents of the 2km buffer towards the northwest and there are PRoWs beyond Grendon to the east at the edge of the 2km buffer.

Viewpoints and Visualisations

7.5.62 A suite of viewpoints has been identified through desk studies which have been verified through fieldwork. Their positions would be subject to consultation with the Local Planning Authorities (LPA) and fixed prior to verified photography being undertaken. Viewpoint selection would follow good practice guidance and in particular paragraphs 6.18 to 6.20 of GLVIA3. The viewpoints proposed will be used to aid the description of effects on both Landscape and Visual resources and would be utilised for visual assessment purposes.

7.5.63 The selection of viewpoints was made on the basis of the following types of publicly accessible viewpoints, as follows:

- Representative viewpoints (representative of views from a particular PRoW);
- Specific viewpoints (such as key views from a specific visitor attraction);
- Illustrative viewpoints (chosen to demonstrate a particular effect/specific issue);
- Any important sequential views, for example, along key recreational or transport routes; and



- Any additional viewpoints that have been requested by statutory consultees at Scoping.

- 7.5.64 For the purposes of the LVIA, all of the viewpoints are proposed to be taken from publicly accessible land and once photography has been agreed these would be undertaken in both summer and winter to ensure a worst-case scenario is assessed and illustrated.
- 7.5.65 In order to assist with viewpoint selection and to appreciate the potential influence of the Scheme in the wider landscape, preliminary ZTV figures are used to illustrate the area from where it may be theoretically possible to view all, or part, of the Scheme. The ZTV'S produced are both Bare Earth (landform only) to illustrate a worst-case scenario and augmented ZTV figures which illustrate the effects of landform, built form and vegetation.
- 7.5.66 The ZTVs provide a starting point in the assessment process and therefore provide a 'worst case' illustration of theoretical visibility and assume that if any of the Scheme is visible it will be shown on the ZTV.
- 7.5.67 The ZTV's would be refined through the iterative design process to help understand the impacts of changes to the designs. The ZTV are produced using ArcGIS Pro 2.1 software, and the calculations were based on the Scheme at 4.5m above ground level (AOD). Separate ZTVs will be provided for the substations once locations have been established.
- 7.5.68 Augmented ZTV's would also be refined through the iterative design process to illustrate with greater accuracy the theoretical visibility of the Scheme.
- 7.5.69 A series of photomontages are proposed to be produced to show the effects of the Scheme at locations where significant effects are considered likely to occur. Locations of the required photomontages and Accurate Visual Representation (AVR) level would be agreed with the Local Planning Authority. At these locations it is proposed to produce LI TGN 06/19 Type 4 photomontages in both winter and summer months. This ensures that the effects of reduced vegetation (worse case) are illustrated. Such montages are also proposed to be utilised if required at the time of assessment for cumulative photography where the effects of the Scheme would be seen in combination with another scheme. At present no cumulative photography has been defined and it is proposed that this would again be agreed in consultation with the LPA.
- 7.5.70 The following tables list the proposed viewpoint locations that will be used In the LVIA assessment. These tables should be read In conjunction with **Figures 7.10, 7.10.1 - 7.10.4, Appendix 7.1.**
- 7.5.71 It should be noted that early baseline conditions surveys for Green Hill A.2, a potential extension of Green Hill A that is currently being explored by the Applicant, have not been completed prior to the submission of this Scoping Report. As such, suggested viewpoints for Green Hill A.2 are not included below but will be presented at PEIR.
- 7.5.72 The Cable Corridor is being refined, see 7.1.11-7.1.12 above, and the assessment of the 0.5km Study Area will be carried out for the ES once the Cable Corridor has been refined.

**Table 7.1: Proposed Viewpoint Locations - Green Hill A**

Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP1	Lamport House & Gardens	Visitors, Walkers	Looking eastwards, long distant views towards Green Hill A on the Horizon.	3.5km





Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP2	Townsend Road/Old Road	Residents	Mid distant view from properties on Townsend Road/Old Road.	500m
VP3	Broughton Road	Motorists	View from road user along Broughton Road looking south.	8m
VP4	Broughton Road, Old Village	Commercial Property users, Road users	Corner of Green Hill A boundary, Broughton Road, edge of Village Old.	Adjacent to Green Hill A.
VP5	Newlands Road	Walkers, Motorists	Halfway along Newlands Road, looking west into Green Hill A.	2m

**Table 7.2: Proposed Viewpoint Locations - Green Hill B**

Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP6	Tithe Farm car park	Commercial users. Motorists	View from Tithe Farm Car Park looking west and south.	23m
VP7	PROW NN CW 1	Walkers	View from footpath/PROW looking south to the mid-distant properties.	Within Green Hill B
VP8	PROW NN CW 1	Walkers	View taken from footpath/PROW on other side of stile looking 360 views. - additional	Edge of Green Hill B
VP9	PROW NN DG 2#2	Walkers	Taken from near to the footpath, looking north towards and into Green Hill B.	310m



**Table 7.3: Proposed Viewpoint Locations - Green Hill Option C,D & E**

Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP10	Beckworth Emporium	Commercial users. Motorists	Northerly View from a gated entrance adjacent to Green Hill C, opposite Beckworth Emporium & Garden Centre.	15m
VP11	Sywell Road	Horse rider, Motorists	North Easterly view from the corner of Sywell Road and Bridleway/recreational route	Adjacent to Green Hill C
VP12	Bridleway - NN TN 7	Walkers, Horse Riders	South to east view from the Bridleway/Recreational Route looking southward	Within Green Hill C
VP13	Moonshine Gap - NN TN 3#1	Walkers, Motorists	Southern View taken from edge of Moonshine Gap Road the footpath	Adjacent to Green Hill D
VP14	Highfield Road	Motorists	Westerly View from edge of Green Hill D on Highfield Road	Adjacent to Green Hill D
VP15	Highfield Footpath - NN TN 3#1	Walkers	Northerly 180-degree view from edge of Green Hill D on the Footpath.	Within Green Hill D
VP16	Wilby Road Near Allotments	Residents, Walkers & Motorists	Northerly View from gated entrance to Green Hill E, proximity to Allotments.	Adjacent to Green Hill E
VP17	Pumping Station, Wilby Road	Motorists, Commercial Users.	360-degree View from Wilby Road, in proximity to the Pumping Station.	Adjacent to Green Hill E
VP18	Mears Ashby Road	Residents	Easterly View from Mears Ashby Road.	Approx. 475m
VP19	Line Way	Residents	Northly Views towards site from a new house build	Approx. 230m



Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP20	Mears Ashby Road, PROW	Walkers	Taken within close proximity footpath NN TN 1 and Mears Ashby Road.	Within Green Hill E
VP21	A4500 Main Layby	Residents, Motorists	Northern View taken from a Layby close to Brookhill Farm	Adjacent to Green Hill E

**Table 7.4: Proposed Viewpoint Locations - Green Hill BESS**

Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP22	Pasture Farmhouse	Residents	Taken in proximity of Pastures Farm looking southeast towards Green Hill BESS	150m
VP23	PROW NN TF 3	Walkers	Taken from the PROW, on an elevated bridge over the aggregate conveyor belt.	600m
VP24	Green Hill BESS Entrance, Station Road	Road users	Taken at Green Hill BESS entrance from Station Road looking Northeast into Green Hill BESS.	3m
VP25	Additional View from PROW NN TF 4	Walkers	Additional View from Footpath/PROW directly south of Grendon	580m
VP26	PROW NN TF 1	Walkers	Taken from the PROW looking across the field to the west towards the substation	510m



**Table 7.5 Proposed Viewpoint Locations - Green Hill Option F**

Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP27	PRoW NN TF 81	Walkers / residents	Taken from a PRoW on the southern extent of Grendon looking southeast towards Green Hill F	765m
VP28	PRoW NN TD 3	Walkers	Taken from a PRoW, north of Easton Maudit looking north.	115m
VP29	PRoW NN TD 5	Walkers	Taken from the junction of three PRoW, west of Horn Wood, looking northwest.	Within Green Hill F
VP30	Junction of NN TA 3, NN TA 17 and NN TA 42	Walkers	Taken from the junction of two PRoW, west of the A509, looking northwest.	165m
VP31	PRoW NN TA 41	Walkers	Taken from the PROW directly north of Green Hill F looking south.	3m
VP32	Wollaston Road	Road users	Taken from the A509, Wollaston Road looking west.	5m
VP33	Castle Ashby	Walkers	Taken from the gardens of the Registered Park and Garden Castle Ashby looking east.	1.76km



**Table 7.6 Proposed Viewpoint Locations - Green Hill Option G**

Viewpoint Reference Number	Viewpoint Title	Receptor Represented by the Viewpoint	Direction of View	Distance to the nearest field boundary (approximate)
VP34	PRoW MK Lavendon 004	Walkers & Horse Riders	Taken from a Bridleway on the northern extent of Green Hill G looking south west.	Within Green Hill G
VP35	Milton Keynes Boundary Walk Long Distance Route - PRoW MK Lavendon 005	Walkers/ Residents	Taken from a section of the Long Distance Route, east of Northey Farm looking south.	2m
VP36	Milton Keynes Boundary Walk Long Distance Route - PRoW NN TD 5	Walkers	Taken from a section of the Long Distance Route, looking north and south.	Within Green Hill G
VP37	Junction of Milton Keynes Boundary Walk and Three Shires Way Long Distance Routes	Walkers & Horse Riders	Taken from the junction of two Long Distance routes and PRoW MK Lavendon 001 looking west.	Within Green Hill G
VP38	PRoW MK Lavendon 001	Walkers	Taken from the PROW east of Green Hill G looking west.	195m
VP39	Three Shires Way Long Distance Route - PRoW MK Lavendon 015 #2	Walkers & Horse Riders	Taken from a section of the Three Shires Way Long Distance Route just within the southern extent of Green Hill G looking north.	Within Green Hill G
VP40	A428	Road users	Taken from the A428, looking north.	25m
VP41	Junction of PRoW MK Lavendon 014, Mk Lavendon 001 and MK Lavendon 019	Walkers & Road users	Taken from the PROW east of Green Hill G looking west.	226m



## 7.6 Receptor Scoping

7.6.1 A table of receptors which are proposed to be scoped in and out of the LVIA has been included in **Appendix 7.4**. Landscape and Visual Receptor Scoping Sheets. The tables have been informed by the proposed Study Areas included in Section 7.1 as well as the methodology in **Appendix 7.2** and are subject to consultation with the LPA.

## 7.7 Conclusion

7.7.1 The Scheme has the potential to affect Landscape and Visual receptors across a large area which has been assessed based on the Scheme boundary, including ZTV’s produced in **Appendix 7.1**. The preliminary Study Areas proposed would be further refined through the LVIA process. The following elements are proposed for consideration at scoping stage as follows:

**Table 7.7 Landscape and Visual Receptors Scoping Table**

Study Area	Scoped In	Scoped Out
Receptors within 0.5km Cable Corridor Study Area	Landscape & Visual	-
Receptors within 1km Local Study Area	Landscape & Visual	-
Receptors between 1km and 2km Wider Study Area	Landscape & Visual (Visual receptors identified with direct, extensive and/or open views towards the Scheme)	Visual (Visual receptors identified with no direct, extensive and/or open views towards the Scheme)
Receptors between 2km and 5km Outer Study Area	Landscape	Visual

- A 0.5km Study Area is proposed for the Cable Corridor. The 0.5km radius is considered appropriate for the Cable Corridor since this involves the construction phase only, it is short term and temporary. Beyond this distance, even with good visibility it is deemed that this element of the Scheme would be barely perceptible. Within the assessment, this parameter is referred to as the '0.5km Study Area'.
- It is proposed that a series of Study Areas are used to assess the Landscape and Visual effects of the Scheme but excluding the Cable Corridor. These include a Local 1km Study Area, a wider 2km Study Area and an Outer 5km Study Area from the Sites.
- The Outer 5km Study Area focuses on impacts upon landscape receptors only. Landscape receptors beyond the Outer 5km Study Area are proposed to be scoped out of the assessment.
- The wider 2km Study Area proposed will focus on impacts upon both Landscape and Visual receptors. Effects to landscape character within the wider 2km Study Area will be included within the LVIA (informed by all relevant landscape character assessments).
- All visual receptors beyond the wider 2km Study Area will be scoped out of the LVIA. It is considered that within the Outer Study Area, even with excellent visibility it is deemed that the Scheme would be barely perceptible and that it would not lead to any significant Visual effects, either independently or cumulatively.



- A Local 1km Study Area will focus on impacts upon both Landscape and Visual receptors.
- Visual receptors located outside of the 1km Study Area that are identified with direct, extensive and/or open views towards the Scheme (particularly larger and taller elements or large open expanses of PV arrays) would be separately identified and Included within this wider 2km Study Area and included within the LVIA. Otherwise, all other Visual receptors located beyond the 1km Study Area would be scoped out of the LVIA. Effects to landscape character within the Local 1km Study Area will be included within the LVIA (Informed by all relevant landscape character assessments).

7.7.2 The following limitations within the LVIA are proposed:

- The LVIA will consider the construction, operational and decommissioning lighting strategy for the Scheme including details of directionality, intermittent lighting. It will also describe any landscape measures necessary to avoid or mitigate lighting effects.
- Fieldwork within the Study Area would be undertaken from publicly accessible locations only.
- Assessment of effects upon residential properties would be undertaken from the curtilage of residential properties where publicly accessible. Professional judgement would be used to assess views from residential properties aided by the ZTV, aerial photography and LVIA figures.

7.7.3 As set out in Paragraph 7.6.18, **Appendix 7.2 Methodology** effects of duration in relation to magnitude of change assessment would be based on the following:

- Short-term: between 0-5 years;
- Medium-term: between 5-10 years; and
- Long-term: more than 10 years.

7.7.4 As well as development duration, the magnitude of change will also consider reversibility of the Scheme.

7.7.5 Agreement of viewpoints would be based on those provided on **Figure 7.10** Viewpoint Locations and any additional ones proposed by the LPA based on consultation through the LVIA process.

7.7.6 Photography would be verifiable in line with TGN 06/19 and would be captured in both winter and summer months.

7.7.7 Photomontages are proposed to be produced to show the effects of the Scheme at locations where significant effects are predicted. Photomontages from locations where significant effects are not predicted to occur are not proposed.

7.7.8 Assessment of effects at construction, operation and decommissioning will be assessed as follows:

- Construction – Assessment would be based on the construction of the Scheme and a winter assessment will be undertaken to assess the worst case scenario.
- Operation (Year 1) - Assessment would be based on all of the elements of the Scheme being operational at the same time and assessed in winter without the benefit of full vegetation in order to assess a worst-case scenario.
- Operation (Year 15) - Assessment would be based on all of the elements of the Scheme being operational at the same time and assessed in summer with vegetation in leaf offering maximum screening potential. This would assume a uniform growth of trees, shelterbelts and woodland mitigation planting of 5m since operation at year 1 representing uniform growth of 1m every 3 years for proposed



trees, shelterbelts and woodland. This would also assume a uniform growth of hedgerow mitigation planting of 4m since operation at year 1 representing uniform growth of 1m every 3.75 years. Existing hedgerows would be assumed to have reached their prescribed management height by year 15 of between 3-5m.

- Decommissioning – Assessment would be based on a similar process to that of construction with the scheme being no longer operational. It would assess the Scheme in winter and would assume retention of existing vegetation and proposed peripheral screening vegetation. It is assumed fields will be returned to agricultural use upon decommissioning.

7.7.9 Effects of the Scheme are assumed to be adverse unless stated otherwise (neutral/beneficial).

7.7.10 The following ZTV's are proposed to be produced:

- Bare earth ZTV (Year 1 of operation and a 5 km Study Area)
- Augmented ZTV - (Year 1 of operation and a 2 km Study Area)
- Cumulative Augmented ZTV (Year 1 of operation and a 2 km Study Area)

7.7.11 The full extent of the Scheme will be developed through the LVIA assessment in an iterative way in line with GLVIA3.

7.7.12 The assessment process includes iterative design and re-assessment of any remaining residual effects that could not otherwise be mitigated or 'designed out'. The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative. The Landscape and Visual assessment unavoidably involves a combination of both quantitative and qualitative assessment and wherever possible a consensus of professional opinion would be sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

## 7.8 References

- Ref.1 Landscape Institute and Institute of Environmental Management and Assessment, Guidelines for Landscape and Visual Impact Assessment, Third Edition, 2013.
- Ref.2 Landscape Institute and Institute of Environmental Management and Assessment, 2013, Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge, London.
- Ref.3 Natural England, An Approach to Landscape Character Assessment, October 2014, by Christine Tudor, Available at: [landscape-character-assessment.pdf](https://www.naturalengland.org.uk/publications/landscape-character-assessment.pdf) (publishing.service.gov.uk)
- Ref.4 Landscape Institute Technical Guidance Note 06/19, Visual Representation of Development Proposals (17 September 2019. Available at: [TGN-06-19-Visual\\_Representation](https://www.landscapeinstitute.com/technical-guidance/06-19-visual-representation/) (windows.net)
- Ref.5 Landscape Institute Technical Guidance Note 02/19, Residential Visual Amenity Assessment (RVAA) (March 2019). Available at: [Residential Visual Amenity Assessment](https://www.landscapeinstitute.com/technical-guidance/02-19-residential-visual-amenity-assessment/) | Landscape Institute
- Ref.6 Landscape Institute Technical Guidance Note 02/21, Assessing landscape value outside national designations (May 2021), [1.9.6tgn-02-21-assessing-landscape-value-outside-national-designations.pdf](https://www.landscapeinstitute.com/technical-guidance/02-21-assessing-landscape-value-outside-national-designations.pdf) (windows.net)
- Ref.7 Northamptonshire Current Landscape Character Assessment, 2003. Available at: <https://www.northampton.gov.uk/downloads/file/12149/08-northamptonshire-current-landscape-character-assessment>
- Ref.8 Milton Keynes Landscape Character Assessment, 2016. Available at: <https://www.milton-keynes.gov.uk/planning-and-building/planning-policy/milton-keynes-landscape-character-assessment>





- Ref.9 Bedford Borough Landscape Character Assessment, 2020. Available at: <https://www.bedford.gov.uk/planning-and-building-control/planning-policy/technical-reports>
- Ref.10 Northampton Urban Fringe Landscape Character & Sensitivity Study produced by Northampton Borough Council, 2018. Available at <https://www.northampton.gov.uk/downloads/download/3616/northampton-urban-fringe-landscape-character-and-sensitivity-study-2018>



## 8 Ecology and Biodiversity

### 8.1 Introduction

8.1.1 The Ecology and Biodiversity Chapter of the Environmental Statement will consider the likely effects of the Scheme on ecological features during its construction, operation and decommissioning phases.

8.1.2 The ecological features that will form the basis of the assessment include:

- Statutory and non-statutory sites designated for nature conservation at international, national and local levels;
- Habitats and Species of Principal Importance (Ref.26) for the conservation of biodiversity; and
- Other legally protected, red-listed or notable species of conservation interest and their supporting habitats.

8.1.3 This Chapter of the Scoping Report will describe an ecological baseline derived from extensive site and desk-based surveys and assess the relative level of effects likely to arise, together with any avoidance, mitigation and compensation measures necessary to reduce these effects, in accordance with environmental and nature conservation legislation and planning policy.

8.1.4 Opportunities for ecological enhancements, in effort to contribute towards local conservation priorities whilst achieving Biodiversity Net Gain (BNG) targets in line with the Environment Act 2021 (Ref.16) and national and local policies, will also be presented.

#### Appendices

8.1.5 This Scoping Chapter is supported by the following appendix:

- Appendix 8.1: Natural England Discretionary Advice Service (DAS) Email Correspondence - 18/03/2024

#### Figures

8.1.6 This Scoping Chapter is supported by the following figures at **Appendix 8.2**:

- Figure 8.1: International Statutory Designated Sites within 10km of the Site Boundary
- Figure 8.2: National and Local Statutory Designated Sites within 5km of the Site Boundary (Green Hill A-E)
- Figure 8.3: National and Local Statutory Designated Sites within 5km of the Site Boundary (Green Hill BESS, F and G)
- Figure 8.4: Non-Statutory Designated Sites within 2km of the Site Boundary (Green Hill A - E)
- Figure 8.5: Non-Statutory Designated Sites within 2km of the Site Boundary (Green Hill BESS, F and G)
- Figure 8.6: Priority Habitats within 2km of the Site Boundary (Green Hill A - E)
- Figure 8.7: Priority Habitats within 2km of the Site Boundary (Green Hill BESS, F and G)



## 8.2 Legislation, Policy & Guidance

### Legislation

8.2.1 Key national legislation relevant to biodiversity and nature conservation which will inform the assessment process includes:

- The Environment Act 2021;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Natural Environment and Rural Communities (NERC) Act 2006;
- The Countryside Rights of Way Act 2000;
- The Protection of Badgers Act 1992; and
- The Hedgerows Regulations 1997.

### National Planning Policy

8.2.2 National Policy Statements (NPS) set out the policy basis for NSIPs and will form the basis for the determination of the application for the Scheme. The NPSs that are relevant to the Scheme and the Ecology and Biodiversity Chapter of the ES are:

- Overarching National Policy Statement for Energy (EN-1) Sections 4.2, 4.5 and 5.4 (Ref.13);
- National Policy Statement for Renewable Energy Infrastructure (EN-3) Section 3.10 (Ref.14); and
- National Policy Statement for Electricity Networks Infrastructure (EN-5) Sections 1.7, 2.5, 2.9, 2.11 (Ref.15).

8.2.3 Wider national planning policies relevant to biodiversity and nature conservation which will inform the assessment process includes:

- The National Planning Policy Framework Section 15 (Ref.21);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Ref.3)

### Local Planning Policy

8.2.4 Local planning policies relevant to biodiversity and nature conservation are drawn from the following documents, which will inform the assessment process:

- North Northamptonshire Joint Core Strategy 2011-2031 (adopted July 2016) (Ref.25) – Policy 4 (Biodiversity and Geodiversity)
- West Northamptonshire Joint Core Strategy Local Plan (adopted December 2014) (Ref.31) – Section 10 (Built and Natural Environment)
- The Plan for the Borough of Wellingborough - Adopted Plan (adopted February 2019) (Ref.28) – Policy GI (Green Infrastructure)
- Settlements and Countryside Local Plan for Daventry District 2011-2029 (adopted February 2020) (Ref.27) – Chapter 9 (The Built and Natural Environment)
- Milton Keynes Council Plan:MK 2016-2031 (adopted March 2019) (Ref.20) – Section 12 (Environment, Biodiversity and Geodiversity)



### Other Guidance

- 8.2.5 Other guidance documents relevant to biodiversity and nature conservation which will inform the assessment process include:
- Northamptonshire Biodiversity Supplementary Planning Document - August 2015 (Ref.4)
  - Upper Nene Valley Gravel Pits Special Protection Area Supplementary Planning Document - August 2015 (Ref.29)
  - Upper Nene Valley Gravel Pits Special Protection Area Supplementary Planning Document - Addendum to the SPA SPD: Mitigation Strategy (adopted 2016) (Ref.30)
  - Natural England Standing Advice regarding Protected Species (Ref.22)
  - Natural England Biodiversity Net Gain Statutory Metric (and associated documents) (Ref.23)
  - A Green Future: Our 25 Year Plan to Improve the Environment (Ref.18)
  - CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Ref.8)
  - CIEEM Biodiversity Net Gain: Good Practice Principles for Development (Ref.9)

## **8.3 Baseline Conditions**

- 8.3.1 This section aims to provide a summary of desk study and survey information compiled to date, to identify ecological features within and relevant to the Scheme.

### The Scheme and Ecological Context

- 8.3.2 The Sites and Cable Route Search Area predominantly comprise large, open, and flat to gently undulating arable fields characterised by winter-sown cereal crops, cover crops (brassicas) and some grasslands (grazed and permanent pasture, as well as agri-environmental conservation measures). Fields are largely bounded by generally narrow arable field margins, and a network of managed hedgerows, frequently species-poor in composition, with some associated with ditches, rivers and agricultural ditches. The Sites and Cable Route Search Area habitats are very much typical of the surrounding landscape, which is a combination of elevated and undulating farmed landscapes, predominately arable fields interspersed with occasional pasture grassland, woodlands, small settlements and farmsteads linked by minor and single-track roads.
- 8.3.3 While no significant woodland stands are present within the Sites, several small stands of managed and unmanaged woodland are present within or bounding some Sites and the Cable Route Search Area, with some including evidence of game management. Several waterbodies are present within the Sites and Cable Route Search Area and in the surrounding area, including those associated with the Upper Nene Valley Gravel Pits SPA, part of which lies immediately adjacent to Green Hill BESS.
- 8.3.4 Watercourses were recorded adjacent to and intersecting the Sites and Cable Route Search Area, including both wet and seasonally-wet agricultural ditches. Flowing watercourses are present in the form of upstream feeder streams for more significant local watercourses (predominately the River Nene), in addition to other watercourses managed as agricultural drainage ditches.



## Survey Effort and Scope

### Overview

- 8.3.5 Baseline data collection commenced in August 2023, comprising both comprehensive desk studies to determine the context of the local area and field surveys to supplement and ground-truth desk study findings. The desk study and field survey methodologies implemented are fully detailed below.
- 8.3.6 It should be noted that early baseline conditions surveys for Green Hill A.2, the potential extension of Green Hill A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purpose of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Site A baseline identified, and will be presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.
- 8.3.7 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

### Desk Study

- 8.3.8 A desk study and data search was undertaken, based on the following zones of influence:
- A search for 'International' designated sites for nature conservation within 10km of the Sites using data from the Natural England Open Data Geoportal. Internationally designated sites include Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Ramsar sites, as well as proposed or potential SACs, SPAs and Ramsar sites. The search area was extended to 30km for internationally designated sites for which migratory birds or bats are listed as a qualifying feature.
  - A search for 'National' and 'Local' statutory designated sites within 5km of the Sites was also conducted using data from the Natural England Open Data Geoportal. National designated sites include Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNRs). Local designated sites predominately comprise Local Nature Reserves (LNRs).
  - Information on non-statutory sites within 2km of the Sites was obtained from Northamptonshire Biodiversity Records Centre (NBRC), Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) and Bedfordshire & Luton Biodiversity Recording & Monitoring Centre (BRMC). Non-statutory designated sites include Local Wildlife Sites (LWSs), Wildlife Trust Reserves (WTRs) and Protected Wildflower Verges (PWVs).
  - A search for Habitats of Principal Importance (also known as Priority Habitats) within 2km of the Sites was undertaken using the list of Habitats of Principal Importance in England (Ref.1) and Ancient Woodland Inventory (Ref.2) datasets.
  - Existing records of protected and notable species within 2km of each Site was obtained from the relevant local records centres (with bat records obtained separately from Northamptonshire Bat Group), in addition to consulting the list of Species of Principal Importance in England. Data is also held for the entirety of the Cable Route Search Area.



- The DEFRA MAGIC website was also consulted for records of previously granted European Protected Species (EPS) Licences issued for mitigation projects concerning EPS within 2km of the Sites.

8.3.9 The distances used in the search radii outlined above are considered proportionate to the scale of protection and likely sensitivity of the features listed above, as well as typical home ranges of wildlife species supported by them. It is considered unlikely that the Scheme would give rise to impacts on designated sites beyond these ranges. Consequently, these standard search areas are considered to remain appropriate when also assessing the potential for cumulative impacts from other developments. The desk study and data search outlined above included the Cable Route Search Area. Extensive desk study information from the surrounding landscape has been acquired to inform the impact assessment of the wider Scheme, and this information is considered sufficient to inform an assessment of the Cable Route Search Area given the relatively low impact and temporary nature of works anticipated for the Cable Corridor.

**Field Surveys**

8.3.10 A suite of baseline ecological surveys has been undertaken since August 2023 and will continue into 2024/2025. The field survey effort and scope presented in Table 8.1 below reflects what is believed, at the time of writing, to be appropriate and proportionate to inform the evaluation of baseline conditions for the Scheme based on CIEEM guidance and our professional judgment. As Ecological Impact Assessment and scoping are iterative processes, the scope may be extended or modified in due course as influenced by emerging survey results or following/during consultation with stakeholders, local planning authorities and nature conservation organisations.

8.3.11 The scope of wintering bird surveys will vary depending on whether each of the Sites falls within or outside of the 10km consultation zone surrounding the Upper Nene Valley Gravel Pits SPA. All Sites within 10km of any part of the SPA (Green Hill B-G and BESS) will be subject to the same scope of nocturnal wintering bird surveys.

8.3.12 Green Hill A lies approximately 11.5km to the north-west of the SPA at its closest point, and the majority of Green Hill A.2 lies outside of 10km from the SPA, with only a very small section of the southernmost field lying just within the 10km consultation zone. As a result, Green Hill A and A.2 will not be subject to nocturnal wintering bird surveys. However, a full suite of diurnal wintering bird surveys (as well as a full suite of diurnal breeding bird surveys) are still proposed at these Sites.

8.3.13 With the exception of nocturnal wintering bird surveys (as detailed above), all Sites will be subject to the same survey scope. However, at the time of writing, a lesser degree of survey work has been completed at Green Hill F, G and A.2 in comparison to the other Sites, as these Sites were later additions to the Scheme.

**Table 8.1: Survey Scope and Surveys Completed to Date**

Survey Type	Methodology	Green Hill A-E & BESS	Green Hill F	Green Hill G	Green Hill A.2
Extended UK Habitat Classification (UKHab) Survey	Habitat walkover surveys of all Sites, following UKHab classification methodology (Ref 19)	Completed August 2023	Completed January 2024	Completed April 2024	Scheduled July 2024
Badger Walkover Survey	Walkover survey to search for badger setts or other field signs, conducted in conjunction with above Extended UKHab Survey.	Completed August 2023	Completed January 2024	Completed April 2024	Scheduled July 2024



Survey Type	Methodology	Green Hill A-E & BESS	Green Hill F	Green Hill G	Green Hill A.2
Ground Level Tree Assessments for Roosting Bats	Daytime ground level assessments of individual trees and trees associated with hedgerows to assess their suitability to support roosting bats. Follows Bat Conservation Trust Good Practice Guidelines (Ref 10).	Completed August 2023	Completed January 2024	Completed April 2024	Scheduled July 2024
Building Inspections for Roosting Bats	Daytime building inspections of buildings within Sites to search for evidence of roosting bats and nesting birds, and to assess their suitability to support roosting bats. Follows Bat Conservation Trust Good Practice Guidelines (Ref 10).	Scheduled April - October 2024	Scheduled April - October 2024	Scheduled April - October 2024	Scheduled April - October 2024
Automated Bat Activity Surveys	Monthly static bat detector surveys of all Sites utilising a total of 35 detectors between April - October inclusive. Follows Bat Conservation Trust Good Practice Guidelines (Ref 10).	5x deployment periods completed between August - October 2023 and April - May 2024	2x deployment periods completed April-May 2024	2x deployment periods completed April-May 2024	Scheduled June - October 2024 & April - May 2025
Otter and Water Vole Surveys	Spring and autumn walkover surveys of all watercourses and ditches to search for evidence of otters and water voles, and to assess the suitability of these features to support these species. Follows Water Vole Field Signs and Habitat Assessment guidance by Mike Dean (Ref 12) and The Water Vole Mitigation Handbook by The Mammal Society (Ref 11).	Completed Autumn 2023 and Spring 2024	Completed Spring 2024 Further survey scheduled for Autumn 2024.	Completed Spring 2024 Further survey scheduled for Autumn 2024.	Scheduled Autumn 2024 and Spring 2025
Wintering Bird Surveys (WBS)	6x survey visits between October 2023 – February 2024 on all Sites. Method	6x survey visits completed between	4x survey visits completed between	None completed to date. Scheduled	None completed to date. Scheduled for



Survey Type	Methodology	Green Hill A-E & BESS	Green Hill F	Green Hill G	Green Hill A.2
	follows British Trust for Ornithology (BTO) Common Bird Census techniques as informed by Bird Survey Guidelines 2024 (Ref 5).	October 2023 – February 2024	December 2023 – February 2024 Scheduled for October - December 2024	for October 2024 – March 2025	October 2024 – March 2025
WBS Nocturnal/ Crepuscular Bird Surveys	Nocturnal bird survey visits (focus on golden plover and lapwing) of all suitable habitat within the solar array site boundaries. Method follows recommendations as informed by nocturnal specific survey guidelines shared by Bird Survey Guidelines (Ref 6)	3x surveys completed (excluding Green Hill A) February-March 2024	3x surveys completed February-March 2024	None completed to date. Scheduled for October 2024 – March 2025	None completed to date. Scheduled for October 2024 – March 2025
Breeding Bird Surveys (BBS)	6x survey visits between March 2024 – May 2024 on all Sites. Method follows British Trust for Ornithology (BTO) Common Bird Census techniques as informed by RSPB Breeding Bird Survey Instructions (Ref 7).  Single survey timed shortly before dusk to allow for species that may have varying detectability during this period, such as common quail, barn owl or nightingale. Method same as BBS.	4 x visits completed.  Dusk/ crepuscular survey scheduled for late June/early July 2024	4 x visits completed.  Dusk/ crepuscular survey scheduled for late June/early July 2024	3 x visits completed.  Dusk/ crepuscular survey scheduled for late June/early July 2024	1x visit completed.  2x visits scheduled for July 2024.  3x visits and 1x dusk/crepuscular survey scheduled for spring 2025
Modular River Physical (MoRPh) Surveys and River Condition Assessments	MoRPh surveys to be completed on all applicable watercourses to inform Biodiversity Net Gain Assessment.	None completed to date. Scheduled for Summer 2024.	None completed to date. Scheduled for Summer 2024.	None completed to date. Scheduled for Summer 2024.	None completed to date. Scheduled for Summer 2024.

8.3.14 The Cable Corridor will be assessed in the Environmental Statement, albeit disturbance will be limited in extent given the narrow width of cable trench required, and the fact that affected land along the Cable Corridor will be reinstated following a short construction period. Techniques such as directional drilling may also be implemented to





avoid damage to ecologically valuable habitats or to avoid impacts on protected species, such as otters and water voles.

8.3.15

The survey scope for the Cable Route Search Area has not yet been finalised, as this will first take into account the habitats that will potentially be affected by the cable works; however, in light of the temporary nature of the cable installation works, the following proportionate survey scope is proposed:

- Data search of designated sites and ecological records pertaining to all areas within the Cable Route Search Area. Given the relatively low impact and temporary nature of works anticipated within the Cable Route Search Area (primarily encompassing trenching, installation of cables and backfilling), a specific additional search for ecological records within 2km of the Cable Route Search Area is not considered to be required. Extensive desk study information from the surrounding landscape has been acquired to inform the impact assessment of the wider Scheme, and this information is considered sufficient to inform an assessment of the Cable Route Search Area.
- Extended UK Habitat Classification (UKHab) Survey and desk study of the Cable Corridor (estimated Q3-4 2024), including a badger walkover survey.
- It is assumed that watercourses will be crossed by the Cable Corridor; either horizontal directional drilling or open-cut trenching may be used. A Modular River Physical (MoRPh) survey will be undertaken of all watercourses crossed by the Scheme, primarily to inform Biodiversity Net Gain requirements. The suitability of the watercourse for protected species will also be considered and spot checks conducted to search for evidence of otters and water voles at any watercourse crossing points. The ecological sensitivities of each watercourse will be considered when determining the appropriate cable installation method at each crossing point. Further baseline assessments will be conducted on a case-by-case basis, as determined by the likelihood of impacts.
- Great crested newt (GCN) District Level Licensing (DLL) via Nature Space Partnership is currently being pursued as a mitigation option for the entire Scheme (including the Cable Corridor), which does not require pond survey data to be collected. However, if DLL is not pursued as the principal mitigation option, then the ecological impact assessment on GCN will instead be informed by eDNA survey work of all accessible ponds within 250m of the Cable Corridor boundaries on third-party land.
- The cable installation works will be temporary and will occur progressively, with operations moving in one direction, thereby minimising the disturbance or incursion into habitats at any one location along the length of the Cable Corridor. It is anticipated that works will be carried out via a combination of open cut trenching and Horizontal Directional Drilling (HDD). HDD would likely be employed where ecological features of an increased importance or sensitivity (e.g. main rivers, important hedgerows or Priority Habitats) are to be crossed by the route, and where less impactful routes could not be followed. Consequently, due to the different nature of the Cable Corridor works compared to that of the Sites, risks to breeding birds along the Cable Corridor are limited to that of killing and injury during works, and the disturbance of Schedule 1 (fully protected) species.
- We therefore propose a proportionate approach to baseline survey with respect to breeding birds, comprising the appraisal of habitats for Schedule 1 birds in particular, as well as other notable and ground-nesting birds, during the Extended UK Hab survey. Primarily, this will entail the investigation of trees, hedgerows and watercourses for their potential to support Schedule 1 birds including hobby, barn owl, nightingale, turtle dove, osprey and red kite, as well as an assessment of open habitats to support ground nesting birds such as skylark, yellow wagtail and grey partridge.



- Further recommendations may be made following this work either in the design of the Scheme (i.e. micro-siting the Cable Corridor working area to avoid potential impacts) or in the implementation of embedded mitigation (such as pre-commencement bird surveys, sensitive seasonal timing of works and the use of Ecological Clerks of Works). From an examination of the habitats within the Cable Route Search Area, together with our understanding of the breeding bird assemblage, habitat usage and relative habitat importance derived from extensive surveys undertaken for the Sites, we believe this to be an appropriate and proportionate approach.

### Consultation to Date

- 8.3.16 Natural England has been consulted on the proposed survey scope identified above via their Discretionary Advice Service (DAS). An initial virtual meeting was held between a Natural England advisor and Clarkson and Woods representatives on 16th January 2024, followed by further written consultation in February 2024 and additional correspondence (both written and verbal) in April 2024.
- 8.3.17 The principal area of discussion with Natural England through the DAS process has been the proposed scope of diurnal and nocturnal wintering bird survey work, which is intended to help inform the assessment of potential impacts of the Scheme on wintering birds associated with the Upper Nene Valley Gravel Pits SPA (such as golden plover). The survey scope proposed (comprising six diurnal and three nocturnal wintering bird surveys across all parcels within 10km of the SPA) was confirmed by Natural England both verbally during and in writing in March 2024 as acceptable to inform an impact assessment of the Scheme. However, at the time of writing, a consultation response from Natural England with respect to Green Hill G and Green Hill A.2 has not been received, given their later addition to the Scheme.
- 8.3.18 Natural England also confirmed verbally and in writing (**Appendix 8.1** refers) that two years of wintering bird survey data would not be required, and agreed that one year of survey information (as per the scope proposed above) would be sufficient to inform an assessment of potential impacts upon the Upper Nene Valley Gravel Pits SPA.
- 8.3.19 Further consultation will continue to be undertaken with Natural England, the Environment Agency, relevant local authorities and their nature conservation consultees, and other interested parties, such as Local Wildlife Trusts.

### Designated Sites

- 8.3.20 The statutory and non-statutory designated sites identified within the zones of influence (paragraph 8.3.8-18.3.9 refers) of the Scheme are identified in Table 8.2 below, and have therefore been scoped into the assessment.



**Table 8.2: Designated Sites Scoped into Assessment**

Site Name	Area (ha)	Description	Distance to from Sites
<b>Internationally Designated Sites within 30km</b>			
Upper Nene Valley Gravel Pits RAMSAR/SPA	1,370	This is an internationally important site which comprises a chain of exhausted sand and gravel pits, extending for approx. 35km along the alluvial deposits of the River Nene floodplain running from Clifford Hill on the southern outskirts of Northampton, downstream to Thorpe Waterville north of Thrapston. An extensive mosaic of wetland habitats which are regularly used by over 20,000 wildfowl and wading birds and support major overwintering bird assemblages. Qualifying features of the site include bittern and golden plover (both Annex 1 species), in addition to gadwall (migratory species).	Within 30km of all Sites  Within 10km of Green Hill B, C, D, E, F, G and BESS  Designated site lies closest to Green Hill BESS (parts of RAMSAR/SPA fall adjacent to red line boundary)
<b>National and Local Statutory Designated Sites within 5km</b>			
Upper Nene Valley Gravel Pits SSSI	1,832	This SSSI is a nationally important site for its breeding bird assemblage of lowland open waters and their margins, wintering waterbird species, an assemblage of over 20,000 waterbirds in the non-breeding season and a rare example of wet floodplain woodland.	Within 5km of Green Hill D, E, F and BESS  Designated site lies closest to Green Hill BESS (parts of SSSI fall adjacent to red line boundary)
Bozeat Meadow SSSI	2.63	This is unimproved grassland on well drained clay and loam soils. It has medieval ridge and furrow and diverse flora, including crested dog's-tail, downy oat-grass, quaking grass and dwarf thistle. There are also mature hedgerows and a spring.	Within 5km of Green Hill F, G and BESS  Designated site lies closest to Green Hill F (75m north-east)
Pitsford Reservoir SSSI	413.06	Pitsford Reservoir SSSI and surrounding habitats host large numbers of birds associated with open water, both throughout winter and breeding seasons. Botanical habitats are also very diverse, with many county rarities recorded.	Within 5km of Green Hill A, A.2, B and C  Designated site lies closest to Green Hill B (800m north-west)
Hardwick Lodge Meadow SSSI	10	This is a large area of diverse permanent pasture with an exceptionally rich and varied grassland flora that, in turn, supports uncommon invertebrates.	Within 5km of Green Hill A, A.2, B, C, D, E  Site lies closest to Green Hill C (1.5km north-west)



Site Name	Area (ha)	Description	Distance to from Sites
Badsaddle, Withmale Park and Bush Walk Woods SSSI	25.18	This is ancient coppice woodland with oak and ash on wet calcareous soils. Ground flora include herb paris, goldilocks buttercup and four species of orchid.	Within 5km of Green Hill A, A.2, B, C and D Designated site lies closest to Green Hill A.2 (340m east)
Birch Spinney and Mawsley Marsh SSSI	12.26	A rare type of ash-maple woodland partly on peat, with flora including blunt-flowered rush, jointed rush and water horsetail. There is also a stretch of a dismantled railway line.	Within 2km of Green Hill A and A.2 Designated site lies closest to Green Hill A (2km north)
Crowfields Common LNR	8.73	Three fields, adjacent to the village of Moulton. The fields are currently rough grassland, with well-established hedgerows, a few mature trees and it contains a fine example of ridge and furrow farming and a wildflower meadow.	2km south of Green Hill B
Summer Leys LNR	47.7	An excellent nature reserve easily qualifying as an LWS with 10 fen, swamp and marsh indicators recorded within the gravel pits and 13 neutral grassland indicators in the surrounding grasslands.	2km north-east of Green Hill BESS
Dungee Corner Meadow SSSI	5.12	This well drained hay meadow on boulder clay is traditionally managed, and no artificial fertilisers or herbicides have been used, so it has a diverse flora. More than twenty grass species have been recorded, including sweet vernal grass, Yorkshire fog, sheep's fescue, quaking grass, and crested dog's-tail. There is also a population of the locally rare green-winged orchid.	Within 5km of Green Hill F, G and BESS Designated site lies closest to Green Hill F (2.2km east)
Wollaston Meadows SSSI	14.25	This site on the banks of the River Nene is composed of two species-rich hay fields. Flora includes meadow foxtail, crested dog's-tail and red fescue. Overgrown hedges and ditches provide habitats for birds, small mammals, and invertebrates.	Within 5km of Green Hill E, F and BESS Designated site lies closest to Green Hill BESS (3km north-east)
Glamis Meadow and Wood LNR	9.47	A stream runs through this site, which also features woodland and grassland.	Within 5km of Green Hill C, D and E Designated site lies closest to Green Hill E (3.1km north-east)
Lings Wood LNR	20.06	This site features plantation and naturally regenerating woodland, along with scrub, ponds and acid grassland. Amphibians such as frogs and newts are also known to breed within the site.	Within 5km of Green Hill B, C, D, and E Designated site lies closest to Green Hill E (3.7km south-west)



Site Name	Area (ha)	Description	Distance to from Sites
Yardley Chase SSSI	357.61	This chase has diverse semi-natural habitats, and its value for invertebrates has been enhanced by military use of the site, which has resulted in a long absence of intensive agriculture. There is woodland and unimproved grassland, and 30 breeding butterfly species have been recorded.	Within 5km of Green Hill F, G and BESS Designated site lies closest to Green Hill F (3.8km south-west)
Harrold Odell Country Park LNR	59.31	The site is on the edge of the River Ouse. There are two lakes, seasonally flooded woodland, osier beds and water meadows. The site supports a range of birds, including several priority species. Otters, bats, amphibians, reptiles and a range of orchid species are also known to be present.	4.5km northeast of Green Hill G
Irchester Old Lodge Pit Geological SSSI	0.41	Designated for its geological interest, this SSSI exhibits one of the only two complete White Limestone Formation sections in Northamptonshire, which contains rich mollusc, brachiopod and echinoid fossils.	Within 5km of Green Hill F and BESS Designated site lies closest to Green Hill F (4.6km north-east)
Scrub Field LNR	5.05	This site forms part of the Bradlaugh Fields Park complex, and contains fine examples of unimproved, semi-natural limestone grassland and fragments of ancient hedgerow.	4.7km south-west of Green Hill BESS
Odell Great Wood SSSI	85.7	A large wet ash-maple woodland with exceptionally rich flora. The extensive and well-developed system of rides is another important feature, adding greatly to the value of the site for flowering plants, butterflies, and other invertebrates.	4.8km east of Green Hill F
<b>Non-Statutory Sites within 2km</b>			
Horn Wood LWS	24.4	This site qualifies as a LWS with 14 ancient woodland indicators recorded.	Within 2km of Green Hill F and G Adjacent to southern part of Green Hill F site boundary
Threeshire Wood LWS	14.8	Ancient semi-natural woodland with a good range of ground flora species, as well as birds (notably tree sparrow) and other species.	Within 2km of Green Hill F and G Adjacent Green Hill G
Nun Wood CWS	17.9	Broadleaved ancient woodland, neutral grassland and a pond. Directly connected to Threeshire Wood.	Within 2km of Green Hill F and G Adjacent Green Hill G
Bozeat Verge LWS	0.63	A species rich wildflower verge formed on the road cutting of the A509 to the west of Bozeat. The verge also had abundant insects with numerous butterflies and bees.	20m south of Green Hill F



Site Name	Area (ha)	Description	Distance to from Sites
Walgrave East Meadow LWS	6.11	A grassy meadow with a good selection of meadow plants and two streams fringed with rush pasture. The site qualifies as a LWS with 10 neutral grassland indicator species recorded (1 rare).	Within 2km of Green Hill A and A.2 Designated site lies closest to Green Hill A.2 (150m west)
Grendon Lakes LWS	126	A mosaic of wetland habitats and of huge importance to over-wintering birds this site qualifies as a LWS because it contains a variety of species of stonewort amongst other wetland vegetation.	200m north of Green Hill BESS
Bozeat Cemetery LWS	0.79	This cemetery contains areas of species rich meadow.	280m east of Green Hill F
Sywell Reservoir and Country Park LWS	48	A country park consisting of a reservoir and a good mosaic of other habitats including neutral grassland, scrub woodland and swamp edge. This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with 12 fen/swamp/marsh indicators and 13 neutral grassland indicators recorded.	Within 2km of Green Hill C, D and E Designated site lies closest to Green Hill E (300m west)
Cold Oak Copse LWS	43.4	This LWS is listed on the Northants Ancient Wood inventory, with six ancient woodland indicators recorded.	320m west of Green Hill F
Bozeat Wood LWS	3.7	A small oak-ash woodland, possibly ancient in origin, with an interesting ground flora.	Within 2km of Green Hill F and G 330m north of Green Hill G
Broughton Green Lane LWS	2.85	This site comprises a green lane, which forms a good wildlife corridor, with ancient woodland indicators and diverse range of invertebrates recorded.	Within 2km of Green Hill A and A.2 Designated site lies closest to Green Hill A.2 (440m north)
The Slipe CWS	5.4	Broadleaved, semi-natural, ancient woodland.	Within 2km of Green Hill F and G 500m northeast of Green Hill G
Grendon Lakes North LWS	33.97	A mosaic of wetland habitats including a number of small gravel pits, fragments of wet grassland and mire and good aquatic vegetation. The site qualifies as an LWS due to the presence of 10 fen, swamp and marsh indicators within these wetland habitats.	500m north of Green Hill BESS



Site Name	Area (ha)	Description	Distance to from Sites
Grendon Quarter Pond LWS	4.39	A large fishing lake that offers good cover, with a fringe of marginal vegetation and a surround of tall trees.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill BESS (500m south)
Long Furlong and Old Pastures LWS	69.9	A large area of replanted ancient woodland, with 16 ancient woodland indicators recorded.	Within 2km of Green Hill F and G 500m south-west of Green Hill F
Highcroft Farm Meadow LWS	1.44	A neglected meadow which, although predominately species poor having declined due to lacking appropriate management, hosts an excellent invertebrate assemblage with supporting habitats considered likely to improve through restoration.	Within 2km of Green Hill A and A.2 Designated site lies closest to Green Hill A.2 (500m north)
Bozeat Glebe Meadow LWS	1.01	A former hay meadow that has still retained a decent meadow flora, in particular on the slopes.	515m east of Green Hill F
Yardley Brook Field LWS	2.52	This field has areas of species rich calcareous grassland associated with the old earthworks, which qualify the site as a LWS with 12 calcareous indicators recorded.	600m west of Green Hill F
Earls Barton Meadow LWS	6.09	A floodplain meadow site adjacent to the River Nene, near to gravel extraction. This site has been identified as a potential wildlife site and features 6 neutral grassland indicators, including 1 strong indicator and many of the elements of MG4 grassland. Therefore, the site is an out of condition Wildlife Site.	700m north-west of Green Hill BESS
Lavendon Wood LWS	20.7	Ancient semi-natural woodland with a good range of ground flora species, as well as fungi, birds (notably tree sparrow) and other species.	700m east of Green Hill G
Wilby Meadows Stream LWS	0.14	A section of the Wilby Brook that flows through farmland on the edge of the village and designated for its water vole colony. The site has been retained as a Wildlife Site as the most recent survey suggests water vole are still present.	700m east of Green Hill E
Earl's Barton Carr LWS	20	A large area of wet woodland on former gravel workings adjacent to the Nene. Although declining in quality the site easily qualifies as a LWS due to the presence of a large area of wet woodland habitat and the presence of 10 fen, swamp, marsh indicator species.	800m north-west of Green Hill BESS
Earls Barton Lock Lake LWS	26	A Nene Valley gravel pit with abundant marginal vegetation. The site qualifies as a LWS as this marginal vegetation holds 13 fen, swamp and marsh indicator species.	800m north of Green Hill BESS



Site Name	Area (ha)	Description	Distance to from Sites
Scotland Pond LWS	3.41	A large angling lake fringed with marginal and emergent vegetation.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill BESS (800m south)
Old Poors Gorse LWS	9.65	A roughly square woodland which covers just over 9.5 hectares.	900m north of Green Hill A
Park Farm Industrial Estate LWS	7.41	Park Farm Industrial Estate contains a matrix of grassland, scrub and woodland. The site does not meet the neutral grassland criteria with only 7 species recorded. However with management it is possible it could recover hence it is retained as LWS.	Within 2km of Green Hill D and E Designated site lies closest to Green Hill E (1km north-east)
The Basin LWS	2.53	A narrow lake within the Castle Ashby Estate, with a good cover of emergent and marginal vegetation providing habitat for birds and amphibians.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill BESS (1km south)
Hog Hole Spinney LWS	4.8	A largely broadleaved woodland on sandy soil. Trees include ash and oak, with a dense scrub layer below. This is a significant site, being the largest woodland for several kilometres around	1.1 km south-west of Green Hill B
Par Pond LWS	3.21	A long lake on the edge of Castle Ashby Park, well-vegetated with emergent and marginal vegetation and surrounded by parkland.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill F (1.1km west)
Pitsford Water Wildlife Trust Reserve (WTR)	181.25	Forms part of Pitsford Reservoir SSSI. Four main streams enter the reserve and form large bays of shallow water across connected valleys. During winter these provide excellent feeding and sheltering areas for wildfowl, whereas lowered water levels in summer expose stretches of mud and foraging areas for migrating waders.	Within 2km of Green Hill A and B Designated site lies closest to Green Hill B (1.2km north)
Castle Ashby Parkland LWS	4.47	This woodland is near the centre of Castle Ashby parkland and leads from the church to the ponds and boathouse. It contains a large variety of parkland and semi-natural species, and a largely semi-natural ground flora with several ancient woodland species and one or two odd parkland additions.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill F (1.3km west)
Menagerie Pond LWS	2.09	A lake within the Castle Ashby parkland, with areas of thick fringing emergent vegetation and occasional aquatics. The invertebrate life is said to be of interest.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill BESS (1.3km south)





Site Name	Area (ha)	Description	Distance to from Sites
Vivians Covert LWS	4.64	This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS with 7 ancient woodland indicators recorded and opportunity to improve.	Within 2km of Green Hill C, D and E Designated site lies closest to Green Hill E (1.3km north-east)
Warren Ponds LWS	0.3	These ponds extend the habitat of Par Pond and provide cover for birds and amphibians, they are of some significance as an extension to the habitat corridor.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill F (1.3km west)
Castle Ashby Woodland LWS	2.47	A patch of old woodland that probably dates from the time of Castle Ashby parkland. There is a large amount of wych elm in the canopy, and a mixture of other broadleaved species, mainly ash and scrub such as elder, hawthorn, crab apple and sallow. An oddly structured woodland, but well-established and probably of interest for invertebrates as well as the unusual plants.	Within 2km of Green Hill F and BESS Designated site lies closest to Green Hill BESS (1.4km south-west)
Cowpasture Spinney LWS	9.09	A long, narrow shelterbelt spinney with a stream running through the centre and associated emergent vegetation. The tree cover is very varied and the ground cover contains a number of ancient woodland indicator species.	Within 2km of Green Hill B and C Designated site lies closest to Green Hill B (1.5km south-east)
Hardwick Wood LWS	39.93	An ancient woodland site that has been mainly replanted with a mixture of oak and spruce. This site was re-assessed using the new criteria in 2006. Based on previous surveys it qualifies as a LWS as 20 ancient woodland indicators (alongside 21 neutral grassland indicators) were recorded.	Within 2km of Green Hill A.2 and C Designated site lies closest to Green Hill A.2 (1.5km south)
Templegrove Spinney CWS	1.7	Broadleaved, semi-natural, ancient woodland.	Within 2km of Green Hill F and G 1.6km northeast of Green Hill G
Ecton Gravel Pits LWS	50.25	Three gravel pits alongside the River Nene, the pits vary in size and shape and provide a mixture of wildlife habitats. The site qualifies as a LWS as 12 wetland indicators were recorded across the site.	1.7km north-west of Green Hill BESS
Engine Pond LWS	2.32	A well-established pond, with emergent vegetation and abundant dragonflies and damselflies.	1.8km south-west of Green Hill BESS
Hardwick Road Verge LWS	0.19	Two sections of verge to the north and south of Hardwick Road. With nine neutral grassland indicators on the southern section (including 3 strong) and 8 on the northern section (including 3 strong) these verges qualify as a Protected Wildflower Verge (PWV) and a LWS.	Within 2km of Green Hill C and D Designated site lies closest to Green Hill D (1.8km north-east)



Site Name	Area (ha)	Description	Distance to from Sites
Wilby Way Meadows LWS	5.61	A neutral grassland site that has suffered from poor management in recent years. Species-rich patches of MG5 grassland remain and the site qualifies as a LWS as it is a lowland meadow with areas of MG5 vegetation and 9 neutral indicator species recorded.	1.9km east of Green Hill E
Hardwater Meadows LWS	27.69	A series of fields adjacent to the Nene. The site retains its LWS status to the presence of species rich wetland vegetation around the pond and alongside the old course of the river. A total of 11 fen, swamp and marsh indicators were recorded.	2km north-east of Green Hill BESS

**Priority Habitats**

8.3.21 The following Habitats of Principal Importance (HPIs) under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Ref.26) and Local Priority Habitats identified within the Northamptonshire BAP (2015-2020) (Ref.24) all occur either within the Sites, or within 2km of the Sites and Cable Route Search Area and are therefore considered capable of being impacted by the proposals. The locations of Priority Habitats are shown in **Figures 8.6** and **8.7**.

**On-Site**

8.3.22 Arable Field Margins: Arable Field Margins were recorded across all Sites. The management of these margins varied across the Sites, and included margins sown to provide seed for wild birds or pollinator mixes, as well as margins providing tussocky grassland strips.

8.3.23 Broadleaved/Deciduous Woodland: Small parcels of broadleaved woodland were recorded within Green Hill A and E. Additional parcels of broadleaved woodland are present throughout the local landscape, outside of the Sites.

8.3.24 Hedgerows: Fields were bounded by an extensive network of hedgerows, that were largely species-poor in composition but with mature, standard trees noted frequently within hedgerows. Hedgerows were often associated with dry and wet agricultural ditches.

8.3.25 Ponds: Several ponds were noted within the site, some of which were connected to the agricultural ditch/stream network intersecting and/or bounding fields within sites. Ponds within 250m of the site and the Cable Route Search Area were also identified.

**Off-Site (including Cable Route Search Area)**

- The following Habitats of Principal Importance (HPIs) all occur off-site within 2km of the Sites and/or within the Cable Route Search Areas, and will therefore be considered during the assessment:
- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Good Quality Semi-Improved Grassland
- Lowland Calcareous Grassland
- Lowland Fens



- Lowland Meadows
- Priority Ponds
- Reedbeds
- Traditional Orchards
- Wood-pasture and Parkland

### **Protected and Priority Species**

8.3.26 This section outlines the results of species-specific surveys relating to the Sites as well as the desk study, for which species records within 2km of the Sites were obtained.

8.3.27 Searches for records of protected and priority species within the Cable Route Search Area will be provided once available.

### **Badger**

8.3.28 The data search returned 153 records of badger since 2000, with records returned within 2km of all Sites.

8.3.29 The presence of badger setts was recorded during baseline habitat walkover surveys, with a summary of sett size and activity level recorded. Badger foraging activity was also noted during these surveys and will be added to where incidental evidence is found during other surveys.

8.3.30 Badger setts have been recorded across all Sites excluding Green Hill BESS, predominately within hedgerows, pockets of scrub or at field margins, but on occasion also within fields amongst cropped areas. Sett types recorded within the Sites ranged from single-entrance outlying setts to main setts with at least 22 entrances. Given the geographical distribution and extent of the Sites, and the presence of badger setts across several Sites, the Scheme as a whole is certainly used by multiple badger social groups.

### **Bats**

8.3.31 Data search records for bats obtained from Northamptonshire Bat Group were only provided with 4-figure OS grid references, and therefore only identified a 1km square within which the record was obtained.

8.3.32 Records of the following species were returned within 2km of at least one of the Sites since 2000: barbastelle, brown long-eared, common pipistrelle, Daubenton's, Leisler's, Nathusius's pipistrelle, Natterer's, noctule, soprano pipistrelle, whiskered bat, and unidentified records of pipistrellus sp., Myotis sp., and whiskered/Brandt's bats. Nine barbastelle records were returned, including two roost records, which related to OS Grid Reference SP8370 and SP8158 respectively.

8.3.33 The Scheme supports habitats typical of arable farmland landscapes, including arable fields with and without field margins and conservation measures (such as overwintering stubble, species-rich grassland margins); grazed pasture; ponds, ditches and rivers; small pockets of woodland connected to more substantial parcels off-site; and a network of hedgerows of varying quality. Overall, this mosaic of habitats was classified to be of moderate habitat suitability, in accordance with the Bat Conservation Survey Guidelines (Ref.10).

8.3.34 Bat activity surveys utilising static detectors deployed across all Sites are currently ongoing, commencing in August 2023 and due to be completed across the Sites in October 2024. Static detectors will be deployed each month between April and October, inclusive. Full analysis of the collated data has not yet been undertaken, however a diverse range of species have been recorded utilising the Sites, including rarer



species for the local area, such as barbastelle *Barbastella barbastellus* (although with a relatively low frequency) but some localised pockets of increased activity.

- 8.3.35 Ground level tree assessments (standard trees within fields, as well as field boundaries) have been completed across all Sites, in order to assess trees for their suitability to support roosting bats. Each linear feature that contains several trees will be buffered from development according to the highest level of suitability for roosting bats afforded to a tree along that particular feature, and therefore survey effort will focus on trees with the highest suitability for roosting bats across any particular hedgerow/other linear feature.
- 8.3.36 Inspections of buildings present within the scheme boundary will also be completed to assess their suitability for roosting bats, where buildings suitable for roosting bats are at risk of habitat fragmentation or a loss of habitat connectivity resulting from the Scheme.

#### **Otter and Water Vole**

- 8.3.37 The data search returned 9 records of otter and 11 records of water vole since 2000. Otter records were returned within 2km of Green Hill A, B, C, D, E, G and BESS, whilst water vole records were returned within 2km of Green Hill C, D and E.
- 8.3.38 Suitable riparian and wetland (pond and ditches) habitats are present within all Sites and will be subject to thorough surveys carried out in accordance with survey good practice guidelines (Ref.11, Ref.12). In summary, this will comprise all watercourses being investigated for their habitat suitability and categorised accordingly, followed by detailed 'spot check' for field signs of the presence of riparian mammals.
- 8.3.39 At the time of writing, a single otter and water vole survey has been completed at Green Hill F and G in April 2024, with all remaining Sites having been subject to two surveys in September 2023 and April 2024. The otter and water vole surveys are ongoing with an autumn survey scheduled at Green Hill F and G in or before the end of September 2024.
- 8.3.40 To date, otter field signs (spraints and prints) have been recorded at Green Hill B, C, D and E. No holts were recorded during the initial autumn survey undertaken in September 2023, although a single potential holt was recorded at Green Hill E in April 2024.
- 8.3.41 Potential water vole feeding signs were recorded at Green Hill BESS, as well as at a single location at Green Hill E. A dead, adult water vole was also found within a field margin downstream of the Green Hill E location during the habitat walkover survey. Wilby Meadows Stream LWS, situated to the east of Green Hill E (approx. >700m off-site), is indirectly connected to this watercourse and has previously been designated for its water vole colony. A series of potential water vole burrows were also recorded at Green Hill C and D in April 2024.

#### **Hazel Dormouse**

- 8.3.42 The data search did not return any records of hazel dormice *Muscardinus avellanarius* within the 2km search area around Scheme. Habitats across the Scheme were considered sub-optimal for dormice, being restricted to managed simple hedgerow networks infrequently connected to woodland and also impacted by the restricted range of dormice within Northamptonshire.
- 8.3.43 Hazel dormice rarely occur in Northamptonshire and the Scheme is considered to be towards the northern extent of their range within the United Kingdom. Although a known population have been reintroduced into extensive woodlands within the north of the county at Rockingham Forest, these woodlands have poor connectivity to the Sites and it is therefore considered highly unlikely that the Sites would be functionally linked to any known populations of dormice. Therefore, hazel dormice will be scoped out of future assessment.

#### **Other Mammals**

- 8.3.44 The data search returned records of the following other terrestrial mammal species: polecat *Mustela putorius*, brown hare *Lepus europaeus*, and west European hedgehog



*Erinaceus europaeus*. Three polecat records were returned, which related to areas within 2km of Green Hill B and E, whilst brown hare and hedgehog records were returned within 2km of all Sites.

- 8.3.45 Other mammalian species of principle importance for conservation will be considered in the ecological assessment. Based on current statuses and known distributions, this will be restricted to brown hare, hedgehog and polecat only, all of which appear in the desk study records and are capable of being impacted by the Scheme.

### **Amphibians**

- 8.3.46 Desk studies were conducted to establish amphibians presence within the local area, with a particular focus on great crested newts *Triturus cristatus* given the legal protection they are afforded, in addition to common toad *Bufo bufo* as a Species of Principal Importance (NERC Act, 2006) and palmate newt *Lissotriton helveticus* previously recognised as a priority (BAP) species for Northamptonshire (Ref.3).
- 8.3.47 The data searches returned records of great crested newt within 2km of all Sites, and within 500m of Green Hill D, E and F. Common toad have also been recorded within 2km of Green Hill B, D, E, F and BESS, whilst only one record of palmate newt was returned within 2km of Green Hill F. At the time of writing, adult great crested newts had also been observed during field surveys within terrestrial habitats in the northern section of Green Hill F during February 2024.
- 8.3.48 Several ponds on Sites were considered suitable to support great crested newts and other amphibians during the habitat walkover surveys. Suitable on-site terrestrial habitats were present, although generally limited in extent to field boundaries/conservation areas amongst hedgerow bases, tussocky grasslands, field margins and woodland edges. A decommissioned area of mineral works adjacent to Green Hill F provides a more extensive area of suitable habitat.
- 8.3.49 Great crested newt (GCN) District Licensing (DL) is currently being pursued as a mitigation option for the entire Scheme (including the Cable Corridor) for this species, which does not require pond survey data to be collected. However, if DL is not pursued as the principal mitigation option, then the ecological impact assessment on great crested newts will instead be informed by eDNA survey work of all accessible ponds within the Scheme and within 250m of any of the Sites or Cable Corridor, where access permission can be obtained.

### **Reptiles**

- 8.3.50 The data search returned one adder record which related to Sywell Reservoir and Country Park (located approximately 600m to the south-west of Green Hill E), and 8 grass snake records, which were recorded within 2km of Green Hill B, D, E, F and BESS.
- 8.3.51 It is recognised that common reptile species including slow worm *Anguis fragilis*, grass snake *Natrix helvetica* and common lizard *Zootoca vivipara* may be present within parts of the Sites. Areas of particularly suitable habitat include areas of conservation grassland or set-aside fields and tussocky field margins, along with hedgerows and areas of scrub, which all provide shelter for these species. However, specific surveys for reptiles are not being undertaken, given the relatively low risk to individual reptiles during the construction and operational phases of the proposed solar development (due to the majority of suitable habitat being located at the peripheries of fields) and size of the Sites. Nevertheless, this group will be considered at the impact assessment stage to ensure that any potential impacts such as habitat loss/fragmentation and the risk of individuals being killed/injured during the construction phase (if present) are taken into account and allowed for within proposed mitigation.

### **Wintering (Non-breeding) Birds**

- 8.3.52 The data search returned over 36,000 bird records of at least 173 species within 2km of the Sites since 2000. Many of these records related to several designated sites in the local



landscape, including Pittsford Reservoir, Sywell Reservoir and Country Park, and Summer Leys LNR.

- 8.3.53 Wintering bird surveys, both diurnal and nocturnal surveys, are currently ongoing at the time of writing. These surveys are being completed to record all species, but with particular interest and consideration of the arable farmland bird assemblages and waders associated with the Upper Nene Valley Gravel Pits SPA that may be using habitats on-site for foraging and loafing (in particular, golden plover *Pluvialis apricaria* and lapwing *Vanellus vanellus*).
- 8.3.54 The diurnal surveys are being completed in accordance with BTO standard methodologies (Ref.7) adapted for wintering birds and the extensive survey area, and Bird Survey Guidelines (Ref.5). All species present are recorded, along with abundance and behaviour. In-field transects are also undertaken to record activity across entire fields. The majority of these surveys commenced in October 2023, continuing until February 2024, but with two individual surveys scheduled for October and November 2024 at Green Hill F only, due to its addition to the Scheme in December 2023.
- 8.3.55 Following the recording of low numbers of golden plover and lapwing on-site, flying overhead and heard/seen offsite at Green Hill A, C, D, E and F during the initial diurnal wintering bird surveys in winter 2023/24, nocturnal surveys commenced in early February 2024 to provide supplementary data on how these species use the habitats at night. The nocturnal surveys are ongoing with an additional two surveys scheduled for completion prior to late February and March 2024. The results of these surveys will be used, in consultation with Natural England, to inform the additional survey effort required, if any, across the remaining winter period.
- 8.3.56 The Upper Nene Valley Gravel Pits SPA Supplementary Planning Document (Ref.29) identifies a 10km consultation zone from the SPA, within which Natural England must be consulted about any solar developments over 0.5ha which may give rise to potential impacts on the SPA. In addition, a literature review suggested that overwintering golden plovers forage opportunistically and are highly mobile, regularly moving between sets of fields up to 10-12km apart (Ref.17). Consequently, any land within the 10km consultation zone is considered to potentially be functionally linked to the SPA. All Sites within 10km of any part of the SPA will therefore be subject to nocturnal wintering bird surveys. This comprises the entirety of all Sites, excluding Green Hill A (Green Hill A lies approximately 11.5km to the north-west of the SPA at its closest point; and the majority of Green Hill A.2 lies outside of 10km from the SPA, with only a very small section of the southernmost field lying just within the 10km consultation zone) which will only be subject to diurnal wintering bird surveys (in addition to diurnal breeding bird surveys).
- 8.3.57 Nocturnal surveys include walked transects to enable entire fields to be scanned using thermal scopes from either vantage points or connecting walked transects within fields. Species present, behaviour and abundance are recorded, with a particular focus on golden plover and lapwings in addition to other ground-feeding farmland waders recorded incidentally. The surveys are being carried out with consideration of Bird Survey Guidelines for nocturnal surveys (Ref.6) to ensure proportionate survey effort across Sites.

### **Breeding Birds**

- 8.3.58 The habitats present on the Sites provide suitable nesting and foraging opportunities for a range of bird species typical of farmland environments, including ground nesting species, such as skylark *Alauda arvensis* and common quail *Coturnix coturnix*. Rare and declining farmland species, such as turtle dove *Streptopelia turtur* and yellow wagtail *Motacilla flava*, have also been reported anecdotally by local landowners and within the data search respectively.
- 8.3.59 A full suite of six breeding bird surveys commenced across all parcels in March 2024, and will continue until early July 2024. The breeding bird surveys are being completed in accordance with BTO standard methodologies (Ref.7) adapted for the extensive survey area. All recorded species are noted, including abundance and behaviour. In-field



transects are also undertaken to record activity across entire fields to ensure that ground nesting species are recorded.

- 8.3.60 Should survey findings further support the likely presence of breeding species that may be more detectable at dusk, such as common quail and owls, a supplementary survey will take place, commencing shortly before and continuing into twilight to ensure that these species are fully considered.

#### **Invertebrates**

- 8.3.61 A small number of notable invertebrate species records were returned during the desk study. Habitats within the Sites provide suitable opportunities for a range of species, particularly at hedgerows, field margins and areas of botanically diverse grassland. Given the overall relatively low distinctiveness of the Sites' habitats, as well as the nature of the Scheme, specific surveys for invertebrates are not being undertaken. Nevertheless, this group will be considered at the impact assessment stage to ensure that any potential impacts such as habitat loss/fragmentation are taken into account.

#### **Plants**

- 8.3.62 The majority of habitats recorded across the Sites were conventional arable farmland with limited opportunities for notable botanical communities to thrive. Nevertheless, some areas were evidentially being managed for environmental land management schemes, including the presence of arable margins and species- or pollinator-rich grassland areas.
- 8.3.63 All grasslands within the Sites noted as species-rich grasslands during walkover surveys or where potential arable weed indicators have been noted will be subject to detailed botanical quadrat surveys and grassland condition assessments between May – July/August 2024. This will ensure that an accurate condition assessment of their floristic diversity and quality is reached. In addition, where the presence of potential presence of arable weed communities has been noted on other surveys undertaken during spring/summer, more detailed botanical surveys will be carried out to confirm the presence and abundance of any notable arable weeds.

#### **Fish**

- 8.3.64 Three records of spined loach *Cobitis taenia*, a Species of Principal Importance, derived from Pitsford Reservoir, the River Nene, and a lake associated with Summer Leys Nature Reserve, were returned within the desk study data. While these rivers and waterbodies do not form part of the Sites themselves, the Sites and Cable Route Search Area fall within the catchment for them and contain drains or streams which flow downstream into this catchment zone.
- 8.3.65 No specific surveys for this group are being undertaken, however fish will be considered at the impact assessment stage to ensure that any potential impacts, such as electromagnetic fields, are taken into account.

#### **Invasive and Non-Native Species**

- 8.3.66 Historic records of several invasive and non-native species were returned by various environmental records centres during the desk study, including American mink *Neovison vison*, American signal crayfish *Pacifastacus leniusculus*, Virginia-creeper *Parthenocissus quinquefolia*, water fern *Azolla dilliculoides*, Japanese knotweed *Fallopia japonica*, orange balsam *Impatiens capensis*, and Chinese water deer *Hydropotes inermis*. The only invasive species records returned since 2000 relate to Japanese knotweed, orange balsam and Nuttall's waterweed *Elodea nuttallii*. None of these records were located within the Sites.
- 8.3.67 To date, potential field signs of American mink have been observed within Green Hill E, and Chinese water deer have been observed predominately within Green Hill F. No invasive plant species have been recorded within the Sites to date.



## 8.4 Identification of Impacts and Assessment Scope

### Potential Sources of Impact

8.4.1 The following sources of impacts, given here to provide context in the scoping assessment, may affect the various ecological features identified and give rise to significant effects. The examples given are not exhaustive.

8.4.2 Chartered Institute of Ecology and Environmental Management (CIEEM) guidance draws a necessary distinction in Ecological Impact Assessment between ‘impacts’ and ‘effects’. An ‘impact’ is an action resulting in changes to an ecological feature, whereas an ‘effect’ is the outcome to an ecological feature from an impact. Impacts are discussed here, while potential effects are discussed later in this Scoping Chapter.

### Construction Phase

- **Habitat Loss and Habitat Change:** Limited habitat loss (for example affecting hedgerows) may occur where access for construction and operation is required, should it not be possible to use existing field access or current access points need to be widened. Other examples include habitat clearance to facilitate any permanent hard standing, such as foundations or footings. Habitat change will principally be associated with the reversion of arable fields to grassland and other habitats through management, as well as habitat creation where valuable habitat creation opportunities are identified.
- **Habitat Fragmentation:** Described by CIEEM as, “The breaking up of a habitat, ecosystem or land-use type into smaller parcels with a consequent impairment of ecological function”. Potentially in combination with habitat loss and habitat change, fragmentation can reduce the function of a habitat as well as impede the ability of a species to disperse and maintain a viable population. An example includes where infrastructure construction severs wildlife corridors or results in the isolation of important habitat features (such as a roost separated from foraging grounds). Installation of fencing or culverting streams may also cause fragmentation, as well as excessive light and noise disturbance resulting in some areas becoming unsuitable habitats for certain species.
- **Pollution and Habitat Degradation:** Release of chemical, sediment or dust pollution can interfere with the normal function of habitats and directly harm species, while processes such as erosion, compaction and alteration of soil/water chemical composition cause the degradation of habitat quality. The construction phase risks the release of pollutants through vehicle and plant movement/operation as well the introduction of new materials onto and into the soil. Protection of sensitive features will be important in safeguarding them throughout the life of the scheme.
- **Habitat Creation and Enhancement:** Beneficial effects are likely to arise from the creation of new habitats, such as wooded belts, grassland, hedgerow or wetland habitats across the Sites, as well as the enhancement of retained habitats through undeveloped buffer zones to increase and strengthen habitat connectivity. Beneficial effects may also be derived from the cessation of cultivation, chemical treatments and soil inputs.
- **Killing and Injury:** Habitat clearance and the actions of mechanical plant during construction has the potential to cause direct harm to fauna.
- **Disturbance:** This is the action of pressures or changes in the environment on individuals of a species so as to alter their behaviour. Such disturbance-causing pressures or changes include noise, movement and vibration during construction operations, as well as increased human presence.





### Operational Phase

- **Habitat Loss and Habitat Change:** Significant impacts from these are not anticipated as operation will be largely benign, unless major unexpected maintenance or repair events are required. Ongoing habitat maintenance will seek to ensure favourable condition and enhancement of all newly created and retained habitat for the life of the Scheme. Ecological habitat and species monitoring will be key to realising this.
- **Killing and Injury:** Routine operational works are unlikely to give rise to these effects although there is the risk of direct harm to species from the movement of vehicles around the site (including during the replacement of panels during the lifetime of the scheme), or the trapping of certain species within the fencing or fenced area.
- **Fragmentation:** The presence of a solar farm is anticipated to be habituated to by most mobile species, especially with the creation of new, and enhancement of retained, habitats. However, such impacts will vary between species groups, for example migrating birds and bats may interact with or be perturbed by the surfaces of the solar array, therefore this should also be considered. Typical perimeter fencing is not considered to impede the movement of most mammals, which may continue to move through, beneath or potentially over fencing although movement of deer is likely to be impacted.
- **Disturbance:** Operational disturbance may occur through the routine movement of vehicles and personnel on site (including during the replacement and regular maintenance of panels during the lifetime of the Scheme), as well as the presence of low-level noise associated with electrical equipment. Light reflection and glare may be another factor.
- **Electro-magnetic Fields (EMFs):** The potential for effects of anthropogenic EMFs on ecology is an emerging and poorly researched issue. It is feasible that EMFs emanating from electrical cables could impact certain species which utilise naturally generated EMFs (for instance for navigation), although to date there is very little evidence of significant behavioural changes from EMFs generated by electric cables. The size of generated fields are highly contingent on geometry, voltage and current, and it is considered that EMFs associated with the higher voltage export cable are more likely to risk impacts than those potentially emanating from interconnecting cables across the Scheme. All electrical cables associated with the Scheme are expected to be buried underground; buried cables typically have their electric fields fully attenuated by cable sheathing and the substrate under which they are buried. However, magnetic fields and induced electric fields are not attenuated in this way, and there lies a risk of effects on receptive wildlife species, particularly on a number of fish species which are known to have evolved sensitivity to electric and/or magnetic fields. In terms of terrestrial species, it is important to note that there is no evidence to suggest that typical solar array infrastructure can cause impacts and, due to the burial, sheathing and relatively low voltage of cabling within generating stations, the overall risk of EMFs resulting in significant effects on terrestrial wildlife is considered highly unlikely. There is some risk of EMFs affecting fish in the vicinity of the 400-132kV cables (i.e. where the cable is required to cross beneath watercourses). Consequently, the potential effects of this will be assessed within the ES, particularly while the relationship between EMFs and aquatic wildlife remains poorly understood.
- **Pollution and Habitat Degradation:** The risk of these impacts during operation are overall very low, especially where good maintenance practice is followed to avoid further pollution events or degradation of adjacent habitats. Pollution risks also extend to include impacts resulting from fire management, in the unlikely event this were to occur. Risks are further increased around battery energy storage infrastructure, as the water used on surrounding habitats to control fire may create a source of contaminated fire water runoff into surrounding water bodies, without



appropriate drainage and pollution control allowed for at the design stage. Potential impacts relating to contaminated water will be addressed specifically in the hydrology and drainage chapter, and measures to mitigate impacts from fire will be detailed within the Outline Battery Safety Management Plan.

- **Habitat Creation and Enhancement:** Ecological benefits can be maximised through the implementation of a habitat management and monitoring scheme for the life of the development. Beneficial effects may also be derived from the cessation of cultivation, chemical treatments and soil inputs, where the Scheme remains operational across multiple decades.

#### **Decommissioning Phase**

8.4.3 Considering the anticipated 60-year lifespan of the Scheme, the accurate prediction of decommissioning effects is challenging and can only be informed by the legal, policy and conservation constraints and priorities present at the time of application.

- **Habitat Loss and Habitat Change:** It is assumed that the fields will be able to be returned to agricultural use upon decommissioning, therefore this habitat change will need to be considered, including impacts on any newly created habitats.
- **Killing and Injury:** As per the construction phase, risks for direct harm to species should be considered.
- **Habitat Fragmentation:** While the removal of development infrastructure as a reversal of the construction phase is unlikely to result in habitat fragmentation, the reversion to agriculture may impact connectivity between habitats networks and species populations, which have arisen as a result of the Scheme.
- **Disturbance:** Disturbance impacts are likely to be the same as those described within the construction phase.
- **Pollution and Habitat Degradation:** Pollution and habitat degradation risks are likely to be the same as the construction phase.

#### **Potential Beneficial Effects**

8.4.4 There is potential for a number of beneficial effects on biodiversity to arise from the Scheme, including the ecological enhancement measures to be included within Scheme design, such as habitat creation and enhancement, detailed in in the relevant sections (Construction Phase and Operational Phase potential impacts) above. More general effects inherently arising from cessation of intensive agricultural practices within the Sites may result in benefits to wildlife, including:

- Halting the application of chemical herbicides and pesticides on previously arable areas is likely to contribute towards increased botanical and invertebrate diversity within the Sites;
- Limiting the application of fertilisers will not add to the current loads of nutrients present within soils;
- Limited fertiliser application may also reduce the possibility for additional run-off into watercourses within and connected to the Sites;
- Reduced movement of agricultural machinery within the Sites may result in reduced levels of disturbance to certain protected species throughout the lifetime of the Scheme; and
- Reduced movement of agricultural machinery within the Sites may result in reduced soil compaction and/or damage to root systems associated with individual trees, hedgerows and woodland blocks.



**Ecological Receptors to be Scoped Out**

8.4.5

Based on the information currently available, the following ecological receptors/effects are proposed to be scoped out of the Ecology and Biodiversity Chapter of the Environmental Impact Assessment process, with justification provided in the above sections and summarised within Table 8.3 below.

**Table 8.3: Effects and Ecological Receptors to be Scoped Out**

Ecological Receptor to be Scoped Out	Justification
Hazel Dormice	Dormice considered likely absent across the Scheme due to their national distribution and poor connectivity with local reintroduced populations.
Impacts of EMF on terrestrial species, and impacts of EMFs resulting from cables within the Sites and Cable Corridor	<p>Electric fields emanating from all cables associated with the Scheme will be fully attenuated by cable sheathing and will therefore have no resulting impacts on ecological receptors. Magnetic fields and resulting from induced electrical fields are not attenuated in this way.</p> <p>There is a lack of evidence on the effects of magnetic and induced electrical fields on wildlife. However, it is recognised that potential effects of EMFs generated along the length of any 400kV cable route, pose potential risks to certain ecological receptors.</p> <p>Existing research suggests that a number of fish species are sensitive to and utilise EMFs for predator/prey detection and navigation, although there is very little evidence of significant behavioural changes due to EMF effects arising from electrical cables. However, it is feasible that fish species with sensitivity to EMFs could be subject to disturbance resulting from installation of a 400kV cable. Where any 400kV cables cross watercourses, the effects of EMF will be considered within the assessment.</p> <p>The effects of EMFs on terrestrial species along the length of any 400kV cable routes have been scoped out of the assessment on the basis that there is no evidence</p>



Ecological Receptor to be Scoped Out	Justification
	<p>to suggest potential significant impacts to terrestrial wildlife, and that burial of the 400kV cable will provide a certain degree of attenuation of the possible impacts consistent with that provided by other schemes of a similar nature.</p> <p>The other cables to be used within the Scheme will be between 33-132kV as the size of generated fields will be consequently smaller, the risk of EMFs resulting in significant impacts is considered highly unlikely. Due to the burial, sheathing and relatively low voltage of cabling within generating stations, the overall risk of EMFs resulting in significant effects on terrestrial wildlife is considered highly unlikely. The effect of EMFs resulting from cables for the Scheme has therefore been scoped out of this assessment and is considered proportionate to the potential for significant effects in this instance.</p>
Boughton Green Corner Local Geological Site (LGS)	Designated solely for its geological interest and not for its ecological value. Potential impacts upon these features will be discussed in other chapters as appropriate.
Brampton Half Cutting LGS	Designated solely for its geological interest.
Boughton Cross Roads Quarry LGS	Designated solely for its geological interest.
Pitsford Quarry LGS	Designated solely for its geological interest.
Bozeat Quarry LGS	Designated solely for its geological interest.

## 8.5 Assessment Methodology

8.5.1 The standard approach applied in the UK to Ecological Impact Assessment (EcIA) is that developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) in 2018 and revised in 2019 (Ref.8). This methodology will be used to evaluate existing conditions, and to assess the significance of likely effects on ecological features that may arise during construction, operation and decommissioning of the Scheme. This involves determining the relative importance of each ecological feature and



undertaking an impact assessment pre- and post-implementation of mitigation measures. From this, any residual effects likely to occur can be identified along with an appreciation of their significance.

### **Baseline Evaluation**

8.5.2 When evaluating the baseline biodiversity importance of natural features found, the following characteristics are considered:

- Animal or plant species which are rare or uncommon, either internationally, nationally or more locally;
- Ecosystems which provide the habitats required by the above species;
- Species that are afforded legal protection;
- Endemic or locally distinct sub-populations of a species;
- Habitat diversity, connectivity and/ or other synergistic associations;
- Priority Species and Habitats under the Natural Environmental and Rural Communities (NERC) Act 2006 – Section 41 (as amended);
- Notably large populations or concentrations of animals considered uncommon or threatened in a wider context;
- Plant communities that are considered to be typical of valued natural/ semi-natural vegetation types;
- Species at the edge of their range; and
- Species-rich assemblages of plants or animals.

8.5.3 Habitats, species and sites identified in the baseline conditions will all be attributed with a status of ecological importance. The importance, or potential importance, of an ecological feature will be described in a geographical context (i.e. International, National, Regional, County, District and Local importance). Furthermore, a category of 'site' importance will be applied to a feature which is present or potentially present, but where the importance to nature conservation of the feature is of relatively low value in the context of the wider landscape. A further 'Negligible' category will be assigned to features of no particular intrinsic nature conservation importance.

8.5.4 In line with the guidelines set out by CIEEM, the impacts of the Scheme will only be assessed on those Important Ecological Features (IEFs) with importance equal to, or higher than Local level, or where mitigation is required for non-IEFs where it is necessary to ensure legal compliance. Habitats or species which are present for which there may be a potential breach of legislation will be considered to be IEFs, even if the feature itself is not considered to be of significant intrinsic nature conservation importance. Non-statutory designated sites will also be identified as IEFs where these lie within the Zone of Influence of the Scheme.

8.5.5 Published selection criteria, contained within the selection of Biological Sites of Special Scientific Interest (SSSI), can also be referred to aid the assessment of importance. Where significant habitats, such as Ancient Woodland, do not carry a designation, these are nevertheless considered at an appropriate geographic level.

### **Characterisation of Impacts**

8.5.6 When assessing the impact of the Scheme and impacts on baseline conditions, the assessments will solely focus on the Zone of Influence for each IEF in the context of the lifetime of the Scheme. The Zone of Influence will be assessed separately for each individual feature. Features considered when defining the Zone of Influence of the Scheme on each IEF include: the vulnerability of sites and habitats to the effects of construction and operation of the array; the mobility of species both on and surrounding the Site; the sensitivity of species to noise and disturbance; the impacts on transient or



migratory species; and the importance of any particular species or habitats as keystone features within local ecological networks.

8.5.7 Each potential impact on an IEF will be assessed at its respective geographical scale. Where appropriate, the following parameters will be used in characterising effects:

- Positive or Negative (whether the impact will have a Positive or Negative effect);
- Magnitude (the size of the impact);
- Extent (area over which impact occurs);
- Duration (time impact expected to last before recovery);
- Reversibility (an impact may be permanent or temporary); and
- Timing and frequency (impact may be seasonal e.g. bird nesting season).

#### Application of the Mitigation Hierarchy and Biodiversity Net Gain

8.5.8 The stepwise approach to avoidance, mitigation and compensation will be followed when reducing potential impacts.

8.5.9 Negative impacts can be avoided through fundamental scheme design choices, such as which fields to include within the final scheme and the extent of the final development site boundary. Avoidance of impacts can also be part of the mitigation package, such as the imposition of protective buffer zones from sensitive features kept free of all development activity. A distinction is made between avoidance undertaken in deciding the fundamental size and location of the Scheme and avoidance undertaken in the mitigation process when designing the detailed scheme (such as fencing and buffer zones). Fundamental avoidance is included in the characterisation of impacts ‘pre-mitigation’, while all other measures are taken into consideration when characterising impacts in the light of proposed mitigation.

8.5.10 Mitigation measures are typically given where likely adverse impacts are identified upon the IEFs. The mitigation measures will aim to reduce the overall impact value, typically at the location at which the impact occurs. An assessment of residual effects which takes account of the proposed mitigation is then made. Due consideration is given to the reliability of mitigation measures and the likelihood that they will achieve their stated goals, using the terms defined above.

8.5.11 Mitigation measures are also identified for species that did not qualify as IEF, but which are afforded legal protection under the Wildlife and Countryside Act (1981) or other environmental legislation, and as such will require appropriate precautionary methodologies to avoid environmental offences from being committed.

8.5.12 Compensation measures may be appropriate for IEFs which are likely to experience significant effects once mitigation options have been exhausted. Compensation measures seek to offset these residual effects, for example through the provision of alternative habitat either elsewhere within or outside of the scheme boundary. An examination of the appropriateness of proposed compensation options and the uncertainty in achieving successful compensation will take place. Finally, any remaining residual effects can then be further assessed.

8.5.13 Ecological monitoring forms a key role in achieving successful proposed mitigation or compensation measures.

8.5.14 Ecological enhancement measures are those which are not expressly required in order to deliver mitigation or compensation but are included to provide further benefits for nature conservation. The Environment Act 2021 contains provisions that require that at least a 10% net gain for biodiversity be demonstrated through a Biodiversity Net Gain assessment (using the Natural England Statutory Metric or later). It is noted that these provisions are not currently in force for NSIPs, however, a Biodiversity Net Gain assessment



will form part of the ES chapter. Additionality rules around Biodiversity Net Gain will be followed to ensure that at least 10% of the net gain is derived from habitat enhancement, rather than from species-specific mitigation requirements.

- 8.5.15 An Outline Ecological Protection and Mitigation Plan (OEPMP) will be prepared, which will detail the measures to be adopted to avoid and mitigate impacts upon important ecological features during the construction phase of the Scheme. An Outline Landscape and Ecological Management Plan (OLEMP) will also be prepared, to outline all habitat creation, management and monitoring prescriptions as required by the ES, with the aim to enhance the site for biodiversity (including delivering Biodiversity Net Gain).

#### Assessment of Residual Effects and Significance

- 8.5.16 After assessing the potential impacts of the Scheme and taking into account all avoidance, mitigation and compensation measures incorporated into the design of the Scheme, an assessment of residual impacts will be undertaken to determine the significance of their effects on the identified ecological features.
- 8.5.17 Following the methodology described by CIEEM, an ecologically significant effect is defined as “an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local”.
- 8.5.18 In line with CIEEM guidance, residual effects will be described as being ‘significant’ or ‘not significant’. In determining whether an effect is significant, consideration will be given to the following:
- Designated sites: Is the project and associated activities likely to undermine the conservation objectives of the designated site, or affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features;
  - Habitats: Is the project and associated activities likely to positively or negatively impact the structure and function of defined habitats and (if applicable) their conservation status;
  - Species: Is the project and associated activities likely to positively or negatively affect the conservation status of species (including their extent, abundance and distribution).
- 8.5.19 As CIEEM guidance discourages the use of the matrix approaches to assign categories (e.g. minor, moderate, major) to residual effects, ‘significant’ residual effects will be qualified with reference to the appropriate geographical scale at which the effect is considered to be felt.

#### Cumulative Effects

- 8.5.20 Cumulative effects, being effects of similar impacts from multiple schemes on the same receptor, will be assessed. The cumulative impacts arising from the Scheme will be assessed in combination with other relevant development, comprising in-construction, consented or emerging proposals of sufficient size, scale and development nature to cause or increase effects upon IEFs in combination with the Scheme. The list of cumulative developments to be considered will be compiled in consultation with stakeholders.
- 8.5.21 Cumulative effects may be additive or synergistic and result from individually non-significant but collectively significant impacts. Implications for further mitigation or compensation will be considered, as well as changes to any likely residual effects.
- 8.5.22 Cumulative effects will be addressed within the separate Cumulative Effects Chapter 23.



**In-Combination Effects**

8.5.23 In-combination effects, being effects on receptors from different pathways within the same scheme (as identified within different chapters of the ES) which combine to have a new or greater effect, will also be considered within the Ecology and Biodiversity Chapter 8 of the ES.

**8.6 Conclusions on Scoping**

8.6.1 Table 8.4 below summarises the results, in our considered opinion, of the scoping assessment. Please note, while the final assessment within the ES will deal with each likely impact and Important Ecological Feature individually, this table gives a broad indication of the overall residual effects considered likely.

**Table 8.4: Summary of Scoping Assessment Results**

Ecological Impact Pathway/Receptor	Scoped In/out	Justification
<b>Potential Impact Pathways</b>		
Impacts of EMFs on terrestrial species, and impacts of EMFs resulting from cables within the Scheme	Out	Identification of Impacts and Assessment Scope: Operational Phase
Impacts of EMFs on aquatic species from cables within the Scheme	In	Identification of Impacts and Assessment Scope: Operational Phase
<b>Ecological Receptors</b>		
Upper Nene Valley Gravel Pits SPA and Ramsar	In	Table 8.2; 8.3.53 - 8.3.58
National Statutory Designated Sites within 5km of Scheme	In	Table 8.2
Local Statutory and Non-Statutory Designated Sites within 2km of Scheme	In	Table 8.2
Local Statutory and Non-Statutory Designated Sites within 2km of Scheme designated solely for geological interest	Out	Table 8.2
Habitats of Principal Importance and Local Priority Habitats	In	8.3.22
Badgers	In	8.3.29 – 8.3.31
Bats	In	8.3.32 – 8.3.37
Otters and Water Vole	In	8.3.38 – 8.3.42
Hazel Dormice	Out	8.3.43 – 8.3.44
Other Mammals (Brown Hare, Harvest Mice, Hedgehog and Polecat only)	In	8.3.45 – 8.3.46
Amphibians (including Great Crested Newts)	In	8.3.47 – 8.3.50
Reptiles	In	8.3.51 – 8.3.52





Ecological Impact Pathway/Receptor	Scoped In/out	Justification
Non-breeding birds	In	8.3.53 – 8.3.58
Breeding birds	In	8.3.59 – 8.3.61
Invertebrates	In	8.3.62
Plants	In	8.3.63 – 8.3.64
Fish	In	8.3.65 – 8.3.66
Invasive and Non-Native Species	In	8.3.67 – 8.3.68

8.6.2 Table 8.5 below identifies the ecological receptors present within the Zone of Influence of the Scheme that are considered likely to be sensitive to sources of impact. This provides a summary of the impact context which each receptor will be assessed in the Environmental Statement.

**Table 8.5: Ecological Receptors Likely to be Sensitive to Construction, Operational and Decommissioning Phase Impacts**

Source of Impact	Sensitive Ecological Receptors
<b>Construction Phase</b>	
Habitat Loss and Habitat Change	Priority habitats, birds (notably ground-nesting species and farmland specialists), bats, amphibians, otter and water vole, reptiles and other mammals.
Killing and Injury	Badger, birds, bats, amphibians, otter and water vole, and other mammals.
Habitat Fragmentation	Badger, birds, bats, amphibians, otter and water vole, reptiles, other mammals, and invertebrates.
Disturbance	Badger, Schedule 1 birds, bats, amphibians (specifically great crested newts) and otter and water vole.
Pollution and Habitat Degradation	Designated sites, priority habitats, badger, birds, bats, amphibians, reptiles, other mammals and invertebrates.
Habitat Creation and Enhancement	Designated sites, priority habitats, badger, birds, bats, amphibians, reptiles, other mammals and invertebrates.
<b>Operational Phase</b>	
Habitat Loss and Habitat Change	None.
Killing and Injury	Badger, birds, bats, amphibians, otter and water vole, reptiles and other mammals.
Habitat Fragmentation	Birds, bats and other mammals.
Disturbance	Badger, Schedule 1 birds, bats and other mammals, .
Electro-magnetic Fields (EMF)	EMF-sensing fish species.
Pollution and Habitat Degradation	None



Source of Impact	Sensitive Ecological Receptors
Habitat Creation and Enhancement	Designated sites, priority habitats, badger, birds, bats, amphibians, otter and water vole, reptiles, other mammals and invertebrates.
<b>Decommissioning Phase</b>	
Habitat Loss and Habitat Change	Designated sites, priority habitats, badger, birds, bats, amphibians, otter and water vole, reptiles, other mammals and invertebrates.
Killing and Injury	Badger, birds, bats, amphibians, otter and water vole, reptiles and other mammals.
Habitat Fragmentation	Badger, birds, bats, amphibians, otter and water vole, reptiles, other mammals and invertebrates.
Disturbance	Badger, birds, bats, amphibians, otter and water vole, reptiles and other mammals.
Pollution and Habitat Degradation	Designated sites, priority habitats, badger, birds, bats, amphibians, otter and water vole, reptiles, other mammals and invertebrates.

## 8.7 References

Ref.1 Available at: <https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::priority-habitats-inventory-england/about>

Ref.2 Available at: <https://naturalengland-defra.opendata.arcgis.com/datasets/ancient-woodland-england/explore>

Ref.3 Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available at: <https://assets.publishing.service.gov.uk/media/5a78c263ed915d04220651ea/pb13583-biodiversity-strategy-2020-111111.pdf> (Accessed 29 Feb 2024)

Ref.4 Biodiversity Supplementary Planning Document: Annexes For Northamptonshire (2015). Available at: <https://cms.northnorthants.gov.uk/media/3829/download> (Accessed 17 Feb 2024)

Ref.5 Bird Survey Guidelines (2024) Non-breeding walkover survey (online) Available at: <https://birdsurveyguidelines.org/non-breeding-walkover-survey/> (Accessed 05 Jan 2024)

Ref.6 Bird Survey Guidelines (2024) Nocturnal Bird Surveys (online) Available at: <https://birdsurveyguidelines.org/nocturnal-bird-surveys/> (Accessed 06 Jan 2024)

Ref.7 BTO (2015) BTO/JNCC/RSPB Breeding Bird Survey Instructions (online) Available at: [https://www.bto.org/sites/default/files/u16/downloads/forms\\_instructions/BBS-Instructions-2015-online.pdf\\_.pdf](https://www.bto.org/sites/default/files/u16/downloads/forms_instructions/BBS-Instructions-2015-online.pdf_.pdf) (Accessed 22 Sept 2023)

Ref.8 CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.2 – Updated April 2022. CIEEM, Winchester.

Ref.9 CIEEM Biodiversity Net Gain: Good Practice Principles for Development (online). Available at: [Biodiversity-Net-Gain-Principles.pdf](#) (cieem.net) (Accessed 19 June 2024)

Ref.10 Collins J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition) The Bat Conservation Trust, London



- Ref.11 Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London
- Ref.12 Dean, M. (2021) Water Vole Field Signs and Habitat Assessment: A Practical Guide to Water Vole Surveys. Pelagic Publishing, Exeter, UK
- Ref.13 Department for Energy Security & Net Zero (November 2023) Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/65bbfbd709fe1000f637052/overarching-nps-for-energy-en1.pdf> (Accessed 28th Feb 2024)
- Ref.14 Department for Energy Security & Net Zero (November 2023) National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: <https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf> (Accessed 28th Feb 2024)
- Ref.15 Department for Energy Security & Net Zero (November 2023) National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at: Electricity Networks National Policy Statement - EN-5 ([publishing.service.gov.uk](https://assets.publishing.service.gov.uk)) (Accessed 19th June 2024)
- Ref.16 Environment Act 2021, c.30. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents>
- Ref.17 Gillings & Fuller (1999) Golden plovers and lapwings: A review and consideration of extensive survey methods. British Trust for Ornithology Research Report No. 224.
- Ref.18 HM Government (2018). A Green Future: Our 25 Year Plan to Improve the Environment. (online) Available at: [25-year-environment-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/744122/25-year-environment-plan.pdf) ([publishing.service.gov.uk](https://assets.publishing.service.gov.uk)) (Accessed 19th June 2024)
- Ref.19 UKHab Ltd (2023). UK Habitat Classification Version 2.0 (at [www.ukhab.org](http://www.ukhab.org))
- Ref.20 Milton Keynes Council Plan:MK 2016-2031 (adopted March 2019). Available at: <https://www.milton-keynes.gov.uk/planning-and-building/developingmk/planmk> (Accessed 20th May 2024)
- Ref.21 National Planning Policy Framework (2012) Section 15: Conserving and enhancing the natural environment. Available at: <https://www.gov.uk/guidance/national-planning-policy-framework/15-conserving-and-enhancing-the-natural-environment> (Accessed 28th Feb 2024)
- Ref.22 Natural England (October 2023) Protected species and development: advice for local planning authorities. Available at: <https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications> (Accessed 28th Feb 2024)
- Ref.23 Natural England (2023) The Statutory Biodiversity Metric: Technical Annexe 1 – Condition Assessment Sheets and Methodology
- Ref.24 Northamptonshire Biodiversity Action Plan (3rd edition, 2015-2020). Available at: <https://www.northnorthants.gov.uk/conservation-and-protection/biodiversity> (Accessed 15th April 2024).
- Ref.25 North Northamptonshire Joint Core Strategy 2011-2031 (adopted July 2016). Available at: [https://www.nnjpdu.org.uk/site/assets/files/1086/joint\\_core\\_strategy\\_2011-2031\\_high\\_res\\_version\\_for\\_website.pdf](https://www.nnjpdu.org.uk/site/assets/files/1086/joint_core_strategy_2011-2031_high_res_version_for_website.pdf) (Accessed 28th Feb 2024)
- Ref.26 Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006: habitats and species of principal importance in England. Available at: <https://www.gov.uk/government/publications/habitats-and-species-of-principal-importance-in-england>
- Ref.27 Settlements and Countryside Local Plan for Daventry District 2011-2029 (adopted February 2020). Available at: <https://www.daventrydc.gov.uk/living/planning-policy/part-2-local-plan/> (Accessed 28th Feb 2024)



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- Ref.28 The Plan for the Borough of Wellingborough - Adopted Plan (adopted February 2019). Available at: <https://wellingborough-consult.objective.co.uk/kse/event/34092/section/> (Accessed 28th Feb 2024)
- Ref.29 Upper Nene Valley Gravel Pits Special Protection Area Supplementary Planning Document - August 2015. Available at: <https://www.northampton.gov.uk/info/200205/planning-for-the-future/2105/upper-nene-valley-gravel-pits-spa-spd> (Accessed 28th Feb 2024)
- Ref.30 Upper Nene Valley Gravel Pits Special Protection Area Supplementary Planning Document - Addendum to the SPA SPD: Mitigation Strategy (adopted 2016). Available at: <https://www.northampton.gov.uk/info/200205/planning-for-the-future/2105/upper-nene-valley-gravel-pits-spa-spd>
- Ref.31 West Northamptonshire Joint Core Strategy Local Plan (adopted December 2014). Available at: <https://www.westnorthants.gov.uk/west-northamptonshire-joint-core-strategy/west-northamptonshire-joint-core-strategy-local-plan-part> (Accessed 28th Feb 2024)



## 9 Hydrology, Flood Risk and Drainage

### 9.1 Hydrology, Flood Risk and Drainage

9.1.1 This chapter deals with Hydrology, Flood Risk and Drainage. The Hydrology, Flood Risk and Drainage chapter of the Environmental Statement (ES) will consider the likely significant effects of the Scheme, which cover the Sites, Cable Route Search Area and wider locality as appropriate, on the local hydrology during its construction, operation phases and decommissioning. For the purposes of this assessment, the term 'hydrology' includes risks associated with surface water and drainage, and further includes an assessment of flood risk from all sources of flooding, namely:

- tidal (flood risk from the sea);
- fluvial;
- surface water;
- groundwater; and
- artificial sources (sewers, reservoirs, and canals).

9.1.2 The Scheme is over 1ha and therefore requires a Flood Risk Assessment to support the DCO application in line with footnote 59 of the NPPF. Surface water management is also a key consideration with regards to both surface water and water quality control to ensure that there is no detriment on or off-site with regards to flood risk and or water quality.

### 9.2 Figures

9.2.1 This chapter is supported by the following Figures:

- Figure 9.1 – Green Hill A and Green Hill A.2 – Flood Risk and Drainage
- Figure 9.2 – Green Hill B – Flood Risk and Drainage
- Figure 9.3 – Green Hill C – Flood Risk and Drainage
- Figure 9.4 – Green Hill D – Flood Risk and Drainage
- Figure 9.5 – Green Hill E – Flood Risk and Drainage
- Figure 9.6 – Green Hill F – Flood Risk and Drainage
- Figure 9.7 – Green Hill G – Flood Risk and Drainage
- Figure 9.8 – Green Hill BESS – Flood Risk and Drainage

### 9.3 Legislation, Policy and Guidance

9.3.1 Detailed Legislative Context and Energy Policy is contained within Chapter 5. Legislation, policy and guidance specifically relevant to this topic area is outlined below.

#### European Legislation

- The Water Framework Directive 2000/60/EC (WFD);
- The Groundwater Directive (80/68/EEC as amended);
- The Groundwater Daughter Directive (2006/118/EC);
- The EU Directive on the assessment and management of flood risks (2007/60/EC) (the 'Flood Directive'); and
- The Nitrates Directive (91/676/EEC) (the 'Nitrates Directive').



### UK Legislation

- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003;
- The Groundwater (Water Framework Directive) (England and Wales) Regulations 2009;
- Groundwater (Water Framework Directive) (England) Direction 2016;
- The Flood and Water Management Act 2010;
- The Water Resources Act 1991 (and Land Drainage bylaws);
- The Nitrates Directive is implemented by the Nitrate Pollution Prevention Regulations 2015;
- The Land Drainage Act 1991;
- The Water Resources Act (1991);
- The Flood and Water Management Act (2010);
- Flood Risk Regulations (2009);
- Building Regulations (2010) Part H of Schedule 1 ('Building Regulations Part H');

### National Planning Policy and Guidance

- Overarching National Policy Statement for Energy (EN-1);
  - Section's 3.3 and 5.8 and Paragraph's 3.3.20, 5.8.9, 5.8.10, 5.8.11, 5.8.12 and 5.8.36;
- National Policy Statement for Renewable Energy Infrastructure (EN-3);
  - Section 3.10 and Paragraph's 3.10.51, 3.10.75, 3.10.145;
- National Policy Statement for Electricity Networks Infrastructure (EN-5);
  - Section 2.6 and Paragraph's 2.6.1 and 2.6.2;
- National Planning Policy Framework 2023;
  - Paragraphs 165-175 'Meeting the challenge of climate change, flooding and coastal change';
  - Paragraphs 165-175 relating to 'Planning and Flood Risk';
  - Annex 3 'Flood risk vulnerability classification';
- Planning Practice Guidance: Flood Risk and Coastal Change (August 2022)
- National Standards for Sustainable Drainage Systems (2015); and
- Non-Statutory Technical Standards for Sustainable Drainage (2015).

### Local Planning Policy

- 9.3.2 The Sites and Cable Route Search Area which make up the Scheme are located within the administrative boundaries of: West Northamptonshire, North Northamptonshire and Milton Keynes. Green Hill A, A.2 and B are located within the administrative boundary of West Northamptonshire, Green Hill C to F and Green Hill BESS site are located within the administrative boundary of North Northamptonshire and Green Hill G is located within the administrative boundary of Milton Keynes.
- 9.3.3 Local Planning policies are considered from the following documents:
- West Northamptonshire Joint Core Strategy Local Plan Part 1 (Adopted 2014)
    - Policy BN7 – Flood Risk



- North Northamptonshire Joint Core Strategy 2011-2031 (Adopted 2016)
  - Policy 5- Water Environment, Resources and Flood Risk Management
- Milton Keynes Local Plan - Plan:MK (Adopted 2019)
  - Policy FR1 Managing Flood Risk;
  - Policy FR2 Sustainable Drainage Systems (SuDS) and Integrated Flood Risk Management; and
  - Policy FR3 Protecting and Enhancing Watercourses.

## 9.4 Baseline Conditions

### The Scheme and Context

- 9.4.1 The risk of fluvial flooding has been interpreted from the EA's online Flood Map for Planning (Ref.1). The risk of surface water flooding has been assessed from the EA Long Term Flood Risk Map (Surface Water) (Ref.2).
- 9.4.2 The Site and Cable Route Search Area situated within Anglian River Basin Management Plan (RBMP) area. Within the Anglian RBMP the Site is further situated within the Nene Management Catchment. Local land drainage feed into local watercourses several of which are WFD surface waterbodies.
- 9.4.3 As described in **Chapter 3: The Site and Wider Context** the Scheme comprises Sites Green Hill A-G and BESS and the Cable Route Search Area. At present, the final Cable Corridor is yet to be determined and the Cable Route Search Area has been identified for the potential Cable Corridor (see **Figure 3.2.1-3.2.3**). Only a narrow width within the Cable Route Search Area will be required for the Cable Corridor and its construction. The locations of these elements will be refined prior to submission of the DCO application. The following sets out the flood risk and drainage baseline for the Sites; as the Cable Route Search Area lies within the areas described for each Site, as shown in **Figures 9.1-9.8**, it is not described separately.

### Green Hill A

#### **Flood Risk and Drainage Designations**

##### *Fluvial Flood Risk*

- 9.4.4 A network of land drainage ditches is located within Green Hill A (see **Figure 9.1** - Green Hill A). Flows within the ditches are expected to flow generally in a south-westerly direction based on local topography. All the land drains are 'Ordinary Watercourses' and are therefore the responsibility of the LLFA to maintain.
- 9.4.5 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 9.4.6 The entirety of Green Hill A is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding.
- 9.4.7 The EA 'Historical Flood Map' indicates that Green Hill A has not historically flooded and neither has the Site's near vicinity.
- 9.4.8 Green Hill A is therefore considered to be at low risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and protected.



Surface Water Flood Risk

- 9.4.9 The EA 'Flood Risk from Surface Water' map indicates that Green Hill A ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 9.4.10 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches which flow throughout Green Hill A.
- 9.4.11 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be Low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and protected thereby reducing the potential to be impacted in the event of surface water flooding.

Green Hill A.2

- 9.4.12 There are two identifiable land drainage ditches located within Green Hill A.2. Flows within the ditches are expected to flow generally in a south-westerly direction based on local topography. The land drains are 'Ordinary Watercourses' and are therefore the responsibility of the LLFA to maintain.
- 9.4.13 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 9.4.14 The entirety of Green Hill A.2 is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding.
- 9.4.15 The EA 'Historical Flood Map' indicates that Green Hill A.2 has not historically flooded and neither has the Site's near vicinity.
- 9.4.16 Green Hill A.2 is therefore considered to be at low risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and protected.

Surface Water Flood Risk

- 9.4.17 The EA 'Flood Risk from Surface Water' map indicates that Green Hill A.2 ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 9.4.18 As described in the fluvial section above, the surface water flooding extents largely correspond with the land drainage ditches which flow east to west through Green Hill A.2.
- 9.4.19 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be Low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and protected thereby reducing the potential to be impacted in the event of surface water flooding.

Green Hill B

**Flood Risk and Drainage Designations**

Fluvial Flood Risk

- 9.4.20 There are two land drainage ditches located within 200m of Green Hill B (see **Figure 9.2** – Green Hill B). Flows within the ditches are expected to flow in a south-westerly direction





based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.

- 9.4.21 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 9.4.22 The entirety of Green Hill B is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding.
- 9.4.23 The EA 'Historical Flood Map' indicates that Green Hill B has not historically flooded and neither has the Site's near vicinity.
- 9.4.24 Green Hill B is therefore considered to be at low risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and protected.

#### Surface Water Flood Risk

- 9.4.25 The EA 'Flood Risk from Surface Water' map indicates that Green Hill B ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 9.4.26 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches.
- 9.4.27 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately protected thereby reducing the potential to be impacted in the event of surface water flooding.

### Green Hill C

#### **Flood Risk and Drainage Designations**

##### Fluvial Flood Risk

- 9.4.28 There is one land drainage ditch which runs through the centre of Green Hill C (**Figure 9.3** - Green Hill C). Flows within the ditches are expected to flow in a south-westerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.
- 9.4.29 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 9.4.30 The entirety of Green Hill C is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding.
- 9.4.31 The EA 'Historical Flood Map' indicates that the Site has not historically flooded and neither has the Site's near vicinity.
- 9.4.32 Green Hill C is therefore considered to be at low risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and protected.

##### Surface Water Flood Risk

- 9.4.33 The EA 'Flood Risk from Surface Water' map indicates that Green Hill C ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of



surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).

9.4.34 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches.

9.4.35 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and protected, thereby reducing the potential to be impacted in the event of surface water flooding.

### Green Hill D

#### **Flood Risk and Drainage Designations**

##### *Fluvial Flood Risk*

9.4.36 There is an Unnamed Ordinary Watercourse located along the western boundary of Green Hill D, flowing in a south-westerly direction (see **Figure 9.4** - Green Hill D). Fluvial flooding could occur if the Ordinary Watercourse overtopped its banks during or following an extreme rainfall event.

9.4.37 The majority of Green Hill D is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding. However, a limited area to the south-western boundary is identified as being in Flood Zone 3, associated with the Unnamed Ordinary Watercourse.

9.4.38 The EA 'Historical Flood Map' indicates that the Site has not historically flooded and neither has the Site's near vicinity.

9.4.39 Green Hill D is therefore considered to be at low risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and protected.

##### *Surface Water Flood Risk*

9.4.40 The EA 'Flood Risk from Surface Water' map indicates that Green Hill D ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).

9.4.41 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches and ordinary watercourses.

9.4.42 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and protected thereby reducing the potential to be impacted in the event of surface water flooding.

### Green Hill E

#### **Flood Risk and Drainage Designations**

##### *Fluvial Flood Risk*

9.4.43 A network of land drainage ditches is located within Green Hill E (see **Figure 9.5** - Green Hill E). Flows within the ditches are expected to flow in a south-westerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.



9.4.44 The majority of Green Hill E is situated in Flood Zone 1. However, an area to the western boundary, southern boundary and the south-eastern boundary are within the extents of Flood Zone 3. The EA 'Historical Flood Map' indicates that Green Hill E has not historically flooded and neither has the neighbouring land.

9.4.45 Green Hill E is therefore considered to be at low risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and protected.

#### Surface Water Flood Risk

9.4.46 The EA 'Flood Risk from Surface Water' map indicates that Green Hill E ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).

9.4.47 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches and ordinary watercourses.

9.4.48 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and protected thereby reducing the potential to be impacted in the event of surface water flooding.

### **Green Hill F**

#### **Flood Risk and Drainage Designations**

#### Fluvial Flood Risk

9.4.49 A network of land drainage ditches is located within Green Hill F (see **Figure 9.6** - Green Hill F). Three tributaries of an Unnamed Main River are shown as ditches and will flow in a northerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain, whereas the Main Rivers are the responsibility of the EA to maintain.

9.4.50 The majority of Green Hill F is situated in Flood Zone 1. However, the northern and north-western boundary are shown to be within Flood Zone 3, as well as sections of the Unnamed Main River Tributaries within the Site are within the extents of Flood Zone 3. The EA 'Historical Flood Map' indicates that the Site has historically flooded in the north, due to flooding at the River Nene in March 1947.

9.4.51 As areas of Green Hill F are within Flood Zone 3 (high risk) of flooding, EA modelling can detail the flood risk depths and extents from the River Nene. A comprehensive hydraulic modelling exercise is ongoing to refine the flood extents and depths.

9.4.52 Green Hill F is therefore considered to be at low to moderate risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately protected against flooding if necessary.

#### Surface Water Flood Risk

9.4.53 The EA 'Flood Risk from Surface Water' map indicates that Green Hill F ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).

9.4.54 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches and ordinary watercourses.



- 9.4.55 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and protected, thereby reducing the potential to be impacted in the event of surface water flooding.

### **Green Hill G**

#### **Flood Risk and Drainage Designations**

##### *Fluvial Flood Risk*

- 9.4.56 There is a network of land drains which join and flow southwards through the centre of Green Hill G. The land drains become a more rational watercourse flowing through Lavendon to the south and ultimately discharges to the River Great Ouse approximately 2km south of Green Hill G (see **Figure 9.7** - Green Hill G). Flows within the ditches are expected to flow in a south-westerly direction based on local topography. All the land drains are Ordinary Watercourses and are therefore the responsibility of the LLFA to maintain.
- 9.4.57 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 9.4.58 The majority of Green Hill G is situated in Flood Zone 1 and therefore has less than a 1 in 1,000 annual probability of river or sea flooding. However, a limited area to the southern boundary is identified as being in Flood Zone 3, associated with the land drain and unnamed Ordinary watercourse. The EA 'Historical Flood Map' indicates that Green Hill G has not historically flooded and neither has the Site's near vicinity.
- 9.4.59 Green Hill G is therefore considered to be at low risk of fluvial flooding, the proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately located out of the flood zone and protected.

##### *Surface Water Flood Risk*

- 9.4.60 The EA 'Flood Risk from Surface Water' map indicates that Green Hill G ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 9.4.61 As described in the fluvial section above, the surface water flooding extents largely match the courses of the land drainage ditches.
- 9.4.62 Based on the above and considering the embedded mitigation as part of the design of the solar panels, the overall risk of surface water flooding is considered to be Low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately protected thereby reducing the potential to be impacted in the event of surface water flooding.

### **Green Hill BESS**

#### **Flood Risk and Drainage Designations**

##### *Fluvial Flood Risk*

- 9.4.63 The nearest watercourse is Whiston Brook, an EA main river that forms the northern boundary of the BESS3 field within Green Hill BESS (see **Figure 9.8** - Green Hill BESS).
- 9.4.64 Whiston Brook is a tributary of the River Nene, also an EA main river, situated approximately 570m north of the site at its closest point.



- 9.4.65 A further EA main river named Grendon Brook flows in a northerly direction and forms the eastern boundary of BESS1 field within Green Hill BESS. Whiston Brook and Grendon Brook flow in a general north-eastern direction before they all converge to the River Nene approximately 1km away from the site.
- 9.4.66 An unnamed brook, a tributary of Whiston Brook, also flows in a northerly direction east of BESS2 field but west of the existing Grendon Substation before its confluence with the Whiston Brook.
- 9.4.67 Fluvial flooding could occur if the land drains overtopped their banks during or following an extreme rainfall event.
- 9.4.68 The EA 'Historical Flood Map' indicates that fields BESS1 and BESS3 have historically flooded in March 1947 due to the River Nene. It is known that recent flooding causing the evacuation of Billing Aquadrome occurred in the area in February 2024, it is understood Green Hill BESS was not impacted.
- 9.4.69 All fields within Green Hill BESS are within Flood Zone 3 (high risk) of flooding. EA modelling can detail the flood risk depths and extents from the River Nene. A comprehensive hydraulic modelling exercise is ongoing to refine the flood extents and depths.
- 9.4.70 Green Hill BESS is therefore considered to be at a moderate risk of fluvial flooding, the proposed BESS infrastructure will be raised above surrounding ground levels and sequentially located within areas at lowest risk as defined by the comprehensive hydraulic modelling exercise with associated power infrastructure appropriately protected.

#### Surface Water Flood Risk

- 9.4.71 The EA 'Flood Risk from Surface Water' map indicates that Green Hill BESS ranges from a very low risk of surface water flooding (less than 0.1% annual probability) to low risk of surface water flooding (between a 1% and 0.1% annual probability) to medium risk of surface water flooding (between a 3.3% and 1% annual probability) to high risk of surface water flooding (greater than 3.3% annual probability).
- 9.4.72 As described in the fluvial section above, the surface water flooding extents largely match the courses of the watercourses and land drainage ditches.
- 9.4.73 Based on the above and considering the embedded mitigation as part of the design of the Scheme, the overall risk of surface water flooding is considered to be low. The proposed solar panels will be raised above surrounding ground levels and will be appropriately located out of the flood zone and protected thereby reducing the potential to be impacted in the event of surface water flooding.

## **9.5 Potential and Likely Significant Environmental Effects**

- 9.5.1 The Potential and Likely Significant Environmental Effects relating to Chapter 9 Hydrology, Flood Risk and Drainage as a result of the Scheme comprise the following (during the construction, operational and decommissioning phases):
- possible surface water pollution during the construction, operational and decommissioning phases;
  - effect on surface water attributes, including water quality;
  - increased on and off-site surface flood risk;
  - impact on the public drainage network (foul and surface water), both in terms of water quality and capacity; and
  - assessment of in-combination impacts where relevant.



## 9.6 Assessment Methodology

### Assessment Process

- 9.6.1 An initial desktop analysis of the available data has been undertaken to inform this scoping study. Further data will be collected as part of a Flood Risk Assessment (FRA) report. The assessment will identify and assess the risks of all forms of flooding to and from the proposed Scheme and demonstrate:
- The significant effects and receptors at risk.
  - Consultation with the EA, LLFA and other stakeholders.
  - Whether the proposed Scheme is likely to be affected by current or future flooding from any source.
  - Whether the proposed Scheme will cause increased flood risk elsewhere.
  - Whether the measures proposed to deal with these effects and risks are appropriate.
  - Completion of the Sequential Test and, if required, the Exception Test.
  - SuDS will be examined for mitigating any increases in site runoff. Requirements for this will be determined with consultation with the EA, North and West Northamptonshire and Milton Keynes Council as LLFA.
- 9.6.2 A hydrological assessment will be undertaken to establish local drainage catchments and overland flow routes. The Hydrology, Flood Risk and Drainage ES Chapter will include a review and summary of relevant legislation and national, regional and local planning policy relevant to the water environment. Assessment in the form of a drainage assessment in accordance with the CIRIA guidance 'The SuDS Manual C753' will be undertaken by:
- site visit and hydrological/drainage surveys;
  - baseline hydrological assessment, data acquisition and regulatory consultation;
  - hydrological analysis (considering climate change);
  - sustainable drainage system design; and
  - surface water quality risk assessment & pollution control review.
- 9.6.3 This chapter will consider potential impacts over the lifetime of the Scheme and propose appropriate mitigation measures if required. The assessment of the significance of impact will be informed by the valuation of the watercourse and the magnitude of impact. In line with the Design Manual for Roads and Bridges (DMRB) guidance, the magnitude of impact will be determined only for residual impacts following mitigation.
- 9.6.4 Flood risk and surface water drainage will be summarised in the ES in accordance with guidance in the DMRB Volume 11, Section 3, Part 10 (HD 45/09).
- 9.6.5 Consultation is required with the EA, Milton Keynes and North and West Northamptonshire Councils (LLFA) to assess the risk from all sources of flooding to and from the Scheme to ensure flood risk is not exacerbated.
- 9.6.6 The ES chapter will summarise the findings and recommendations of the Drainage Strategy. Recommendations will be made for mitigation measures in order to minimise the potential effects of the Scheme on water quality and drainage. Any residual effects will be identified as well as the potential for relevant cumulative effects associated with any other developments nearby.
- 9.6.7 A Screening and Scoping WFD Assessment will be undertaken. The aim of this assessment would be to determine the potential for any non-compliance of the Scheme with WFD



objectives for affected water bodies, using readily available information and site observations. This will include an examination of the potential construction, operation and decommissioning phase effects of the Scheme on relevant WFD biological, hydromorphological and physio-chemical parameters. Depending on the outcomes of the Screening and Scoping WFD Assessment, more detailed investigations and assessments may be required, which will be determined in consultation with the EA. If further assessment is required, this would be provided alongside the ES.

9.6.8 It should be noted that early baseline conditions surveys for Green Hill A.2, the potential extension of Green Hill A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purpose of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Green Hill A baseline identified and will be presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

9.6.9 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

Consultation

9.6.10 At the time of writing, there has been ongoing engagement via email to numerous consultees. The Environment Agency has been contacted and there were no substantive comments received, however a meeting has been requested by both parties and is planned to occur imminently. The North Northamptonshire Council - Lead Local Flood Authority (LLFA), West Northamptonshire Council LLFA and Milton Keynes City Council LLFA have had engagement sought by the applicant but have yet to have any comments received.

Approach and Method

9.6.11 As summarised in Tables 9.1, 9.2 and 9.3, magnitude is considered in relation to the potential impact on the receptor. Magnitude is defined in a range from 'Negligible' to 'Major,' and the receptor sensitivity is defined as 'Low', 'Medium' or 'High' depending on the specific receptor character and its ability to tolerate change. The significance of the effect is defined in relation to both the magnitude of the impact and receptor significance. If the significance of the potential effect is 'Moderate Adverse' or higher, then mitigation measures may need to be considered.

**Table 9.1: Sensitivity/Importance of the Identified Environmental Receptor**

Sensitivity	Definition
High	<p>WFD Classification – Good or High</p> <p>Site protected under EU or UK wildlife legislation (SAC, SPA, SSSI, Ramsar Site);</p> <p>European Designated salmonid fishery (or salmonid &amp; cyprinid fishery);</p> <p>Important social or economic uses such as water supply, navigation or mineral extraction.</p> <p>Floodplain or defence protecting 1 or more residential properties or industrial premises from flooding.</p>



Sensitivity	Definition
Medium	<p>WFD Classification: Moderate</p> <p>May be designated as a local wildlife Site.</p> <p>May support a small / limited population of protected species. Limited social or economic uses.</p> <p>Floodplain or defence protecting 10 or fewer industrial properties from flooding.</p>
Low	<p>WFD classification – Poor</p> <p>No nature conservation designations.</p> <p>Low aquatic fauna and flora biodiversity and no protected species.</p> <p>Minimal economic or social uses.</p> <p>Floodplain with limited constraints and a low probability of flooding of residential and industrial properties.</p>
Negligible	<p>WFD classification – Poor</p> <p>No nature conservation designations.</p> <p>Low aquatic fauna and flora biodiversity and no protected species.</p> <p>Minimal economic or social uses.</p> <p>Floodplain with very limited constraints and a very low probability of flooding of residential and industrial properties.</p>

**Table 9.2: Methodology for determining impact magnitude**

Magnitude of Impact	Examples of Receptor
High	<p>Loss of Protected Area.</p> <p>Pollution of potable sources of water abstraction.</p> <p>Deterioration of a water body leading to a failure to meet Good Ecological Status (GES) under the WFD and reduction in Class (or prevents the successful implementation of mitigation measures for heavily modified or artificial water bodies).</p> <p>Significant potential increase in peak flood level (1% annual probability).</p>
Medium	<p>Loss in production of fishery.</p> <p>Discharge of a polluting substance to a watercourse but insufficient to change its water quality status (WFD class) in the long term.</p> <p>No reduction in WFD class, but effect may prevent improvement (if not already at GES) or the successful implementation of mitigation measures for heavily modified or artificial water bodies.</p> <p>Moderate potential Increase in peak flood level (1% annual probability).</p>





Magnitude of Impact	Examples of Receptor
Low	Noticeable effect on features, or key attributes of features, on the Protected Areas Register.  Measurable changes in attribute but of limited size and / or proportion, which does not lead to a reduction in WFD status or failure to improve.  Minor potential increase in peak flood level (1% annual probability).
Negligible	No effect on features, or key attributes of features, on the Protected Areas Register.  Discharges to watercourse but no significant loss in quality, fishery productivity or biodiversity.  No effect on WFD classification or water body target. Negligible change in peak flood level (1% annual probability).
Neutral	No change from baseline conditions.
Beneficial	Improvement on features, or key attributes of features, on the Protected Areas Register.  Improvement in fishery production or biodiversity.  Improvement in WFD classification or water body target. Potential reduction in peak flood level (1% annual probability).

**Table 9.3: Methodology for determining significant effects**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Moderate/Minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

9.6.12 In considering the significance of the effect account is taken of an effect’s duration; reversibility and compatibility with relevant environmental policies and standards. Effects can be temporary or permanent. Temporary effects are largely associated with the construction phase and permanent effects are largely associated with the operational phase.

**Assumptions and Limitations**

9.6.13 The methodology for assessment of potential water resource and flood risk effects has incorporated the following assumptions, that:



1. the Scheme will be low impact with access roads and footways surfaced with permeable surfacing and therefore assumed to be effectively permeable;
2. any runoff from waste materials would be collected, contained and prevented from direct entry to local water courses;
3. all clean roof drainage would be discharged directly to the nearest surface water drainage feature;
4. analysis of flood extents is reliant on the accuracy of the published EA Flood Map for Planning and EA flood data. No new hydraulic modelling has been undertaken as part of this study;

9.6.14 Given the Scheme is anticipated to be unmanned during the operational phase, with infrequent attendance for maintenance, welfare facilities will be limited or non-existent; and

1. maintenance checks would likely be the only time in which there would be staff present. Therefore, there will be no foul water discharge from the Scheme so no mains connected foul water drainage systems are deemed necessary. As such, impacts on foul sewer capacity is scoped out of further assessment.

#### **Mitigation and Enhancement**

9.6.15 Potential mitigation measures (where required) will be fully assessed on completion of Flood Risk Assessment, Drainage Strategy, WFD Assessment and ES chapters. It is likely that any potential flood risk will be mitigated by sequentially locating development to areas of lowest risk. Where the flood risk cannot be avoided, flood resistance and resilience measures will be utilised. The solar panels themselves can withstand up to 1m depth of flooding.

9.6.16 Following completion of the Drainage Strategy it will be confirmed that the existing drainage regime of the sites will not be altered. Solar panels will shed water to the undeveloped surface as per the existing situation. Infrastructure such as switches and substations will include Site-specific mitigation measures, these typically consist of gravel filled trenches (French drains) surrounding the equipment to stop horizontal migration of surface waters and promote infiltration, mimicking the existing situation.

9.6.17 Construction stage effects will be managed through a Construction Environmental Management Plan (CEMP), compliance with which will be secured in the DCO by a requirement. Decommissioning stage effects will be managed through a Decommissioning Environmental Management Plan (DEMP), compliance with which will be secured in the DCO by a requirement.

#### **Cumulative and In-Combination effects**

9.6.18 Cumulative and In-Combination effects will be assessed as part of the Flood Risk Assessment and Drainage Strategy. In general, local and national policy ensures that the Scheme cannot have a detrimental impact offsite with regards to local Hydrology, Flood Risk and Drainage. Where in-combination effects are identified, these will be addressed in the Hydrology, Flood Risk and Drainage Chapter. Cumulative effects will be addressed within the Cumulative Effects Chapter 23.

#### **Conclusions**

9.6.19 Based on the scoping work to date, there is the potential for the Scheme to have significant effects on local hydrology. The potential effects are considered in Tables 9.4 and 9.5 below which cover the Sites, Cable Route Search Area and wider locality as appropriate. Given the identified 'Likely Significant' effects hydrology, flood risk and drainage will be scoped into the Environmental Statement.



**Table 9.4: Flood risk and drainage summary of likely significant effects and receptors at risk if left unmitigated**

Likely Significant Effect	Receptor(s)	Scoped In / Out
<b>Construction / Decommissioning Phase</b>		
Mud and debris blockages	Flood risk to future people or property. Construction workers and construction equipment	In
Temporary increase in impermeable area	Flood risk to future people or property.. Construction workers and construction equipment	In
Compaction of soils	Flood risk to future people or property. Construction workers and construction equipment	In
<b>Operational Phase</b>		
Increase in permanent impermeable area	Flood risk to future people or property.	In
Increase in discharge to local watercourses.	Flood risk to future people or property.	In
Blockage of drainage networks	Flood risk to future people or property.	In

**Table 9.5: Water Resources summary of likely significant effects and receptors at risk if left unmitigated.**

Likely Significant Effect	Receptor(s)	Scoped In / Out
<b>Construction / Decommissioning Phase</b>		
Silt-laden runoff	Local watercourses and groundwater bodies	In
Spillages, leakages and pollutants	Local watercourses and groundwater bodies	In
Inappropriate wastewater disposal from welfare facilities	Local watercourses.	In
<b>Operational Phase</b>		
Diffuse pollution contained in urban runoff	Local watercourses and groundwater bodies	In



Likely Significant Effect	Receptor(s)	Scoped In / Out
Diffuse pollution contained in fire water runoff	Local watercourses and groundwater bodies	In
Increase in highway routine runoff	Local watercourses	In
Increase in highway spillage risk	Local watercourses and groundwater bodies	In
Increased demand on water supply	Surrounding area	In
Disposal of surface and foul water from the Scheme	Local watercourses	In

## 9.7 References

- Ref.1 GOV.UK (2024). <https://flood-map-for-planning.service.gov.uk>
- Ref.2 GOV.UK (2024). <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>



## 10 Ground Conditions and Contamination

### 10.1 Introduction

10.1.1 This chapter considers the likely significant effects of the Scheme in respect of ground conditions and contamination during its construction, operation and decommissioning phases. The chapter describes and identify the relative level of effects arising as a result of the Scheme, including prior to and post mitigation, in relation to human health and controlled waters risk.

### 10.2 Appendices

10.2.1 This chapter is supported by the following appendices:

- Appendix 10: Preliminary Geo-Environmental Risk Assessment, Green Hill Solar Farm, Northampton, Delta-Simons Project No. 93791.580478, dated May 2024.

### 10.3 Legislation, Policy and Guidance

10.3.1 The following legislative provisions, policy and guidance, as well as the EIA Regulations, provide the context for the ground conditions and contamination assessment to be undertaken in the EIA:

- Land Contamination: Risk Management pages of the GOV.UK web pages, the relevant requirements of the National Planning Policy Framework (NPPF) (as revised 2023) (paragraphs 180 & 189-190); (Ref.1) and
- Planning Practice Guidance (Land Affected by Contamination). (Ref.2)

### 10.4 Baseline Conditions

10.4.1 The baseline conditions associated with the soil and groundwater conditions have been obtained from a desktop review (Preliminary Geo-Environmental Risk Assessment (PRA)), including the identification of the environmental setting, a review of historical and present-day maps and a review of regulatory information. The environmental setting information has been obtained from a variety of sources including: British Geological Survey (BGS) online data, Environment Agency (EA) data, a Landmark Envirocheck® Report for the assessment sites, Coal Authority (CA) online data and information provided by Wellingborough Council, West Northamptonshire Council, North Northamptonshire Council and Milton Keynes Council. Delta-Simons' PRAs for the development site and Cable Route Search Area is included as **Appendix 10** and should be read in conjunction with this chapter. At this stage, the exact Cable Corridor is unknown, however, an assessment has been undertaken of the Cable Route Search Area within which the underground cables could be located.

10.4.2 The scheme is split into the following Sites and the adjoining Cable Route Search Area:

- Green Hill A - Land east of Broughton Road, Old; and Green Hill A.2 to the south of Kettering Road, Walgrave
- Green Hill B - Land south of Holcot;
- Green Hill C - Land north of Sywell Road, Sywell;
- Green Hill D - Land west of Highfield Road, Mears Ashby;
- Green Hill E - Land at Wilby Road, Mears Ashby;
- Green Hill F - Land west of Bozeat;
- Green Hill G - Land at Warrington; and



- Green Hill BESS - Land at Grendon Substation.

10.4.3 The Sites and Cable Route Search Area are shown within the PRA in **Appendix 10.1**. Although Site A.2 is included in the figures in **Appendix 10.1**, Site A.2 is not specifically assessed within the PRA having been introduced to the Scheme at a later date. However, before A.2 was introduced to the Scheme it was located within the Cable Route Search Area and will have been considered as such in the PRA.

10.4.4 It should be noted that early baseline conditions surveys for Site A.2, the potential extension of Site A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Site A, the baseline conditions for Site A.2 are assumed for the purpose of this Scoping Report to be equivalent to Site A. If Site A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Site A baseline identified, and will be presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

#### Consultation

10.4.5 The stakeholders consulted for this chapter include the local councils relevant to the site area, namely Wellingborough Council, West Northamptonshire Council, North Northamptonshire Council and Milton Keynes Council, regarding the contaminative status of the sites in the context of Part 2A. No further stakeholder consultation has been conducted.

#### Green Hill A

##### Geology

10.4.6 Published BGS data indicates Green Hill A to be underlain by superficial Diamicton of the Oadby Member and Glaciofluvial Deposits (Sand and Gravel) in the eastern area.

10.4.7 The bedrock is mapped as the Northampton Sand Formation and Whitby Mudstone Formation in the east.

10.4.8 Made Ground is anticipated in the concrete storage area, however, is likely to be limited in thickness.

##### Hydrogeology and Hydrology

10.4.9 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer and the Glacio-fluvial Deposits as a Secondary A Aquifer.

10.4.10 Bedrock of the Northampton Sand Formation is classified as a Secondary A Aquifer and the Whitby Mudstone Formation as Unproductive Strata.

10.4.11 The EA also indicate that Green Hill A is not located within a Groundwater Source Protection Zone (SPZ).

10.4.12 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill A.

10.4.13 A drainage ditch is orientated north-east to south-west in Green Hill A.

##### Mining

10.4.14 There is no recorded coal or underground non-coal mining within Green Hill A.

10.4.15 Three BGS Recorded Mineral Sites are mapped on Green Hill A including a sand pit in the north-west, a clay pit in the central southern area and an old gravel pit along the south-western boundary. All entries are now noted to be ceased.

##### Historical Summary

10.4.16 Green Hill A has largely remained undeveloped and comprises a series of agricultural fields.



10.4.17 Walgrave Lodge Sand Pit is present in the north-western area of Green Hill A from 1884 until no longer mapped by 1974.

### Green Hill B

#### **Geology**

10.4.18 BGS data indicates Green Hill B to be underlain by superficial Diamicton of the Oadby Member.

10.4.19 The bedrock is mapped as the Rutland Formation, Stamford Member and Blisworth Limestone Formation in the most northern extent.

#### **Hydrogeology and Hydrology**

10.4.20 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer.

10.4.21 Bedrock of the Stamford Member is classified as a Secondary A Aquifer, the Rutland Formation as a Secondary B Aquifer and the Blisworth Limestone Formation as a Principal Aquifer.

10.4.22 The EA also indicate that Green Hill B is not located within a Groundwater Source Protection Zone (SPZ).

10.4.23 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill B.

10.4.24 A pond is located on-site in the eastern area. Pitsford Reservoir is located approximately 1 km north.

#### **Mining**

10.4.25 There is no recorded evidence of mining within Green Hill B.

#### **Historical Summary**

10.4.26 Green Hill B has remained undeveloped throughout its history and comprises a series of agricultural fields.

### Green Hill C

#### **Geology**

10.4.27 BGS data indicates Green Hill C to be underlain by superficial Diamicton of the Oadby Member.

10.4.28 The bedrock is mapped as the Stamford Member, Northampton Sand Formation and Wellingborough Limestone Member.

#### **Hydrogeology and Hydrology**

10.4.29 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer.

10.4.30 Bedrock of the Stamford Member, Wellingborough Limestone Member and Northampton Sand Formation are classified as a Secondary A Aquifer.

10.4.31 The EA also indicate that Green Hill C is not located within a Groundwater Source Protection Zone (SPZ).

10.4.32 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill C.

10.4.33 A pond is located to the north-east of Green Hill C.

#### **Mining**

10.4.34 There is no recorded coal or underground non-coal mining within Green Hill C.



10.4.35 Mears Ashby Iron Ore Pit is located along the western boundary of Green Hill C. The entry is noted to be ceased.

**Historical Summary**

10.4.36 Green Hill C has largely remained undeveloped and in agricultural use.

10.4.37 An agricultural building is mapped in the northern central area from 1900 until 1971.

10.4.38 Mears Ashby Iron Ore Pit is mapped along the western boundary of Site C from 1901 until 1958.

**Green Hill D**

**Geology**

10.4.39 BGS data indicates Green Hill D to be underlain by superficial Diamicton of the Oadby Member.

10.4.40 The bedrock is mapped as the Rutland Formation, Wellingborough Limestone Member, Stamford Member and Northampton Sand Formation.

**Hydrogeology and Hydrology**

10.4.41 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer.

10.4.42 Bedrock of the Stamford Member, Wellingborough Limestone Member and Northampton Sand Formation are classified as a Secondary A Aquifer and the Rutland Formation as a Secondary B Aquifer.

10.4.43 The EA also indicate that Green Hill D is not located within a Groundwater Source Protection Zone (SPZ).

10.4.44 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill D.

10.4.45 A drainage ditch is present in the central area of Green Hill D.

**Mining**

10.4.46 There is no recorded, or evidence of mining within Green Hill D.

**Historical Summary**

10.4.47 Green Hill D has remained undeveloped through its history and comprises a series of agricultural fields.

**Green Hill E**

**Geology**

10.4.48 BGS data indicates Green Hill E to be underlain by superficial Diamicton of the Oadby Member across the northern and central areas. Pockets of Glacio-Fluvial (Sand and Gravel) are present in the south-west.

10.4.49 The bedrock is mapped as the Blisworth Limestone, Rutland Formation, Wellingborough Limestone Member, Stamford Member, Northampton Sand Formation and Whitby Mudstone.

10.4.50 Made Ground is anticipated in the developed area however, it is likely to be limited in thickness.

**Hydrogeology and Hydrology**

10.4.51 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer and the Glacio-fluvial Deposits as a Secondary A Aquifer.





- 10.4.52 Bedrock of the Stamford Member, Wellingborough Limestone Member and Northampton Sand Formation are classified as Secondary A Aquifers, the Rutland Formation as a Secondary B Aquifer, Blisworth Limestone Formation as a Principal Aquifer and Whitby Formation as Unproductive Strata.
- 10.4.53 The EA also indicate that Green Hill E is not located within a Groundwater Source Protection Zone (SPZ).
- 10.4.54 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill E.
- 10.4.55 Two streams are present in the west and along the eastern boundary of Green Hill E. Sywell Reservoir is present approximately 450 m west.

### **Mining**

- 10.4.56 There is no recorded coal or underground non-coal mining within Green Hill E.
- 10.4.57 Ward's Barn Sand Pit is mapped along the western boundary of Green Hill E. The entry is noted to be ceased.

### **Historical Summary**

- 10.4.58 The majority of Green Hill E has remained undeveloped and in agricultural use.
- 10.4.59 Agricultural barns/storage buildings are present in the central area from the earliest map edition dated 1884 until present.
- 10.4.60 Ward's Barn Sand Pit is present along the western boundary from 1901 until 1988.
- 10.4.61 A sewage works is mapped in the western area of Green Hill E adjacent to the on-site stream from 1927 until 1958 when the area is mapped as a works. By 1999 the works are no longer mapped, and the area is noted to comprise woodland from 2004 onwards.

### **Green Hill F**

#### **Geology**

- 10.4.62 BGS data indicates Green Hill F to be underlain by superficial Diamicton of the Oadby Member, Bozeat Till, Milton Sand and Alluvium.
- 10.4.63 The bedrock is mapped as the Blisworth Limestone, Blisworth Clay Formation, Rutland Formation, Wellingborough Limestone Member, Stamford Member, Northampton Sand Formation, Whitby Mudstone and Cornbrash Formation.
- 10.4.64 Made Ground is anticipated in the developed area however, it is likely to be limited in thickness.

#### **Hydrogeology and Hydrology**

- 10.4.65 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer and the Alluvium and Milton Sand as Secondary A Aquifers. The Bozeat Till is classified as Unproductive Strata.
- 10.4.66 Bedrock of the Stamford Member, Wellingborough Limestone Member and Northampton Sand Formation are classified as Secondary A Aquifers, the Rutland Formation and Cornbrash Formation as Secondary B Aquifers, Blisworth Limestone Formation as a Principal Aquifer and Whitby Formation and Blisworth Clay Formation as Unproductive Strata.
- 10.4.67 The EA also indicate that Green Hill F is not located within a Groundwater Source Protection Zone (SPZ).
- 10.4.68 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill F.
- 10.4.69 Two drainage ditches are present in the west and central area.



### **Mining**

- 10.4.70 There is no recorded coal or underground non-coal mining within Green Hill F.
- 10.4.71 From available online planning records, several historical planning applications for the extraction of sand and gravel were present within the northern area of Green Hill F, associated with the now exhausted Bozeat Quarry. For further information see Chapter 11.

### **Historical Summary**

- 10.4.72 The majority of Green Hill F has remained undeveloped and in agricultural use.
- 10.4.73 Three agricultural barns/storage buildings are present in the western area of Green Hill F from the earliest map edition dated 1884. The most northern barn is no longer visible in 2003 aerial Imagery and the central and southern buildings remain until present.

### **Green Hill G**

#### **Geology**

- 10.4.74 BGS data indicates Green Hill G to be underlain by superficial Diamicton of the Oadby Member (central and northern portions of Green Hill G). Superficial deposits are not mapped in the southern portion of Green Hill G.
- 10.4.75 The bedrock is mapped as the Cornbrash Formation- Limestone, the Kellaways Clay Member and Kellaways Sand Member.
- 10.4.76 Made Ground is not anticipated at Green Hill G. If Made Ground is encountered, it will be limited to current field boundary farm tracks of likely minimal thickness.

#### **Hydrogeology and Hydrology**

- 10.4.77 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer.
- 10.4.78 Bedrock of the Cornbrash Formation as Secondary B Aquifers and the Kellaways Clay Member and Kellaways Sand Member as Secondary A Aquifers.
- 10.4.79 The EA also indicate that Green Hill G is not located within a Groundwater Source Protection Zone (SPZ).
- 10.4.80 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill G.
- 10.4.81 Several drainage ditches located in the centre of Green Hill G draining into a singular tributary that flows offsite to the south to adjoin the River Great Ouse.

### **Mining**

- 10.4.82 No record, or evidence of mining is noted across Green Hill G

### **Historical Summary**

- 10.4.83 The majority of Green Hill G has remained undeveloped and in agricultural use.
- 10.4.84 A named farm, Tinick Farm is present in the centre of Green Hill G from the earliest map edition dated 1885 to 1981.

### **Green Hill BESS**

#### **Geology**

- 10.4.85 BGS data indicates Green Hill BESS is underlain by superficial Alluvium, Ecton Member and Glaciofluvial deposits.
- 10.4.86 The bedrock is mapped as the Whitby Mudstone Formation.



### **Hydrogeology and Hydrology**

- 10.4.87 The EA classify the superficial deposits as Secondary A Aquifers.
- 10.4.88 Bedrock of the Whitby Mudstone Formation is classified as Unproductive Strata.
- 10.4.89 The EA also indicate that Green Hill BESS is not located within a Groundwater Source Protection Zone (SPZ).
- 10.4.90 There are no licensed groundwater abstractions for potable water within 500 m of Green Hill BESS.
- 10.4.91 Several streams are present along north-western boundary with connect to Grendon Lakes to the north and Grendon Quarter Pond to the south. The River Nene is located approximately 620 m north.

### **Mining**

- 10.4.92 There are seven BGS Recorded Mineral Sites associated with Earls Barton Quarry (former sand and gravel) located within 300 m, to the north-east of the Land at Grendon Substation. One entry is indicated to be within Green Hill BESS, with aerial imagery showing it being worked until 2004. The wider off-site area associated with Earls Barton Quarry to the north-east of the site boundary has now been infilled and is listed as an EA Historical Landfill Area.

### **Historical Summary**

- 10.4.93 The Green Hill BESS has remained undeveloped and in agricultural use throughout its history. An electrical sub-station constructed in c.1970 is present within Green Hill BESS.

### **Cable Route Search Area**

#### **Geology**

- 10.4.94 Published BGS data indicates that the Cable Route Search Area is largely underlain by superficial deposits of the Oadby Member with Alluvium and River Terraced Deposits in the central area associated with the River Nene and discrete pockets of Glacio-Fluvial deposits.
- 10.4.95 The bedrock is mapped as the Blisworth Limestone, Rutland Formation, Wellingborough Limestone Member, Stamford Member, Northampton Sand Formation and Whitby Mudstone.

### **Hydrogeology and Hydrology**

- 10.4.96 The EA classify the superficial Oadby Member as a Secondary Undifferentiated Aquifer and the Alluvium, River Terrace and Glacio-fluvial Deposits as a Secondary A Aquifer.
- 10.4.97 Bedrock of the Stamford Member, Wellingborough Limestone Member and Northampton Sand Formation are classified as Secondary A Aquifers, the Rutland Formation as a Secondary B Aquifer, Blisworth Limestone Formation as a Principal Aquifer and Whitby Formation as Unproductive Strata.
- 10.4.98 The EA also indicate that the Cable Route Search Area is not located within a Groundwater Source Protection Zone (SPZ).
- 10.4.99 There are no licensed groundwater abstractions for potable water located within the Cable Route Search Area.
- 10.4.100 The most significant surface water feature is the River Nene in the central area with associated ponds and tributaries.



### **Mining**

- 10.4.101 There are a number of BGS recorded Mineral Sites adjacent to the Scheme and located within the Cable Route Search Area. Earls Barton Quarry in the central area adjacent to the River Nene is the only active entry.
- 10.4.102 Historical mineral extraction is noted throughout the Cable Route Search Area as discrete small-scale extraction and large-scale extraction adjacent to the River Nene.

### **Historical Summary**

- 10.4.103 Historical maps indicate that the majority of the Cable Route Search Area has remained in agricultural use with discrete areas of development.
- 10.4.104 Small scale mineral (clay, sand and gravel) extraction is noted in discrete locations throughout the Cable Route Search Area. Large scale mineral extraction (sand and gravel) is mapped in the central area of the Cable Route Search Area adjacent to the River Nene. For further details on mineral extraction, see Chapter 11 'Minerals'.

## **10.5 Assessment Methodology**

- 10.5.1 A risk assessment of the identified plausible contaminated linkages has been undertaken as part of the Preliminary Risk Assessments included in **Appendix 10**. The methodology utilised within this assessment is detailed as followed:
- review of the environmental setting of the Scheme, including the current use / status of the Sites, Cable Route Search Area and surrounding area, and review of the geology, hydrogeology and hydrology;
  - review of the historical activities of the Sites, Cable Route Search Area and surrounding area;
  - review of regulatory information relating to the Sites and Cable Route Search Area; and
  - review of the online planning records for the Site and Cable Route Search Area.
  - Consult and review information from the Local Authority / Petroleum Officer / EA in relation to Part 2A of the Environmental Protection Act 1990;
  - review online records of potential unexploded ordnance risks;
  - complete a reconnaissance by undertaking a visual inspection of readily accessible areas of the Site and Cable Route Search Area, to identify current conditions and highlight any potential risks;
  - review of readily available third-party reports relating to the Site, Cable Route Search Area or surrounding area;
  - develop an outline Conceptual Site Model, including site zoning, and undertake a Preliminary Risk Assessment with respect to potential contamination focussed on the proposed land use; and
  - provide commentary on potential land contamination and geotechnical constraints in the context of the Scheme.
- 10.5.2 The underlying principle is the evaluation of pollutant linkages via the Conceptual Site Model in order to assess whether the presence of a source of contamination could potentially lead to significant harm. A contaminant linkage consists of three elements:
- A “contaminant” is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters.
  - A “receptor” is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters. The



various types of receptors that are relevant under the Part 2A regime are explained in later sections.

- A “pathway” is a route by which a receptor is or might be affected by a contaminant.

10.5.3 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

## 10.6 Assessment Process

10.6.1 Following the Preliminary Risk Assessment, the sensitivity and magnitude of impact has been determined by considering the nature of the change, its severity, the duration of an effect, the likelihood of an effect occurring, and the relative extent of the effects of contamination to the receptor. Therefore, the risk assessment has been based on a qualitative assessment and professional judgement.

### Assessment of Sensitivity

10.6.2 The sensitivity is based on the relative importance of the receptor, as detailed in **Table 10.1**.

**Table 10.1: Sensitivity Criteria**

Sensitivity	Definition
High	Land to be used for human consumption (e.g. agricultural, allotments), highly sensitive ecosystems (e.g. SPA, SAC, SSSI, NNR) and the receptor being a public drinking water supply.
Medium	Parks and open spaces, regional or locally sensitive ecosystems and water bodies of medium quality.
Low	Commercial or industrial land uses, low to non-sensitive ecosystems (e.g. derelict land, Solar Farms), water bodies of low quality and not a public water supply.
Negligible	Land with no sensitive environmental receptors. Residual risk considered to be so minor that it would not be detectable. No appreciable change in environmental risk to environmental receptors.

### Assessment of Magnitude of Impact

10.6.3 The magnitude of impact on the receptor is detailed in **Table 10.2**.

**Table 10.2: Magnitude of Impact**

Magnitude	Definition
High	The proposal will cause the release of large areas of contamination which are significantly above guideline values, or release hazardous contamination for the operational timescale of the development. Remediation will be required.



Magnitude	Definition
Medium	The proposal will cause the release of large areas of contamination which are significantly above guideline values, or release hazardous contamination for the operational timescale of the development. Remediation will be required.
Low	The proposals will cause the release of contamination that are below the guideline values for short period of time. Remediation will be not required; however, mitigation measures may be used to reduce the potential impact.
Negligible	The proposal will cause the release of contaminants at very low concentrations. Remediation not required.
Neutral	No change from baseline conditions.

10.6.4 The key receptors have been identified as follows: construction workers, third parties during construction (adjacent site users and adjacent residents), future users of the Scheme including maintenance workers and public rights of way users (PRoW), controlled waters including on and off-site land drains, adjacent rivers and the underlying aquifers and the built environment (new buildings and infrastructure/utilities).

**Environmental Receptor (Construction Workers)**

10.6.5 Construction workers (groundworkers involved with the Scheme's installation and decommission) may be exposed to contamination through direct dermal contact, ingestion and inhalation during the construction and decommission phases. Limited potential sources of contamination have been identified within the PRAs. As such, groundworkers are classed as high sensitivity, however the magnitude of impact is considered negligible.

**Environmental Receptor (Future Scheme Users)**

10.6.6 Future Scheme users, including maintenance workers and PRoW users, may be exposed to contamination through direct dermal contact, ingestion and inhalation during the operational phase. Limited potential sources of contamination have been identified within the PRAs. As such, maintenance workers and PRoW users are classed as high sensitivity, however the magnitude of impact is considered negligible.

**Environmental Receptor (Adjacent Users and Adjacent Residents)**

10.6.7 Adjacent users may be exposed to contamination through direct dermal contact, ingestion and inhalation via windblow dust during all three stages of construction, operational and decommissioning phases. Limited potential sources of contamination have been identified within the PRAs. As such, adjacent users are classed as high sensitivity, however the magnitude of impact is considered negligible.

**Environmental Receptor (Controlled Waters)**

10.6.8 Groundwater could become contaminated via the mobilisation of existing contamination during construction and decommissioning phase, however, limited potential sources of contamination have been identified within the PRAs. Controlled waters could also become contaminated via potential spillages or leakages of temporary fuels and chemicals during construction, operational and decommissioning phases, with the leaching of chemical contaminants from faulty batteries, fires/ damage to the storage of batteries and associated subsequent fire ash deposition/ extinguishing



fire waters. As such, controlled waters are considered to be of moderate to high sensitivity (in the area of potable abstractions) and low to medium impact magnitude.

**Environmental Receptor (Future Users and Built Environment)**

10.6.9 There is a potential for hazardous ground gases to accumulate and migrate into buildings during the operational phase, with subsequent asphyxiation of future users, or the potential for explosion. Limited potential sources of ground gas have been identified and the potential for hazardous ground gases to accumulate in proposed solar farm infrastructure is considered very low. As such, future users are considered to be of high sensitivity, but the impact is considered to be negligible. The built environment is considered to be of moderate sensitivity and negligible impact.

**10.7 Significance**

10.7.1 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. The Significance matrix is set out in Table 10.3.

**Table 10.3: Impact Significance Matrix**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Moderate/Minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

10.7.2 Based on the above, the overall significance (using Table 10.3) for each receptor is as follows:

**Environmental Receptor (Construction Workers)**

- 10.7.3 Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres.
- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
  - During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

**Environmental Receptor (Future Scheme Users)**

- 10.7.4 Direct contact/ingestion and inhalation of dust, vapours, and asbestos fibres.
- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
  - During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

**Environmental Receptor (Adjacent Users and Adjacent Residents)**

- 10.7.5 Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres.
- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.



- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

**Environmental Receptor (Controlled Waters)**

10.7.6 Leaching of contamination into groundwater and vertical/lateral migration through permeable deposits below the site.

- During construction and decommissioning phase – Medium Sensitivity and Low Magnitude: Moderate/Minor significance.
- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

**Environmental Receptor (Future Users and Built Environment)**

10.7.7 Direct contact between and accumulation of gas into buildings, enclosed spaces and sub-floor voids.

- During construction and decommissioning phase – Medium Sensitivity and Negligible Magnitude: Minor significance.
- During operational phase – Medium Sensitivity and Negligible Magnitude: Minor significance.

10.7.8 Prior to mitigation, the potential impact for construction, operation and decommissioning are of a moderate to minor significance.

**10.8 Mitigation Measures**

10.8.1 A Construction Environmental Management Plan (CEMP) will be required for each phase through a requirement in the DCO which will be based on the Outline Construction Environmental Management Plan (OCEMP), this will describe the construction related mitigation measures outlined below. The plan will clearly set out best practice to ensure any environmental impacts during construction and in terms of land contamination are minimal. The OCEMP shall include the following:

- Limited potential sources of contamination have been identified across the Scheme. Site workers will be made aware of the possibility of encountering localised contamination through toolbox talks and good standards of personal hygiene, including welfare facilities on-site and the use of appropriate levels of personal protective equipment (PPE), will be enforced.
- Workers will adhere to health, safety and environmental precautions to reduce the potential for any accidents and incidents.
- A 'Discovery Strategy' protocol shall be included within the OCEMP and drawn upon to ensure that any contamination identified during construction is assessed by a specialist in land contamination. This will include but not be limited to stopping works in the area and ensuring the identified contamination does not pose a risk until an environmental specialist undertakes an assessment and a method is agreed to deal with the identified contamination. If required, the Local Planning Authority will be notified.
- Methods will be used to reduce the amount of dust, e.g. washing down of vehicle's wheels and dampening down materials.
- Any bulk fuels or chemical used on the construction site should be stored appropriately, within an impervious bund of 110% of the volume of the container to reduce the potential for any contamination source in the event of a container failure/ leak of battery fire and associate fire waters. Also, any spillages will be promptly addressed by appropriate measures, such as spill kits.





### 10.9 Cumulative and In-Combination effects

- 10.9.1 Cumulative Effects are reviewed within Chapter 23. Given modern methods of construction and the low sensitivity end use, there is not considered to be any cumulative effects to human health or controlled waters. Therefore, the risk of cumulative effects occurring is considered to be negligible.
- 10.9.2 There are no potential in-combination sources identified during the Preliminary Risk Assessment. Therefore, the risk of in-combination effects is considered to be negligible.

### 10.10 Conclusions Scoping

- 10.10.1 Limited potential sources of contamination have been identified from the Preliminary Risk Assessments for Green Hill A - G, Green Hill BESS and the Cable Route Search Area. No significant environmental effects are expected for ground conditions during construction, operation and decommissioning subject to the implementation of a detailed OCEMP.
- 10.10.2 It is considered that the OCEMP will be issued and implemented by the scheme's principal contractor and will provide mitigation against significant effects and associated receptors identified. As such, it is proposed that the development at Green Hill A - G, Green Hill BESS and the Cable Route Search Area be scoped out of the EIA.
- 10.10.3 Based on the available information to date, no significant sources of contamination have been identified and therefore no significant environmental effects have been identified associated with the Cable Route Search Area. Given the nature of the cable route comprising linear infrastructure the works involving the ground are temporary, with the land returned to former use following the cable being laid. As such, the receptors involved in this work are construction/groundworkers only, in which the risk would be managed via standard mitigation measures detailed within the OCEMP. It is proposed that the development of the Cable Route Search Area be scoped out of the EIA.

**Table 10.4: Conclusions on Scoping**

Likely Significant Effect	Receptors	Scoped In / Out	Mitigation
<b>Construction / Decommissioning Phase</b>			
Exposure to contamination through direct contact/ingestion and inhalation of dust, vapours and asbestos fibres.	Construction Workers, including groundworkers; Human Health - Adjacent Users and Adjacent Residents.	Out	Measures implemented by the scheme’s principal contractor, as will be set out in an OCEMP are considered to mitigate against significant effects.
Mobilisation of existing contamination via vertical/lateral migration through permeable deposits below the site.	Controlled Waters, including underlying groundwater.	Out	
Spillages or leakages of fuels and chemicals. Leaching of chemicals from faulty battery incidents (fire damage, ash deposition and extinguishing waters).	Controlled Waters, including underlying groundwater.	Out	



Likely Significant Effect	Receptors	Scoped In / Out	Mitigation
<b>Operational Phase</b>			
Exposure to contamination through direct contact/ingestion and inhalation of dust, vapours and asbestos fibres.	Human Health - Future Scheme Users, including maintenance workers and PRoW users;  Human Health - Adjacent Users and Adjacent Residents.	Out	Measures implemented by the scheme’s principal contractor as will be set out in an OCEMP are considered to mitigate against significant effects.
Spillages or leakages of fuels and chemicals. Leaching of chemicals from faulty battery incidents (fire damage, ash deposition and extinguishing waters) via vertical/lateral migration through permeable deposits below the site.	Controlled Waters, including underlying groundwater.	Out	
Hazardous ground gases to accumulate and migrate into buildings, enclosed spaces and sub-floor voids, with subsequent asphyxiation and/or the potential for explosion.	Human Health - Future users, including maintenance workers;  Built Environment, buildings on Site.	Out	

### 10.11 References

- Ref.1 Department for Levelling Up, Housing & Communities (2023). National Planning Policy Framework. <https://assets.publishing.service.gov.uk>
- Ref.2 GOV.UK (2019). Guidance: Land affected by contamination. Available at: <https://www.gov.uk/guidance/land-affected-by-contamination>



## 11 Minerals

### 11.1 Introduction

11.1.1 This chapter considers the likelihood of significant effects of the Scheme on identified mineral resources during its construction, operation and decommissioning phases. The assessment will describe and identify the potential level of effects arising because of the Scheme and consider any avoidance and mitigation measures necessary.

11.1.2 Minerals are important national resources, and adequate and steady supplies are vital for development and sustaining the economy and society. Minerals are a finite natural resource that can only be worked where they are found. A key aspect of sustainable development is the conservation and safeguarding of non-renewable resources for future generations. As such it is important that other development does not needlessly prevent the future extraction of mineral resources.

11.1.3 This Chapter is supported by the following figures

- 11.1.1 Mineral Resource Plans Green Hill A & A.2 Sheet 1 of 5
- 11.1.2 Mineral Resource Plans Green Hill B Sheet 2 of 5
- 11.1.3 Mineral Resource Plans Green Hill C, D & E Sheet 3 of 5
- 11.1.4 Mineral Resource Plans Green Hill F & BESS Sheet 4 of 5
- 11.1.5 Mineral Resource Plans Green Hill G Sheet 5 of 5

### 11.2 Legislation, Policy and Guidance

11.2.1 Legislation, policy and guidance specifically relevant to this topic area is outlined below.

#### Legislation

11.2.2 The Planning Act 2008 sets out the process for the consenting of NSIPs and the basis for the decision whether to grant development consent.

11.2.3 The EIA Regulations require consideration to be given to the use of natural resources, in particular land (including land take). In this case, the Scheme would occupy a large surface area and consideration needs to be given to the impact this may have on the existing geology and identified mineral resources.

#### Policy

11.2.4 National Policy Statement for Energy (EN-1) (designated January 2024) (Ref 1) sets out general principles and impacts to be taken into account for all types of energy NSIP development covered by the Energy National Policy Statements (NPS).

11.2.5 Paragraph 5.11.19 of EN-1 states 'Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place.'

11.2.6 Paragraph 5.11.28 states that 'Where a proposed development has an impact upon a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that appropriate mitigation measures have been put in place to safeguard mineral resources.'

11.2.7 National Policy Statement for Renewable Energy Infrastructure (EN-3) (designated January 2024) (Ref 2). There are no specific references to mineral safeguarding within EN-3 however it states in paragraph 2.1.4 'The policies set out in this NPS are additional to those on generic impacts set out in EN-1. Applicants should show how their application meets the requirements in EN-1 and this NPS'.

11.2.8 The National Planning Policy Framework (NPPF) 2023 (Ref 3) together with the accompanying Planning Practice Guidance (PPG) set out the Government's planning



policies for England for the particular purpose of making development plans and deciding applications under the Town and Country Planning Act 1990. Paragraphs 215 – 216 of the NPPF highlight the need to safeguard mineral resources.

11.2.9 National Planning Practice Guidance (PPG) Minerals (2014) (Ref 4) confirms that minerals 'make an essential contribution to the Country's prosperity and quality of life'

11.2.10 The Northamptonshire Minerals and Waste Local Plan (Adopted July 2017) (Ref 5) which sets out the key principles to guide the future winning and working of minerals in Northamptonshire up to 2031

11.2.11 The Milton Keynes Minerals Local Plan (Adopted July 2017) (Ref 6) which sets out the key principles to guide the future winning and working of minerals in Milton Keynes up to 2031

#### Guidance

11.2.12 The assessment process will take account of published good practice guides such as the Mineral Safeguarding in England Good Practice Advice British Geological Survey 2011.

11.2.13 The predicted significance of the effect is determined through a standard method of assessment based on professional judgement which considers both sensitivity and magnitude of change.

### 11.3 Baseline Conditions

#### Geological Context

11.3.1 The mineral interest is determined by the underlying geology. Within the Site and Cable Route Search Area the surface bedrock is a series of sedimentary beds dating from the Jurassic period. The oldest occurring bedrock is ironstone but this is overlain in places by outliers of younger sandstones, siltstones and limestones. The strata is generally progressively younger moving from west to east across the Scheme. The bedrock is overlain in places by quaternary superficial deposits of alluvium, clays, silts, sand and gravels principally of fluvial or glacial origin.

11.3.2 Some of the superficial deposits have been identified as being of mineral interest by the British Geological Survey and are 'safeguard mineral resources' in the Northamptonshire Minerals and Waste Local Plan and the Milton Keynes Minerals Local Plan. Historically, other mineral deposits have been exploited in the vicinity of the Scheme including ironstone (close to Green Hill A and B) and clay (close to Green Hill E).

#### Green Hill A & A.2

11.3.3 The majority of Green Hill A and A.2 are within a sand and gravel mineral safeguarding area shown in the Northamptonshire Minerals and Waste Local Plan (see **Figure 11.1.1**). The Cable Route Search Area connecting these sites to Green Hill C passes through a further sand and gravel mineral safeguarding area east of Walgrave. The Scheme therefore has the potential to sterilise an identified mineral deposit for the life of the Scheme.

#### Green Hill B

11.3.4 The Northamptonshire Minerals and Waste Local Plan shows sand and gravel mineral safeguarding areas to the north and west of Green Hill B and a further safeguarded area to the south (see **Figure 11.1.2**). Green Hill B encroaches into these safeguarded areas therefore has the potential to sterilise an identified mineral deposit for the life of the Scheme.

#### Green Hill C, D and E

11.3.5 None of these Sites are identified as lying within a Minerals Safeguarding Area or Minerals Consultation Area. The Cable Route Search Area connecting Sites Green Hill C and Green Hill D is also outside any Minerals Safeguarding Area or Minerals Consultation Area (see **Figure 11.1.3**).



- 11.3.6 The Cable Route Search Area from Green Hill E to Green Hill BESS (see **Figures 11.1.3** and **11.1.4**), crosses a sand and gravel mineral safeguarding area south of Earls Barton. These are fluvial sand and gravel deposits associated with the River Nene. These deposits are actively being worked and the Cable Route Search Area also passes through several mineral consultation zones, permitted quarries and associated processing areas. The Scheme therefore has the potential to affect future mineral supplies extraction within Northamptonshire and partially sterilise a permitted mineral deposit.

#### Green Hill BESS

- 11.3.7 The entire Green Hill BESS Site is within a sand and gravel Mineral Safeguarding Area shown in the Northamptonshire Minerals and Waste Local Plan (see **Figure 11.1.4**). These are fluvial sand and gravel deposits associated with the River Nene. The Scheme therefore has the potential to sterilise an identified mineral deposit for the life of the Scheme.

#### Green Hill F

- 11.3.8 The northern half of Green Hill F lies within a sand and gravel Mineral Safeguarding Area shown in the Northamptonshire Minerals and Waste Local Plan, this is the area around the now exhausted Bozeat Quarry (see **Figure 11.1.4**). To the north east of the worked area of Bozeat Quarry and north of Green Hill F is an allocation for future mineral extraction. The boundary of Green Hill F includes the Bozeat Quarry haul road linking the quarry site to the A509 and providing vehicular access to the allocated mineral deposit. Green Hill lies within the Minerals Consultation Area associated with Bozeat Quarry and allocated extension. The Cable Route Search Area connecting Green Hill F to Green Hill BESS passes through the sand and gravel mineral safeguarding area south of Green Hill BESS.

#### Green Hill G

- 11.3.9 The southern edge of Green Hill G lies within two mineral safeguarding areas shown in the Milton Keynes Minerals Local Plan: one for sand and gravel and the other for limestone (see **Figure 11.1.5**). The Scheme therefore has the potential to sterilise identified mineral deposits for the life of the Scheme.

#### Geological Context – Summary

- 11.3.10 The Scheme therefore has the potential to affect planned mineral extraction within North Northamptonshire, which is required to ensure an adequate supply of sand and gravel to supply the local market and without mitigation partially sterilise permitted mineral deposits. The Scheme will also sterilise some areas of safeguarded mineral deposits within West and North Northamptonshire and Milton Keynes on a temporary period for the life of the Scheme.

## **11.4 Assessment Methodology**

### Potential and Likely Significant Environmental Effects

- 11.4.1 Any built development has the potential to sterilise underlying mineral deposits by effectively preventing access for future exploitation. Non-mineral development occurring within areas with the benefit of planning permission for mineral extraction or allocated for future mineral extraction has the potential to interrupt the supply of minerals.

- 11.4.2 There are permitted or proposed mineral extraction sites adjacent to the Sites, and the Cable Route Search Area south of the Earls Barton crosses permitted mineral workings. There is a proposed mineral extraction site in close proximity of Green Hill F. In the case of Green Hill A, A.2, B, F and G and the Cable Route Search Area connecting Sites A, A.2, E and F, the Mineral Planning Authorities have identified mineral resources that require safeguarding. Thus, there are considered to be potential conflicts with the mineral safeguarding policies which require consideration and mitigation. In the long term, due



to the temporary nature of the Scheme and with adequate mitigation measures in place including refining the Cable Corridor, any minerals that are beneath the Site and Cable Route Search Area will not be permanently sterilised and would be available to exploit if required at a future date.

- 11.4.3 The assessment of impact will identify how the Scheme is predicted to affect identified mineral resources and the significance of those effects. The assessment process will take account of published good practice.
- 11.4.4 The predicted significance of the effect is determined through a standard method of assessment based on professional judgement which considers both sensitivity and magnitude of change as detailed in **Table 11.1** below.
- 11.4.5 The mineral resources to be assessed are identified by the British Geological Survey (BGS) in their Mineral Resource Reports and through allocations, minerals safeguarding areas and mineral consultation areas contained in the Northamptonshire Minerals and Waste Local Plan and the Milton Keynes Minerals Local Plan. Assessment of the impacts of the Scheme on the mineral interests will consider a number of parameters including extent, magnitude, duration and reversibility of the Scheme as well as the extent, likely quality and situation of the mineral reserve. The significance of the impacts on identified mineral resources will be assessed having regard to national and local planning policy.
- 11.4.6 The impact of the Scheme will be considered as a whole, there being no distinction in terms of impact on mineral resources between construction, operation and decommissioning phases on the basis that as soon as construction commences the impact on mineral resources effectively occurs and remains until such time as the Scheme is fully decommissioned.
- 11.4.7 For the purposes of assessment, the impact on mineral resources will include the full extent of the area occupied by the Scheme, this includes the Sites Green Hill A-G and BESS and the Cable Route Search Area, together with margin extending 250m from the boundary. The assessment will consider the impact of the Cable Route Search Area although as the Cable Corridor is refined the area of the assessment can be reduced accordingly. Incompatible development close to Mineral Safeguarding Areas and existing/allocated mineral workings may lead to sterilisation of part of the resource. BGS good practice advice suggests that it may therefore often be appropriate to extend beyond the resource boundary to take account of such risks. Although the solar arrays are not considered to be particularly sensitive developments, adopting a 250m margin would ensure that all potential impacts on mineral resources including existing mineral extraction sites are identified.
- 11.4.8 The significance of the impact for mineral resources can be ranked using professional judgement in terms of the national and local policy objectives. A high sensitivity receptor is an existing quarry or site specific allocation for future mineral working: this is because these sites have already been through a selection process and either are, or will be, contributing to sustaining the economy and society. A high sensitivity site would also include safeguarded nationally scarce mineral resources or mineral resources of exceptional quality. A medium sensitivity receptor is an identified local or widespread mineral resource which is protected so other development does not needlessly prevent the future extraction of mineral resources to ensure non-renewable resources are conserved and safeguarded for future generations. A low sensitivity site does not contain any known mineral resources of economic interest. **Table 11.1** ranks the significance of the effect considering the status of the receptor.

**Table 11.1: Criteria for Assessing Sensitivity of Receptors**

Sensitivity	Definition
High	Allocated or existing mineral working
Medium	Safeguarded local or widespread mineral resource



Sensitivity	Definition
Low	No identified mineral resource
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions

11.4.9 In terms of the magnitude of impacts for mineral resources, this can be ranked from a major impact (which prevents the future exploitation of a known mineral resource) through to a neutral impact (where there is no change from baseline conditions). This can either be through direct destruction of the resource through ground disturbance, or effectively physical prevention of access to a mineral resource by way of surface development. A moderate impact development for a mineral resource would add further significant constraints for future exploitation. This could either be in the form of introducing sensitive land uses adjacent to the mineral resource, or by bisecting the resource with, for example, a roadway, cable or pipeline. These are constraints to future mineral working which are likely to inhibit the full exploitation of the resource. A minor development either does not inhibit future exploitation of the mineral resource or includes mitigation to ensure the mineral resource is not sterilised, for example, by winning and working the mineral reserve prior to the development taking place. **Table 11.2** ranks the magnitude of the impact.

**Table 11.2: Criteria for Assessing Magnitude of Impacts (positive or negative)**

Sensitivity	Definition
Very High	The total loss or major change/substantial alteration to key elements/features of the baseline (pre-development) conditions, such that the post-development character/composition/attributes will be fundamentally changed, such as the permanent sterilisation of identified mineral resource.
High	Loss or alteration to one or more key elements/features of the baseline conditions, such that post-development character/composition/attributes of the baseline will be materially changed such as permanent constraint to future exploitation of identified mineral resource.
Medium	A minor shift away from baseline conditions. A change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation such as a temporary constraint to future exploitation of identified mineral resource
Low	Very little change from baseline conditions. The change will be barely distinguishable and approximating to a non-change situation.
Negligible	No change from baseline conditions.

11.4.10 Taking account of the nature of the mineral resource affected and the nature of the development proposed, **Table 11.3** shows how the significance of the impact of the Scheme would be assessed. Those impacts being considered moderate and above being considered significant in the context of the assessment.



**Table 11.3: Degree of Significance**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Moderate/Minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

### 11.5 Cumulative and In-Combination effects

11.5.1 The cumulative and in-combination impacts arising from the Scheme will be assessed in combination with other relevant development, including other solar related development. The list of cumulative developments to be considered will be compiled in consultation with stakeholders. Any in-combination impacts identified will be considered within the Minerals Chapter 11 of the ES and cumulative effects will be considered in the Cumulative Effects Chapter 23 of the ES.

### 11.6 Conclusions on Scoping

11.6.1 The protection of mineral resources is of national significance. The Scheme will affect areas of safeguarded mineral resource and has the potential to affect allocated and/or permitted mineral workings. The proposed scope of the Minerals Assessment to be included within the ES is outlined in **Table 11.4** below. The scope of the assessment will include the entire Cable Route Search Area although, as this is refined into the Cable Corridor, the area of the Minerals Assessment can be reduced to reflect this.

**Table 11.4: Proposed EIA Scope**

Receptor	Likely Significant Effects	Stage	Scoped In/Out
Safeguarded mineral resource	Potential sterilisation of mineral resource for the life of the Scheme. Additional constraints to future mineral exploitation for the life of the Scheme	Construction Operation Decommissioning	Scoped In
Sites with planning permission or allocated in development plan	Disruption to local mineral supply. Potential sterilisation of mineral resources.	Construction Operation Decommissioning	Scoped In





## 11.7 References

- Ref.1 National Policy Statement for Energy (EN-1) (2024). Available at <https://assets.publishing.service.gov.uk>
- Ref.2 National Policy Statement for Renewable Energy Infrastructure (EN-3) Nov 2023 (2024). Available at <https://assets.publishing.service.gov.uk/>
- Ref.3 The National Planning Policy Framework (NPPF) 2023. Available at <https://assets.publishing.service.gov.uk/>
- Ref.4 National Planning Practice Guidance (PPG) Minerals (2014) <https://www.gov.uk/guidance/minerals>
- Ref.5 Northamptonshire Minerals and Waste Local Plan (Adopted July 2017). Available at <https://www.northnorthants.gov.uk/minerals-and-waste-planning-policy/adopted-minerals-and-waste-local-plan>
- Ref.6 Milton Keynes Minerals Local Plan (Adopted July 2017). Available at <https://www.milton-keynes.gov.uk>



## 12 Cultural Heritage

### 12.1 Introduction

12.1.1 This Cultural Heritage scoping chapter sets out the proposed approach to the assessment of likely significant effects on the historic environment (comprising built heritage and archaeological remains) during construction, operation and decommissioning of the Scheme, how these will be identified and assessed, and how suitable mitigation strategies will be put forward, within a Cultural Heritage Chapter of the Environmental Statement (ES).

12.1.2 A description of the Scheme can be found in Chapter 3 and Chapter 4 of this Scoping Report.

12.1.3 This Chapter is supported by the following figures:

- Figure12.1\_DesignatedHeritageAssets
- Figure12.1.1\_DesignatedHeritageAssets\_GreenHill\_A and A.2
- Figure12.1.2\_DesignatedHeritageAssets\_GreenHill\_B
- Figure12.1.3\_DesignatedHeritageAssets\_GreenHill\_CDE
- Figure12.1.4\_DesignatedHeritageAssets\_GreenHill\_FBESS
- Figure12.1.5\_DesignatedHeritageAssets\_GreenHill\_G
- Figure12.2\_NonDesignatedHeritageAssets
- Figure12.2.1\_NonDesignatedHeritageAssets\_GreenHill\_A and A.2
- Figure12.2.2\_NonDesignatedHeritageAssets\_GreenHill\_B
- Figure12.2.3\_NonDesignatedHeritageAssets\_GreenHill\_CDE
- Figure12.2.4\_NonDesignatedHeritageAssets\_GreenHill\_FBESS
- Figure12.2.5\_NonDesignatedHeritageAssets\_GreenHill\_G

### 12.2 Legislation, Policy and Guidance

12.2.1 The following legislative provisions, policy and guidance, as well as the EIA Regulations, provide the context for the cultural heritage assessment to be undertaken in the EIA:

- Ancient Monuments and Archaeological Areas Act (AMAAA) 1979
- Planning (Listed Buildings and Conservation Areas) Act 1990
- NPS EN-1 Overarching National Policy Statement for Energy inc. Section 5.9, Designated January 2024
- NPS EN-3 Renewable Energy Infrastructure. Section 2.10 (Designated January 2024)
- National Planning Policy Framework (NPPF), revised December 2023
- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
- North Northamptonshire Joint Core Strategy (adopted July 2016)
- West Northamptonshire Joint Core Strategy (adopted December 2014)
- Planning Practice Guidance, Section 16: Conserving and enhancing the historic environment (December 2023)
- The Hedgerows Regulations 1997
- Conservation Principles, Policies and Guidance (English Heritage 2008)



- Historic Environment Good Practice Advice in Planning 2: Managing Significance in Decision Taking in the Historic Environment (Historic England 2015)
- Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision Taking in the Historic Environment, Historic England (2015)
- Statements of Heritage Significance. Analysing Significance in Heritage Assets, Historic England (2019)
- Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Historic Environment Desk-based Assessment (2020)

## 12.3 Baseline Conditions

### Study Area

- 12.3.1 Records of all designated heritage assets and Conservation Areas within the Scheme and 2km from its boundary will be collated to inform an assessment of the potential indirect (setting) impacts of the Scheme upon these. Designated heritage assets beyond the 2km Study Area may also be assessed if identified as being potentially affected by the Scheme by relevant consultees, and the EIA technical team. It is considered that this Study Area is appropriate as it is considered unlikely that there would be significant effects upon settings at distance of greater than 2km, but nevertheless there is flexibility to extend the Study Area to include specific receptors if this is considered to be appropriate for the Scheme.
- 12.3.2 Records of non-designated heritage assets, archaeological finds and previous archaeological investigations will be collated for within the Scheme and 1km from its boundary, allowing the archaeological potential of the Scheme to be assessed in its wider context together with potential (direct) impacts on any archaeological remains or heritage assets. The Study Area is considered to be appropriate as it is a standard sized Study Area for assessments of this type in rural areas of England and aligns with professional practice.
- 12.3.3 At this stage, the exact route of the Cable Corridor is yet to be determined but it will be routed within the Cable Route Search Area (refer to **Figures 3.2.1 to 3.2.3**). The Cable Route Search Area will be refined during the design process which will be presented in the PEIR and refined further for the ES as the Cable Corridor. It is anticipated that localised impact will occur during the construction phase. A 250m Study Area from the Cable Corridor is considered appropriate to assess any impacts to heritage assets (including designated and non-designated assets). Any impacts to built heritage are expected to be minimal and temporary in nature, and the proposed Study Area is considered sufficient to identify and characterise any potential archaeological remains. Assessments undertaken as part of the EIA will be used to inform the final design to minimise any potential impacts and allow for micrositing of the cables.

### Summary of Designated Heritage Assets

- 12.3.4 The following sets out the cultural heritage baseline for the Sites; as the Cable Route Search Area lies within the areas described for each Site, as shown in **Figures 12.1-12.2**, it is not described separately.

#### **Green Hill A and A.2**

- 12.3.5 There are no designated heritage assets within Green Hill A and A.2.
- 12.3.6 Within the 2km Study Area surrounding Green Hill A there are 41 designated heritage assets, comprising three Scheduled Monuments, two Grade I Listed Buildings and 36 Grade II Listed Buildings. There are no Registered Parks and Gardens, Registered Battlefields, World Heritage Sites or Conservation Areas within the 2km Study Area. The



locations of all designated heritage assets within 2km of the Green Hill A and A.2 area of the Scheme are illustrated on **Figures 12.1 and 12.1.1**.

### **Green Hill B**

12.3.7 There are no designated heritage assets within Green Hill B.

12.3.8 Within the 2km Study Area of Green Hill B there are 55 designated heritage assets, comprising two Grade I Listed Buildings, 53 Grade II Listed Buildings, and one Conservation Area (Mouton). There are no Scheduled Monuments, Registered Parks and Gardens, Registered Battlefields or Conservation Areas within the 2km Study Area. The locations of all designated heritage assets within 2km of the Green Hill B area of the Scheme are illustrated on **Figures 12.1 and 12.1.2**.

### **Green Hill C, D and E**

12.3.9 There are no designated heritage assets within Green Hill C, D and E.

12.3.10 Within the combined 2km Study Area of Green Hill C, D and E there are 116 designated heritage assets, comprising two Scheduled Monuments, one Grade I Listed Building, 10 Grade II\* Listed Buildings, 98 Grade II Listed Buildings, and five Conservation Areas (Ecton, Hardwick, Earls Barton, Mears Ashby and Sywell). There are no Registered Parks and Gardens, Registered Battlefields or World Heritage Sites within the 2km Study Area. The locations of all designated heritage assets within 2km of the Green Hill C, D and E areas of the Scheme are illustrated on **Figures 12.1 and 12.1.3**.

### **Green Hill F**

12.3.11 There are no designated heritage assets within Green Hill F.

12.3.12 Within the 2km Study Area of Green Hill F there are 107 designated heritage assets, comprising three Scheduled Monuments, four Grade I Listed Buildings, five Grade II\* Listed Buildings, 91 Grade II Listed Buildings, one Grade I Registered Park and Garden (Castle Ashby) and three Conservation Areas (Easton Maudit, Castle Ashby and Grendon). There are no, Registered Battlefields within the 2km Study Area. The locations of all designated heritage assets within 2km of the Green Hill F area of the Scheme are illustrated on **Figures 12.1 and 12.1.4**.

### **Green Hill BESS**

12.3.13 There are no designated heritage assets within Green Hill BESS.

12.3.14 Within the 2km Study Area surrounding Green Hill BESS there are 81 designated heritage assets, comprising three Scheduled Monuments, three Grade I Listed Buildings, four Grade II\* Listed Buildings, 69 Grade II Listed Buildings, one Grade I Registered Park and Garden (Castle Ashby) and two Conservation Areas (Grendon and Castle Ashby). There are no, Registered Battlefields, or Protected Wreck Sites within the 2km Study Area. The locations of all designated heritage assets within 2km of Green Hill BESS are illustrated on **Figures 12.1 and 12.1.4**.

### **Green Hill G**

12.3.15 There are no designated heritage assets within Green Hill G.

12.3.16 Within the 2km Study Area of Green Hill G there are 35 designated heritage assets, comprising seven Scheduled Monuments, one Grade I Listed Building, 26 Grade II Listed Buildings, and one Conservation Area (Lavendon). There are no Registered Parks and Gardens or Registered Battlefields or Protected Wreck Sites within the 2km Study Area, but within a wider 5km Study Area there is one Grade I Registered Park and Garden (Castle Ashby). The locations of all designated heritage assets within 2km of Green Hill G are illustrated on **Figures 12.1 and 12.1.5**.



### Summary of Non-Designated Heritage Assets

#### **Green Hill A and A.2**

- 12.3.17 There are eleven HER entries within, or partially within Green Hill A and A.2. In Green Hill A these include cropmarks of possible prehistoric enclosures and ditches, and findspots of Roman objects discovered by metal detectorists, suggesting possible Romano-British settlement activity. The Northampton the Kettering toll road (now the A43) runs to the east of Green Hill A.2; the HER Polygon associated with the road is recorded as extending into the Study Area.
- 12.3.18 Within the 1km Study Area for Green Hill A there are 120 'monument' records held on the Northamptonshire HER. These include archaeological findspots, earthworks, features identified from air photographs as cropmarks or soilmarks, features identified from documentary evidence such as historic mapping, and extant elements of the built environment including Listed Buildings and non-designated buildings. They also include HER 'monument' records relating to activity dating from the prehistoric, Iron Age/Romano-British, medieval, post-medieval and modern periods. The locations of all HER 'monument' records within 1km of Green Hill A and A.2 Area of the Scheme are illustrated on **Figures 12.2 and 12.2.1**.

#### **Green Hill B**

- 12.3.19 There are four HER entries which partially extend into Green Hill B. These include cropmarks of ridge and furrow earthworks and possible medieval/post-medieval headlands, cropmarks of undated enclosures, and an extensive area of rectilinear enclosures identified by geophysical survey and confirmed by excavation, which recovered Roman pottery and a possible Bronze Age boundary ditch. It should be noted that all four of these HER polygons are almost wholly outside of Green Hill B, and it is possible that the features that they relate to do not extend into the scheme boundary.
- 12.3.20 Within the 1km Study Area for Green Hill B there are 126 'monument' records held on the Northamptonshire HER. These include archaeological findspots, earthworks, features identified from air photographs as cropmarks or soilmarks, features identified from documentary evidence such as historic mapping, evidence from previous archaeological excavations, and extant elements of the built environment including Listed Buildings and non-designated buildings. They include HER 'monument' records relating to activity dating from the prehistoric, Iron Age/Romano-British, medieval, post-medieval and modern periods. The locations of all HER 'monument' records within 1km of Green Hill B are illustrated on **Figure 12.2 and 12.2.2**.

#### **Green Hill C, D and E**

- 12.3.21 There are five HER 'monument' records within, or partially within, Green Hill C. These include two areas of Late Iron Age settlement evidence identified as cropmarks and confirmed by excavation, two worked flint and Romano-British pottery scatters indicative of prehistoric and Romano-British activity, and part of the former Sywell Airfield.
- 12.3.22 There is a single HER 'monument' record within Green Hill D, relating to possible medieval or post-medieval water management, comprising a possible pond identified as a cropmark/soilmark.
- 12.3.23 Within Green Hill E there are 105 HER 'monument' records, mostly relating to extensive cropmarks/soilmarks of enclosures, trackways, ditches, and pits of likely prehistoric and/or Romano-British date. The on-site HER 'monuments' also include possible Bronze Age round barrows, the site of a windmill, the site of a World War II searchlight battery and findspots of prehistoric worked flint, Romano-British pottery and slag, the latter indicating possible metalworking activity.
- 12.3.24 Within the 1km Study Area for Green Hill C, D and E there are 536 'monument' records held on the Northamptonshire HER. These include archaeological findspots, earthworks, features identified from air photographs as cropmarks or soilmarks, features identified



from documentary evidence such as historic mapping, evidence from previous archaeological excavations, and extant elements of the built environment including Listed Buildings and non-designated buildings. They include HER 'monument' records relating to activity dating from the prehistoric, Iron Age/Romano-British, medieval, post-medieval and modern periods. The locations of all HER 'monument' records within 1km of Green Hill C, D and E are illustrated on **Figures 12.2 and 12.2.3**.

### **Green Hill F**

- 12.3.25 There are 49 HER 'monument' records within Green Hill F, mostly relating to extensive cropmarks/soilmarks of enclosures, trackways, ditches, and pits of an unknown or prehistoric and/or Romano-British date. Several on-site 'monument' records relate to possible Iron Age ironstone working, and the sites of two partially excavated Roman stone-built buildings, possibly villas or other high-status sites are located within the Green Hill F area. Later evidence includes medieval/post-medieval ridge and furrow earthworks, the site of a 19th century brickworks, and the sites of numerous World War II military ordnance dumps.
- 12.3.26 Within the 1km Study Area for Green Hill F Area there are 448 'monument' records held on the Northamptonshire HER. These include archaeological findspots, earthworks, features identified from air photographs as cropmarks or soilmarks, features identified from documentary evidence such as historic mapping, evidence from previous archaeological excavations, and extant elements of the built environment including Listed Buildings and non-designated buildings. They include HER 'monument' records relating to activity dating from the prehistoric, Iron Age/Romano-British, medieval, post-medieval and modern periods. The locations of all HER 'monument' records within 1km of Green Hill F are illustrated on **Figures 12.2 and 12.2.4**.

### **Green Hill G**

- 12.3.27 There are 25 'monument' records held on the Milton Keynes HER within Green Hill G, in addition to one 'monument' record that is held on both the Northamptonshire and Bedford Borough HERs but is not recorded on the Milton Keynes HER. The 'monuments' within Green Hill G include cropmarks of a Roman road; numerous Iron Age and/ or Romano-British settlement enclosures; several undated enclosures; and medieval and post-medieval field boundaries, furlongs and ridge and furrow. In addition, there are findspots of Romano-British pottery; slag of possible Iron Age or Medieval date indicating the likely location of a bloomery; the location of two post-medieval buildings identified from historic maps, and the site of a USAAF World War II bombing practice range identified from air photos taken in 1944 which depict bomb craters, two Nissen-type huts, a probable range observation building and a concrete range directing arrow, none of which were visible on photographs taken in 1949.
- 12.3.28 Within the 1km Study Area for Green Hill G there are 167 'monument' records held on the Milton Keynes HER, 48 'monument' records held on the Northamptonshire HER (six of which are duplicated on one or both of the other HERs with coverage within the search area) and 12 'monument' records held on the Bedford Borough HER, one of which is a duplicate of a Northamptonshire HER entry. Many of these 'monument' records derive from air photo analysis undertaken as part of the Bedford Borough National Mapping Programme for which there are 30 entries recorded within the 1km search area, all of which are also included in one or more of the HERs. In addition, Historic England's NRHE has 59 'monument' records within the 1km search area, all but three of which are also included on one or more of the HERs. In total, there are 224 individual 'monument' records within the 1km search area spread across the various archaeological databases. The 'monument' records include archaeological findspots, earthworks, features identified from air photographs as cropmarks or soilmarks, features identified from documentary evidence such as historic mapping, evidence from previous archaeological excavations, and extant elements of the built environment including Listed Buildings and non-designated buildings. The locations of all HER 'monument' records within 1km of Green Hill F are illustrated on **Figures 12.2 and 12.2.5**.



### **Green Hill BESS site**

- 12.3.29 Within Green Hill BESS there are ten HER 'monument' records, including five heritage assets that were recorded prior to gravel extraction in 2004-5, an area of levelled ridge and furrow earthworks, a possible enclosure identified from a cropmark/soilmark, part of what is thought to be the site of the Deserted Medieval Village of Cotton, and the site of a World War II searchlight battery.
- 12.3.30 Within the 1km Study Area for Green Hill BESS there are 252 'monument' records held on the Northamptonshire HER. These include archaeological findspots, earthworks, features identified from air photographs as cropmarks or soilmarks, features identified from documentary evidence such as historic mapping, evidence from previous archaeological excavations, and extant elements of the built environment including Listed Buildings and non-designated buildings. They include HER 'monument' records relating to activity dating from the prehistoric, Iron Age/Romano-British, medieval, post-medieval and modern periods. The locations of all HER 'monument' records within 1km of Green Hill BESS are illustrated on **Figures 12.2 and 12.2.4**.

### **Information Sources**

- 12.3.31 In line with the guidelines laid down by ClfA (2020) and Local Planning Authorities, sources of information that will be consulted to inform the Cultural Heritage chapter of the ES include:
- **Northamptonshire Historic Environment Record (HER)**
    - All records relating to non-designated heritage assets, other archaeological records and previous archaeological investigations within 1km of the boundary of the Scheme
  - **Bedford Borough Historic Environment Record (BBHER)**
    - All records relating to non-designated heritage assets, other archaeological records and previous archaeological investigations within 1km of the boundary of the Scheme
  - **Milton Keynes Historic Environment Record (MKHER)**
    - All records relating to non-designated heritage assets, other archaeological records and previous archaeological investigations within 1km of the boundary of the Scheme
  - **National Record of the Historic Environment (NRHE)**
    - All records relating to heritage assets, other archaeological records and previous archaeological investigations within 1km of the boundary of the Scheme
  - **National Heritage List for England (NHLE)**
    - All records relating to designated heritage assets within 2km of the Scheme
  - **Portable Antiquities Scheme (PAS)**
    - All records relating to reported archaeological finds found within 1km of the Scheme
  - **Historical Cartographic Sources**
    - Relevant and accessible historical maps and plans of the area within the Scheme
  - **National Mapping Programme (NMP)**
    - Aerial photograph interpretation and investigation undertaken by English Heritage (now Historic England)



- **LIDAR Data**
  - LIDAR data produced by the Environment Agency and published on the DEFRA Data Service Platform (DEFRA 2023) will be consulted in order to identify any previously unrecorded earthwork features within the Scheme.
- **Archaeological field evaluation**
  - Geophysical survey will be undertaken within all areas of the scheme boundary that are suitable for survey (for example, excluding roads and areas of woodland) and where land access can be obtained.
  - Trial trenching will be undertaken as appropriate to test the results of the geophysical survey following consultation with the Local Authority's Planning Archaeologist.
- **Site Visit**
  - Site visits will be undertaken, to provide an assessment of the character of land within the Scheme and appraise any potential impacts to heritage assets from the Scheme, either directly or indirectly (i.e. to elements of their setting that contribute to their significance).

## 12.4 Potential Effects

### Overview

- 12.4.1 There are numerous non-designated archaeological features recorded within Green Hill A to G, Green Hill BESS and the Cable Route Search Area and it is likely that previously unrecorded archaeological remains could survive within the Scheme, on which there could be potential for effects.
- 12.4.2 The Scheme also has potential to have indirect (setting) effects on heritage assets within the surrounding area.
- 12.4.3 In summary, potential impacts could include;
- Partial or total removal of non-designated heritage assets within the scheme boundary;
  - Partial or total removal of unrecorded archaeological remains within the scheme boundary;
  - Effects upon the significance of heritage assets due to changes to their setting beyond the scheme boundary.

### Construction Phase

- 12.4.4 There may be potential for construction groundworks within the Sites and Cable Route Search Area to directly affect previously unrecorded archaeological remains within the boundary of the Scheme, that could be identified through the production of the forthcoming archaeological Desk-Based Assessment (DBA), which will be informed by the information sources listed in Section 12.3.31 and will be undertaken to inform the Cultural Heritage Chapter of the ES.
- 12.4.5 There may be potential for the Scheme to indirectly affect heritage assets beyond the boundary of the Scheme during the Construction Phase (i.e. elements of their setting that contribute to their significance), but any such effects relating to the Construction Phase would be reversible following decommissioning of the Scheme. Any impacts to setting caused by the installation of the underground cables within the Cable Corridor would be temporary.
- 12.4.6 There may be the potential for in-combination effects during the construction phase as a result of the mitigation required to reduce other potential impacts caused by the





Scheme on other environmental factors (i.e. landscape, ecology, noise etc), and changes to land use / management (for example changes to land drainage.

**Operational Phase**

12.4.7 Once the Scheme is operational, no further adverse effects on buried archaeological remains are anticipated.

12.4.8 There may be potential for the Scheme to have effects upon the settings of heritage assets within the surrounding area during its operation.

**Decommissioning Phase**

12.4.9 Any potential for impacts to heritage assets as a result of the decommissioning phase will be considered as part of the Environmental Impact Assessment.

**12.5 Methodology for the Environmental Statement**

**Consultation**

12.5.1 Consultation will be undertaken with the Local Authority’s Planning Archaeologist(s), Historic England, relevant Conservation Officers and any other relevant stakeholders on the scope of the assessment.

**Assessment Methodology**

12.5.2 The Cultural Heritage Chapter of the ES will be informed by the results of an archaeological DBA and Heritage Statement, which will be supported by information sources as detailed in Section 12.3.31.

**Environmental Statement Methodology**

12.5.3 The ES chapter will present a consideration of designated and non-designated heritage assets within the Scheme and the Study Area in its vicinity, an assessment of their significance and the potential direct (physical) and indirect (setting) effects that the Scheme could have on these. It will then provide proposals for mitigating any impacts through archaeological recording or through design-based mitigation.

**Significance Criteria**

12.5.4 NPS (EN-1) and the NPPF refer to the consideration of the 'significance' of heritage assets. However, in the context of an EIA, the term 'significance' is used to denote the magnitude of likely environmental effects.

12.5.5 Significance as defined in the NPS (EN-1) and the NPPF, lies in the value of a heritage asset to this and future generations because of its heritage interest, which may be archaeological, architectural, artistic or historic.

12.5.6 It is recognised that not all parts of a heritage asset will necessarily be of equal significance. In some cases, certain elements could accommodate change without affecting the significance of the asset. Change is only considered harmful if it erodes an asset’s significance. Understanding the significance of any heritage assets affected and any contribution made by their setting (paragraph 200, NPPF December 2023) is therefore fundamental to understanding the scope for and acceptability of change.

12.5.7 The criteria to establish the sensitivity of assets is provided in Table 12.1 below.

**Table 12.1: Sensitivity of Heritage Assets**

Heritage Sensitivity	Description
High (e.g. International / National)	<ul style="list-style-type: none"> <li>• World Heritage Sites</li> <li>• Buildings or structures of recognised international importance</li> </ul>



Heritage Sensitivity	Description
	<ul style="list-style-type: none"> <li>Scheduled Monuments</li> <li>Grade I and II* Listed Buildings</li> <li>Grade I and II* Registered Historic Parks and Gardens</li> <li>Non-designated assets of equivalent heritage significance which are potentially nationally important.</li> </ul>
Medium (e.g. Regional / County)	<ul style="list-style-type: none"> <li>Grade II Listed Buildings</li> <li>Grade II Registered Historic Parks and Gardens</li> <li>Conservation Areas</li> <li>Regionally important archaeologically features and areas (as defined in the HER)</li> </ul>
Low (e.g. Local)	<ul style="list-style-type: none"> <li>Locally Listed Buildings</li> <li>Non-designated archaeological sites of local value, and/or potential to contribute to local research objectives</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Heritage assets with very little or no surviving research value</li> <li>Assets compromised by poor preservation and/or poor contextual association, or very common archaeological features/buildings of little or no value at local or other scale</li> </ul>

**Assessment of Effects**

12.5.8 The consideration and forecasting of likely significant effects is based upon an assessment of data relating to designated and non-designated heritage assets, undertaken by professionals with extensive experience in the identification, assessment and mitigation of development-related effects on the historic environment.

12.5.9 The significance of the effect (Section 2; Table 2.3) is dependent on:

- The sensitivity of the heritage asset or its setting (Table 12.1 above); and
- The magnitude of the effect (Table 12.2 below).

12.5.10 The magnitude of effect will be determined as the predicted change to the existing baseline conditions during and following the construction of the Scheme. The effect can either be adverse or beneficial, direct or indirect, and the criteria for assessing the magnitude of the impact is set out in Table 12.2 below.

**Table 12.2: Magnitude of Effects**

Magnitude of Effect	Environmental Impact
High	<ul style="list-style-type: none"> <li>Change such that the significance of the asset is totally altered or destroyed. Comprehensive change to setting affecting significance, resulting in a serious loss in our</li> </ul>



Magnitude of Effect	Environmental Impact
	<p>ability to understand and appreciate the asset.</p> <ul style="list-style-type: none"> <li>High loss of archaeological material (&gt;60% by area) or loss of specific areas of material which contribute directly to the understanding of the asset concerned; or Circumstance within which it is not possible to determine the precise level of change in this way.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Change such that the significance of the asset is affected. Noticeably different change to setting affecting significance, resulting in erosion in our ability to understand and appreciate the asset.</li> <li>Moderate loss of archaeological material (&gt;40% by area) or loss of small specific areas of material which contribute to the understanding of the asset concerned. Indicative modification of high magnitude of change following best practice mitigation strategy.</li> </ul>
Low	<ul style="list-style-type: none"> <li>Change such that the significance of the asset is slightly affected.</li> <li>Slight change to setting affecting significance, resulting in a change in our ability to understand and appreciate the asset.</li> <li>Loss of archaeological material (&gt;10% by area).</li> <li>Indicative modification of medium magnitude of change following best practice mitigation strategy.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Changes to the asset that hardly affects significance. Minimal changes to the setting of an asset that have little effect on significance, resulting in no real change in our ability to understand and appreciate the asset.</li> <li>No change.</li> <li>Indicative modification of low magnitude of change following best practice mitigation strategy.</li> </ul>
Neutral	<ul style="list-style-type: none"> <li>No change from baseline conditions.</li> </ul>



**Significance of Effects**

- 12.5.11 It is proposed that the criteria provided in the matrix in Table 2.3 of Chapter 2 are used to allow a determination of the significance of effects prior to the implementation of any mitigation, and are in line with paragraph 5.9.27 of NPS (EN-1) and paragraph 205 of the NPPF (December 2023). This would take into account that a ‘Low’ magnitude of effect on a heritage asset of ‘High’ (i.e. national) importance may equate to ‘Less than substantial harm’, while for an asset of local importance the equivalent effect would be less.
- 12.5.12 As the matrix indicates, there is a degree of overlap between the matrix categories, and professional judgement is applied to the matrix result to ensure it is commensurate with unique factors which might apply to the heritage assets concerned. Not all adverse effects are considered to be ‘significant’ and it considered that those assessed as Neutral, Negligible or Minor Adverse would not be considered to be a ‘significant’ effect in EIA terms.

**In Combination and Cumulative effects**

- 12.5.13 Where in combination effects are identified, these will be addressed in the Cultural Heritage Chapter 12.
- 12.5.14 An assessment will be made of likely cumulative effects that may arise from the addition of the Scheme to a baseline including other, proposed developments that could impact the same receptors as the Scheme. Cumulative effects will be dealt with in the Cumulative Effects Chapter 23 of the ES.

**Mitigation**

**Direct (physical) impacts**

- 12.5.15 The detailed design and evolution of the Scheme will be informed by environmental assessment(s) to reduce any adverse effects as considered necessary. Any mitigation measures as required will be confirmed in the ES.

**Indirect (setting) impacts**

- 12.5.16 Mitigation options will be explored where any impacts are identified that could have an adverse effect on any elements of a Heritage Asset’s setting that contribute to its significance. Any mitigation measures as required will be confirmed in the ES.

**12.6 Conclusion on Scoping**

**Scoped in**

- 12.6.1 The aspects described in Table 12.3 below are proposed to be ‘scoped in’ the assessment

**Table 12.3: Matters to be ‘scoped in’ the assessment**

Effects	Justification
Impact to archaeological remains during the construction phase	There is a potential for impact to Archaeological remains during the construction phase of the Scheme as a result of ground disturbance that could either partially or fully impact buried archaeology.  As such the potential for impact to archaeological remains during the construction phase is ‘scoped in’ for further assessment.
Impact to built heritage	There is a potential for an indirect impact to heritage assets where the Scheme could result in changes to elements of heritage asset’s setting that contribute to



Effects	Justification
	<p>its significance during the construction, operation and decommissioning phases. Therefore, built heritage will be 'scoped in' for further assessment during the construction, operation and decommissioning phases of the Scheme.</p> <p>Study Areas to identify built heritage assets that could be impacted by the Scheme will be in line with that detailed in paragraphs 12.3.1 and 12.3.3. As agreed with the Local Authority Conservation Officer and Historic England, individual heritage assets will be 'scoped out' of further assessment where no potential for impact is identified.</p>

**Scoped out**

12.6.2 The aspects described in Table 12.4 below are proposed to be 'scoped out' of the assessment

**Table 12.4: Matters to be 'scoped out' of the assessment**

Effects	Justification
<p>Impact to archaeological remains during the operation and decommissioning phases</p>	<p>Activities associated with the operation and decommissioning phases are not considered to cause further impact to buried archaeological remains beyond that which will occur during the construction phase.</p> <p>While the potential for impact to archaeological remains during the operation and decommissioning phases is 'scoped out' of further assessment, mitigation measures will be considered to ensure archaeological remains are adequately protected during the operation and decommissioning phases (i.e. archaeology is included in an operation and decommissioning environmental management plan).</p>



## 13 Transport and Access

### 13.1 Introduction

- 13.1.1 This chapter presents an assessment of the likely significant effects of the Scheme with regard to associated traffic movements during its construction, operational and decommissioning phases, and the proposed access arrangements.
- 13.1.2 The assessment will be undertaken in accordance with the guidance provided in the Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement (2023) (Ref 1).
- 13.1.3 A separate Transport Assessment (which will include an Abnormal Loads Assessment), Outline Public Rights of Way Management Plan and Outline Construction Traffic Management Plan (CTMP) will be submitted with the DCO application.
- 13.1.4 As part of the consultation process, the scope of the transport reports identified above will be discussed with the relevant local highway authorities (West Northamptonshire Council, North Northamptonshire Council and Milton Keynes City Council) in addition to National Highways.

### 13.2 Legislative and Policy Section

- 13.2.1 The Planning Act 2008 sets out the process for the consenting of NSIPs and the basis for the decision whether to grant development consent.
- 13.2.2 National Policy Statements (NPSs) set out the policy basis for NSIPs and form the basis for determination of decisions on DCO applications by the Secretary of State. The NPSs that are relevant to the Scheme and the Transport and Access chapter of the ES are:
- National Policy Statement for Energy (NPS EN-1) (Ref 2); and
  - National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (Ref 3).
- 13.2.3 Section 5.14 of NPS EN-1 outlines matters relating to traffic and transport and confirms that a transport appraisal of likely effects arising from the transportation of materials and people should be undertaken. Specific reference is made to undertaking the appraisal of the construction and operational stages.
- 13.2.4 Section 2.10 of NPS EN-3 considers solar photovoltaic generation with the requirement for traffic and transport matters during the construction phase clearly set out from paragraph 2.10.120-2.10.126. The need to assess routes and the cumulative effects of the scheme is identified. Paragraph 2.10.161 confirms that operational phase traffic will generally be *'very light with as little as a visit each month'*.
- 13.2.5 The wider national and local planning policy documentation considered relevant to the Scheme and Transport and Access are identified below and will be considered as part of the Transport and Access ES Chapter 13:
- National Planning Policy Framework (NPPF) (as amended December 2023) (Ref 4);
  - Planning Practice Guidance (PPG) (updated February 2024) (Ref 5);
  - North Northamptonshire Joint Core Strategy 2011-2031 (Adopted 2016) (Ref 6);
  - West Northamptonshire Joint Core Strategy Local Plan Part 1 (Adopted 2014) (Ref 7);
  - Plan:MK 2016 – 2031 (Adopted 2019) (Ref 8); and
  - Strategic road network and the delivery of sustainable development (DfT, 2022) (Ref 9).
- 13.2.6 The Transport and Access ES chapter 13 will be prepared with reference to guidance provided within the IEMA Guidelines.



### 13.3 Baseline Conditions

13.3.1 The Scheme comprises the Sites and 3 and the Cable Route Search Area. The Sites and Cable Route Search Area are in an area of countryside to the west and south of Wellingborough, and north, east and southeast of Northampton (described in greater detail in Chapter 3 of the Scoping Report).

13.3.2 Baseline conditions for Sites and Cable Route Search Area that comprise the Scheme and the highway and transport networks that are relevant are outlined below.

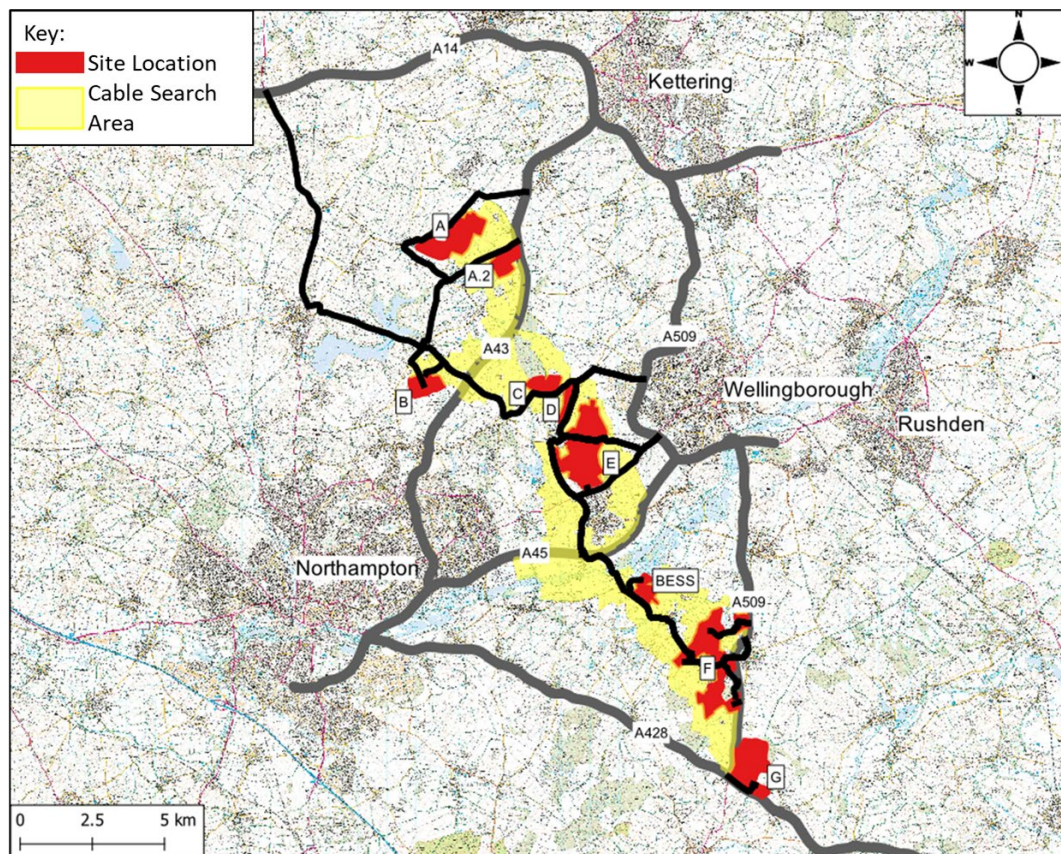
#### Local Highway Network

13.3.3 The Strategic Road Network (SRN) and Major Road Network (MRN) will form the primary route for all vehicle movements until the local routes need to be used to reach the Scheme.

13.3.4 The A45 and A14 are both part of the SRN and are both dual carriageways. The A43, A428 and A509 are part of the MRN and are A roads designed to accommodate high traffic flows and heavy goods vehicles (HGVs). The A43, A428 and A509 are predominantly single carriageway roads.

13.3.5 The SRN and MRN in relation to the Scheme is provided in **Figure 13.1**. As the Cable Route Search Area lies within the areas described for each Site, as shown in **Figure 13.1** it is not described separately.

**Figure 13.1 - Scheme Sites and proximity to SRN and MRN**



13.3.6 Green Hill A is located to the west of the A43. Newland Road bisects Green Hill A and is a designated Quiet Lane. Immediately to the north of Green Hill A, Mawsley Road and Broughton Road can be used to access the A43. Similarly, to the east Broughton Road and Walgrave Road can be used to access Walgrave. Kettering Road connects Walgrave to the A43, and Holcot Road connects Walgrave to Holcot. Green Hill A.2 is



located west of the A43 and south of Kettering Road with each road forming a boundary with Green Hill A.2. All of the roads listed (except the A43) are single carriageway rural roads.

- 13.3.7 Green Hill B is located to the west of the A43 and Green Hill B connects onto both Sywell Road to the northeast and Moulton Road to the northwest, both of which are single carriageway roads forming part of the local highway network. Moulton Road connects to Sywell Road, which connects to the A43.
- 13.3.8 Green Hill C and Green Hill D are located to the east of the A43 and can both be accessed from the A43 via Holcot Lane and Sywell Road to the west of the sites, with both being single carriageway local roads. This route is via Sywell. To the east of Green Hill C and Green Hill D, Sywell Road connects these sites through Park Farm Industrial Estate to reach the A509. This section of Sywell Road between Green Hill C and Green Hill D and the A509 is a signed 'Black Route' for Sywell Aerodrome, meaning it is suitable and recommended for HGVs. Green Hill D borders Highfield Road which is a single lane rural road with limited passing places.
- 13.3.9 Green Hill E is located to the west of the A509 and north of the A45. Wilby Road bisects Green Hill E and can be used to access Green Hill E and the A509, passing through Wilby. Mears Ashby Road to the west provides a connection to Green Hill E. The A4500 runs to the south of Green Hill E and has a 7.5T weight limit applied to it at points. Mears Ashby Road runs parallel to the west of Green Hill B and has a 7.5T weight limit (except for loading). Northampton Road connects the A45 to Earls Barton and is a signed 'Black Route' for the Earls Barton Industrial Estate, meaning it is suitable and recommended for HGVs.
- 13.3.10 Green Hill F lies immediately to the west of the A509. Easton Lane bisects Green Hill F site and connects to London Road (through Bozeat) to access the A509, with both being single carriageway local roads. To the west, Easton Way connects into Grendon.
- 13.3.11 Green Hill G is located north of the A428 and east of the A509. A bridleway runs north-south through site towards its eastern extent. The A509 and A428 are single carriageway roads where national speed limits (60mph) apply. The junction of the A509 and A428 is formed by a four-arm roundabout with priority control.
- 13.3.12 Green Hill BESS is to the south of the A45 and surrounds the Grendon Substation. Station Road is a single carriageway road that connects the site to the A45 and has a 7.5T weight limit (except for loading) applied between Green Hill BESS and to the south of the access for Earls Barton Quarry. To the north of the quarry access along Station Road is a signal controlled, single way bridge.
- 13.3.13 It should be noted that early baseline conditions surveys for Green Hill A.2, the potential extension of Green Hill A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purpose of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Green Hill A baseline identified, and will be presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

#### Wider Transport Network

- 13.3.14 A number of Public Rights of Ways (PROWs) are located across the Sites and Cable Route Search Area that comprise the Scheme and on routes that will comprise the Study Area. These will be identified as part of the Transport and Access ES Chapter and within a separate Outline Public Rights of Way Plan. Once the design of the Scheme has been developed and the detailed layout within each of the Sites and the refined Cable Corridor confirmed, affected PROWs will be identified.
- 13.3.15 Walking, cycling and public transport opportunities proximate to each Site and the Cable Corridor will be described in the Transport and Access ES Chapter.





### Baseline Data Sources

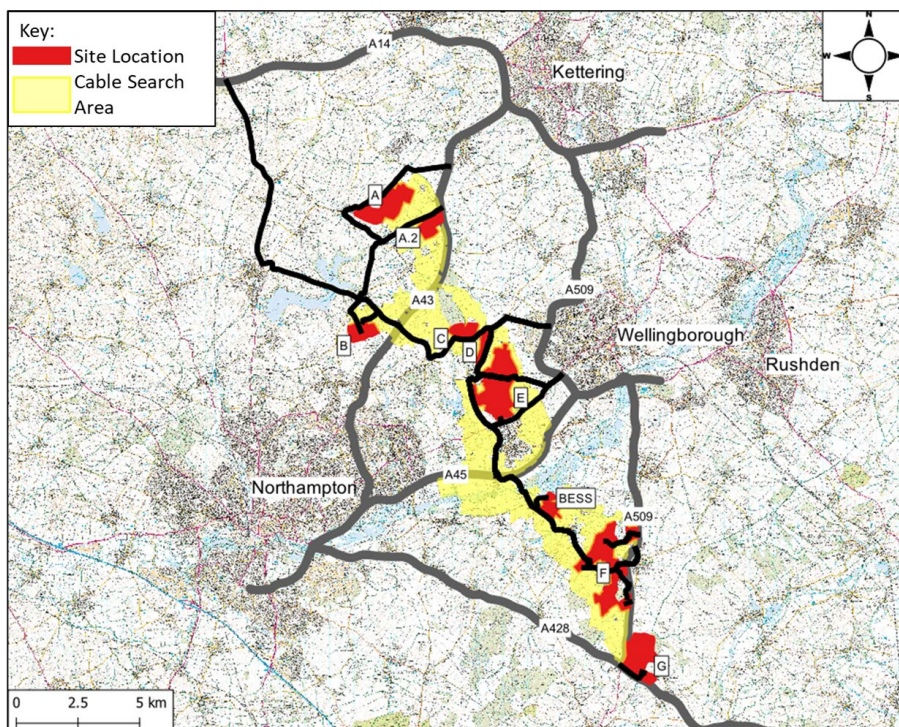
- 13.3.16 The potential impacts arising from the Scheme will be assessed relative to the future year baseline conditions. Data sources are expected as follows:
- Traffic volume surveys at key link and junctions on the local highway network;
  - Traffic speed surveys at key links on the local highway network;
  - Public Rights of Way from the Definitive Map and Definitive Statement;
  - Personal injury collision data;
  - Highway boundary information;
  - Site visits;
  - OS Mapping; and
  - Topographical surveys.

## 13.4 Assessment Methodology

### Study Area

- 13.4.1 The extent of the Study Area for assessment in terms of Transport and Access will be subject to discussion, with National Highways who are the highway authority for the SRN and West Northamptonshire Council, North Northamptonshire Council and Milton Keynes City Council who are responsible for the local highway network.
- 13.4.2 As part of this ES scoping, an Initial Study Area has been defined by identifying the likely routes that may be used by construction traffic and workers travelling to the Sites and Cable Route Search Area during the construction, operation and decommissioning phases of the Scheme. Key routes from the MRN and SRN have been considered when defining the Study Area.
- 13.4.3 The Initial Study Area is presented in **Figure 13.2**.

**Figure 13.2 - Initial Study Area for Green Hill**





- 13.4.4 Within the Study Area, specific links or points that connect the Scheme to the highway will be identified that will form the basis of the assessment. The forecast routes that vehicles may take forms the starting point. From here, changes in character arising from identified receptors or changes in traffic volumes will be the key determining factors in sub-dividing roads into links.
- 13.4.5 Each link within the Study Area will be used to consider the magnitude of change arising from the Scheme, the relative sensitivity of the link with reference to receptors and the resultant significance of any effect.
- 13.4.6 As part of the Study Area, a Cable Route Search Area from the Sites to the National Grid Substation at Grendon has been established, and this will be refined to confirm a Cable Corridor. Across the Cable Corridor, access points from the highway to the corridor will be defined at various appropriate points. In the first instance, existing junctions and farm access points will be considered and utilised wherever possible. Where new access points are required, opportunities to utilise those associated with the Sites will be taken with temporary access points considered as a last resort.

#### Initial Sifting

- 13.4.7 Following on from the determination of the Study Area, an initial sifting exercise will be used to remove road links where the traffic effects of the scheme are not considered to be significant.
- 13.4.8 Within the IEMA Guidelines (Ref 1) two broad rules are suggested that can be used as criteria to assist in limiting the scale and extent of the environmental assessment:
- Rule 1: include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%).
  - Rule 2: include highway links of high sensitivity where traffic flows have increased by 10% or more.
- 13.4.9 A sensitive link is one that is considered a 'High' sensitivity as defined under the criteria set out later in this section in Table 13.1.
- 13.4.10 The IEMA Guidelines (Ref 1) state that, as a starting point, a 30% change in traffic flow (Rule 1) represents a reasonable threshold for including a highway link within an environmental assessment.
- 13.4.11 Under Rule 2, the IEMA Guidelines (Ref 1) state it would not be appropriate to consider links where traffic flows are forecast to change by less than 10%, unless there are significant changes in the composition of traffic, e.g. a large increase in the number of HGVs.
- 13.4.12 Road links within the Study Area that do not meet the above IEMA thresholds will be considered to have non-significant effects on transport and will be scoped out of any further assessment.

#### Traffic Effects to be Assessed

- 13.4.13 In accordance with the IEMA Guidelines (Ref 1), the transport and access effects that will be assessed and presented in the ES are as follows:
- Severance of communities;
  - Non-motorised user delay;
  - Non-motorised user amenity;
  - Fear and intimidation on and by road users;
  - Road vehicle driver and passenger delay;
  - Road user and pedestrian safety; and
  - Hazardous / large loads (including abnormal loads).



- 13.4.14 Noise and vibration effects from construction traffic during the construction, operation and decommissioning phases will be assessed in **ES Chapter 14: Noise and Vibration**.
- 13.4.15 Dust and dirt from construction traffic on the local highway network during the construction, operation and decommissioning phases are assessed in **ES Chapter 17: Air Quality**.
- 13.4.16 Effects on designated habitats sites from road traffic associated with air quality and noise disturbance are assessed in **ES Chapter 8: Ecology**.

#### **Assessing Traffic Effects**

- 13.4.17 The following methodologies and assumptions will be applied to assess the likely traffic effects of the Scheme. These will be applied to highway links that meet the IEMA initial sifting criteria outlined above.
- 13.4.18 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

#### **Severance of Communities**

- 13.4.19 Severance is defined in the IEMA Guidelines (Ref 1) as the perceived division that can occur within a community when it becomes separated by major transport infrastructure. It describes a series of factors that separate people from places and other people. Such division may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.
- 13.4.20 The measurement and prediction of severance is difficult, but relevant factors include road width, traffic flow, speed, the presence of crossing facilities and the number of movements across the affected route.
- 13.4.21 Different groups in a community may be more affected by severance than others. Accordingly, consideration of severance will relate to:
- The nature of transport infrastructure on any assessed link (for example type and speed of road, availability of crossing facilities);
  - The characteristic of movements on that link (people crossing roads, the speed and volume of traffic); and
  - The nature of receptors that may travel to facilities on that link (for example people travelling to schools or places of employment).
- 13.4.22 The effect the Scheme may have on receptors on any transport link can be assessed with consideration of the current severance caused by traffic and related factors, and the extent to which additional traffic may exacerbate any identified issues.
- 13.4.23 The IEMA Guidelines (Ref 1) identify that *'The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively'*.
- 13.4.24 The thresholds provide a starting point for assessment to consider the potential effects of the Scheme with the full consideration of severance made with full regard to specific local conditions outlined above.

#### **Non-motorised User Delay**

- 13.4.25 Changes in the volume, composition and / or speed of traffic may affect the ability of people to cross roads or travel along transport links. Typically, increases in traffic levels



would be the main cause in increased delays, although increased non-motorised user activity itself can also contribute.

- 13.4.26 The IEMA Guidelines (Ref 1) identifies that there are a range of factors that can influence delay and this might vary dependent upon whether a location is within an urban or rural environment. Accordingly, the Guidelines do not set down definitive thresholds where it is instead suggested that *'the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect'*.
- 13.4.27 The IEMA Guidelines (Ref 1) state that *'Pedestrian delay and severance are closely related effects and can be grouped together'*. Accordingly, the changes in traffic flows identified for severance of communities will be applied where considering non-motorised user delay.
- 13.4.28 The above approach is deemed a robust starting point for narrowing down affected links within the Study Area. Thereafter, judgements against the characteristics of transport links, receptor sensitivity and infrastructure provision can be made.

#### **Non-motorised Amenity**

- 13.4.29 The IEMA Guidelines (Ref 1) define non-motorised amenity as 'the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and the infrastructure provision relative to traffic.'
- 13.4.30 The IEMA Guidelines (Ref 1) describe that previous guidance presented tentative thresholds for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled.
- 13.4.31 The thresholds will be used as a starting point for any assessment of a link which will then give regard to specific local conditions. The methodology will use the defined threshold making further judgments based upon this and the wider consideration of infrastructure.

#### **Fear and Intimidation on and by Road Users**

- 13.4.32 The IEMA Guidelines (Ref 1) identify that fear and intimidation is dependent upon a number of factors including traffic volumes and speeds, composition and the proximity of road users to traffic as a factor of infrastructure that is in place. It is stated in paragraph 3.36 that *'While most of these factors can be quantified, there will be a need for judgement to be exercised in determining the degree of fear and intimidation'*.
- 13.4.33 The guidance (Ref 1) sets out a weighting system to provide an approximation of the likelihood of fear and intimidation. This relates to non-motorised users. The approach allows the degree of hazard to be assessed with reference to the established thresholds, and a score provided for each combination for each highway link within the Study Area.
- 13.4.34 The approach outlined in the IEMA Guidelines (Ref 1) will be used to assess any effects relating to fear and intimidation on non-motorised road users.

#### **Road Vehicle Driver and Passenger Delay**

- 13.4.35 Traffic delays to non-development traffic can occur at several points on transport networks. The IEMA Guidelines (Ref 1) set out that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. Generally, this relates to junction capacity rather than the capacity of a section of road.
- 13.4.36 Proportional and absolute increases in traffic numbers provide an indication of likely effects upon driver delay. Such assessment will help inform the extent of required highway capacity assessments which will normally form part of the technical work reported within the Transport Assessment, and which generally focuses on conditions in the network peak periods.
- 13.4.37 The assessment of vehicle driver and passenger delay will be undertaken through consideration of proportional and absolute impacts, judgments of highway network



performance and through the scope of the Transport Assessments to be agreed with relevant highway authorities. Any highway capacity assessment will use appropriate junction modelling packages to provide an estimate of vehicle delay and determine the sensitivity to development traffic.

#### **Road User and Pedestrian Safety**

- 13.4.38 Collision clusters within the Study Area will be identified by undertaking a detailed review of the baseline characteristics to determine the road safety sensitivity of the highway network. The assessment will be based on an analysis of personal injury collision data occurring within the most recent 5 years.
- 13.4.39 Patterns or road safety factors that could be exacerbated by traffic or movement will be identified and considered in the context of construction movements strategies, their managements and the temporary nature of effects.
- 13.4.40 Given the temporary nature of effects that are expected from the Scheme, the approach is considered appropriate.
- 13.4.41 As outlined in the IEMA Guidelines (Ref 1), relevant authorities will be engaged to consider the best approach for determining the significance of road safety effects.

#### **Hazardous / Large Loads**

- 13.4.42 Whilst the Scheme is not expected to result in the movement of hazardous loads, the movements of specific equipment and materials will fall within the categorisation of large or abnormal loads.
- 13.4.43 The movement of large (abnormal) loads is regulated by National Highways and will be subject to separate agreement with the relevant highway authorities and police through the Electronic Service Delivery for Abnormal Loads (ESDAL) system.
- 13.4.44 A specific assessment of abnormal loads will be undertaken as part of the Transport Assessment and set out in the ES Chapter. Appropriate routes for abnormal load movements and mitigation strategies to secure safe passage will be identified. The ES chapter will consider if other traffic impacts arising from abnormal loads could result.

### **13.5 Determining the Significance of Effect**

#### **Sensitivity of Receptors**

- 13.5.1 Receptors of potential effects associated with the Scheme can be people, wildlife, or elements of the natural and built environment. In the context of this chapter, receptors are considered to be users of the transport networks to whom the transport effects of the Scheme from its construction, operation and decommissioning would be perceptible.
- 13.5.2 The users of the transport networks are considered to be:
- non-motorised users using the highway and public rights of way networks (pedestrians, cyclists, and equestrians); and
  - drivers and passengers of motorised vehicles (including public transport and emergency services) using the highway network.
- 13.5.3 All receptors will exhibit a greater or lesser degree of sensitivity to the changes brought about by the Scheme. The sensitivity of a receptor is a function of its capacity to accommodate change. For example, transport users (receptors) that have a higher sensitivity to changes in traffic are those visiting places such as schools, hospitals and playgrounds. Alongside this, the sensitivity of a receptor can also be a function of the infrastructure on a highway link. For example, where there is a high concentration of pedestrians, and limited facilities such as crossings and footways, the transport users would have a higher sensitivity to changes in traffic.



13.5.4 Therefore, highway links which have these characteristics are assumed to have a higher concentration of these users, and therefore are classified with a higher sensitivity.

13.5.5 The sensitivity of highway links with regard to infrastructure and the receptors on those links are set out in Table 1 which has been prepared with reference to the high-level detail set out in paragraph 1.30 of the IEMA Guidelines (Ref 1).

**Table 13.1: Sensitivity of Receptors**

Receptor sensitivity	Receptor type
High	Receptors of greatest sensitivity to traffic flows, such as schools, hospitals, playgrounds/recreational spaces, accident blackspots, retirement/nursing homes. Includes areas with no footways with high pedestrian footfall and congested areas.
Medium	Receptors with moderate sensitivity to traffic flow, such as conservation areas, historical buildings, tourist attractions, and residential areas.
Low	Receptors with low sensitivity to traffic flows, and those distant from affected roads.
Negligible	Receptors with no material sensitivity to traffic flows.

**Magnitude of Impact**

13.5.6 For those links that are not screened out of the assessment using Rules 1 and 2 of the IEMA Guidelines (Ref 1), the criteria set out in Table 2 will be used to determine the magnitude of impacts. The criteria are based upon the IEMA Guidelines (Ref 1), and in the case of non-motorised user delay and amenity, has been adapted and added to in order to allow a suitable assessment of the Scheme and associated effects.

13.5.7 However, the absolute level of an impact is also important (e.g. the total flow of traffic or HGVs on a link) and will be considered in the analysis. In addition, it is important to note that impacts during construction, operation and decommissioning are not permanent but are temporary and this is material when considering the impact magnitude criteria attached to them.

**Table 13.2: Magnitude of Impact Criteria**

	Magnitude of Impact				
	High	Medium	Low	Negligible	Neutral
Severance of communities	Change in total traffic or HGV flows of >90%	Change in total traffic or HGV flows of >=60 and <90%.	Change in total traffic or HGV flows of >=30 and <60%.	Change in total traffic or HGV flows of > 0 and <30%	No change
Driver delay	Changes which are likely to be perceptible and which could change	Changes which are likely to be perceptible and which would materially	Changes which are likely to be perceptible but not to the extent that it	Changes which are unlikely to be perceptible (based on a judgement).	No change



	Magnitude of Impact				
	High	Medium	Low	Negligible	Neutral
Non-motorised user delay	conditions which would otherwise prevail to the extent that it would significantly affect travel behaviour.	change conditions which would otherwise prevail to the extent that it may affect travel behaviour to measurable degree.	would materially change conditions which would otherwise prevail.		
Non-motorised user amenity	Magnitude of impact is based on professional judgement regarding the “pleasantness” of a journey and is affected by the composition, speed or volume of traffic introduced as a result of the Proposed Development. The IEMA Guidance suggests that assessors use their judgement to determine whether pedestrian amenity is a significant effect and as such, the magnitude of change for pedestrian amenity has been defined qualitatively based on professional judgement.				No change
Fear and intimidation on and by road users	As IMEA guidance: Two step changes in level	One step change in level, but with • >400 vehicle increase in average 18hr two-way all vehicle flow; and/or • >500 increase in total 18hr heavy vehicle flow	One step change in level, with • <400 vehicle increase in average 18hr two-way all vehicle flow; and/or • <500 increase in total 18hr heavy vehicle flow	No change in step changes	No change
Road user and pedestrian safety	Magnitude of impact to be based on professional judgement following analysis detailed in the Transport Assessment	No change	Road user and pedestrian safety	Magnitude of impact to be based on professional judgement following analysis detailed in the Transport Assessment	No change



	Magnitude of Impact				
	High	Medium	Low	Negligible	Neutral
	on collision history and the nature of movements associated with the Scheme.			on collision history and the nature of movements associated with the Scheme.	
Hazardous / large loads	Magnitude of impact to be based on professional judgement following the outcomes of the abnormal loads assessment which will be an appendix to the Transport Assessment, frequency and size of abnormal loads and consideration of wider traffic effects.	No change	Hazardous / large loads	Magnitude of impact to be based on professional judgement following the outcomes of the abnormal loads assessment which will be an appendix to the Transport Assessment, frequency and size of abnormal loads and consideration of wider traffic effects.	No change

**Significance of Effects**

13.5.8

The effect of the scheme on transport will be determined with due regard to the sensitivity of the receptor and magnitude of impact. The significance of effects matrix for transport effects are shown in Table 13.3.

**Table 13.3: Classification and Significance of Effects**

Magnitude of Impact	Sensitivity of Receptor			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	Negligible
Negligible	Minor	Minor	Negligible	Negligible
Neutral	No effect	No effect	No effect	No effect





- 13.5.9 Following the classification of an effect, a clear statement will be made as to whether the effect is 'significant' or 'not significant'. As a general rule, major and moderate effects are considered to be significant and minor and negligible effects are considered to be not significant.
- 13.5.10 The IEMA Guidelines (Ref 1) state in Paragraph 1.13 that 'these updated and replacement Guidelines are intended to complement professional judgement and the experience of trained and competent assessors' and goes on to state that 'the experience and expertise of the assessor will remain of primary importance.' Further, paragraph 1.27 of the guidance states that assessments 'should consider the forecast changes to baseline (magnitude of change/ impact), the relative value/sensitivity/importance of the affected asset/receptor and the scale, nature and significance of the effect (consequence)'.
- 13.5.11 Professional judgement will be applied where appropriate as well as consideration of absolute level of traffic in combination with the percentage change in traffic.

#### **Cumulative and In-combination Effects**

- 13.5.12 Identification of other developments that may give rise to cumulative effects for the temporary construction and decommissioning phases will be agreed with the relevant statutory bodies and any cumulative effects arising from will be considered and described in Chapter 23 Cumulative Effects
- 13.5.13 Identification of any transport effects in-combination with other effects and/or from combined phases of work on the Scheme will be considered and described within the Transport and Access Chapter. Where there are no in-combination effects, this will also be confirmed.

### **13.6 Mitigation Measures**

- 13.6.1 Any mitigation measures that are considered necessary will be set out and controlled within the outline Construction Traffic Management Plan (CTMP) and summarised in the ES Chapter.

### **13.7 Conclusion**

#### **Construction Phase**

- 13.7.1 Construction phase effects are to be scoped into the ES. Mitigation measures are anticipated and will be considered within the EIA and detailed in the ES. Temporary effects are anticipated.

#### **Operational Phase**

- 13.7.2 Whilst traffic movements associated with the maintenance and operation of the solar farm are expected to be below the IEMA sifting criteria and will generally be very light and made by a light commercial vehicle or car. Further consideration of traffic movements associated with the replacement of panels and batteries is required and will be detailed in the ES. Operational phase effects are therefore proposed to be scoped in.

#### **Decommissioning Phase**

- 13.7.3 The Scheme has an anticipated design life of 60 years. At the end of the design life of the Scheme it will be decommissioned.
- 13.7.4 The number of vehicles associated with the decommissioning phase are not anticipated to exceed those that will be assumed for the construction phase. Additionally, industry standard traffic forecasting tools do not provide data that would extend to the 60-year design life of the Scheme.
- 13.7.5 Transport and Access effects for the decommissioning phase will be largely the same as for the construction phase, short term and temporary. Mitigation during the



decommissioning phase will broadly follow what is set out for the construction phase. It is therefore proposed to scope this phase out of the ES.

**Summary**

**Table 13.4: Transport and Access Scoping Summary**

Development Phase	Assessment Criteria	Scoped in or out
Construction phase	Severance of communities	In
	Non-motorised user delay	In
	Non-motorised user amenity	In
	Fear and intimidation on and by road users	In
	Road vehicle driver and passenger delay	In
	Road user and pedestrian safety	In
	Hazardous / large loads (where this relates to abnormal loads)	In
Operational phase	Severance of communities	In
	Non-motorised user delay	In
	Non-motorised user amenity	In
	Fear and intimidation on and by road users	In
	Road vehicle driver and passenger delay	In
	Road user and pedestrian safety	In
	Hazardous / large loads (where this relates to abnormal loads)	In
Decommissioning phase	All	Out



### 13.8 References

- Ref.1 Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement (2023)
- Ref.2 Department for Energy Security & Net Zero, National Policy Statement for Energy (EN-1), (2023)
- Ref.3 Department for Energy Security & Net Zero, National Policy Statement for Renewable Energy Infrastructure (EN-3) (2023)
- Ref.4 Department for Levelling Up, Housing & Communities, National Planning Policy Framework, (2023)
- Ref.5 Department for Levelling Up, Housing & Communities and Ministry of Housing, Communities & Local Government, Planning Practice Guidance (PPG) (updated February 2024)
- Ref.6 North Northamptonshire Council, North Northamptonshire Joint Core Strategy 2011-2031, (2016)
- Ref.7 West Northamptonshire Council, West Northamptonshire Joint Core Strategy Local Plan Part 1, (2014)
- Ref.8 Milton Keynes City Council, Plan:MK 2016 – 2031, (2019)
- Ref.9 Department for Transport, Strategic road network and the delivery of sustainable development, (2022)



## 14 Noise and Vibration

### 14.1 Introduction

14.1.1 This chapter considers the likely significant effects of noise and vibration associated with the construction, operation and decommissioning of the Scheme. It has been carried out in accordance with recognised standards and guidance. This chapter is accompanied by **Appendix 14** detailing the baseline noise survey.

#### Legislation, Policy and Guidance

14.1.2 The following guidance, legislation and information sources will be considered when carrying out the Environmental Impact Assessment (EIA):

- Control of Pollution Act 1974
- Environmental Protection Act 1990
- National Policy Statements (NPS) EN1, EN3 and EN5
- National Planning Policy Framework (NPPF)
- National Planning Policy Guidance (NPPG)
- The Noise Policy Statement for England (NPSE)
- British Standards (BS) 4142:2014+A1:2019 Methods for rating and assessing Industrial and commercial sound (BS 4142:2014)
- BS 8233:2014 Guidance on sound Insulation and noise reduction for buildings (BS 8233:2014)
- BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 1 (Noise)
- BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Part 2 (Vibration)
- Calculation of Road Traffic Noise (CRTN)
- Design Manual for Roads and Bridges (DMRB) Volume 11

### 14.2 Baseline Conditions

14.2.1 Chapter 3 of the scoping report describes the Sites, the Cable Route Search Area and surrounding local area.

14.2.2 For the purposes of providing an assessment of likely significant noise and vibration effects the Study Area has been determined by receptors within approximately 500m of the Scheme.

14.2.3 The baseline noise environment has been established following noise surveys undertaken across Green Hill A-G and BESS (except Site A.2) A logging weather station was installed onsite during the surveys so any periods of adverse weather conditions can be identified and omitted from further analysis, in accordance with BS 4142:2014. Full details of the baseline noise survey are attached in **Appendix 14**. Baseline noise survey locations were chosen to be representative of the nearby existing sensitive receptors.

14.2.4 It should be noted that early baseline conditions surveys for Green Hill A.2, the potential extension of Green Hill A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purpose of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Green Hill A baseline



identified, and will be presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

14.2.5 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Site A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

14.2.6 Figures 14.1 to 14.5 present the monitoring locations.

Figure 14.1 Monitoring Locations Green Hill A

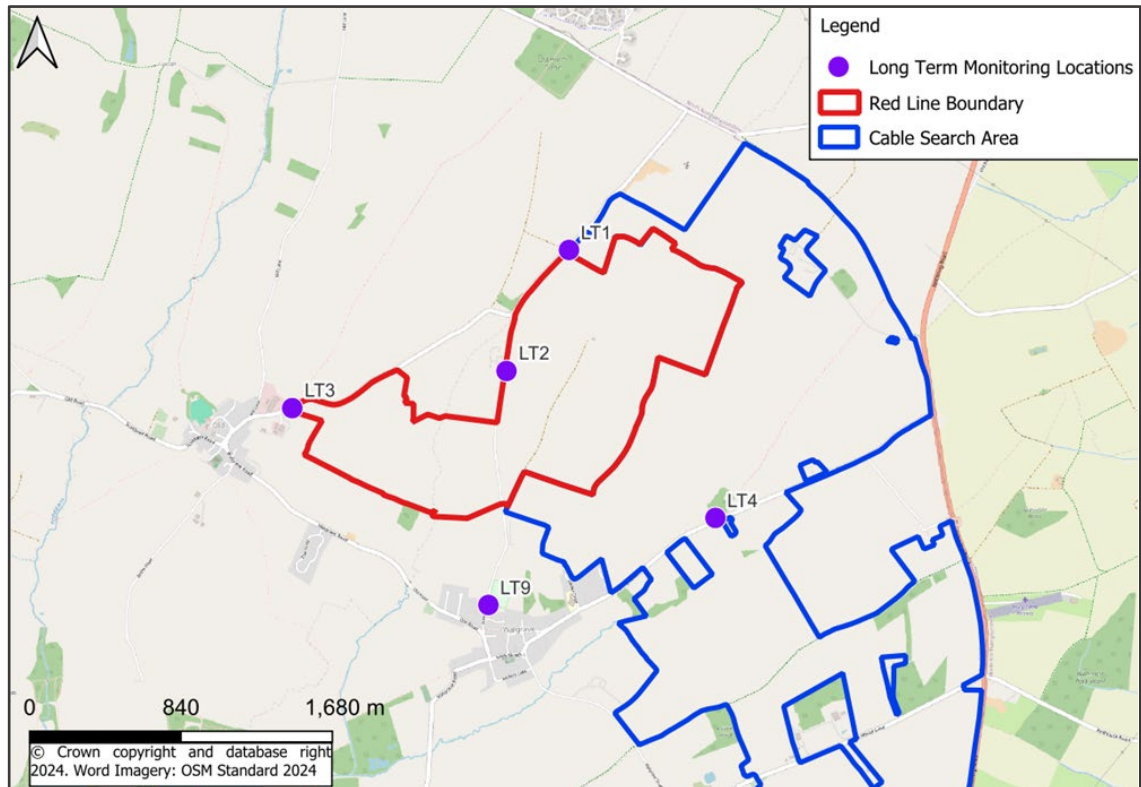




Figure 14.2 Monitoring Locations Green Hill B

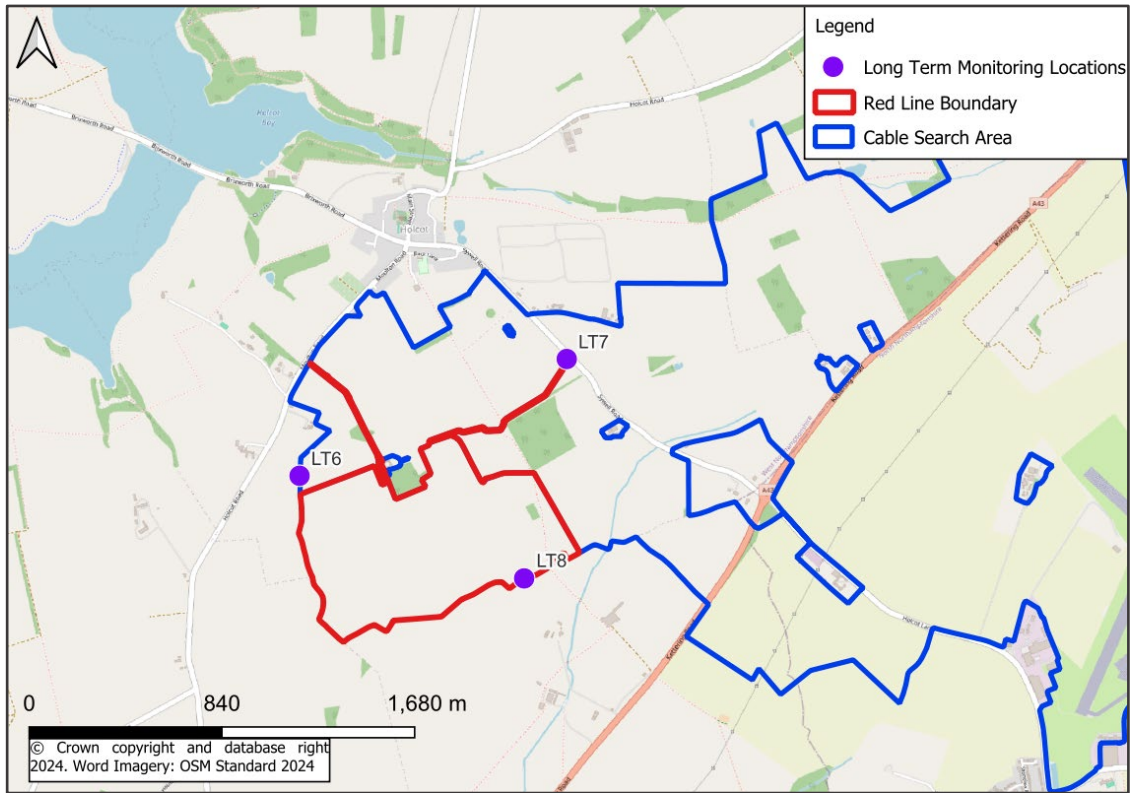


Figure 14.3 Monitoring Locations Green Hill C to E

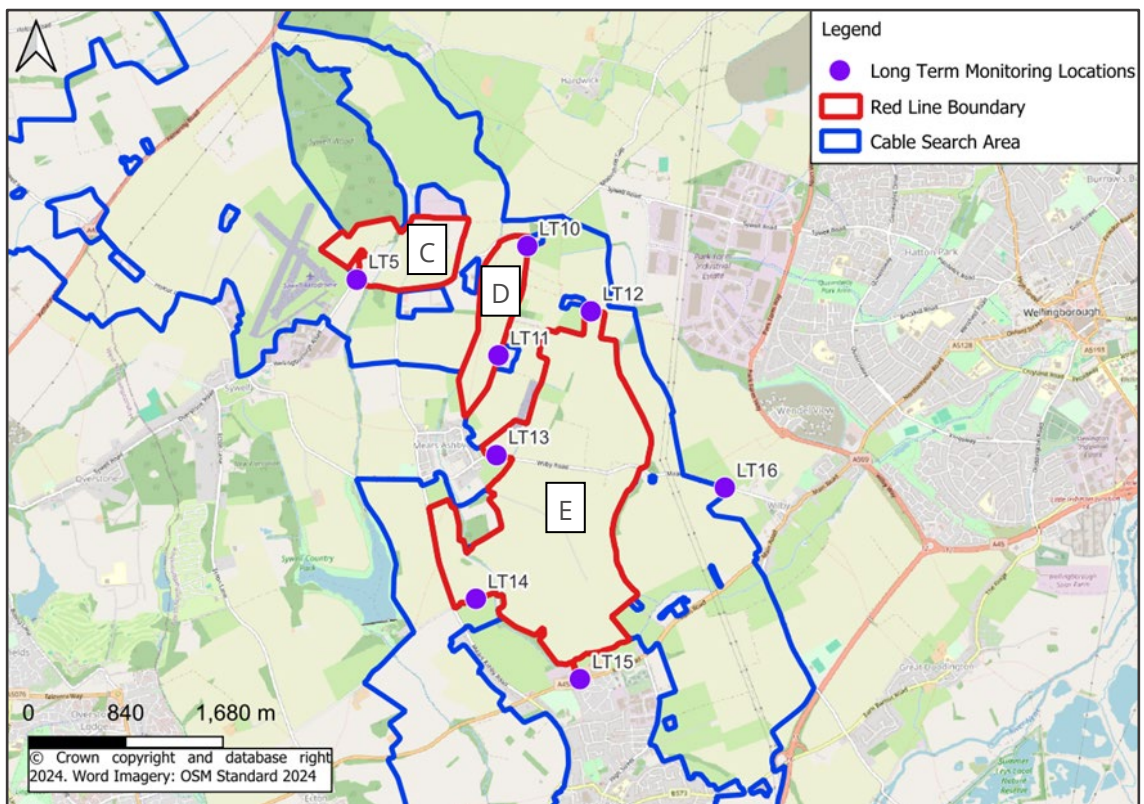




Figure 14.4 Monitoring Locations Green Hill F and BESS

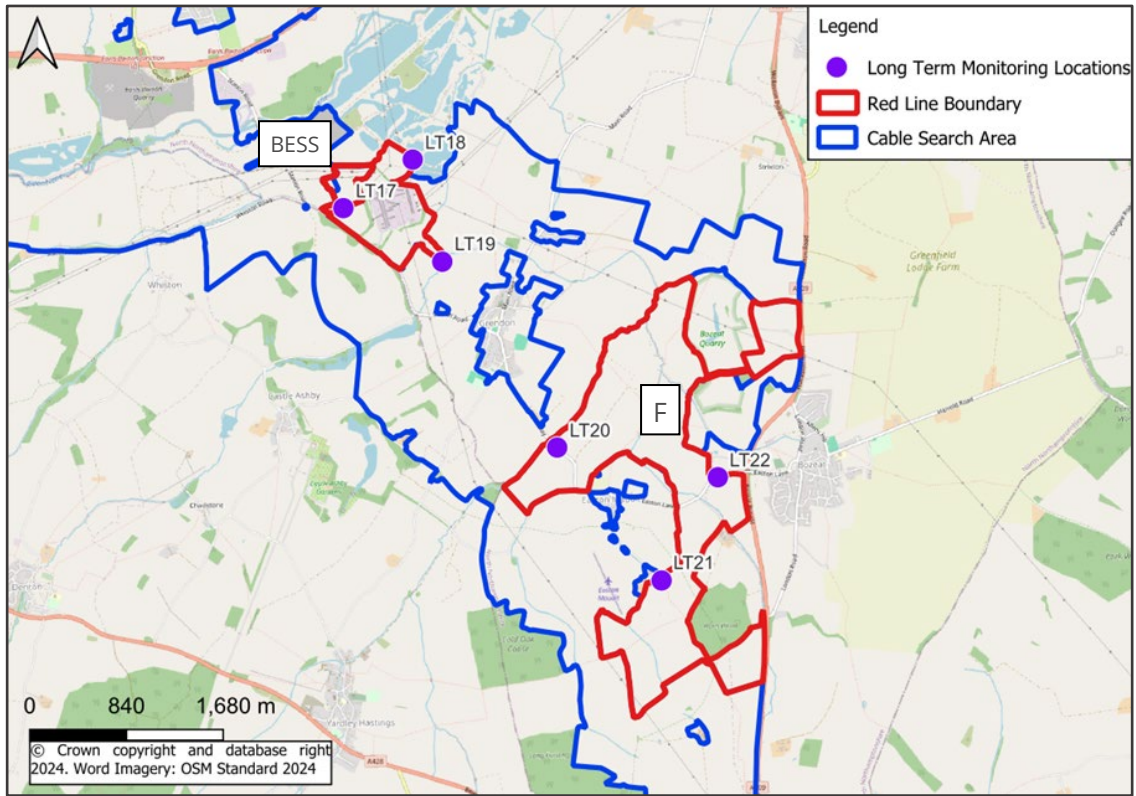
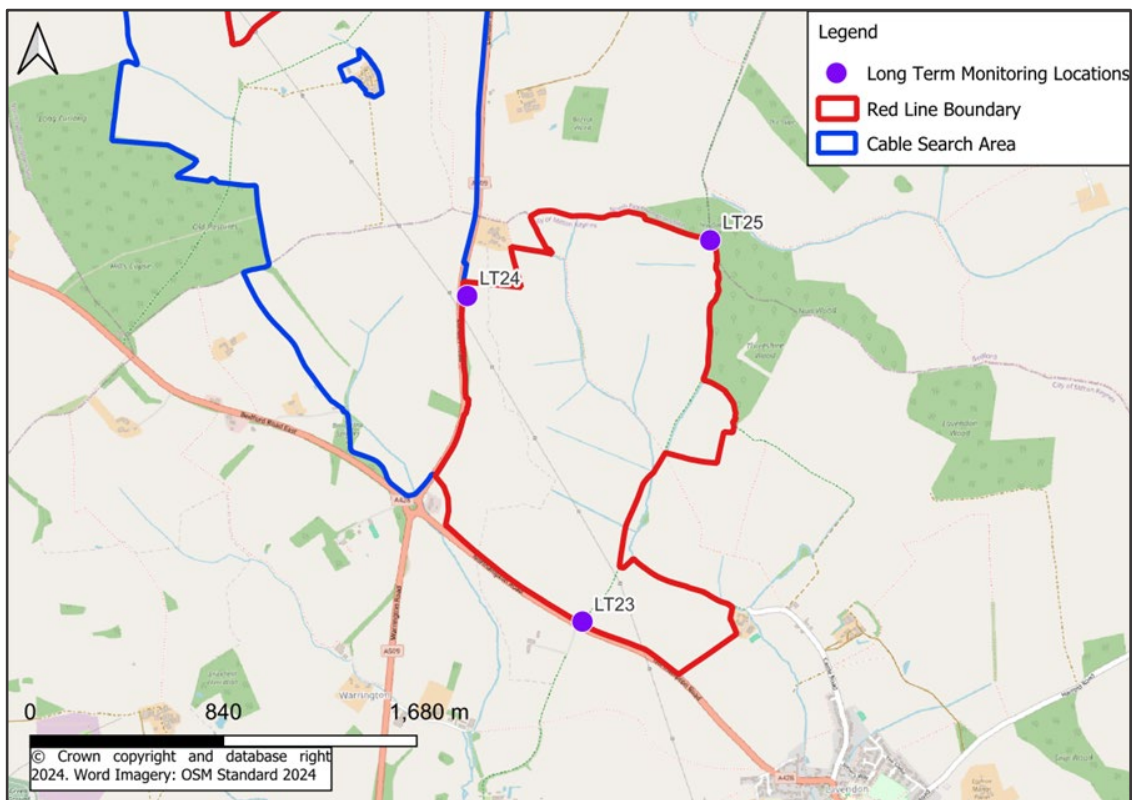


Figure 14.5 Monitoring Locations Green Hill G





### Likely Environmental Effects

- 14.2.7 Potential noise effects during construction and decommissioning would typically be due to the undertaking of site preparation works, plant installation and cable laying. The level of noise at nearby receptors due to construction activities would be dependent on the distance to construction works and equipment being used.
- 14.2.8 In addition, potential noise effects would be likely from construction traffic on regional and local roads within the Scheme.
- 14.2.9 Noise effects due to construction activities would be temporary in nature, reversible and are unlikely to result in significant effects, however it is not possible to conclude that construction effects would be 'not significant'. In all cases, as such, a proportionate assessment of construction noise and vibration will be undertaken to determine the level of effect and identify appropriate mitigation, where necessary.
- 14.2.10 During the operational phase, noise would be generated by the substations, inverters battery units transformers, and tracker panel motors associated with the Scheme. The level of noise at nearby receptors would be dependent on the plant noise emission levels and distance to the receptors. Operational noise levels will be predicted at the nearest residential receptors and assessed to determine the magnitude of any effect.
- 14.2.11 Vibration associated with piling of solar panel mounting structures, compaction of tracks/hard standing area and excavating trenches for the cable runs and cable routing have the potential to cause a temporary effect at nearby receptors. All other construction phase activities, and all operational phase and decommissioning phase activities produce negligible levels of vibration, and as such do not require detailed assessment.

## **14.3 Assessment Methodology**

### Scope of Assessment

- 14.3.1 The key issues for the assessment of potential noise and vibration effects relating to the Scheme would be:
- Effects arising from noise and vibration emitted by construction plant during the construction and decommissioning phase. These effects would be short-term and reversible; and,
  - Operational effects from noise generated by operations relating to the Scheme. These effects would be ceased completely when operation of the Scheme ceases and are therefore long-term and reversible.

### Methodology for the Assessment of Effects

- 14.3.2 The NPSE introduced three concepts to the assessment of noise, as follows:
- NOEL - No Observed Effect Level
- 14.3.3 This is the level below which no effect can be detected and below which there is no detectable effect on the health and quality of life due to noise.
- LOAEL – Lowest Observable Adverse Effect Level
- 14.3.4 This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level
- 14.3.5 This is the level above which significant adverse effects on health and quality of life occur.





**Construction and Decommissioning**

14.3.6 Noise associated with construction and decommissioning works will be predicted at the assessed receptors using the methodology in BS 5228-1 based on plant noise emission levels, distance to receptors, plant 'on-time' etc.

14.3.7 The construction impact semantic scale, set out in Table 14.1 below, is based on the ABC method of assessment described in Annex E.3.2 of BS 5228, which sets out threshold values depending upon the ambient noise at receptors, which have been determined from the baseline sound survey.

**Table 14.1 Construction Time Period - LOAEL and SOAEL**

Time Period	LOAEL	SOAEL	Threshold Level L <sub>Aeq,1hr</sub> dB
Day (0700-1900 hours Weekday and 0700-1200 Saturdays)	Baseline noise levels L <sub>Aeq,T</sub>	Threshold level determined as per BS 5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	65 - 75
Night (2300-0700) hours	Baseline noise levels L <sub>Aeq,T</sub>	Threshold level determined as per BS 5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	45 - 55
Evening and weekends (time periods not covered above)	Baseline noise levels L <sub>Aeq,T</sub>	Threshold level determined as per BS 5228-1:2009+A1:2014 Section E3.2 and Table E.1 BS 5228-1:2009+A1:2014	55 - 65

14.3.8 The magnitude of impact for construction noise is outlined in Table 14.2 (as defined in DRMB LA 111).

**Table 14.2 Magnitude of Impact for Construction Noise**

Magnitude of Impact	Construction Noise Level
Neutral	No increase
Negligible	Below LOAEL
Low	Above or equal to LOAEL and below SOAEL
Medium	Above or equal to SOAEL and below SOAEL + 5 dB
High	Above or equal to SOAEL + 5 dB



**Construction and Decommissioning Traffic Noise**

- 14.3.9 Baseline traffic noise levels will be predicted at assessment receptors based on the methodology in CRTN, utilising baseline traffic flows along the construction traffic route for the proposed year of construction. The percentage increase in all traffic and Heavy Goods Vehicles (HGVs) will be used to calculate the likely change in traffic noise due to construction traffic during the construction works.
- 14.3.10 The magnitude of effects for construction traffic noise, as defined in DRMB are presented in Table 14.3.

**Table 14.3 Magnitude of Impact for Construction Road Traffic Noise**

Magnitude of impact	Increase in basic noise level of closest public road used for construction traffic (dB)
Neutral	No increase
Negligible	Less than 1.0
Low	Greater than or equal to 1.0 and less than 3.0
Medium	Greater than or equal to 3.0 and less than 5.0
High	Greater than or equal to 5.0

**Construction Vibration**

- 14.3.11 The level of vibration at the assessment receptors will be predicted using the method in Table E.1 of BS 5228-2 which is based on the distance to receptor and a scaling factor.
- 14.3.12 For construction phase vibration the LOAEL and SOAEL is set out in DRMB LA 111 and provided in Table 14.4.

**Table 14.4 Construction Vibration LOAEL's and SOAEL's**

Time Period	LOAEL	SOAEL
All time periods	0.3 mm/s PPV	1.0 mm/s PPV

- 14.3.13 The magnitude of Impact for construction vibration is therefore determined in accordance with Table 14.5, as defined in DMRB LA 111.

**Table 14.5 Magnitude of Impact for Construction Vibration**

Magnitude of Impact	Vibration Level
Neutral	No increase
Negligible	Below LOAEL
Low	Above or equal to LOAEL and below SOAEL
Medium	Above or equal to SOAEL and below 10 mm/s PPV
High	Above or equal to 10 mm/s PPV



**Operational Noise**

- 14.3.14 The assessment of operational noise effects will be undertaken according to the methodology set out in BS 4142:2014.
- 14.3.15 The baseline noise measurements will be used to determine representative daytime and night-time background noise levels at the assessed receptors.
- 14.3.16 Noise from operational plant such as substations, inverters, transformers and battery storage units will be predicted using noise modelling software and plant emission data provided by the Applicant.
- 14.3.17 The assessment will consider the level by which the Scheme’s BS 4142 Rating level exceeds the prevailing background noise levels, as well as the context in which the sound will occur. BS 4142 states that a difference of +5 dB is likely to be an indication of adverse impact.
- 14.3.18 Where background and rating levels are low, BS 4142:2014 states that the absolute level might be as, or more, relevant than the margin by which the Rating level exceeds the background noise level. As such, it is proposed that noise limits will be a combination of a margin of 5 dB above the representative background level, subject to a fixed lower threshold of 35 dB, which would apply in low background noise situations.
- 14.3.19 Table 14.6 below presents the operational noise magnitude of effect.

**Table 14.6 Method for Assessing the Magnitude of Impact**

Magnitude of Impact	Effect Level	Noise Level Criteria	Justification for Effect Level-Action Required
Negligible	No Observed Effect Level (NOEL) and No Observed Adverse Effect Level (NOAEL)	Difference between Rating Level ( $L_{Ar,T}$ ) dB and existing background level $L_{A90,T}$ dB is less than or equal to 0dB depending on context	Justification for Effect Level: Below low impact threshold in BS4142:2014  Action Required: None
		Noise levels are below:  Living Rooms: 35 $dBL_{Aeq,16hours}$  Kitchens, Dining Rooms, and Studies: 40 $dBL_{Aeq,16hours}$  Bedrooms Rooms: 35 $dBL_{Aeq,16hours}$ 30dB $L_{Aeq,8hr}$  $L_{AFmax,2min}$ noise levels do not exceed:  45dB $L_{AFmax}$ based on 10th highest $L_{AFmax,2min}$ sample)	Justification for Effect Level:  Less than threshold values in Table 4 in BS8233:2014 and Table 1 in World Health Organisation (1999) Guidelines on Community Noise  Action Required: None
		Increase in ambient $L_{Aeq,T}$ due to contribution from	Justification for Effect Level:  Within negligible short-term impact classification range



Magnitude of Impact	Effect Level	Noise Level Criteria	Justification for Effect Level-Action Required
		proposed development of $\leq 1$ dB.	in Table 7.14 in IEMA 2014 guidance Guidelines for Environmental Noise Impact Assessment  Action Required: None
Low	Lowest Observed Adverse Effect Level (LOAEL)	Difference between Rating Level ( $L_{Ar,T}$ ) dB and existing background sound level $L_{A90,T}$ dB is between 1-4dB, depending on context.	Justification for Effect Level:  Within less likely for adverse or significant adverse impact to occur low impact threshold in BS4142:2014  Action Required:  Mitigate and reduce to a minimum the exceedance over 0dB above background threshold
		Noise levels are between:  Living Rooms: 35-40 $dBL_{Aeq,16hours}$  Kitchens, Dining Rooms, and Studies: 40-45 $dBL_{Aeq,16hours}$  Bedrooms Rooms: 35-40 $dBL_{Aeq,16hours}$  30-35dB $L_{Aeq,8hr}$  $L_{AFmax,2min}$ noise levels do not exceed 45dB $L_{AFmax}$ based on 10th highest $L_{AFmax,2min}$ sample)	Justification for Effect Level:  Exceed threshold guidelines in Table 4 of BS8233:2014 and World Health Organisation (1999) Guidelines on Community Noise by no greater than 5dB to achieve reasonable internal conditions as defined by Note 7 to Table 1 in BS8233:2014  Action Required:  Mitigate and reduce to a minimum the exceedance over the threshold
		Increase in ambient $L_{Aeq,T}$ due to contribution from proposed development of 1.0-2.9dB.	Justification for Effect Level:  Within minor short-term impact classification range in Table 7.14 in IEMA 2014 guidance Guidelines for Environmental Noise Impact Assessment  Action Required:



Magnitude of Impact	Effect Level	Noise Level Criteria	Justification for Effect Level-Action Required
			Additional mitigation required to achieve effect of LOAEL or less.
Medium	Significant Observed Adverse Effect Level (SOAEL)	Difference between Rating Level ( $L_{Ar,T}$ ) dB and existing background sound level $L_{A90,T}$ dB is between 5-9dB, depending on context.	Justification for Effect Level: Within adverse impact threshold in BS4142:2014.  Action Required Additional mitigation required to achieve effect of LOAEL or less.
		Noise levels are between:  Living Rooms: 40-45 $dBL_{Aeq,16hours}$  Kitchens, Dining Rooms, and Studies: 45-50 $dBL_{Aeq,16hours}$  Bedrooms Rooms: 40-45 $dBL_{Aeq,16hours}$  35-40dB $L_{Aeq,8hr}$  45-55dB $L_{AFmax,2min}$ based on 10th highest $L_{AFmax,2min}$ sample)	Justification for Effect Level: Exceeds BS8233:2014 $L_{Aeq,T}$ reasonable criteria by 5dB or exceeds $L_{AFmax,2min}$ (10th highest sample)  Action Required: Additional mitigation required to achieve effect of LOAEL or less.
		Increase in ambient $L_{Aeq,T}$ due to contribution from proposed development of 3.0-4.9dB.	Justification for Effect Level: Within moderate short-term impact classification range in Table 7.14 in IEMA 2014 guidance Guidelines for Environmental Noise Impact Assessment  Action Required: Additional mitigation required to achieve effect of LOAEL or less.
High	Unacceptable Observed Adverse Effect Level (UOAEL)	Difference between Rating Level ( $L_{Ar,T}$ ) dB and existing background sound level $L_{A90,T}$ dB is equal to or greater than 10dB, depending on context.	Justification for Effect Level: Within significant adverse impact threshold in BS4142:2014  Action Required:



Magnitude of Impact	Effect Level	Noise Level Criteria	Justification for Effect Level-Action Required
			Additional mitigation required to achieve effect of LOAEL or less.
		Noise levels exceed: Living Rooms: 45 dBL <sub>Aeq,16hours</sub> Kitchens, Dining Rooms, and Studies: 50 dBL <sub>Aeq,16hours</sub> Bedrooms Rooms: 45 dBL <sub>Aeq,16hours</sub> 40dB L <sub>Aeq,8hr</sub>  L <sub>AFmax,2min</sub> noise levels exceeds 55dB L <sub>AFmax</sub> based on 10th highest L <sub>AFmax,2min</sub> sample)	Justification for Effect Level: Exceeds BS8233:2014 L <sub>Aeq,T</sub> reasonable criteria by 10dB or exceeds L <sub>AFmax,2min</sub> (10th highest sample) by 10dB or more.  Action Required: Additional mitigation required to achieve effect of LOAEL or less.

14.3.20 Whilst the noise descriptors and categories presented in Table 14.6 have been established through reference to relevant guidance documents, there are other factors (predominantly site context in accordance with BS4142:2014) which need to be taken into account when assessing the noise impact.

14.3.21 Therefore, a flexible approach to these categories will be undertaken in the context of how specific impacts associated with the Scheme affect the identified sensitive receptors.

**Sensitivity of Receptors**

14.3.22 The sensitivity of potentially affected receptors will be assessed in line with Table 14.7 below.

**Table 14.7 Receptor Sensitivity**

Sensitivity of Receptor	Definition
High	Residential dwellings, schools and hospitals
Medium	Offices, internal teaching/training spaces
Low	Commercial premises

14.3.23 Based on an initial desk-based study, the closest (and therefore worst case) receptors are residential and are therefore of High sensitivity. As such, providing noise and vibration



effects are not significant at the closest receptor, effects at all other receptors will also be not significant, regardless of sensitivity.

**Significance of Effect**

14.3.24 The sensitivity of the receptor and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects. Table 14.8 summarises guideline criteria for assessing the significance of noise and vibration effects.

**Table 14.8 Significance of Effects Matrix**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/Moderate	Moderate	Neutral
Medium	Major/Moderate	Moderate	Moderate/Minor	Neutral
Low	Moderate	Moderate/Minor	Minor	Neutral
Negligible	Moderate/Minor	Minor	Negligible	Neutral
Neutral	Neutral	Neutral	Neutral	Neutral

14.3.25 Effects predicted to be of major or major/moderate significance are considered to be 'significant' in the context of the EIA. Where a departure from this approach has been taken this will be justified accordingly.

**Mitigation**

14.3.26 During the construction and operation stages of the development embedded mitigation in the form of Outline Construction Environmental Management Plans (OCEMP) and Operational Environmental Management Plans (OEMP) will be used.

**14.4 Assessment of Cumulative Effects and In-Combination Effects**

14.4.1 The assessment will identify any other Solar or Battery Energy Storage System (BESS) developments, or any other significant developments, either operational, consented or currently in planning which have the potential to result in cumulative effects; i.e., where the Study Area for the other development overlaps with the Study Areas for the Development. Where required, the potential cumulative noise effects will be assessed according to the assessment criteria, which will be developed with statutory consultees. Any identified cumulative effects will be considered in the Cumulative Effects chapter of the ES and In-combination effects will be addressed within the Noise and Vibration chapter of the ES.

**14.5 Conclusions on Scoping**

**Scoped In**

14.5.1 The aspects described in Table 14.9 below are proposed to be scoped in the assessment.

**Table 14.9 Matters to be Scoped in the Assessment**

Effects	Justification
Vibration from construction	Construction activities within the Scheme have the potential to generate likely significant vibration effects of a temporary nature at nearby sensitive receptors, dependent on the precise



Effects	Justification
	<p>nature and location of the construction work required. Activities that may cause vibration include piling of solar panel mounting structures, compaction of tracks/hard standing area and excavating trenches for cable routing.</p> <p>As such, the effects of construction vibration are proposed to be scoped into the detailed assessment.</p>
Noise from construction	<p>Construction activities within the Scheme have the potential to generate likely significant noise effects of a temporary nature at nearby sensitive receptors. As such, the effects of noise generated during construction activities are proposed to be scoped into the detailed assessment.</p>
Noise from construction traffic	<p>Traffic movements to and from the Scheme during the construction phase have the potential to result in likely significant effects of a temporary nature at sensitive receptors, depending on the proximity of construction traffic routes to receptors and the volume of vehicle movements required during construction. Consequently, the likely effects of construction traffic noise will be scoped into the detailed assessment.</p>
Operational noise	<p>Whilst the solar PV arrays are not a noise emission source when in operation, there is the potential for adverse noise impacts to be generated by ancillary equipment such as substations and battery storage equipment. The effect of operational noise from the Scheme is proposed to be scoped into the detailed assessment.</p>

14.5.2 The aspects described In Table 14.10 below are proposed to be scoped out of the assessment.

**Table 14.10 Matters to be Scoped Out of the Assessment**

Effects	Justification
Vibration from operation	<p>Solar PV arrays do not make use of any plant or equipment that generates significant vibration levels during operation. As such, vibration from the operation of plant and equipment within</p>





Effects	Justification
	the Scheme is proposed to be scoped out of the detailed assessment.
Operational traffic	It is anticipated that only minimal numbers of road traffic movements would be generated by the Scheme once it is in operation. The volume of traffic associated with the replacement of panels and batteries will not make a material difference to noise impact. As such, it is proposed that noise and vibration from operational road traffic are scoped out of the detailed assessment.

## 14.6 References

- Ref.1 British Standards Institute (BSI). (2003). BS 7445:2003. Description and Measurement of Environmental Noise. United Kingdom.
- Ref.2 British Standards Institute (BSI). (2009). BS 5228-1:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. United Kingdom.
- Ref.3 British Standards Institute (BSI). (2009). BS 5228-2:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration. United Kingdom.
- Ref.4 British Standards Institute (BSI). (2014). BS 4142:2014+A1:2019. 'Method for Rating Industrial and Commercial Sound'. United Kingdom.
- Ref.5 British Standards Institute (BSI). (2014). BS 8233:2014. 'Guidance on Sound Insulation and Noise Reduction for Buildings'. United Kingdom.
- Ref.6 Department for Communities and Local Government (DCLG). (2012). National Planning Policy Framework. United Kingdom.
- Ref.7 Department for the Communities and Local Government (DCLG). (2014). National Planning Practice Guidance. United Kingdom.
- Ref.8 Institute of Environmental Management & Assessment (IEMA). (2014). Guidelines for Environmental Noise Impact Assessment. United Kingdom.
- Ref.9 World Health Organisation (WHO). (1999). Guidelines for Community Noise.



## 15 Glint and Glare

### 15.1 Introduction

15.1.1 This chapter of the Scoping Report considers the approach to the assessment of likely significant effects of Glint and Glare by the Scheme during its construction, operation and decommissioning phases. The chapter will describe and identify the potential level of effects arising as a result of the Scheme, including prior to and post mitigation, in relation to:

- Aviation
- Roads
- Residential Dwellings
- Rail Infrastructure
- Public Rights of Way (PRoW)
- Horse Facilities

15.1.2 This chapter is supported by the following appendix: **Appendix 15** Glint and Glare Receptor Scoping Assessment.

### 15.2 Legislation, Policy and Guidance

15.2.1 The national planning policy relevant to glint and glare that will be considered when carrying out the assessment is:

15.2.2 The National Policy Statement for Renewable Energy Infrastructure (EN-3) (Ref.1) which sets out the primary policy for decisions by the Secretary of State for nationally significant renewable energy infrastructure, and dictates how glint and glare should be considered within the decision.

15.2.3 The local planning policy that will be considered when carrying out the assessment is:

15.2.4 West Northampton Planning Policy (Ref.2) which sets out the long-term vision and objectives for the whole area covered by the former Daventry District, Northampton Borough, and South Northamptonshire Councils for the plan period up to 2029, including strategic policies for steering and shaping development.

15.2.5 North Northamptonshire Planning Policy (Ref.3) which provides the strategic planning policies for the future development of the area from 2016 to 2031.

15.2.6 Milton Keynes Developing Plan (MK:Plan) (Ref.4) which sets out the vision and framework for the future development of the area from 2015 to 2031.

15.2.7 Other guidance that will be considered within the assessment are:

15.2.8 The National Planning Practice Guidance for 'Renewable and Low Carbon Energy' (Ref.5) which sets out the factors that local planning authorities will need to consider in regard to the deployment of large-scale solar farms.

15.2.9 The UK Highway Code (Ref.6) which states that a road user should be aware of particular hazards such as glare from the sun.

15.2.10 Network Rail Guidance based on Rail Industry Standard (RIS) RIS-0737-CCS (Ref.7) which sets out guidelines which detail reflections and glare, visibility of signals, and train drivers' field of vision.

15.2.11 The Interim Civil Aviation Authority (CAA) - Solar PV Systems sets out recommendations on where glint and glare assessments are necessary as part of the relevant planning application. Beyond these recommendations, no specific methodology or frame of reference are defined for assessing the impact of glint and glare on aviation infrastructure.



- 15.2.12 Combined Aerodrome Safeguarding Team (CAST) Aerodrome Safeguarding Guidance Note (Ref.8) which aims to provide safeguarding advice in relation to solar photovoltaic developments.
- 15.2.13 US Federal Aviation Administration Policy (Ref.9) which sets out the standards for measuring ocular impact, and the appropriate methodology for glint and glare assessments.
- 15.2.14 The British Horse Society Advice on Solar farms near routes used by equestrians (Ref.10) and Advice on Solar Farms (Ref.11) which sets out that potential impact on equestrian businesses should be considered.

### 15.3 Baseline Conditions

#### Receptor Identification

- 15.3.1 NPS EN-3 (para 2.10.158) states that *"Solar PV panels are designed to absorb, not reflect, irradiation. However, the Secretary of State should assess the potential impact of glint and glare on nearby homes, motorists, public rights of way, and aviation infrastructure (including aircraft departure and arrival flight paths)."*
- 15.3.2 It is acknowledged that Network Rail may also raise concerns where a development generates glare towards train drivers or affects railway signals, and equestrians may raise concerns where a development generates glare towards equestrian businesses where horses are kept or trained.
- 15.3.3 The receptor sensitivities and potential magnitude of impact are reviewed within this Scoping Chapter to explain whether significant effects are likely for the above receptors and whether further assessment is required following receptor screening.
- 15.3.4 The main source of irradiance will be the sun, which is a more intense source of light than solar reflections from solar photovoltaic panels. As such, potential glare impacts that coincide with direct sunlight appear less prominent than those that do not. Road users are already aware of safety implications when driving in bright sunlight. Dwellings will experience the most noticeable source of irradiance at sunset and sunrise.
- 15.3.5 Sywell Road Solar Farm is located north of Green Hill C. Cumulative effects are predicted to be theoretically possible in combination with other solar developments that are consented, under construction, or operational, and will therefore be considered cumulatively within the technical impact assessment and Cumulative Effects chapter 23.

#### Initial Surveys

- 15.3.6 No field work or surveys were undertaken as part of this Scoping Report and are not proposed to be undertaken for the Environmental Statement. Where necessary, Google Satellite, Google Street View, and Google Earth imagery are used to provide required evidence.

#### **Potential and Likely Significant Environmental Effects**

- 15.3.7 The following potential effects were identified at the scoping stage for consideration in this assessment:
  - Direct effects during operation from glint and glare on:
    - Aviation
    - Roads (national and regional as defined in para 1.4.7 below)
    - Residential Dwellings
    - Rail Infrastructure
    - PRow
    - Horse Facilities



- There are no indirect effects during operation from glint and glare.

15.3.8 As not all of the proposed panels will be present simultaneously during the construction or decommissioning phase, it is considered that the length and intensity of any glare will be less than or equal to the operational phase. The worst-case scenario for glint and glare effects is therefore the operational phase.

## 15.4 Assessment Methodology

15.4.1 In general, light-sensitive receptors with view of a solar PV development have potential to experience solar panel glare. There are no technical distance limits/thresholds reported within which glare is possible for such receptors. However, the potential or significance of a reflection decreases with distance. This is due to an observer's decreasing field of vision capability with increasing distance, as well as possible obstructions such as shielding caused by terrain and vegetation.

15.4.2 In the absence of UK government guidance, industry good practice published by Glint & Glare Assessors (Ref.12) states that a 1km buffer is appropriate for assessing glint and glare effects on local dwellings, road users, PRoWs, and equestrian receptors. A distance of 500m is commonly used for railway operations and infrastructure. Updated Civil Aviation Authority guidance states that 5km is the screening distance of choice although aerodromes could be considered out to 10km.

15.4.3 An initial judgement may be made based on review of aerial mapping or photography. Where it is clear no line of sight is possible, receptors are excluded from further assessment. Where line of sight is possible, a more detailed assessment is undertaken using modelling software to determine if glare is geometrically possible.

15.4.4 It should be noted that early baseline conditions for Green Hill A.2, the potential extension of Green Hill A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purpose of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Green Hill A baseline will be identified, and will be present in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

15.4.5 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

### Assessment Process

15.4.6 The following methodology for glint and glare assessments is derived from good practice considerations whilst incorporating relevant guidance undertaken for this assessment:

15.4.7 Light-sensitive receptors will be identified in the area surrounding the Scheme.

15.4.8 The visibility of the panels from the identified receptors will be considered. If the panels are not visible from the receptor, then no glare can occur.

15.4.9 Solar panel glare from the Sites towards the identified receptors will be considered by undertaking geometric modelling calculations.

15.4.10 Where solar glare is predicted, factors such as the duration, time of day and, for aviation receptors, the glare intensity will be considered to determine the magnitude of impact.

15.4.11 Mitigating factors will also be considered e.g. glare coinciding with direct sunlight to determine the magnitude of impact.

15.4.12 Determination will be made whether a significant impact is likely.



**Assessment of Sensitivity**

15.4.13 The sensitivity of receptors can be defined as below in Table 15.1:

**Table 15.1 Table of Sensitivity**

Sensitivity	Definition	Receptors
High	The receptor of resource has little ability to absorb the change without fundamentally altering its present character or it is of international or national importance.	None
Medium	The receptor or resource has moderate capacity to absorb the change without significantly altering its present character or is of high and more than local importance.	Aviation Receptors (Air Traffic Control Tower and Approach Paths), Railway Receptors (Train Drivers and Railway Signals), Roads (excluding local roads), Residential Dwellings.
Low	The receptor or resource is tolerant of change without detrimental effect, is of low or local importance.	Local Roads, Horse Facilities, and Public Rights of Way.
Negligible	The receptor or resource is not affected by glare.	All others not mentioned above.

**Dwellings**

15.4.14 The sensitivity of dwellings is categorised as ‘Medium’ sensitivity because the receptor has moderate capacity to absorb change without significantly altering its present character.

**Roads**

15.4.15 Roads are generally categorised according to the road type, which is defined by the number of carriageways, speed and traffic density:

- Major National – fast-moving vehicles (up to 70 mph) on busy roads with a minimum of two carriageways.
- National – fast-moving vehicles (up to 60 or 70 mph) on moderately to busy roads with one or more carriageways.
- Regional – fast-moving vehicles (up to 60 mph) on low to moderately busy roads comprising single carriageways.
- Local – variable speed vehicles on less busy roads.

15.4.16 Major National, National and Regional roads are considered to be of ‘Medium’ sensitivity due to having higher traffic than local roads. As such, the receptor has moderate capacity to absorb change without significantly altering its present character. Local roads are considered to be of ‘Low’ sensitivity due to traffic volumes predicted to be low. As such, the receptor is tolerant to change without detriment to its character.



### **Aviation**

15.4.17 The sensitivity of aviation receptors is categorised as 'Medium' due to the receptor having moderate capacity to absorb change without significantly altering its present character.

### **Railway Infrastructure**

15.4.18 The sensitivity of railway infrastructure receptors is categorised as 'Medium' due to the receptor having moderate capacity to absorb change without significantly altering its present character.

### **PRoW**

15.4.19 The sensitivity of PRoW is categorised as 'Low' because the receptor is tolerant to change without detrimental effect and are of local importance. Other reasons for this include:

- The typical density of users on a PRoW is low in a rural environment;
- Relative to other receptor types, there is less risk to safety. For example, solar glare toward a road network can be much more serious to safety, owing to the higher travel speeds and higher density of users;

15.4.20 Receptors on a PRoW are transient, and time and location sensitive, whereby a PRoW user could move beyond the solar reflection zone with ease with little impact upon safety or amenity.

### **Assessment of Magnitude of Impact**

15.4.21 The magnitude of impact is determined using different factors dependent on the type of receptor being assessed, as shown below. While there is no specific guidance on glint and glare impact magnitude evaluation or limits, the adopted approach is in line with industry best practice.

### **Horse Facilities**

15.4.22 The sensitivity of Horse Facilities (defined as equestrian businesses where horses are kept or trained) is categorised as 'Low' because the receptor is tolerant to change without a detrimental effect and are of local importance. Other reasons for this include:

15.4.23 The typical density of users at a Horse Facility is low;

15.4.24 Relative to other receptor types, there is less risk to safety. For example, a solar glare toward a road network can be much more serious to safety, owing to the higher travel speeds and higher density of users;

15.4.25 Receptors at a Horse Facility are transient, and time and location sensitive, whereby a horse rider could move beyond the solar reflection zone with ease with little impact upon safety or amenity.

15.4.26 The magnitude of impact is determined using different factors dependent on the type of receptor being assessed, as shown below. While there is no specific guidance on glint and glare impact magnitude evaluation or limits, the adopted approach is in line with industry best practice.

### **Dwellings**

15.4.27 The magnitude of glare impact upon dwelling receptors is predominantly dependent on the following factors:

- Distance between the panel area and the receptor (1 km screening distance applied).
- Whether glare is geometrically possible.



- The daily and annual duration of the predicted impact, compared to thresholds of one hour per day and three months per year.
- 15.4.28 Where glare is not predicted to be experienced at a dwelling observation point or is not geometrically possible, a 'Negligible' magnitude impact would occur.
- 15.4.29 Where glare is predicted to be experienced for less than one hour per day and less than three months per year at a dwelling observation point, a 'Low magnitude impact is designated. 'Low / Minor' impacts may also be determined following consideration of mitigating factors such as:
- Separation distance from panel area to dwelling observation point – the proportion of an observer's field of view that is affected by glare reduces with increased separation distance.
  - The sun's position relative to the panel area – Effects that coincide with direct sunlight appear less prominent than those that do not as the sun is a far more significant source of light than reflecting panels. This factor is important at sunset and sunrise where the sun is lowest in the sky.
  - The extent to which cloud cover and glare impacts coincide – cloud cover varies across a year with overcast or mostly cloudy conditions ranging from 51-79% of the year across the UK. This is of particular significance for interpretation of annual glare duration results, derived from models which assume clear, sunny skies all year-round.
  - The location of the main living space within the dwelling – ground floor rooms are typically the most occupied part of residential dwelling during daylight hours and these have a greater amenity significance than upper floors.
  - Dwelling windows facing the solar arrays – where there are no windows facing the solar arrays, the impact magnitude reduces.
- 15.4.30 Where unmitigated glare is predicted to occur for more than one hour per day or more than three months per year, a 'Medium' magnitude impact is designated.
- 15.4.31 Where unmitigated glare is predicted to occur for more than one hour per day and more than three months per year, a 'High' magnitude impact is designated.

**Roads**

- 15.4.32 The magnitude of impact upon road user receptors is predominantly dependent on the following factors:
- Distance between the solar arrays and the receptor (1 km screening distance applied).
  - Whether glare is geometrically possible.
  - Whether glare is within the main field of view of a road vehicle driver travelling along a road – glare within the main field of view of a driver is considered to be more hazardous than glare outside this range.
- 15.4.33 Where glare is not predicted toward a road vehicle driver or is not geometrically possible, a 'Negligible' magnitude impact would occur.
- 15.4.34 Where glare is predicted but it is outside a road vehicle driver's main field of view, 'Low' magnitude impact is designated.
- 15.4.35 Where glare is predicted within a road vehicle driver's main field of view, 'Medium' magnitude impact may be determined following consideration of mitigating factors such as:



- Separation distance from solar array to road vehicle driver observation point – the proportion of an observer’s field of view that is affected by glare reduces with increased separation distance.
- The sun's position relative to the solar array – Effects that coincide with direct sunlight appear less prominent than those that do not as the Sun is a far more significant source of light than reflecting panels. This factor is important at sunset and sunrise where the sun is lowest in the sky.

15.4.36 Where glare is predicted within a road vehicle driver's main field of view and there are no mitigating factors, the magnitude of impact is 'High'.

#### **Aviation**

##### *Air Traffic Control (ATC) Tower*

15.4.37 The magnitude of glare impact toward ATC Tower personnel is dependent on the following factors:

- Whether glare is geometrically possible.
- Location of origin of the solar panel glare relative to the ATC Tower – glare predicted outside the ATC personnel's view of the aerodrome key operational areas (runway threshold) is mitigated.
- Separation distance from the solar array to ATC Tower – the proportion of an observer’s field of view that is affected by glare reduces with increased separation distance.
- The predicted intensity of the solar panel glare.
- Solar panel glare duration per day.
- Number of days solar panel glare is geometrically possible per year.
- The time of day when solar panel glare is geometrically possible.

15.4.38 Where glare is not predicted toward an ATC Tower personnel or is not geometrically possible, a 'Negligible' magnitude impact would occur.

15.4.39 Where glare is predicted toward an ATC Tower personnel but there are sufficient mitigating factors or the aerodrome confirms the glare is acceptable, a 'Low' magnitude impact is designated.

15.4.40 Where glare is predicted toward an ATC Tower personnel that would occasionally and marginally affect aerodrome safeguarding operations, a 'Medium' magnitude impact is designated.

15.4.41 Where glare is predicted toward an ATC Tower personnel that would regularly and substantially affect aerodrome safeguarding operations, a 'High' magnitude is designated.

##### *Approach Paths*

15.4.42 The magnitude of impact upon aircraft pilots on approach to a runway (termed "approach paths") is dependent on the following main factors:

- Whether glare is geometrically possible.
- The relative position and visibility of the reflecting panels relative to final approach path and whether the glare is within the main field of view of the pilots.
- The extent to which impacts coincide with effects of direct sunlight. Effects that coincide with direct sunlight appear less prominent than those that do not as the sun is a far more significant source of light than reflecting panels.





- Reflectors in the existing environment. Where there are existing reflective surfaces in the surrounding environment, solar panel glare is less noticeable for pilots.
- Solar panel glare duration per day.
- Number of days a solar panel glare is geometrically possible per year.
- The time of day when solar panel glare is possible.
- The length of the section of the final approach that is potentially affected by glare.
- Where glare is not predicted toward approach paths or is not geometrically possible, a 'Negligible' magnitude impact would occur.
- Under the following scenarios, 'Low magnitude impact may be designated:
  - Glare is predicted but it is outside a pilot's main field of view.
  - Glare has a "low potential for temporary after-image" (green glare).
  - Glare has a "potential for temporary after-image" (yellow glare) with sufficient mitigating factors.

15.4.43 Aerodrome has confirmed the level of glare is acceptable.

15.4.44 Where unmitigated glare with 'potential for temporary after-image' (yellow glare) is predicted to occur without sufficient mitigating factors, a 'Medium' magnitude impact is designated.

15.4.45 Where unmitigated glare with 'potential for permanent eye damage' (red glare) is predicted to occur without sufficient mitigating factors, a 'High' magnitude impact is designated.

#### **Railway Infrastructure**

15.4.46 The magnitude of impact upon train driver receptors is predominantly dependent on the following factors:

- Whether glare is geometrically possible.
- Whether glare is within the main field of view of a driver – glare within the main field of view of a train driver is considered to be more hazardous than glare outside this range.
- The estimated driver workload at the section of track where glare is predicted – where there is important rail infrastructure (e.g. railway station or railway signal), the potential impact may be more hazardous.

15.4.47 Where glare is not predicted toward a train driver or is not geometrically possible, a 'Negligible' magnitude impact would occur.

15.4.48 Where glare is predicted but it is outside a train driver's main field of view, 'Low magnitude impact is designated. 'Low / Minor' impacts may also be determined following consideration of mitigating factors such as:

- Separation distance from panel area to rail driver observation point – the proportion of an observer's field of view that is affected by glare reduces with increased separation distance.
- The sun's position relative to the panel area – Effects that coincide with direct sunlight appear less prominent than those that do not as the sun is a far more significant source of light than reflecting panels.

15.4.49 Where unmitigated glare is predicted to occur within a train driver's field of view on a section of track where there is no other important rail infrastructure (e.g. railway station or railway signal), a 'Medium' magnitude impact is designated.



15.4.50 Where unmitigated glare is predicted to occur within a train driver’s field of view on a section of track and there is other important rail infrastructure (e.g. railway station or railway signal), a 'High' magnitude impact is designated.

**PRoW**

15.4.51 With regard to the maximum magnitude of impact, this is considered to be 'Low' for PRoW because:

15.4.52 Impacts that coincide with direct sunlight appear less prominent than those that do not as the sun is a far more significant source of light than reflecting panels.

15.4.53 The reflection intensity for solar panels is similar to common outdoor sources of solar reflection (e.g. still water). Therefore, solar panel glare is likely to be comparable to that from common outdoor sources whilst navigating the natural and built environment on a regular basis.

**Horses Facilities**

15.4.54 With regard to the maximum magnitude of impact, this is considered to be 'Low' for Horse Facilities because:

15.4.55 Impacts that coincide with direct sunlight appear less prominent than those that do not as the sun is a far more significant source of light than reflecting panels.

15.4.56 The reflection intensity for solar panels is similar to common outdoor sources of solar reflection (e.g. still water). Therefore, solar panel glare is likely to be comparable to that from common outdoor sources whilst navigating the natural and built environment on a regular basis.

**Significance of Impact**

15.4.57 The significance of any environmental effects is determined by the combination of the magnitude of any impacts and the sensitivity of the receptor, as seen below in Table 15.2. Effects deemed as moderate or greater are deemed to be "significant effects" in EIA terms.

**Table 15.2 Significance of Impact**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major	Moderate	Major
Medium	Major	Moderate	Moderate	Major
Low	Moderate	Minor	Minor	Moderate
Negligible	Negligible	Negligible	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

**Receptor Screening for Modelling**

15.4.58 Screening distances derived from industry good practice (Ref.12) were applied to identify light-sensitive receptors potentially affected by the Scheme:

- Residential dwellings within 1km of the proposed solar arrays.
- National and regional roads within 1km of the proposed solar arrays.
- Rail infrastructure (sections of railway line and identified railway signals) within 500m of the proposed solar arrays.



- Aviation within 10km of the proposed solar arrays.
- Horse Facilities within 1km of the proposed solar arrays.

### **Dwellings**

15.4.59 As per best practice guidance and recommendations (Ref.12), residential dwellings were identified within the 1km screening distance of the Sites through a review of mapping and aerial photography of the region as per the Glint and Glare EIA Scoping Chapter **Appendix 15**. It is expected that outside 1km, the potential or significance of a reflection decreases. This is due to an observer's decreasing field of vision capability with increasing distance, as well as possible obstructions such as shielding caused by terrain and vegetation.

### **Roads**

15.4.60 As above, Major National, National and Regional roads are predicted to have higher level of traffic compared to local roads and have higher sensitivity. Therefore, these roads are taken forwards for the technical modelling.

15.4.61 As per the Glint and Glare EIA Scoping Chapter **Appendix 15**, road infrastructure was identified within the screening distance of Green Hill B, Green Hill E, and Green Hill F:

- Kettering Road (A43) (national road) was identified within the screening distance of Green Hill B. A high-level review indicated that there is no line of sight between road users on the A43 and the proposed panels. As such, road receptors will be discussed qualitatively within the assessment but not included within the technical modelling.
- The A4500 (national road) and B573 (regional road) were identified within the screening distance of Green Hill E. A high-level review indicated that there is no line of sight between road users on the A509 and the proposed panels. As such, the A509 will be discussed qualitatively within the assessment but not included within the technical modelling. A high-level review indicated that there is a potential line of sight from A4500 and B573 road users and the proposed panels such that these roads will require technical modelling.
- The A509 (national road) was identified within the screening distance of Green Hill F. A high-level review indicated that there is a potential line of sight from A509 road users and the proposed panels such that it will require technical modelling.
- The A428 and the A509 (national roads) were identified within the screening distance of Green Hill G. A high-level review indicated that there is a potential line of sight from road users along the A428 and A509 and the proposed panels such that it will require technical modelling.

15.4.62 In accordance with good practice guidance (Ref.12), technical modelling is not recommended for local roads, where traffic densities are likely to be relatively low. Any solar reflections from the Scheme that are experienced by a road user along a local road would be considered 'Low' impact magnitude.

15.4.63 Given the 'Low' sensitivity of local road users and the maximum corresponding 'Low' impact magnitude, it is not considered possible to have significant glint and glare impacts upon local road users. Technical modelling is not proposed for local road users on this basis.

### **Aviation**

15.4.64 As per the Glint and Glare EIA Scoping Chapter **Appendix 15** aviation receptors were identified within the screening distances of the Sites. At each aviation receptor, approach paths and (if present) Air Traffic Control Tower are assessed. The list below sets out which of the identified receptors will require technical modelling and which will be discussed qualitatively within the assessments for each of the Sites:



- Green Hill A:
  - Hold Farm Airstrip, Pitsford Airstrip and William Pitt Airstrip were identified within 5km and will require technical modelling.
  - Sywell Aerodrome, Rothwell Airstrip and Wold Lodge Airstrip were identified within 10km and as such will be discussed qualitatively within the assessment but not included within the technical modelling for Green Hill A.
- Green Hill B:
  - Pitsford Airstrip, Sywell Aerodrome, William Pitt Airstrip and Hold Farm Airstrip were identified within 5km and will require modelling.
  - No additional aviation receptors were identified within 10km of Green Hill B.
- Green Hill C:
  - Sywell Aerodrome, William Pitt Airstrip and Hold Farm Airstrip were identified within 5km and will require technical modelling.
  - Pitsford Airstrip and Tower Farm Airstrip were identified within 10km and as such will be discussed qualitatively within the assessment but not included within the technical modelling for Green Hill C.
- Green Hill D:
  - Sywell Aerodrome, William Pitt Airstrip and Hold Farm Airstrip were identified within 5km and will require technical modelling.
  - Pitsford Airstrip, Tower Farm Airstrip and Easton Maudit were identified within 10km and as such will be discussed qualitatively within the report but not included within the technical modelling for Green Hill D.
- Green Hill E:
  - Sywell Aerodrome, William Pitt Airstrip, and Hold Farm Airstrip were identified within 5km and will require technical modelling.
  - Pitsford Airstrip, Tower Farm Airstrip and Easton Maudit Airstrip were identified within 10km and as such will be discussed qualitatively within the assessment but not included within the technical modelling for Green Hill E.
- Green Hill F:
  - Easton Maudit Airstrip and Tower Farm Airstrip were identified within 5km and will require technical modelling.
  - New Farm Airfield, William Pitt Airstrip and Sywell Aerodrome were identified within 10km and as such will be discussed qualitatively within the assessment but not included within the technical modelling for Green Hill F.
- Green Hill G:
  - Easton Maudit Airstrip was identified within 5km and will require technical modelling.
  - New Farm Airstrip, Tower Farm Airstrip and Top Farm Airstrip were identified within 10km and as such will be discussed qualitatively within the assessment but not included within the technical modelling of Green Hill G.

### **Railway Infrastructure**

15.4.65 As per the Glint and Glare EIA Scoping Chapter **Appendix 15**, no rail infrastructure was identified within the screening distance of any of the Sites. Assessment of railway infrastructure is scoped out on this basis.



### **PRoW**

- 15.4.66 Given the 'Low' sensitivity of PRoW users and the maximum corresponding 'Low' impact magnitude, it is not considered possible to have significant glint and glare impacts upon PRoW users. Technical glare modelling is not proposed for PRoW users on this basis.

### **Horse Facilities**

- 15.4.67 Given the 'Low' sensitivity of Horse Facilities and the maximum corresponding 'Low' impact magnitude, it is not considered possible to have significant glint and glare impacts upon equestrian businesses where horses are kept or trained. Technical glare modelling is not proposed for Horse Facilities users on this basis.

### **Mitigation**

- 15.4.68 Where glare impacts are predicted toward ground-based receptors (ATC Tower, residential dwellings and road infrastructure), these can likely be solved with relatively simple mitigation strategies – the most common being the provision of screening at the site perimeter to obstruct views of potentially reflecting panels. Where views of reflecting panels are obstructed, no effects can be experienced. Other solutions such as layout modification can be considered but are rarely required in practice.
- 15.4.69 Where 'Medium Adverse' effects are predicted toward approach paths, mitigation may be requested by the relevant safeguarding authority. Whilst formal guidance within the UK for quantifying impacts is sparse, the industry standard is to evaluate effects on aviation receptors based on their intensity (specifically the potential for a temporary after-image following publication of a methodology by Sandia Laboratories in the USA) as well as their duration and operational sensitivity. A variety of mitigation measures are available including layout and, for tracking panels, the operation of the tracking system.

### **Cumulative and In-Combination Effects**

#### **Predicted Cumulative Effects during Construction and Operation**

- 15.4.70 Cumulative effects may occur where other developments are proposed within screening distances set out here. Developments which could contribute to cumulative effects will be identified and agreed with relevant stakeholders. Cumulative effects will be addressed within the Cumulative Effects Chapter 23.

#### **In-combination Effects**

- 15.4.71 Potential in-combination effects (i.e. glint and glare effects combined with other effects and/or from combined phases of work on the Scheme) will be considered and described. The Glint and Glare Chapter 15 will assess if there is potential for in-combination effects or not. Where in-combination effects are identified, these will be addressed in the Glint and Glare Chapter 15.

## **15.5 Conclusions on Scoping**

- 15.5.1 Based on the initial scoping work herein, it is proposed that rail receptors, PRoWs and Horse Facilities are scoped out of the Environmental Statement. Additionally, it is proposed that the construction and decommissioning phases of the project are scoped out as operational effects represent the worst case scenario. With regard to road users, dwellings and aviation receptors the Scheme has the potential to have a 'Moderate Adverse' degree of significance if unmitigated. This is based on the worst-case assumption of 'Medium / Moderate' magnitude impact and 'Medium' receptor sensitivity (residential dwellings, road receptors, and aviation receptors). Mitigation to remove all impacts may not be fully possible through design, therefore glint and glare modelling assessment will be scoped into the Environmental Statement. Potential impacts on PRoW receptors and Horse Facilities will also be assessed qualitatively, however given the 'Low' sensitivity of PRoW users and Horse Facilities, and the maximum corresponding 'Low' impact magnitude, it is not considered possible to have significant glint and glare



impacts upon PRow users and Horse Facilities. As such, PRowS and Horse Facilities are scoped out of the Environmental Statement.

**Table 15.3 - Receptors Scoped In**

Receptor	Justification
Dwellings	The Scheme has the potential to have 'Moderate Adverse' degree of significance against dwellings if left unmitigated.
Road Infrastructure	The Scheme has the potential to have a 'Moderate Adverse' degree of significance against road users if left unmitigated.
Aviation Infrastructure	The Scheme has the potential to have a 'Moderate Adverse' degree of significance against aviation infrastructure if left unmitigated.

**Table 15.4 - Receptors Scoped out**

Receptor	Justification
Construction and Decommissioning Phases.	As not all of the proposed panels will be present simultaneously during the construction or decommission phase, it is considered that the length and intensity of any glare will be less than or equal to the operational phase. The worst-case scenario for glint and glare effects is therefore the operational phase.
Rail Infrastructure	No rail infrastructure identified within the 500m screening distance of the Scheme.
PRowS	Given the 'Low' sensitivity of PRow users and the maximum corresponding 'Low' impact magnitude, it is not considered possible to have significant glint and glare impacts upon PRow users.
Horse Facilities	Given the 'Low' sensitivity of Horse Facilities and the maximum corresponding 'Low' impact magnitude, it is not considered possible have significant glint and glare impacts upon Horse Facilities.



## 15.6 References

- Ref.1 <https://assets.publishing.service.gov.uk/media/655dc352d03a8d001207fe37/nps-renewable-energy-infrastructure-en3.pdf>
- Ref.2 West Northamptonshire Joint Core Strategy Local Plan (Part 1) | West Northamptonshire Council ([westnorthants.gov.uk](http://westnorthants.gov.uk)) (Dec 2014)
- Ref.3 North Northamptonshire Local Plan | North Northamptonshire Council ([northnorthants.gov.uk](http://northnorthants.gov.uk)) (July 2016)
- Ref.4 Plan:MK | Milton Keynes City Council ([milton-keynes.gov.uk](http://milton-keynes.gov.uk)) (March 2019)
- Ref.5 <https://www.gov.uk/guidance/renewable-and-low-carbon-energy>
- Ref.6 The Highway Code - Driving in adverse weather conditions (226 to 237) - Guidance - GOV.UK ([www.gov.uk](http://www.gov.uk))
- Ref.7 Rail Industry Standard for Signal Sighting Assessment Requirements ([rssb.co.uk](http://rssb.co.uk))
- Ref.8 [cast-renewable-energy-developments-solar-july-2023.pdf](#) ([caa.co.uk](http://caa.co.uk))
- Ref.9 Federal Register :: Federal Aviation Administration Policy: Review of Solar Energy System Projects on Federally-Obligated Airports
- Ref.10 <https://wwwprod.bhs.org.uk/media/qthpp3br/solar-0123.pdf>
- Ref.11 Layout 1 ([bhs.org.uk](http://bhs.org.uk))
- Ref.12 [Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf](#) ([pagerpower.com](http://pagerpower.com))



## 16 Electromagnetic Fields

### 16.1 Introduction

16.1.1 This chapter considers the approach to the assessment of likely significant electromagnetic field (EMF) effects created by the Scheme during its construction, operation and decommissioning phases, with particular focus on risk to human health.

16.1.2 EMFs arise from the generation, transmission, distribution and use of electricity. EMFs occur around all electronic infrastructure. In this instance, the most significant EMF sources could be the electrical cables (ranging from 11kV to 400kV) and associated infrastructure which connect the Scheme to the grid.

16.1.3 Additionally, the levels of EMF emitted by the solar panels themselves, given the distance from the identified receptors, are expected to be low in magnitude. These levels are not expected to be more than those emitted by common household appliances. Therefore, EMF emitted by the solar panels are not considered to be harmful to human health.

16.1.4 The chapter will describe and identify the likely significant effects arising as a result of the Scheme.

16.1.5 This chapter considers EMF in relation to the following Scheme infrastructure:

- Underground electrical cables
- Substations, inverters and transformers
- Battery energy storage system (BESS)

16.1.6 This chapter is supported by the following appendix:

- **Appendix 16:** High-Level Electromagnetic Field Assessment – V4

### 16.2 Legislation, Policy and Guidance Section

16.2.1 This Scoping Report has considered the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines published in 1998 (Ref 1), as has the associated technical appendix 'High-Level Electromagnetic Field Assessment – V4' (**Appendix 16**). Assumptions were made regarding the type of infrastructure that is to be implemented, where required.

16.2.2 The reference limits presented within the ICNIRP guidelines have been used when determining recommended setback distance from residential and non-residential properties and other locations where the general public may congregate.

### 16.3 Baseline Conditions

#### The Site and Context

16.3.1 The Scheme will be located on predominantly agricultural land. The Scheme will consist of numerous solar panel areas with varying distances between them. The Scheme will be connected to the grid via underground cables, to be located within a Cable Corridor within the Cable Route Search Area. The route of the Cable Corridor has not yet been determined.

16.3.2 The cables will connect into the electrical infrastructure located at Grendon Substation, as well as proposed BESS to store surplus energy. There are no existing electrical cables, solar panels or other associated electrical infrastructure present within the Sites or Cable Route Search Area which will be used as part of the Scheme.

16.3.3 The focus of the EMF assessment will be primarily within the immediate vicinity of the Scheme's infrastructure, as EMFs decrease significantly with increasing distance from the source.





**Initial Surveys**

16.3.4 No field work/site surveys were undertaken as part of the Scoping Report.

**Likely Significant Environmental Effects**

16.3.5 The following potential effects were identified at the scoping stage for consideration in this assessment:

- Direct effects during construction and operation from EMF on:
  - Local residents
  - People located in non-residential properties
  - The general public on Public on Rights of Way.
- There are no known indirect effects predicted during construction or operation from EMF. This is because EMF produce no physical output meaning there can be no downstream emissions/waste product which could lead to additional effects not already captured within the assessment of direct EMF effects.

16.3.6 Decommissioning the solar scheme poses no risk of EMF generation, and in turn no effects are predicted. Dismantling the scheme and the associated electrical infrastructure eliminates any potential EMF source.

16.3.7 Please refer to Chapter 8: Ecology and Biodiversity for an overview of ecological impacts of EMF.

**16.4 Assessment Methodology**

**Assessment Process**

16.4.1 The proposed Cable Corridor, locations of infrastructure, cable powers, and locations of existing residential properties will be considered. Within the technical appendix, reference calculations will be undertaken to determine whether setback distances are required.

**Assessment of Sensitivity**

16.4.2 The nature or sensitivity of all identified environmental receptors, as well as the magnitude of impact on those receptors will be described as high, medium, low or negligible. This is set out in the context of EMF below.

**Table 16.1: Sensitivity/Importance of the Identified Environmental Receptor**

Sensitivity	Definition
High	A receptor that requires exceptional isolation or shielding from EMFs of any kind
Medium	A receptor that routinely experiences varying EMFs within a regulated range with no adverse impacts
Low	A receptor that is largely unaffected by EMFs of any kind
Negligible	A receptor where there will be no discernible effect and therefore is not considered

16.4.3 The identified environmental receptors are local residents, people located in non-residential properties or the general public on Public on Rights of Way (PRoWs).

16.4.4 Sensitivity and importance: people are of 'Medium' sensitivity because people experience EMFs from a man-made environment all the time, usually subject to commercial limits.



16.4.5 Magnitude of impact: The magnitude of effect upon a person is predominantly dependent on the following factors:

- The predicted EMF level
- The duration a person may be subjected to the EMF
- The person’s setting e.g. a dwelling, office, Public Rights of Way (PRoW) etc.

**Table 16.2: Magnitudes of EMF of varying degrees**

Magnitude	Definition
High	If a person could be subjected to EMF which was above the human health limit with respect to their setting as per ICNIRP guidance
Medium	If a person could be subjected to EMF which was above the reference health limit but below the human health limit with respect to their setting as per ICNIRP guidance e.g. increased exposure limits based on a person’s profession
Low	If a person could be subjected to EMF which was below the reference health limit with respect to their setting as per ICNIRP guidance
Negligible	If no measurable EMF could be experienced by any person

**Significance**

16.4.6 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity. This impact significance matrix is set out below.

**Table 6.3: Impact Significance Matrix**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/Moderate	Moderate	Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Moderate/Minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

16.4.7 Overall, the level of effect would be considered ‘Significant’ if the resultant significance of effect was ‘moderate’ or higher.

**Methodology**

**Receptors**

16.4.8 The detailed plans for the location of the associated electronic infrastructure have not yet been confirmed. However, **Appendix 16** ‘High-Level Electro Magnetic Field Assessment V4’ will determine the level of clearance required, if any, from residential and non-residential properties, as well as the general public on Public on Rights of Way.



### **Infrastructure Type**

- 16.4.9 The analysis will consider the following infrastructure:
- Underground cables (11kV to 400kV high-voltage cables).
  - Infrastructure including:
    - Substations
    - Inverters
    - Transformers
    - BESS

### **Mitigation and Enhancement**

- 16.4.10 The Scheme will be designed in a way that will mitigate any EMF impacts with respect to human health.
- 16.4.11 Mitigating techniques will include minimum setback distances between receptors, if required. These distances can significantly differ based on whether the cable is above ground or below ground, as well as its voltage.
- 16.4.12 There are no overhead cables planned as part of the Scheme. This is material as underground cables significantly reduce the risk of significant EMF impacts upon human health.

### **Cumulative and In-Combination effects**

- 16.4.13 The cumulative effects of the Scheme will be assessed within chapter 23 of the ES, and a methodology is set out within chapter 23 of this Scoping Report.
- 16.4.14 Combined effects are not predicted, but should such effects be identified then they will be assessed within the EMF Chapter 16 of the ES.

## **16.5 Conclusions on Scoping**

- 16.5.1 Based on the findings detailed in the technical appendix, the maximum levels of electromagnetic radiation from the proposed underground cables, where one cable lies within a trench, are predicted to be below ICNIRP reference levels for magnetic fields. However, the electrical design is considering the possibility of up to four high-voltage cables within a single trench along sections of the Cable Corridor. This scenario could potentially result in a cumulative impact on the resultant magnetic field intensity. Since the precise voltages and quantity of cables within the cable trenches are still awaiting confirmation, it cannot yet be confirmed whether the reference limits would be exceeded. Therefore, the impact of electromagnetic fields pertaining to the Cable Corridor will be scoped into the Environmental Statement regarding direct effects of EMF during construction and operation of the scheme. No effects are predicted during decommissioning.
- 16.5.2 Radiation from the substations, transformers and PV inverters will be even less significant than a singular underground cable, as the equipment is typically housed in protective enclosures and the transformers and PV inverters will be CE marked, meaning they should not generate or be affected by electromagnetic disturbance.
- 16.5.3 Additionally, radiation from the substations and BESS will not be significant as they will be at least 100m from any surrounding dwellings and workplaces. For users of PRowS, any radiation effects would likely be minimal and transient, as these are not continually occupied, rather they are moving receptors, as opposed to permanent residential dwellings and workplaces.
- 16.5.4 Consequently, radiation from the BESS, substations, transformers and PV inverters for the Scheme are predicted to have a 'minor' effect, in a worst case scenario, upon all surrounding receptors. Therefore, EMF from the BESS, substations, transformers and PV



inverters will be scoped out of the Environmental Statement, as any potential impact from construction, operation and decommissioning of the scheme will be identified and mitigated through design considerations before the DCO application is submitted.

## **16.6**      **References**

Ref.1      International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines (1998)



## 17 Air Quality

### 17.1 Introduction

17.1.1 This chapter addresses the proposed scope of the Environmental Impact Assessment (EIA) with respect to air quality. It includes a brief summary of air quality specific legislation and policy, air quality baseline conditions and the proposed assessment methodology with reference to relevant guidance. Potential air quality issues that are to be scoped in or out of the assessment are identified. It considers all potentially relevant air quality sensitive receptors within the Study Area including human receptors and ecological sites.

### 17.2 Legislation, Policy and Guidance

#### European Policy and Legislation

17.2.1 The assessment will be undertaken in accordance with, and with reference to, the following legislation:

- Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (Ref.1). This sets legally binding limits for concentrations of specific air pollutants. It merges, consolidates and replaces the majority of previous EU air quality legislation, and incorporates the Fourth Daughter Directive. While the UK has now left the EU, the Air Quality Standards Regulations 2010 (as amended) (Ref.2) which implement the Directive still apply in UK legislation as 'retained EU law'.
- The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (Ref.3). These regulations amend the Air Quality Standards Regulations 2010 to reflect the UK's departure from the EU;
- The Air Quality (England) Regulations 2000 (Ref.4) and the Air Quality (England) (Amendment) Regulations 2002 (Ref.5) set national air quality objective levels for local authorities to meet in England; and
- Part IV of the Environment Act 2021 (Ref.6). The Environment Act 2021 requires the UK Government to produce a national Air Quality Strategy (AQS), which contains standards, objectives and measures for improving ambient air quality. Where the air quality standards are not being met, a local authority is required to designate an Air Quality Management Area (AQMA). This led to the creation of The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 which have set an annual mean concentration target of 10µg/m<sup>3</sup> to be achieved across England by the end of 2040, and a population exposure reduction target of 35% by the end of 2040.
- Environmental Protection Act 1990 (Ref.7). Part III of the Environmental Protection Act 1990 provides legislation around statutory nuisance, which applies to dust.

#### National Planning Policy

17.2.2 The following planning policy, legislation, guidance and standards are of particular relevance to air quality and the proposed Scheme:

- Overarching National Policy Statement for Energy (EN-1) (Ref.8);
- National Policy Statement on Renewable Energy Infrastructure (EN-3) (Ref.9);
- National Planning Policy Statement for Electrical Networks (EN-5) (Ref.10); and
- The National Planning Policy Framework (Ref.11);

17.2.3 The Scheme must be determined in accordance with these NPS, whilst the other national and local planning policy are 'important and relevant' considerations only.



- 17.2.4 The overarching NPS for Energy (EN-1) was designated in January 2024. The policy sets out the overarching national energy policy for delivering major energy infrastructure.
- 17.2.5 The following paragraphs in EN-1 are relevant to air quality and the proposed Scheme:
- *'5.2.8 Where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the Environmental Statement (ES)';*
  - *'5.2.9 The ES should describe:*
    - *any significant emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;*
    - *the predicted absolute emission levels of the proposed project, after mitigation methods have been applied;*
    - *Existing air quality levels and the relative change in air quality from existing levels; and*
    - *any potential eutrophication impacts.'*
  - *'5.2.9 Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts.'*
  - *'5.2.10 Where a proposed development is likely to lead to a breach of the air quality thresholds or affect the ability of a non-compliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan at the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those thresholds are not breached.'*
- 17.2.6 EN-1 states that air quality considerations should be given substantial weight where a project would lead to a deterioration in air quality in an area or lead to a new area where air quality breaches any national air quality limits (see EN-1 paragraph 5.2.16).
- 17.2.7 Where substantial changes in air quality levels are expected, even if this does not lead to any breaches of national air quality limits, air quality considerations will also be important. Any relevant statutory air quality limits must be taken account of in all cases. Additionally, where a project is likely to lead to a break of such limits, appropriate mitigation measures should be secured (paragraphs 5.2.7 and 5.2.12).
- 17.2.8 EN-3 applies to solar developments and therefore relevant to the Scheme. EN-3 does not reference any specific requirements regarding air quality, in respect of solar developments.
- 17.2.9 EN-5 was designated in January 2024. EN-5 principally covers above-ground electricity lines of 132kv and above. EN-5 does not specifically reference requirements regarding air quality.

#### **National Planning Policy Framework**

- 17.2.10 The revised National Planning Policy Framework (NPPF) published in 2023 sets out the Government's planning policies for England and how these are expected to be applied. Paragraph 186 considers impacts of developments on air quality:
- 'Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel*



*management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.'*

17.2.11 The NPPF therefore requires:

1. Consideration of the Proposed Scheme air quality impacts on the UK's ability to comply with the Air Quality Directive.
2. Consideration of Proposed Scheme air quality impacts on national objectives for pollutants.

17.2.12 However, the NPPF does not provide guidance on how to come to a judgement on sustaining compliance with the Air Quality Directive.

### Local Planning Policy

#### **North Northamptonshire**

##### Joint Core Strategy 2011-2031

17.2.13 In the North Northamptonshire Joint Core Strategy 2011 – 2031 (Ref.12), adopted June 2016, the following strategic policies relate to air quality and are therefore potentially relevant to the proposed development:

- Policy 4 – Biodiversity and Geodiversity – 'A net gain in biodiversity will be sought and features of geological interest will be protected and enhanced through: ... A) iii. Protecting the natural environment from adverse effects from noise, air and light pollution...'
- Policy 8 – North Northamptonshire Place Shaping Principles – 'Development Should: e) Ensure quality of life and safer and healthier communities by: ... ii. Preventing both new and existing development from contributing to or being adversely affected by unacceptable levels of soil, air, light, water or noise pollution or land instability...'

#### **West Northamptonshire**

##### Local Plan

17.2.14 In the West Northamptonshire Joint Core Strategy Local Plan (Part 1) (Ref.13), the following strategic policies relate to air quality and are therefore relevant to the proposed development:

- Policy S10 – Sustainable Development Principles – '*Development will: ... k) Minimise pollution from noise, air and run off.*'
- Policy BN9 – Planning for Pollution Control – '*Proposals for new development which are likely to cause pollution or likely to result in exposure to sources of pollution or risks to safety will need to demonstrate that they provide opportunities to minimise and where possible reduce pollution issues that are a barrier to achieving sustainable development and healthy communities including: ... a) Maintaining and improving air quality, particularly in poor air quality areas, in accordance with national air quality standards and best practice ...*'
- In the West Northampton Local Plan Part 2 2011 – 2029 (Ref.14), the following strategic policies relate to air quality and are therefore relevant to the proposed development:
- Policy Q3 - Carbon reduction, community energy networks, sustainable design and construction, and water use – '*A: Applications for major development, including redevelopment of existing floorspace, must include a Sustainability Statement*



*submitted with their planning application, setting out their approach to the following issues: ... vi. How the proposals meet all other policies in this plan that relate to sustainability including: ... b. Land, water noise and air pollution ...'*

- Policy Q4 – Health and wellbeing – *'A: The health and wellbeing of communities will be maintained and improved by requiring major development to demonstrate, through an appropriate health impact assessment, that it will contribute to creating an age friendly, healthy and equitable living environment through: ... iii. Preventing negative impacts on residential amenity and wider public safety from noise, ground instability, ground and water contamination, vibration and air quality ...'*
- Policy MO3 – Transport schemes and mitigation – *'D. Transport schemes which provide an element of environmental protection will be prioritised. In some cases, it may be necessary to have regard to mitigation measures in line with table 10 of the Northampton Low Emission Strategy 2017 (or the appropriate part of a successor document) namely: i. Implementation and operation of Clean Air Zones (CAZ) or Low Emission Zone...'*

### **Milton Keynes City Council**

#### Development Plan

17.2.15 In the Milton Keynes Council Plan:MK 2016 - 2031 (Ref.15) the following strategic policies relate to air quality and are therefore relevant to the proposed development:

- Policy EH7 - Promoting Healthy Communities - *'Milton Keynes Council is committed to reducing health inequalities, increasing life expectancy and improving quality of life of the Borough. Proposals should be designed to achieve the aspirations below: ... 5. Seeking to improve air quality and reduce noise by locating and designing pollution generating land uses and roads to avoid adverse impacts on sensitive land uses and securing necessary mitigation measures to make development acceptable'*
- Policy NE6 - Environmental Pollution, Air Quality:
  - *'D. Prevailing air quality and potential impacts upon air quality arising from airborne emissions, dust and odour associated with the construction and operation of a proposal (including vehicular traffic) will be considered when determining planning applications. Proposals that would result in or be subject to unacceptable risk to human health and the natural environment from air pollution, or would prejudice compliance with national air quality objectives, will be refused.'*
  - *'E. An Air Quality Assessment that demonstrates how prevailing air quality and potential Impacts upon air quality have been considered, and how air quality will be kept to an acceptable standard through avoidance and mitigation, will be required for major and minor development proposals If any of the following apply:*
    1. *The development is likely, due to the nature of the proposal, and through in-combination effects, to give rise to significant air pollution;*
    2. *The site is within an Air Quality Management Area;*
    3. *The site is within 50 metres of a major road or heavily trafficked route;*
    4. *The site is within proximity to a source of air pollution which could present a significant risk to human health; and/or*
    5. *The type of development would mean its occupiers would be particularly sensitive to air pollution, such as schools, health care establishments or housing for older people.*





- *The potential impact of proposals upon odour levels, or their sensitivity to prevailing sources and levels of odour, should be considered and addressed. Where appropriate, the Council will require an Odour Impact Assessment to be provided, including an Odour Management Plan where necessary.*
- Policy SC1 - Sustainable Construction - '*... D. Prioritise the use of materials and construction techniques that have smaller ecological and carbon footprints, help to sustain or create good air quality, and improve resilience to a changing climate where appropriate.*'

### 17.3 Baseline Conditions

17.3.1 This section sets out the baseline data that will be relied upon to produce a detailed assessment of baseline conditions that will be contained within the Preliminary Environmental Information Report (PEIR) and Environmental Statement (ES).

17.3.2 Baseline data has been collated to determine the existing air quality conditions in the area that is likely to be affected by the Scheme. A desk-based review of the existing baseline has been undertaken to establish an understanding of the baseline air quality environment, to identify areas that are likely to be sensitive to changes in emissions as a result of the Scheme. Baseline information on air quality has been collected from the following sources:

- Defra UK Air website – to establish predicted background concentrations for nitrogen dioxide (NO<sub>2</sub>), particulate matter less than 10µm (PM10) and particulate matter less than 2.5µm (PM2.5).
- North Northamptonshire Council website and Annual Status Report (ASR) – to determine existing AQMAs and local air quality monitoring results.
- West Northamptonshire Council website and ASR – to determine existing AQMAs and local air quality monitoring results.
- Milton Keynes City Council website and ASR – to determine existing AQMAs and local air quality monitoring results.
- MAGIC website – to identify ecological sites within the air quality Study Area.

#### North Northamptonshire

##### Local Air Quality Management

17.3.3 North Northamptonshire Council (NNC) manage air quality in the context of Local Air Quality Management. NNC have not declared any AQMAs. As stated in NNC's Annual Status Report 2023 (Ref.16), the council monitor air quality at 100 diffusion tube monitoring sites across North Northamptonshire. The most recent air quality Annual Summary Report (ASR) produced by NNC stated that during 2022 none of these monitoring sites exceeded the AQS objective for annual or hourly mean air quality objective for NO<sub>2</sub>.

17.3.4 North Northamptonshire currently does not monitor concentrations of PM2.5 and PM10, however it does take measures to address PM2.5 pollution which are listed in the ASR.

17.3.5 On the NNC website air quality page (Ref.17), the local authority states that the East Midlands Air Quality Network (EMAQN) Air Quality and Emissions Guidance for Developers (Ref.18) should be considered by any developer applying for planning permission in order to consider and mitigate air quality impacts from the proposed development. This supplementary planning guidance will be considered in the environmental statement.



### West Northamptonshire

#### **Local Air Quality Management**

- 17.3.6 West Northamptonshire Council encompasses the area of Northampton, Daventry and South Northamptonshire which were previously separate local authorities.
- 17.3.7 There are eight AQMAs in West Northamptonshire all of which were declared for exceedance in the NO<sub>2</sub> annual mean AQS Objective. According to the most recent ASR (Ref.19) in 2021 only one of the AQMAs contains monitoring sites that exceed the annual mean AQS Objective for NO<sub>2</sub>. Northampton AQMA No. 4 is the closest AQMA to the proposed development, located approximately 5.5km from the closest boundary of the Sites and Cable Route Search Area and is situated along the A5095, to the north of the city of Northampton. Monitoring data recorded within Northampton AQMA No. 4 during 2021 showed an exceedance in 2021 at monitoring site 57 with an annual mean NO<sub>2</sub> concentration of 42.3 µg/m<sup>3</sup> in 2021. The other AQMAs are all located over 6.5km away from the closest boundary of the Sites and Cable Route Search Area, either in the centre of Northampton, or to the south of the city.
- 17.3.8 Across the entirety of West Northamptonshire Council, there are 139 passive air quality monitors and one automatic monitoring station. As reported in the most recent annual status report (Ref.16), there are two monitoring stations that exceed the annual mean NO<sub>2</sub> AQS Objective:
- Monitoring site 57, situated in Northampton AQMA No. 4, approximately 5.5km from the closest boundary of the Sites and Cable Route search Area; and
  - Monitoring site 4, situated in Northampton AQMA No. 2, approximately 4km from the closest boundary of the Sites and Cable Route Search Area.
- 17.3.9 WNC has one monitoring station that undertakes PM<sub>2.5</sub> monitoring inside its jurisdiction called AURN site UKA00632 located in the city of Northampton. All PM<sub>2.5</sub> concentrations were well below the AQS objective between 2017 and 2021. WNC does not undertake any monitoring of PM<sub>10</sub>.
- 17.3.10 On the air quality page on the WNC website (Ref.20), the location authority states that the East Midlands Air Quality Network (EMAQN) Air Quality and Emissions Guidance for Developers (Ref.21) should be considered by any developer applying for planning permission in order to consider and mitigate air quality impacts from the proposed development. This supplementary planning guidance will be considered in the Environmental Statement.

### Milton Keynes City Council

#### **Local Air Quality Management**

- 17.3.11 There is one AQMA within the administrative boundary of Milton Keynes City Council (MKCC) - Olney AQMA. Olney AQMA was declared in 2008 for exceedance of the annual mean AQS Objective for NO<sub>2</sub>. According to the most recent ASR, monitoring within the AQMA was below the annual mean AQS Objective in 2022.
- 17.3.12 Olney AQMA is situated along the A506, approximately 3km south of the closest boundary of the project development (Site G) and approximately 10km north of the city of Milton Keynes.
- 17.3.13 Across the entirety of MKCC there are 3 automatic monitoring stations and 37 passive monitoring locations. As reported in the most recent annual status report (Ref.22), there were no exceedances in the annual mean NO<sub>2</sub> AQS Objective.
- 17.3.14 There is one monitoring location in MKCC that monitors PM<sub>10</sub> concentrations. This is at site 'Fixed', located in the centre of Milton Keynes. Concentrations monitored at this location in 2022 were below the annual mean AQS Objective.



### Air Quality Monitoring

- 17.3.15 NNC, WNC and MKCC have nine, seven and 11 passive monitoring sites within 5km of the Sites and Cable Route Search Area respectively. Table 17.1 presents the five most recent years of available air quality monitoring results at these sites. The location of each site is presented in **Figure 17.1**. In the past five years there was one exceedance in the NO<sub>2</sub> annual mean AQS Objective at W1 in 2019 and site 85 in 2018 and 2019. All NNC and MKCC monitoring sites within 5km of the Sites and Cable Route Search Area in 2022 have monitored concentrations well below the AQS Objective.
- 17.3.16 2022 monitoring data for WNC is currently not available, but the 2021 data shows most of the sites are well below the AQS NO<sub>2</sub> annual mean Objective of 40 µg/m<sup>3</sup> with the exception of monitoring site 91 where the annual mean concentration was 39.8 µg/m<sup>3</sup>. This monitoring site is located approximately 4km south-west from the closest boundary of the Sites and Cable Route Search Area along the main access road to Crow Lane industrial estate. It should be noted that monitoring data from 2021 may be affected by the COVID-19 pandemic, therefore monitoring data will be reviewed again in the preliminary report and environmental statement when more recent data is available for WNC.
- 17.3.17 The closest particulate matter (PM) monitoring station to the Sites and Cable Route Search Area is located in the city of Northampton at the DEFRA run AURN site – UKA00632, approximately 6km south-west of the closest boundary of the Sites and Cable Route Search Area. The annual average PM<sub>2.5</sub> concentration in 2022 was 8.2 µg/m<sup>3</sup> which is well below the annual mean AQS Objective for PM<sub>2.5</sub> of 25 µg/m<sup>3</sup>. PM<sub>10</sub> is not monitored at this monitoring station.



Figure 17.1: Local Air Quality Monitoring Locations

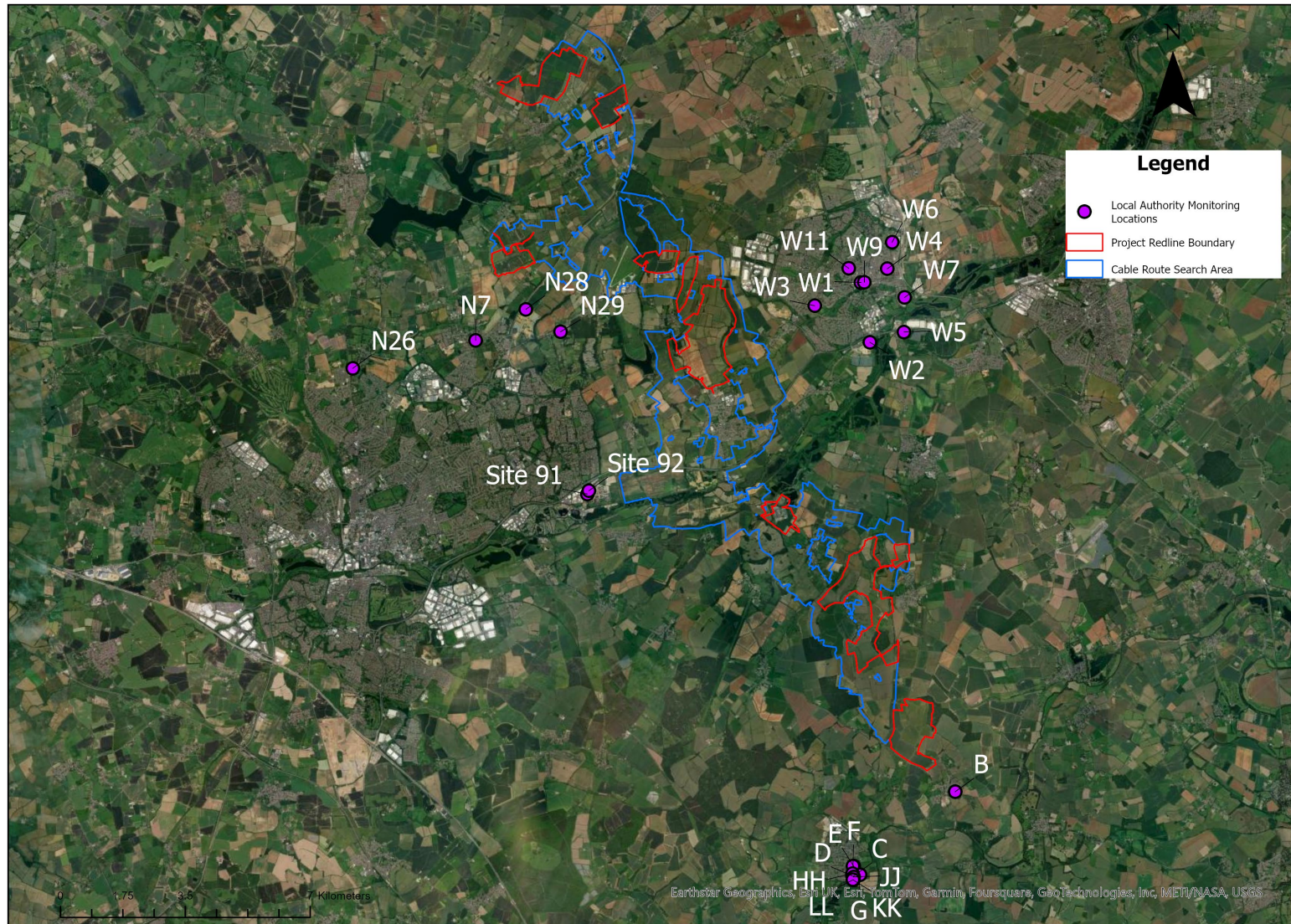




Table 17.1: 2018 - 2022 Annual Mean NO<sub>2</sub> Concentrations within 5km of the Sites and Cable Route Search Area

Site Name	X (m) OS Grid	Y (m) OS Grid	Local Authority	Site Type	Location	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )				
						2018	2019	2020	2021	2022
W1	489131	267820	NNC	Urban Centre	Silver Street	35.8	42.3	30.2	32.2	30.2
W2	489382	266144	NNC	Kerbside	Alma Street	22.7	28.6	20.5	22.9	20.8
W3	487831	267169	NNC	Roadside	Northampton Road	22.8	25.8	18.8	20.5	20
W4	489868	268204	NNC	Kerbside	Finedon Road	18.9	25.2	16.1	16.0	15.3
W5	490336	266433	NNC	Roadside	Butlin Court	20.2	21.4	15.9	16.5	16.5
W6	490002	268946	NNC	Urban Background	Mill Road	15.7	18.7	13.8	14.0	13.5
W7	490351	267400	NNC	Roadside	Ultra Close	25.1	27.8	20.6	22.0	22
W9	489226	267829	NNC	Urban Background	Market Street	21.0	23.3	15.8	17.0	18.4
W11	488788	268215	NNC	Roadside	Broad Green	24.3	29.8	21.4	24.3	22.3
N7	478331	266195	WNC	Roadside	Post Office, Moulton	22.2	21.4	15.6	16.7	TBC
N26	474883	265412	WNC	Roadside	Boughton 1st lamppost on right (Buckton Fields)	24.4	23.5	17.5	18.0	TBC
N28	479739	267067	WNC	Roadside	Moulton A43 lamppost by new estate	-	-	13.1	14.0	TBC
N29	480712	266438	WNC	Roadside	Overstone - lamppost by no. 120 Sywell Road	-	-	18.6	21.9	TBC
85	477391	261834	WNC	Roadside	Archway Cottages, Wellingborough Road	40.5	44.4	33.6	34.0	TBC
91	481457	261889	WNC	Roadside	Home from Home Nursery, 6 -10 Crow Lane	-	-	-	39.8	TBC



Site Name	X (m) OS Grid	Y (m) OS Grid	Local Authority	Site Type	Location	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )				
						2018	2019	2020	2021	2022
92	481508	261983	WNC	Kerbside	Lower Ecton Lane/ Crow Lane Junction	-	-	-	26.7	TBC
B	491769	253542	MKCC	Roadside	Northampton Rd, Lavendon (Horseshoe PH)	17.4	18.8	14.8	14.5	12.8
C	488914	251173	MKCC	Roadside	10 High St South, Olney (Cowper School House)	33.9	36.4	28.5	31.6	26.5
D	488904	251177	MKCC	Roadside	9 High St South, Olney (Olney Wine Bar)	30.2	30.9	24.7	33.3	29.1
E	488926	251455	MKCC	Roadside	20 High St, Olney	21.3	19.8	17.4	18.3	14.9
F	488905	251456	MKCC	Roadside	17 High St, Olney (Opp No.20 High St)	23.1	25.1	19.6	20.7	17.8
G	489108	251213	MKCC	Suburban	Corner of Coneygere and Palmers Rd, Olney	10.8	11.1	8.8	9.4	7.9
FF	488898	251186	MKCC	Roadside	Cross Keys Office, High St South, Olney	30.6	34	27.5	27.7	25.3



Site Name	X (m) OS Grid	Y (m) OS Grid	Local Authority	Site Type	Location	Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> )				
						2018	2019	2020	2021	2022
HH	488891	251248	MKCC	Roadside	Art Mart, 33 High Street South, Olney	26.6	27.9	23.1	25.3	20.7
JJ	488922	251157	MKCC	Roadside	New Roadbox location (Olney)	23.5	18.4	19.9	21.5	16.9
KK	488917	251068	MKCC	Roadside	18/20 Bridge St, Olney	32.9	34.7	28.7	31.3	26.8
LL	488909	251077	MKCC	Roadside	Courtney House, Bridge St, Olney	28.1	29.6	25.1	26.6	21.8
TBC – WNC 2022 monitoring data is currently unavailable										



**Background Concentrations**

17.3.18 A review of the available modelled background concentrations for the proposed development and surrounding area has been carried out using Defra predicted annual mean background concentrations provided in 1km x 1km grid squares. The grid square representing the highest background concentration across all the entirety of the Scheme is shown in Table 17.1 for all pollutants in 2024. The concentrations are well below the relevant AQS objectives for each pollutant.

**Table 17.1: Maximum 2024 Background Concentrations across the proposed Scheme**

Grid Square Coordinates (X, Y OS Grid Ref (m))	Local Authority	2024 Pollutant Concentration (µg/m <sup>3</sup> )			
		NO <sub>x</sub>	NO <sub>2</sub>	PM10	PM2.5
485500, 265500	NNC	10.7	8.2	14.8	8.7

**Site A.2**

17.3.19 It should be noted that early baseline conditions surveys for Green Hill A.2, the potential extension of Green Hill A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purpose of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Site A baseline identified and will be presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

**17.4 Assessment Methodology**

**Study Area**

**Construction Dust**

17.4.1 The Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction (Ref.23) (referred to hereafter as construction dust guidance) requires that construction dust impacts are assessed up to 250m from the locations of demolition, construction and earthworks activities. For the proposed Scheme, the Study Area will include an area up to 250m from demolition, construction and earthwork activities inside the Sites and Cable Corridor within the Cable Route Search Area. The construction phase Study Area also includes the first 50m of any local road within 250m from the main entrance(s) used by the Scheme construction vehicles, as per IAQM construction dust guidance.

**Construction Vehicle Emissions**

17.4.2 The number of vehicles associated with the construction phase of the Scheme is not yet confirmed; therefore, it is assumed that detailed assessment of construction vehicle emissions will be scoped in until traffic flows are available for screening against the screening criteria set out in the IAQM Land-Use Planning & Development Control: Planning For Air Quality guidance (Ref.24). This will be confirmed upon receipt and screening of construction traffic data at either PEIR or ES stage. If construction Heavy Duty Vehicle (HDV) flows are expected to be greater than 100 Annual Average Daily Traffic (AADT) flows on a road during the construction phase or 25 AADT within an AQMA, then exhaust emissions from construction vehicles will be modelled at receptors within 200m of these roads.





- 17.4.3 The IAQM development control guidance (Ref.24) details its own indicative criteria with respect to change as a result of a project's operational or construction phases that, if met, highlight the need for an assessment, rather than necessarily defining the boundaries of a Study Area. The criteria are:
- A change in Light Duty Vehicle (LDV) flows of >100 AADT within or adjacent to an AQMA, or >500 AADT elsewhere;
  - A change in HDV flows of >25 AADT within or adjacent to an AQMA, or >100 AADT elsewhere;
  - Where a road is realigned by 5m or more and is within an AQMA;
  - Where a junction is added or removed close to existing receptors; and
  - Where there are one or more substantial combustion processes and there is a risk of impacts at relevant receptors.

- 17.4.4 The same screening criteria will be used to define the Study Area should the operational phase be scoped in for assessment. However, operational phase traffic flows are expected to be below these screening criteria for potential significant effects. Therefore, it is proposed that the assessment of operational vehicle emissions is scoped out, as air quality impacts will be negligible.

#### **Decommissioning**

- 17.4.5 The decommissioning phase of the Scheme will be assessed following the same approach as construction to consider any dust impacts associated with demolition and potential impacts from vehicle emissions. Therefore, the potential sources of decommissioning impacts are:
- Decommissioning activities such as earthworks and trackout resulting in emissions of dust;
  - Emissions from NRMM (non-road mobile machinery); and
  - Emissions from decommissioning traffic.

#### **Sensitivity of Receptors**

##### **Construction Dust**

- 17.4.6 The sensitivity of the area to dust impacts, can be defined as low, medium or high sensitivity, in accordance with IAQM construction dust guidance.
- 17.4.7 The influencing factors to define receptor sensitivity to dust impacts are as follows:
- High – where human receptors expected to be present continuously for extended periods of time e.g. residential properties, hospitals, schools and care homes. Internationally or nationally designated ecological sites;
  - Medium – where users would expect to enjoy a reasonable level of amenity and value could be diminished by dust soiling e.g. parks and places of work. Nationally designated ecological sites; and
  - Low – where enjoyment of amenity would not reasonably be expected and exposure would be for limited periods e.g. footpaths, shopping streets and car parks. Locally designated ecological sites.

- 17.4.8 Construction dust impacts may affect human and ecological receptors. The IAQM construction dust guidance defines a human receptor as:

*"(...) any location where a person or property may experience the adverse effects of airborne dust or dust soiling, or exposure to PM over a time period relevant to the Air Quality Objectives. In terms of annoyance effects, this will most commonly relate to dwellings, but may also refer to other premises such as buildings housing*



*cultural heritage collections (e.g. museums and galleries), vehicle showrooms, food manufacturers, electronics manufacturers, amenity areas and horticultural operations (e.g. salad or soft-fruit production)."*

17.4.9 An ecological receptor is defined as:

*"(...) any sensitive habitat affected by dust soiling. This includes the direct impacts on vegetation or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats)".*

17.4.10 It is likely that residential properties will be located within 250m of the locations of demolition, construction and earthworks activities and within 50m of the highway up to 250m from entrances and exits to the Scheme. Therefore, all residential receptors within the Study Area will be included in the assessment at PEIR and ES stage.

17.4.11 Similarly, the following ecological designated sites reside inside the construction dust initial Study Area:

- Upper Nene Valley Gravel Pits (Ramsar, SSSI and SPA);
- Sywell Wood (Ancient Woodland);
- Bozeat Meadow (SSSI);
- Horn Wood (Ancient Woodland);
- Three Shire Wood (Ancient Woodland);
- Nun Wood (Ancient Woodland); and
- Unnamed Ancient Woodland (bordering the western boundary of Site G).

17.4.12 These sites maybe sensitive to dust and therefore this will be included within the construction dust assessment at the PEIR and ES stage.

**Construction Vehicle Emissions**

17.4.13 Should construction vehicle emissions be scoped in for detailed assessment as per the IAQM guidance (Ref.24), the potential impacts for vehicle emissions at sensitive receptor locations will be assessed by calculating the change in NO<sub>2</sub> and particulate matter concentrations as a result of the Scheme.

17.4.14 Local Air Quality Management Technical Guidance 2022 (LAQM.TG(22)) (Ref.25) defines a sensitive receptor as a location representative of human (or ecological) exposure to a pollutant, over a time period relevant to the objective that is being assessed against, where the AQS Objectives are considered to apply, as detailed in Table 17.3.

**Table 17.3: Examples of Where the AQS Objectives Apply**

Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
Annual Mean	All locations where members of the public might be regularly exposed.  Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access.  Hotels, unless people live there as their permanent residence.  Gardens of residential properties.



Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
		Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-Hour Mean	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-Hour Mean	<p>All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets).</p> <p>Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where reasonably be expected to spend one hour or more.</p> <p>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.</p>	Kerbside sites where the public would not be expected to have regular access.

**Magnitude of Impact**

**Construction Dust**

17.4.15 The scale and nature of the works determines the magnitude of dust arising as small, medium or large. This terminology is consistent with that in the IAQM construction dust guidance (Ref.23). The relevant criteria to define the potential magnitude of dust emissions include the following factors:

- Small – demolition volume under 12,000m<sup>3</sup> less than 6m above ground level, total site area less than 18,000m<sup>2</sup>, soil type with large grain size, construction material with low potential for dust release, less than 20 Heavy Duty Vehicle (HDV) trips per day, unpaved road length less than 50m etc;
- Medium – demolition volume 12,000m<sup>3</sup> – 75,000m<sup>3</sup> 6m – 12m above ground level, total site area 18,000m<sup>2</sup> – 110,000m<sup>2</sup>, moderately dusty soil type, potentially dusty construction material, 20 to 50 HDV trips per day, unpaved road length 50 – 100m etc.; and
- Large – demolition volume greater than 75,000m<sup>3</sup>, on-site crushing and screening demolition, demolition activities greater than 12m above ground level, total site



area greater than 110,000m<sup>2</sup>, more than 10 heavy earth moving vehicles active at any one time, on site concrete batching, sandblasting, more than 50 HDV trips per day, unpaved road length greater than 100m etc.

**Construction Vehicle Emissions**

17.4.16 Should the construction vehicle emissions assessment be scoped in, the magnitude of impact will be categorised at each receptor in accordance with the IAQM development control guidance (Ref.24) dependent upon the percentage change in concentration between the 'without' and 'with' Scheme scenarios, relative to the relevant air quality objectives considered (i.e. the relevant Air Quality Assessment Level), as presented in Table 17.4

**Table 17.4 IAQM Impact Descriptors for Individual Receptors**

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL	Slight	Moderate	Moderate	Substantial
103 – 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

17.4.17 If none of the screening criteria are met, the guidance (Ref.24) states that there should be no requirement to carry out an air quality assessment for the impact of the Scheme on the local area and the impacts can be considered as having an insignificant effect.

**Significance of Effects**

**Construction Dust**

17.4.18 The IAQM construction dust guidance (Ref.23) categorises the unmitigated risk of dust impacts on human health and amenity (rather than ascribe a significance of effect) as a means of identifying the level of dust emissions mitigation required to ensure that residual effects are 'not significant'. A higher dust risk rating requires more stringent mitigation measures in order to limit residual effects. The mitigation measures identified would be incorporated into the Scheme's Construction Environmental Management Plan (CEMP). Once mitigated, construction dust impacts are considered to be negligible.

**Construction Vehicle Emissions**

17.4.19 The IAQM development control guidance prompts the practitioner to evaluate overall significance of effect from construction vehicle emissions using professional judgement.

17.4.20 The IAQM guidance (Ref.24) notes that the impact descriptors in Table 17.4 are for individual receptors only. The impact descriptors are not themselves a clear and unambiguous guide to reaching a conclusion on significance. These impact descriptors are intended for application at a series of individual receptors. Whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances.

17.4.21 One of the relevant factors in the judgement of the overall significance of effect may relate to the potential for cumulative impacts and, in such circumstances, several



impacts that are described as 'slight' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a 'moderate' or 'substantial' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health. This demonstrates that professional judgement would be required to establish whether impacts considered collectively can be described as significant taking into the degree of impact and factors such as:

- The existing and future air quality in the absence of the Scheme;
- The extent of current and future population's exposure to the impact; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

17.4.22 Such judgements will need to be made taking into account multiple factors and the IAQM guidance avoids the use of prescriptive approaches.

17.4.23 The East Midlands air quality and emissions supplementary planning guidance (Ref.18) will be considered in the assessment. The guidance sets out a series of steps to calculate the potential impact of the Scheme, the type of assessment required, and mitigation and compensation measures required. This assessment will follow the steps outlined in the guidance and include any mitigation and compensation measures in the CEMP.

**Site A.2**

17.4.24 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

**BESS and Substations**

17.4.25 The proposed BESS has the potential for air quality impacts in the rare result of a fire. Therefore, the air quality assessment will include point source emissions modelling of a worst-case scenario to predict potential NO<sub>x</sub> and particulate emissions in the event of a fire and predict concentrations at nearby sensitive receptors. Mitigation measures as a result of this assessment will be discussed where appropriate.

**Cumulative and In-Combination Effects**

17.4.26 Cumulative and in-combination effects will be assessed as part of the Air Quality chapter. In general, local and national policy requires that the Scheme cannot have a detrimental impact with regards to air quality. Therefore, at this stage the risk of in-combination effects occurring are considered to be negligible. Where in-combination effects are identified, these will be addressed in the Air Quality Chapter 17. Cumulative effects will be addressed within the Cumulative Effects Chapter 23.

**17.5 Conclusions on Scoping**

17.5.1 The scoping decisions made for the ES air quality chapter at this stage have been summarised in Table 17.5 and detailed in the following paragraphs.

**Table 17.5 Scoping Summary**

Assessment	Scoped in/out	Justification
Construction Dust Assessment	Scoped In	Construction phase activities may give rise to adverse impacts from fugitive dust emissions such as nuisance



Assessment	Scoped in/out	Justification
		and health impacts if left unmitigated.
Air Quality Fire Assessment	Scoped In	There is potential for a significant short-term increase in toxic gas emissions and particulate matter concentrations at nearby receptors in the event of a fire of the battery storage, substations or solar panels.
Construction Vehicle Assessment	Scoped In	The movement of materials and waste to and from the site by construction vehicles can lead to adverse impacts from increased exhaust emissions of air pollutants, such as NO <sub>2</sub> and PM <sub>10</sub> .
Operational Vehicle Assessment	Scoped Out	Traffic trips associated with the operation and maintenance of the Scheme are anticipated to be below the IAQM indicative criteria for potential significant effects. Therefore, air quality impacts associated with operational phase vehicle emissions will be negligible and are proposed to be scoped out of further assessment.

- 17.5.2 Construction phase activities associated with the Scheme such as earthworks and trackout (the transport of dust and dirt from the construction site onto the public road network) can give rise to adverse impacts from fugitive emissions of dust such as nuisance and health impacts if left unmitigated.
- 17.5.3 A construction dust assessment will be undertaken to determine the risk of dust impacts and identify appropriate mitigation measures. There may also be increases in NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations due to emissions from non-road mobile machinery (NRMM) used during construction. However, these impacts are likely to be temporary in nature and have the potential to be well controlled through best practice mitigation measures. Therefore, assessment of dust emissions during the construction phase cannot be scoped out at this stage.
- 17.5.4 In the event of an accidental fire incident of the BESS and surrounding solar panels, there is potential for a significant short-term increase in toxic gas emissions and particulate matter concentrations at nearby sensitive receptors. Therefore, an air quality assessment in the event of a BESS fire will be scoped in to predict NO<sub>x</sub>, particulate matter and other relevant pollutant concentrations at nearby sensitive receptors and, if necessary, determine mitigation measures.



- 17.5.5 Additionally, the movement of materials and waste to and from the site by construction vehicles can lead to adverse impacts from increased exhaust emissions of air pollutants, such as NO<sub>2</sub> and PM10. It is proposed for construction vehicle emissions to remain scoped in for further assessment until traffic data becomes available for screening at PEIR or ES stage. Should construction vehicle emissions require further assessment upon screening then detailed dispersion modelling will be undertaken to predict NO<sub>2</sub>, PM10 and PM2.5 concentrations at relevant receptor locations and determine overall significance in accordance with the IAQM development control guidance. Therefore, the assessment of emissions from construction vehicle exhaust emissions cannot be scoped out at this stage.
- 17.5.6 Traffic trips associated with the operation and maintenance of the Scheme are anticipated to be below the IAQM indicative criteria for potential significant effects. Therefore, air quality impacts associated with operational phase vehicle emissions will be negligible and are proposed to be scoped out of further assessment.

## 17.6 References

- Ref.1 European Union (2008) Ambient Air Quality and Cleaner Air for Europe (2008/50/EC). Official Journal of the European Union.
- Ref.2 His Majesty's Stationery Office (HMSO) (2010) The Air Quality Standards Regulations 2010, Statutory Instruments No, 1001
- Ref.3 HMSO (2019) Air Quality (Amendment of Domestic Regulations (EU Exit) Regulations 2019. UK
- Ref.4 HMSO (2000), The Air Quality (England) Regulations 2000 (SI 2000/928)
- Ref.5 HMSO (2002), The Air Quality (England) (Amendment) Regulations 2002 (SI 2002/3043)
- Ref.6 HMSO (2021) Environment Act 2021
- Ref.7 HMSO (1990) Part III of the Environmental Protection Act
- Ref.8 Department of Energy Security & Net Zero (2023) Overarching National Policy Statement for Energy (EN-1)
- Ref.9 Department for Energy Security & Net Zero (2023) National Policy Statement for Renewable Energy Infrastructure (EN-3)
- Ref.10 Department for Energy Security & Net Zero (2023) National Policy Statement for Electricity Networks Infrastructure (EN-5)
- Ref.11 Department for Levelling Up, Housing & Communities (2023), National Planning Policy Framework
- Ref.12 North Northamptonshire (Adopted 2016) Joint Core Strategy 2011-2031. Available at: Joint Core Strategy 2011-2031 High Res version for website.pdf (nnjpu.org.uk)
- Ref.13 West Northamptonshire Council (Adopted 2014) Joint Core Strategy Local Plan (Part 1). Available at: West Northamptonshire Joint Core Strategy Local Plan (Part 1) | West Northamptonshire Council (westnorthants.gov.uk)
- Ref.14 West Northamptonshire Council (Adopted 2023) Northampton Local Plan Part 2. Available at: 02 Northampton Local Plan Part 2 | West Northamptonshire Council - Northampton Area
- Ref.15 Milton Keynes Council (Adopted 2019) Plan:MK 2016 – 2031. Available at: Plan:MK 2016-2031 (milton-keynes.gov.uk)
- Ref.16 North Northamptonshire Council (2023) 2023 Air Quality Annual Status Report. Available at: National Planning Policy Framework - Guidance - GOV.UK (www.gov.uk)
- Ref.17 North Northamptonshire Council (2024) Air quality. Available at: Air quality | North Northamptonshire Council (northnorthants.gov.uk)



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- Ref.18 East Midlands Air Quality Network (2018) Air Quality and Emissions Mitigation Guidance for Developers. Available at: <https://cms.northnorthants.gov.uk/media/3790/download>
- Ref.19 West Northamptonshire Council (2022) 2022 Air Quality Annual Status Report. Available at: Annual Report | West Northamptonshire Council ([westnorthants.gov.uk](http://westnorthants.gov.uk)).
- Ref.20 West Northamptonshire Council (2024) Air quality. Available at: Air quality | West Northamptonshire Council ([westnorthants.gov.uk](http://westnorthants.gov.uk))
- Ref.21 East Midlands Air Quality Network (2018) Air Quality and Emissions Mitigation Guidance for Developers. Available at: <https://cms.northnorthants.gov.uk/media/3790/download>
- Ref.22 Milton Keynes City Council (2023) Air Quality Annual Status Report. Available at: ASR\_MKCC\_2023\_V2.pdf ([milton-keynes.gov.uk](http://milton-keynes.gov.uk))
- Ref.23 Institute of Air Quality Management (IAQM) (2024) Guidance on the assessment of Dust from Demolition and Construction
- Ref.24 Institute of Air Quality Management (IAQM) and Environmental Protection UK (2017) Land-Use Planning & Development Control: Planning for Air Quality
- Ref.25 Department for Environment Food & Rural Affairs (2022) Local Air Quality Management Technical Guidance (TG22)





## 18 Socio-Economics, Tourism and Recreation

### 18.1 Introduction

18.1.1 The chapter describes and identifies likely significant environmental effects arising as a result of the Scheme, in relation to:

- Population demography;
- Population skill level and qualification attainment;
- Indices of deprivation;
- Economic activity and performance;
- Business sectors;
- Tourism as an economic sector;
- Agriculture as an economic sector; and
- Accessibility to and desirability of tourism and recreational facilities.

18.1.2 For the purposes of assessing socio-economic, tourism and recreation effects, the Scheme – as defined at paragraph 1.1.3 of this report – are considered functionally and geographically in their entirety. The geographic extents of the Scheme, consisting of the Sites and Cable Route Search Area, are set out on the Location Plan at **Figure 3.1** and in more detail in **Figures 3.1.1-3.1.8**.

18.1.3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref.1) require the direct and indirect likely significant effects of the Scheme on population and human health factors to be identified, described, and assessed. While this chapter considers socio-economic population factors, and factual reporting of population health, such as demographic trends and deprivation, matters directly relating to human health are covered in **Chapter 19: Human Health and Wellbeing**.

#### Appendices

18.1.4 This chapter is supported by the following appendices:

- Appendix 18: Socio-Economics, Tourism and Recreation Baseline Data

### 18.2 Legislation, Policy, and Guidance

#### Legislative Context

18.2.1 The Planning Act 2008 (Ref.2) sets out the process for the consenting of major infrastructure projects and is the principal legislation governing an application for a Nationally Significant Infrastructure Project (NSIP).

18.2.2 The EIA Regulations set out the regulatory framework for Environmental Impact Assessments in connection with development consent order applications, to include screening, scoping and the requirements in respect of their content.

#### National Policy Context

18.2.3 National Policy Statements (NPS) set out the policy basis for NSIPs including for ground mounted solar developments. The NPSs that are relevant to the Scheme are EN-1, EN-3 and EN-5, as adopted on 17 January 2024, and are important material considerations, in addition to other relevant and important national and local planning policies. Those policies therein that pertain directly to socio-economics, tourism and recreation are summarised as follows.

- Overarching National Policy Statement for Energy (EN-1) (Ref.3)



- Specifically, Sections 5.11 and 5.13
- National Policy Statement for Renewable Energy Infrastructure (EN-3) (Ref.4)
  - Specifically, Section 2.10, wherein paragraphs 2.10.73-2.10.126, are considered in relation to socio-economics, and tourism and recreation.
- National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref.5) – this does not have any policy directly specific to socio-economics, tourism and recreation.

18.2.4 Although it “*does not contain specific policies for nationally significant infrastructure projects*” the National Planning Policy Framework (NPPF), amended December 2023 (Ref.6) contains relevant policy matters for decision making or NSIPs, with emphasis placed on supporting “*economic growth and productivity, taking into account both local business needs and wider opportunities for development*” (paragraph 85) and helping to support a prosperous rural economy. Social sustainability is given policy context through emphasis on promoting healthy and safe communities (section 8) through enabling and supporting social healthy lifestyles, social interaction, providing social, recreational and cultural facilities (paragraphs 96-97), retaining access to open space, recreational spaces (paragraphs 102-103), and protecting and enhancing public rights of way (paragraph 104).

#### Local Planning Policy Context

18.2.5 The Local Planning Policy is set out in the host local authorities adopted policy documents:

- North Northamptonshire Joint Core Strategy 2011 to 2031 (adopted July 2016) (Ref.7);
- Wellingborough Local Plan (Part 2) (adopted February 2019) (Ref.8);
- West Northamptonshire Joint Core Strategy Local Plan (Part 1) (adopted December 2014) (Ref.9);
- Daventry Local Plan (Part 2) (adopted February 2020) (Ref.10);
- South Northamptonshire Local Plan (Part 2) (adopted July 2020) (Ref.11);
- Plan:MK 2016-2031 (adopted March 2019) (Ref.12); and
- Any made neighbourhood plans (Ref.13, Ref.14, Ref.15, Ref.16) that cover the Scheme Order Limits.

18.2.6 Due consideration will also be given to:

- The emerging North Northamptonshire Strategic Plan (Ref.17);
- New Local Plan for West Northamptonshire (Ref.18);
- Waste and minerals local plans (Ref.19, Ref.20, Ref.21) where relevant to socio-economic, tourism and recreation;
- Strategic socio-economic objectives in Bedford Borough (Ref.22); and
- Strategic economic objectives set out by the relevant Local Enterprise Partnerships (Ref.23).

#### Local Tourism Policy and Strategy

18.2.7 Local tourism policy and strategy as set out by the local authorities and official visitor strategy and information boards (Ref.24, Ref.25) in the Zone of Influence (‘Zoi’) will be assessed in full in the ES to determine the important and focal attractions near to the



Scheme, and the likely level of impact upon them from the Scheme’s construction and operation.

### Relevant Industry Guidance

- 18.2.8 As the professional accreditation body for the production of EIAs, the Institute of Environmental Management & Assessment (IEMA) provides a number of guides for the production of environmental assessments and hosts a collection of articles by professional bodies on the use of and publication of socio-economic assessments for EIA.
- 18.2.9 It is recognised in the industry that there is a widely varied approach to socio economic assessments as a result of the significant scope of the assessment, variety in development impacts, and limited procedural guidance available directly relating to the technical production of socio-economic assessments. As such, measurements of baseline data sensitivity, and the significance of impacts from the development are reliant on professional judgement based on best practice and experience. As such, socio-economic impacts should consider socio demographic and cultural receptors, local economic factors, as well as the accessibility and provision of local services. It is important that socio-economic assessments are not considered in isolation from other assessment areas in the EIA, as there are multiple overlapping factors, such as with transport, construction management, water and air quality, and human health assessment.

## **18.3 Baseline Conditions**

### Socio-Economic

- 18.3.1 The scale and geographic distribution of the Scheme means that its effects have the potential to impact a significant geographic area and the associated population. The Sites are situated in the centre of the traditional county of Northamptonshire, and as such, is likely to have economic impacts in the constituent and neighbouring authority areas. As such, a Zol for socio-economic impacts has been determined as the combined areas of North Northamptonshire, West Northamptonshire, Milton Keynes City, and Bedford Borough. Receptors discussed within this chapter will also be comparatively assessed against national trends across the United Kingdom.
- 18.3.2 Initial baseline information has been gathered, as set out in **Appendix 18**, relating to:
- Resident Population
  - Skills and Qualification Attainment
  - Deprivation
  - Economic Activity and Unemployment
  - Employment and Wages
  - Working Population
  - Business Sectors
- 18.3.3 The ES will consider the economic effects in respect of changes in land use from current arable production to that of energy production, energy storage and associated electricity infrastructure. This will be informed by the Agricultural Land Classification studies that are ongoing (see further consideration of this in Chapter 21 of this Scoping Report) and a survey of agricultural employment within the Scheme boundaries.

### Tourism and Recreation

- 18.3.4 The Zol falls across a number of authority areas, each with their own economic strategies for tourism and visitors. The Northamptonshire visitor economy is supported by key attractions which include heritage features such as Rockingham Castle in the ‘county of spires and squires’, country parks, the River Nene and Grand Union Canal, and motorsports venues at Silverstone, and Santa Pod Raceway in neighbouring Bedford



Borough. These attractions brought over 18 million visitors to Northamptonshire in 2023, spending close to £1 billion, and supporting over 30,000 jobs (Ref.24). Likewise, the visitor economy for neighbouring Milton Keynes is built around attractions such as Bletchley Park, Milton Keynes' retail centres and sports facilities (Ref.25).

18.3.5 A number of the Sites as well as the Cable Route Search Area host a number of Public Rights of Way (see **Figures 7.7.1-7.7.5** in **Appendix 7.1 Landscape Figures**) and are located nearby to long-distance recreational walking and cycling routes. The Northamptonshire Round, the Nene Way, the Milton Keynes Boundary Walk, and the Three Shires Walk all cross parts of the Scheme. There are also further long-distance walking routes registered by the Long Distance Walking Association (Via Beata, Northamptonshire Boundary Walk, and the Buckinghamshire Way) that cross or border the Scheme (Ref.26). The nearest long-distance cycle routes: National Cycle Routes 6 and 539, are within 4.0km of Scheme (Ref.27).

18.3.6 The Scheme is predominantly set within agricultural land, which is not in itself a key tourist attraction or destination. The land does however play a role in providing a landscape context to recreational use of waterways and walking and cycling routes.

18.3.7 Further initial baseline information on the tourism and recreational environment baseline has been set out in **Appendix 18**.

#### Summary

18.3.8 There is potential for the Scheme to impact the socio-economic environment of the local and regional impact areas. The likely effects are considered to be increased access to employment opportunities, increased workplace population, and increased direct and indirect economic activity. Impacts on agricultural and farming practices and activity will be explored in **ES Chapter 18: Socio-Economics, Tourism and Recreation**, based on the outcomes of proposed ALC and agricultural circumstances surveys to be undertaken. Effects on tourism and recreation are likely to be limited to those facilities immediately impacted by the Scheme, such as Public Rights of Way and landscape and heritage assets within close proximity or direct line of sight to the Scheme. Human health impacts as a result of changes to the socio-economic and recreational environment will be assessed in **Chapter 19: Human Health and Wellbeing** of the ES and will utilise assessment data from the socio-economics chapter as applicable to receptors that are likely to be affected by topic-specific impacts.

## **18.4 Assessment Methodology**

### Assessment Process

18.4.1 The initial baseline assessment undertaken for this Scoping Report will be expanded in the ES to produce a more detailed understanding of the socio-economic conditions within the local and regional impact areas. This will include where applicable, providing additional data at District Ward level for fine-grain data. Tourism and recreation conditions will be assessed across the ZoI, with detailed assessment focussed to within an approximately 2km impact area (or as dictated by zones of theoretical visibility) to define the extent to which these impacts are likely to be felt.

18.4.2 Alongside the expanded baseline assessments, data from the relevant local authorities will be used to assess how the Scheme will affect the socio-economic environment, and tourism and recreation receptors. The information sources to be used for the assessments are as follows:

- Office for National Statistics (ONS) Census 2021;
- Scotland's Census 2022;
- Northern Ireland Statistics and Research Agency (NISRA) Census 2021;
- ONS Annual Population Survey;



- ONS Local Authority and National Population Projections;
- Department for Communities and Local Government (DCLG): Indices of Multiple Deprivation Map App;
- Office for Health Improvement and Disparities (OHID): Fingertips Public Health Data web tool;
- ONS: Annual Survey of Hours and Earnings;
- ONS Business Register and Employment Survey;
- Department for Work and Pensions (DWP) Stat-Xplore web tool;
- Communities NI Statistics;
- Local Plans and supporting documentation;
  - Bedford Borough;
  - North Northamptonshire;
  - Milton Keynes City;
  - West Northamptonshire;
- Local Enterprise Partnership strategic economic documentation;
  - South East Midlands
- National Planning Policy Framework;
- Natural England;
- Tourism and visitor information:
  - Visit Britain;
  - Visit England;
  - Destination Milton Keynes;
  - Experience Bedfordshire;
  - Visit Milton Keynes;
  - Visit Northamptonshire;
- OpenStreetMap;
- OS Explorer Map;
- Google Maps and Google Earth;
- Long Distance Walkers Association;
- The Ramblers Association;
- Cycling UK; and
- Sustrans.

#### **Assessment of Sensitivity and Magnitude**

18.4.3 The sensitivity of all identified environmental receptors will be described as high, medium, low, or negligible, whilst the magnitude of impact on those receptors will be described as high, medium, low, negligible, or neutral.

18.4.4 The sensitivity of the receptors identified in this chapter will be assessed by understanding measurable indicators of the receptor's present characteristics and considering this



alongside the weighted importance of the receptor in local, regional, and national policy or strategic requirements together with professional judgment. For example, the sensitivity of number of jobs is likely to be determined from its local characteristics and how far it deviates from national trends, in consideration with the local policy requirements for the creation of new employment opportunities.

18.4.5 To ensure a consistency of approach across the socio-demographic and economic receptors identified in this assessment, each receptor will be measured by way of statistical analysis against national data at the local authority level to determine its sensitivity. Otherwise, sensitivity will be determined based on professional judgement of the qualitative criteria set out in **Table 18.1** and **Table 18.3**.

18.4.6 The methodology for determining the impact magnitude is described below and has been determined by quantifying the predicted deviation from baseline conditions. This will be considered both with and without mitigation. The magnitude of change will be used for either beneficial or adverse impacts. As there is no standard methodology for determining how magnitude of impacts is calculated, professional judgement has been used to determine the criteria set out in **Table 18.2** and **Table 18.4**.

**Environmental Receptors - Socio-Economic**

18.4.7 The Scheme is likely to have impacts on socio-economic receptors at the local and regional level, and to a more minor extent, the national level. These effects are predominantly focused on economic impacts (particularly during construction), given the nature of the Scheme. Impacts on socio-demographic receptors are likely to be limited to those as a result of the anticipated construction workforce and the related indirect impacts on socio-demographic characteristics. The sensitivity of these receptors will be assessed in accordance with **Table 18.1**.

18.4.8 The Scheme is of a nationally significant scale, and as such will provide a significant number of employment opportunities for direct and indirect sectors of the local and regional economy during construction. These will also have knock-on impacts on other socio-economic factors such as wages, unemployment, and deprivation as a result of increased access to employment. The magnitude of these impacts will be quantified in full for the construction and operational phases of the Scheme and estimated for the Scheme’s decommissioning (considered for the purposes of the EIA to be no later than 2089) in accordance with the metrics set out in **Table 18.3**.

18.4.9 The Scheme is likely to impact on existing economic sectors within the local and regional impact areas as a result of competition for resources, labour force, and direct and indirect conflicts with economic sectors such as the agricultural economy and in the tourism and recreation economies. Additional localised economic impacts may occur where the location of the Scheme impacts on the operation of businesses near to or adjacent to the Scheme where their location, landscape setting, and long views are fundamental to their economic success.

**Table 18.1 Sensitivity and Importance of the Identified Environmental Receptor**

Sensitivity	Definition
High	Receptor is likely to experience direct and significant socio-economic challenges with fundamental change to present characteristics. Accorded a high priority in local, regional or national economic regeneration policy. Receptor is of regional or national importance. Data for the receptor shows it is more than 2σ from the national population mean or median.
Medium	Receptor is likely to experience some socio-economic challenges, which may be indirect, but will materially change its present characteristics. Change relating to receptor has medium priority in local, regional and national economic and regeneration policy.



Sensitivity	Definition
	Receptor is of significant local importance. Data for the receptor shows it is between 1σ and 2σ from the national population mean or median.
Low	Minor socio-economic challenges relating to receptor resulting in non-material changes to baseline conditions. Receptor is accorded a low priority in local, regional and national economic and regeneration policy. Receptor is of low importance. Data for the receptor shows it is less than 1σ from the national population mean or median.
Negligible	Receptor unlikely to experience any socio-economic challenges or changes to baseline conditions. Receptor is not a priority at any level of economic or regeneration policy.

**Table 18.2 Magnitude of Change for the Identified Environmental Receptor**

Magnitude	Definition	Value of Change to Receptor
High	The total loss or major change/substantial alteration to key elements/features of the baseline conditions, such that the post-development characteristics will be fundamentally changed.	Change of more than or equal to 10%
Medium	Loss or alteration to one or more key elements/features of the baseline conditions, such that post-development characteristics of the baseline will be materially changed.	Change of between 1% and 10%
Low	A minor shift away from baseline condition. As change arising from the loss/alteration will be discernible/detectable but not material. The post development characteristics of the baseline condition will be similar to pre-development conditions.	Change of between 0.1% and 1%
Negligible	Very little change from baseline conditions. The change will be barely distinguishable and approximating to a non-change situation.	Change of less than 0.1%
Neutral	No change from baseline conditions.	No change

**Environmental Receptors – Tourism and Recreation**

- 18.4.10 The Scheme is likely to have an impact on tourism and recreation receptors, albeit these are likely to be limited to those receptors that are directly impacted by the location of the Scheme such as Public Rights of Way, and landscape visual receptors and local heritage assets that rely on their setting for their value to the tourism and recreational economy. Assessment of these assets will be made in consideration of the impacts assessed in **Chapter 7: Landscape and Visual**, and **Chapter 13: Cultural Heritage**. This ES will assess the sensitivity of receptors and magnitude of impact on key tourism and recreation receptors based on the metrics in **Table 18.3** and **Table 18.4** respectively.
- 18.4.11 The Scheme, being located on existing agricultural land, is not anticipated to directly impact on the use and accessibility of dedicated recreational spaces and tourist



attractions. The Scheme may impact on the use of Public Rights of Way which cross the Scheme’s boundaries during the project’s construction, but this will be addressed as part of the emerging construction management strategy to ensure these features are retained and protected.

18.4.12 The ES will identify and assess the impact on key local tourism and recreational facilities including but not limited to:

- Public rights of way (PRoW);
- Long distance walking and cycling routes;
- Navigable waterways; and
- Recreational hubs and key tourist attractions.

**Table 18.3 Sensitivity and Importance of the Identified Environmental Receptor**

Sensitivity	Definition
High	Receptor is likely to experience significant direct and indirect tourism and economic challenges with fundamental change to present characteristics. Accorded a high priority in local, regional or national tourism and recreation policy. Receptor is of regional or national importance.
Medium	Receptor is likely to experience some direct and indirect tourism and economic challenges, that will materially change its present characteristics. Change relating to receptor has medium priority in local and regional tourism and recreation policy. Receptor is of significant local importance.
Low	Minor direct or indirect tourism and economic challenges relating to receptor resulting in non-material changes to baseline conditions. Receptor is accorded a low priority in local and regional tourism and recreation policy. Receptor is of low importance.
Negligible	Receptor unlikely to experience any tourism and economic challenges or changes to baseline conditions. Receptor is not a priority at any level of tourism and recreation policy.

**Table 18.4 Magnitude of Change for the Identified Environmental Receptor**

Magnitude	Definition
High	The total loss or major change/substantial alteration to key elements/features of the baseline conditions, such that the post development characteristics will be fundamentally changed.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions, such that post-development characteristics of the baseline will be materially changed.
Low	A minor shift away from baseline condition. As change arising from the loss/alteration will be discernible/detectable but not material. The post development characteristics of the baseline condition will be similar to pre-development conditions.





Magnitude	Definition
Negligible	Very little change from baseline conditions. The change will be barely distinguishable and approximating to a non-change situation.
Neutral	No change from baseline conditions.

**Significance**

18.4.13 The degree of significance of impacts, in respect of Socio-economics and Tourism and Recreation, is determined using the matrix below in **Table 18.5**, taking into consideration both receptor sensitivity to change and magnitude of change to baseline conditions.

18.4.14 Effects assessed to be moderate, major-moderate, or major, are deemed to be significant effects in EIA terms.

**Table 18.5: Criteria for Assessing the Significance of Effects**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major-moderate	Moderate	Moderate-minor
Medium	Major-moderate	Moderate	Moderate-minor	Minor
Low	Moderate	Moderate-minor	Minor	Negligible
Negligible	Moderate-minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

18.4.15 The degree of significance of an effect can be described either as beneficial or adverse in nature, and temporally as being of short-, medium-, or long-term. These together with the level of significance should be used to determine which effects from the Scheme need to be considered further in the ES, and therefore which effects require mitigation measures to be implemented in the design, construction, operation, and decommissioning of the Scheme.

**In-Combination and Cumulative Effects**

18.4.16 The assessment also considers potential in-combination effects from different aspects of the Scheme, and cumulative effects related to relevant projects, where they are considered likely to have significant environmental effects. This includes assessing the cumulative impact of the construction of this Scheme, its operational lifetime, and where relevant its decommissioning, against other nearby NSIPs and relevant Town and Country Planning Act planning applications and approvals which will also have effects within the Zol.

18.4.17 In-combination effects related to socio-economics, tourism and recreation will be assessed in full within **Chapter 18: Socio-Economics, Tourism and Recreation**.

18.4.18 A full list of cumulative sites considered for assessment will be included in the ES, and a full assessment of cumulative effects socio-economics, tourism and recreation will be undertaken in **Chapter 23: Cumulative Effects**.



## 18.5 Conclusions on Scoping

18.5.1 It is considered appropriate to scope in to the ES an assessment of impacts on socio-economics; tourism and recreation for the construction, operational lifetime, and decommissioning of the Scheme. The following specific matters are therefore scoped in to the EIA:

- Socio-economic impacts during construction. There is potential for the Scheme to give rise to socio-economic effects on the Zol. The likely effects are considered to be increased access to employment opportunities, increased workplace population, and increased direct and indirect economic activity, many of which are anticipated to be positive.
- Socio-economic impacts during operation. This will include impacts on the energy industry through on-site employment, economic impacts from any replacement activities for the solar arrays and BESS, agricultural industry through taking the land out of production for the lifetime of the Scheme, and on the tourism and visitor economy due to the long-term impact of the Scheme's siting in the Zol.
- Socio-economic impacts during decommissioning. Due to the limitations of future baseline data for decommissioning in 2089, this will be limited to assessment of direct employment and economic performance from decommissioning works, and aspects such as education that may be directly related to the Scheme.
- Impacts on tourism and recreation during construction and operation. Effects on tourism and recreation are likely to be limited to those facilities immediately impacted by the Scheme, such as Public Rights of Way and heritage assets within close proximity to the Scheme boundaries.

18.5.2 The following matters are proposed to be scoped out of the EIA:

- Socio-economic impacts during decommissioning (other than those explicitly scoped in, as above). These are anticipated to be no more significant than effects assessed for the Scheme's construction. Furthermore, the future baseline date of 2089 is too far in the future to provide meaningful assessment of potential impact on future demographic receptors, nor on future economic prosperity. Instead, a summary of effects from decommissioning activities and post-decommissioning activities will be presented in the ES chapter.
- Tourism and recreation impacts during decommissioning. As for socio-economic impacts, tourism and recreation impacts during decommissioning are likely to be no more significant than during construction, and are anticipated to be short-to-medium term effects rather than long-term effects during operation. As such, these are not anticipated to be significant. Instead, a summary of effects from decommissioning activities and post-decommissioning activities will be presented in the ES chapter.
- Specific matters. Impacts upon property value, and crime are proposed to be scoped out of any stage of the assessment due to these matters being very unlikely to be significantly affected by the Scheme. This is as there is little conclusive evidence that property value is significantly affected by the development of utility scale solar farms or that any negative effect is felt over a large area. Crime has also been scoped out as whilst the solar infrastructure itself may be a target for theft, there is no conclusive evidence that levels of crime or safety to people or residents nearby are adversely affected.



## 18.6 References

- Ref.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, 2017 No.572. (*as amended*)
- Ref.2 Planning Act 2008, 2008 c.29. (*as amended*)
- Ref.3 DESNZ (2024). Overarching National Policy Statement for energy (EN-1). Department of Energy Security and Net Zero. Available at [www.gov.uk](http://www.gov.uk)
- Ref.4 DESNZ (2024). National Policy Statement for renewable energy infrastructure (EN-3). Department of Energy Security and Net Zero. Available at [www.gov.uk](http://www.gov.uk)
- Ref.5 DESNZ (2024). National Policy Statement for Electricity Networks Infrastructure (EN-5). Department of Energy Security and Net Zero. Available at [www.gov.uk](http://www.gov.uk)
- Ref.6 DLUHC (2023). National Planning Policy Framework. Department for Levelling Up, Housing and Communities. Available at [www.gov.uk](http://www.gov.uk)
- Ref.7 North Northamptonshire Joint Planning Unit (2016). North Northamptonshire Joint Core Strategy 2011-2031. Corby: North Northamptonshire Joint Committee.
- Ref.8 Borough Council of Wellingborough (2019). The Plan for the Borough of Wellingborough. Wellingborough: Borough Council of Wellingborough.
- Ref.9 West Northamptonshire Joint Planning Unit (2014). West Northamptonshire Joint Core Strategy Local Plan (Part 1). Northampton: West Northamptonshire Joint Committee.
- Ref.10 Daventry District Council (2020). Settlements and Countryside Local Plan (Part 2) For Daventry District 2011-2029. Daventry: Daventry District Council.
- Ref.11 South Northamptonshire District Council (2020). South Northamptonshire Part 2 Local Plan 2011-2029. Towcester: South Northamptonshire District Council.
- Ref.12 Milton Keynes Council (2019). Plan:MK 2016-2031. Milton Keynes: Milton Keynes City Council.
- Ref.13 Earls Barton Parish Council (2016). Earls Barton Neighbourhood Plan 2011-2031 (Final). Corby: North Northamptonshire Council.
- Ref.14 Moulton Neighbourhood Plan Steering Group (2016). Moulton Neighbourhood Development Plan 2014-2029. Northampton: West Northamptonshire Council.
- Ref.15 Overstone Neighbourhood Plan Steering Group and Overstone Parish Council (2021). Overstone Neighbourhood Development Plan 2019-2029. Northampton: West Northamptonshire Council.
- Ref.16 Lavendon Parish Council (2019). Lavendon Neighbourhood Plan 2019 to 2031. Milton Keynes: Milton Keynes City Council.
- Ref.17 North Northamptonshire Council (2024). North Northamptonshire Local Plan review. Corby: North Northamptonshire Council. Available at [www.northnorthants.gov.uk/planning-strategies-and-plans/north-northamptonshire-local-plan](http://www.northnorthants.gov.uk/planning-strategies-and-plans/north-northamptonshire-local-plan)
- Ref.18 West Northamptonshire Council (2024). New Local Plan for West Northamptonshire. Northampton: West Northamptonshire Council. Available at [www.westnorthants.gov.uk/planning-policy/new-local-plan-west-northamptonshire](http://www.westnorthants.gov.uk/planning-policy/new-local-plan-west-northamptonshire)
- Ref.19 Northamptonshire County Council (2017). Northamptonshire Minerals and Waste Local Plan. Northampton: Northamptonshire County Council.
- Ref.20 Milton Keynes Council (2017). Minerals Local Plan - Adoption Version. Milton Keynes: Milton Keynes Council.
- Ref.21 Milton Keynes Council (2008). Milton Keynes Waste Development Plan Document 2007 – 2026. Milton Keynes: Milton Keynes Council.



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- Ref.22 Bedford Borough Council (2020). Local Plan 2030. Bedford: Bedford Borough Council.
- Ref.23 SEMLEP (2019). South East Midlands Local Industrial Strategy. Cranfield: South East Midlands Local Enterprise Partnership.
- Ref.24 North Northamptonshire Council, and West Northamptonshire Council (2024). Northamptonshire's Tourism Strategy 2023-2030. Northampton: Discover Northamptonshire. Available at [discover-northamptonshire.co.uk](https://discover-northamptonshire.co.uk)
- Ref.25 Destination Milton Keynes, and Milton Keynes City Council (2023). Brief: Milton Keynes Tourism Strategy. Milton Keynes: Destination Milton Keynes. Available at [www.destinationmiltonkeynes.co.uk/news/development-of-new-visitor-economy-and-tourism-strategy-announced/](https://www.destinationmiltonkeynes.co.uk/news/development-of-new-visitor-economy-and-tourism-strategy-announced/)
- Ref.26 Long Distance Walkers Association (2024). Long Distance Paths: Search for a Path app. Available at [ldwa.org.uk](https://ldwa.org.uk)
- Ref.27 Sustrans (2024). The National Cycle Network. Available at [www.sustrans.org.uk/national-cycle-network/](https://www.sustrans.org.uk/national-cycle-network/)



## 19 Human Health and Wellbeing

### 19.1 Introduction

19.1.1 The Human Health and Wellbeing chapter of the of the Environmental Statement (ES) will describe and identify the likely significant environmental effects arising as a result of the Scheme, in relation to human health and wellbeing. This chapter sets out the approach to collective baseline data within the Sites and Cable Route Search Area and surrounding Zone of Influence ('Zol'), based on publicly available information at the time of publication. The proposed scope of assessment of human health and wellbeing impacts is set out, including justification of the proportionality of the aspects proposed to be scoped in or out.

19.1.2 The EIA Regulations 2017 (Ref.1) require the direct and indirect significant effects of the proposed development on population and human health factors to be identified, described, and assessed. The assessment of human health and wellbeing impacts will further be assessed in the local and national planning policy context relevant to NSIPs and the DCO process.

19.1.3 The assessment will be undertaken in accordance with EIA guidance as published by Institute of Environmental Management and Assessment (IEMA) in November 2022 (Ref.2, Ref.3).

### 19.2 Legislation, Policy and Guidance

#### Legislative Context

19.2.1 The Planning Act 2008 (Ref.4) sets out the process for the consenting of major infrastructure projects and is the principal legislation governing an application for a Nationally Significant Infrastructure Project (NSIP).

19.2.2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref.1) sets out the regulatory framework for Environmental Impact Assessments (EIA) in connection with DCO applications. The framework includes screening and scoping, and the requirements in respect of each stage.

#### National Policy Context

19.2.3 National Planning Policy is set out in the following documents:

- Overarching National Policy Statement for Energy (EN-1), adopted January 2024 (Ref.5), where section 4.4 sets out the assessment principles for health;
- National Policy Statement for Renewable Energy Infrastructure (EN-3), adopted January 2024 (Ref.6), which provides the primary policy basis for decisions on renewable energy DCO applications, including Section 2.10 which specifically pertains to solar photovoltaic generation;
- National Policy Statement for Electricity Networks Infrastructure (EN-5), adopted January 2024 (Ref.5), in specific regard to the monitoring of potential health impacts from electromagnetic fields (EMF); and
- National Planning Policy Framework, adopted December 2023 (Ref.8), where Section 8 provides a policy context for the support and promotion of healthy and safe communities.

#### Local Planning Policy Context

19.2.4 The Local Planning Policy is set out in the host local authorities adopted policy documents:



- North Northamptonshire Joint Core Strategy 2011 to 2031 (adopted July 2016) (Ref.9);
- Wellingborough Local Plan (Part 2) (adopted February 2019) (Ref.10);
- West Northamptonshire Joint Core Strategy Local Plan (Part 1) (adopted December 2014) (Ref.11);
- Daventry Local Plan (Part 2) (adopted February 2020) (Ref.12);
- South Northamptonshire Local Plan (Part 2) (adopted July 2020) (Ref.13);
- Plan:MK 2016-2031 (adopted March 2019) (Ref.14); and
- Any made neighbourhood plans that cover the Scheme Order Limits.

19.2.5 Due consideration will also be given to:

- The emerging North Northamptonshire Strategic Plan;
- New Local Plan for West Northamptonshire; and
- Strategic health and wellbeing objectives in Bedford Borough (Ref.15).

19.2.6 Neighbourhood planning policies in areas covered by the Scheme boundaries will be considered in detail in the full ES assessment.

**Relevant Industry Guidance**

19.2.7 National guidance for the assessment of health impacts is available through Planning Practice Guidance (2023) (Ref.16) for the promotion of healthy and safe communities. Specific guidance on consideration of health as a topic within an EIA is provided by IEMA in their guidance documents: Effective Scoping of Human Health in Environmental Impact Assessment (2022) (Ref.2) and Determining Significance For Human Health In Environmental Impact Assessment (2022) (Ref.3).

19.2.8 Local level guidance is also provided by Milton Keynes City Council in their adopted Health Impact Assessment Supplementary Planning Document March 2021 (Ref.17). Whilst it is a useful document to consider, its primary purpose is to provide a guide for Health Impact Assessments (HIAs) for large residential development, and as such, should only be used for reference in the assessment of health and wellbeing in this EIA.

**19.3 Baseline Conditions**

19.3.1 Health and wellbeing impacts are likely to be felt at a different level and across a different area for different types of effect. For the collection of baseline data, the widest likely level of impact, based on the Zol for socio-economic impacts (such as employment and education deprivation) has been used to ensure the worst-case impact area is included. This therefore consists of the authority areas of North Northamptonshire, West Northamptonshire, Bedford Borough, and Milton Keynes City. Baseline conditions are sourced from Census 2021 and Office for Health Improvement and Disparities (OHID) online resources (Ref.18) to determine the scope of this assessment. Reference is also made to the Joint Strategic Needs Assessments for the same assessment area.

**Table 19.1 Health Profile of Local Authority Areas and England**

Health Indicator	Bedford	Milton Keynes	North Northants	West Northants	England and Wales
Male population over 65	15.5%	12.7%	17.0%	16.0%	17.4%



Health Indicator	Bedford	Milton Keynes	North Northants	West Northants	England and Wales
Female population over 65	17.9%	14.9%	19.3%	18.1%	19.7%
Male life expectancy (years)	78.6	79.2	78.8	79.6	78.9
Female life expectancy (years)	82.7	82.5	82.2	83.0	82.8
Self-reported bad or very bad health	4.4%	4.1%	4.9%	4.1%	5.2%
Prevalence of limited activity due to long-term illness or disability	15.5%	14.8%	17.3%	15.2%	17.5%
Under 75 mortality rates from all causes (per 100,000)	340.3	345.8	366.6	332.1	342.3
Suicide rate (per 100,000)	12.4	11.3	10.8	8.7	10.3
Emergency hospital admissions for intentional self-harm (per 100,000)	120.0	111.1	151.9	242.6	163.7
Indices of Multiple Deprivation 2019 Rank (of 317 <sup>1</sup> )	156	172	n/a	n/a	n/a
Indices of Multiple Deprivation 2019 Score	18.9	18.0	19.7	17.7	21.7
Percentage of LSOAs in most deprived 20%	13.6%	11.8%	15.5%	14.9%	20.0% (England only)

19.3.2 Each of the constituent authority areas within the ZoI have their own 'Joint Strategic Needs Assessment' which gives an up-to-date overview of the health and wellbeing conditions in the population of each of the authority areas. These documents are based on research and community consultation to determine what factors have the greatest

<sup>1</sup> Where "1" is the most deprived local authority area.

North Northamptonshire and West Northamptonshire were not formed until 2021.



impact on health and wellbeing, and where the greatest challenges and inequalities exist. The key challenges and areas of focus for each of the authority areas are listed below:

- North Northamptonshire (Ref.19):
  - Physical activity, good food and healthy eating, healthy weight, and mental health in adults.
- West Northamptonshire (Ref.20):
  - Mental health and emotional wellbeing in young people, physical activity, healthy weight, air quality, community safety due to violent crime, health inequalities due to ethnicity, health inequalities due to deprivation.
- Milton Keynes City (Ref.21):
  - Community safety due to violent crime, teenage pregnancy, baby and toddler health, mental health in children, children and youth development, health inequalities due to deprivation, healthy weight, homelessness.
- Bedford Borough (Ref.22):
  - Community safety due to burglary and vehicle crime, children and youth development, health inequalities due to deprivation, healthy weight, mental health.

## 19.4 Assessment Methodology

19.4.1 At present, there is no specific established methodology for assessing the health and wellbeing effects of a solar development. This section therefore provides a summary of the assessment methodology including the baseline analysis, and the relevant standards and guidance that will be used.

### Assessment Approach

19.4.2 The assessment of health will cross refer to the technical assessments undertaken for the other technical disciplines in the EIA, highlighting any conclusions reached which are relevant to human health. A health 'lens' will be applied to these conclusions to determine the extent to which these conclusions have any effect (or not) upon the health of the local population or specific population groups therein. A clear pathway between the anticipated impact and the resultant health effects will need to be determined to understand the significance of any effects to human health and wellbeing. The assessment will also be informed by available topic-specific literature, and where appropriate, engagement with health and wellbeing stakeholders and statutory bodies.

19.4.3 The Study Areas for human health and wellbeing impacts will be largely influenced by the relevant technical assessment in the rest of the ES. For example, where noise and vibration impacts are defined within a given Study Area of the Scheme, this same Study Area will be considered when assessing the health impacts associated with the changes in noise and vibration identified.

19.4.4 As set out in **Chapter 4**, for the purpose of assessment in the ES, the construction phase of the Scheme is anticipated from 2027-2029 for up to 24 months. The operational lifetime of the Scheme is anticipated to be up to 60 years, giving a likely decommissioning date no later than 2089. Human health and wellbeing impacts are to be assessed for the construction phase and for the operational phase. Impacts at decommissioning are anticipated to be less than, or at a maximum no worse than, those experienced at construction.





- 19.4.5 The assessment of health and wellbeing impacts will be applied to the general population, and to identified vulnerable groups as identified through baseline conditions analysis. Consideration of vulnerable groups will be utilised to effectively determine sensitivity of the population as a whole and identify what impacts the Scheme may have on health inequalities. Vulnerable sub-population groups as identified in Table 9.2 of IEMA Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (2022) (Ref.2) include the following groups:
- Age related groups: children, young people, older people;
  - Income related groups: people on low income or with poor job security, economically inactive and unemployed people, people in poverty or experiencing homelessness, those unable to work due to poor health;
  - Health inequality or disadvantage: people with long-term physical disabilities, long-term mental disabilities, and learning or neurological disabilities, and those providing care to people with disabilities;
  - Social disadvantage: people experiencing social isolation, persons experiencing discrimination (including specifically based on race or religion), as necessary any other protected characteristic as defined by the Equality Act 2010 (age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation), gypsy and traveller groups, refugee and/or asylum seekers, non-English speakers, and those with low literacy or numeracy;
  - Geographic factors: people experiencing barriers in access to services or service provision, amenities, or facilities, people living in areas of high deprivation, and differences in urban versus rural challenges to access to services.

- 19.4.6 The health assessment will also consider sensitive physical receptors such as schools, care homes, and healthcare facilities, which may be particularly vulnerable to change as a result of their occupants or users. The identification of these vulnerable groups and locations will be furthermore supported by the technical assessments of other ES chapters as appropriate.

#### Consultation

- 19.4.7 The Applicant will carry out a detailed baseline assessment of human health conditions in the Zol to focus on identifying and understanding local health needs and vulnerable groups that could be significantly impacted by the Scheme.

- 19.4.8 To ensure that this approach is proportionate but suitably robust, engagement will be carried out with relevant public health bodies and the local authority to supplement the desk-based findings ahead of production of the PEIR. Where required, these inputs will inform the evolving design of the Scheme ahead of PEIR and the production of the ES for the DCO application.

#### Assessment of Sensitivity and Magnitude

- 19.4.9 The sensitivity of all identified environmental receptors will be described as high, medium, low, or very low, whilst the magnitude of impact on those receptors will be described as high, medium, low, or negligible. Where an effect is identified, the likely duration, location and significance will be presented. The health effects will be assessed in the context of the baseline position, as well as the nature and context of the effect, taking account of the sensitivity of the identified receptor (i.e. the existing population and identified vulnerable/ priority groups).

- 19.4.10 The sensitivity of the receptors identified in this chapter will be assessed by understanding measurable indicators of the receptor's present characteristics and considering this alongside the weighted importance of the receptor in local, regional, and national policy or strategic requirements together with professional judgment. To ensure a



consistent approach across the socio-demographic and economic receptors identified in this assessment, each receptor will be assessed against the criteria as set out in Table 19.2 to determine its sensitivity. This determination will be based on statistical analysis where appropriate or based on professional judgement of the qualitative aspects of the criteria being assessed.

**Table 19.2 Sensitivity and Importance of the Identified Environmental Receptor**

Sensitivity	Definition
High	Population or population groups with high levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Population or population groups with moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Population or population groups with low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very Low	Population or population groups with very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

19.4.11 The methodology for determining the impact magnitude is described below and will be based on the residual impacts of the Scheme post-mitigation. The magnitude of change will be used for either beneficial or adverse impacts. As there is no standard methodology for determining how magnitude of impacts are calculated, professional judgement has been used to determine the criteria set out in Table 19.3.

**Table 19.3 Magnitude of Change for the Identified Environmental Receptor**

Magnitude	Definition
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.



Magnitude	Definition
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

**Significance**

19.4.12 The degree of significance of impacts, in respect of Human Health and Wellbeing, is determined using the matrix below in Table 19.4, taking into consideration both receptor sensitivity to change and magnitude of change to baseline conditions.

19.4.13 Effects that are major, major/moderate, moderate or moderate/minor are significant in terms of EIA as in accordance with IEMA guidance (Ref.3).

**Table 19.4: Criteria for Assessing the Significance of Effects**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/moderate	Moderate/minor	Minor/negligible
Medium	Major/moderate	Moderate	Minor	Minor/negligible
Low	Moderate/minor	Minor	Minor	Negligible
Negligible	Minor/negligible	Minor/negligible	Negligible	Negligible

19.4.14 The degree of significance of an effect can be described either as beneficial or adverse in nature, or neutral if there is no anticipated impact. Temporally, effects are described as being of short-, medium-, or long-term. These together with the level of significance should be used to determine which effects from the Scheme need to be considered further in the ES, and therefore which effects require mitigation measures to be implemented in the design, construction, operation, and decommissioning of the Scheme.

**In-Combination and Cumulative Effects**

19.4.15 The assessment also considers potential in-combination (or intra-development) effects from different aspects of the Scheme, and cumulative effects related to relevant projects, where they are considered likely to have significant environmental effects. This includes assessing the cumulative impact of the construction of this Scheme, its operational lifetime, and where relevant its decommissioning, against other nearby NSIPs and relevant Town and Country Planning Act planning applications and approvals which will also have effects within the Zol as appropriate.



- 19.4.16 In-combination effects related to human health and wellbeing will be assessed in full within **Chapter 19: Human Health and Wellbeing** of the ES.
- 19.4.17 A full list of cumulative sites considered for assessment will be included in the ES, based on the Zones of Influence for each topic area as set out in each technical chapter, and a full assessment of cumulative effects relating to human health and wellbeing will be undertaken in **Chapter 23: Cumulative Effects**.

## 19.5 Conclusions on Scoping

19.5.1 Table 5.1 of the IEMA Guide to: Effective Scoping of Human Health in Environmental Impact Assessment (2022) (Ref.2) includes a non-exhaustive list of wider determinants of health associated with the WHO definition. Solar farms are designed, operated and maintained safely, and are not known to be linked with or represent a serious risk to public health. Many of the key determinants of human health will not be applicable in this case, or will be assessed throughout other chapters, namely Climate Change, Landscape and Visual, Hydrology and Flood Risk, Ground Conditions and Contamination, Transport and Access, Noise and Vibration, Air Quality, Socio-Economics, Tourism and Recreation; Agriculture and Soils, and Major Accidents and Disasters chapters. With this considered, the wider determinants used by IEMA and the Office for Health Improvement and Disparities, to be scoped in or out of the assessment in the ES for this Scheme are set out below.

### Scoped In

19.5.2 The potential effects on wider determinants of health used by IEMA and the Office for Health Improvement and Disparities, which are considered should be scoped in detailed assessment, or included in other technical chapters within the ES are listed in Table 19.5.

**Table 19.5: Health Effects to be Scoped In**

Health Effect	Consideration and Discussion
<b>Health-related behaviour</b>	
None	
<b>Social environment</b>	
Housing	<p>Construction (and Decommissioning)</p> <p>Although it is anticipated the majority of the construction workforce will reside within the Zol, there may be requirement for temporary accommodation for construction workers moving to the area for work. The quantum of accommodation anticipated will be assessed in the topic chapter for Socio-Economics, Tourism and Recreation.</p> <p>Health effects may be experienced by residents if the local accommodation market is significantly adversely affected.</p>
Open space, leisure and play	<p>Construction (and Decommissioning)</p> <p>The Scheme has potential to impact upon the use and desirability of, and access to, leisure and recreation facilities as a result of direct impacts from construction and decommissioning works (particularly on recreational facilities in the countryside such as Public Rights of Way (PRoWs)). The level of impact upon leisure and recreation facilities will be assessed in in the topic chapter for Socio-Economics, Tourism and Recreation, and will take account of impacts from</p>



Health Effect	Consideration and Discussion
	<p>Transport and Access and Landscape and Visual where appropriate.</p> <p>Operation</p> <p>During operation the Scheme will not directly reduce any land used for or access to open space, leisure and play. Whilst long-term access and connections to the natural environment will be maintained, the impact on landscape amenity and associated desirability and enjoyment will be considered in the topic chapter for Socio-Economics, Tourism and Recreation and Landscape and Visual.</p> <p>The assessment of the impact in health terms will include for any changes to how vulnerable groups access and connect to the natural environment, open space, leisure and play opportunities. Any mitigation or enhancement measures, such as the improvement of PRoWs or creation of new permissive routes will also be taken into account of the health and wellbeing benefit of residents and visitors to the area.</p>
<p>Transport modes, access and connections</p>	<p>Construction, Operation and Decommissioning</p> <p>Construction works may temporarily disrupt use of PRoWs and roads through cable laying or movements by heavy goods vehicles. Any potential disturbance and safety impacts will be assessed in the Transport and Access chapter and will be cross-referenced where appropriate.</p> <p>During the operational phase, the volume of traffic associated with the Scheme is considered to be substantively less than during construction, with only traffic movements associated with replacement of equipment likely to generate any significant effects. This is also proposed to be assessed in the Transport and Access chapter and will be cross-referenced where appropriate.</p> <p>The assessment of the impact in health terms will include for any changes to how vulnerable groups access and connect to other settlements and communities.</p>
<p>Community identity, culture, resilience and influence</p>	<p>Construction, Operation and Decommissioning</p> <p>The Scheme will not result in any demographic changes which would strongly influence community identity, nor will it result in long-term changes to lighting, overshadowing and reflections or the attractiveness of public spaces and buildings. The key change will be the visual landscape of the area, which will be considered in the Landscape and Visual chapter with mitigation measures secured to minimise impacts. The assessment of health impacts will cross-reference to the Landscape and Visual chapter where appropriate.</p> <p>Another key issue is the sense of control within the community and how this can affect anxieties. The health assessment will therefore assess the impact on mental wellbeing of the receptors, and the preparation of the Development Consent</p>



Health Effect	Consideration and Discussion
	Order application will be informed by an extensive programme of community engagement.
<b>Economic environment</b>	
Education and training	<p>Construction, Operation and Decommissioning</p> <p>All phases of the Scheme are expected to support education and training opportunities. This will be assessed in full in the Socio-Economics, Tourism and Recreation chapter.</p> <p>Those impacts that could have a significant impact upon human health such as school programmes, adult learning and apprenticeships will be assessed further in the Human Health and Wellbeing chapter.</p>
Employment and income	<p>Construction, Operation and Decommissioning</p> <p>The Scheme will provide numerous direct and indirect opportunities for employment and higher incomes, which can potentially be particularly beneficial for some vulnerable or priority groups. The greatest extent of these impacts would be during construction, although assessment of all phases of the Scheme will be outlined in the Socio-Economics, Tourism and Recreation chapter. Secondary impacts on existing businesses will also be assessed.</p> <p>The Human Health and Wellbeing chapter will cross-reference to the Socio-Economics, Tourism and Recreation chapter where appropriate. The Human Health and Wellbeing chapter will assess the effect of improving employment opportunities and income on the health of vulnerable groups.</p>
<b>Bio-physical environment</b>	
Climate change mitigation and adaptation	<p>Operation</p> <p>The Climate Change chapter will assess how the Scheme responds to the challenges of climate change which will affect current and future global populations. The Human Health and Wellbeing chapter will cross-reference to the Climate Change chapter where appropriate. Embodied carbon and other emissions which can alter the climate are not expected to be of a scale to have a health impact during the construction phase. During the operational phase the renewable energy generated will assist in transitioning towards net zero and improving climate resilience. The Human Health and Wellbeing chapter will assess how the contribution towards net zero targets affects the physical and mental health of receptors during the operational phase.</p>
Air quality	<p>Construction (and Decommissioning)</p> <p>The Scheme has potential to generate dust from construction works and generate pollution from construction traffic. These matters will be assessed in in the topic chapter for Air Quality.</p>



Health Effect	Consideration and Discussion
	<p>Operation</p> <p>The production of dust and pollution from the Scheme during operation is minimal and so is not anticipated to generate any secondary health impacts. That notwithstanding, there is potential for adverse air quality conditions as a result of fire from the Scheme, particularly in regard to the Battery Energy Storage System. These matters will be assessed in in the topic chapter for Air Quality.</p> <p>The assessment of the impact in health terms will therefore include for any impacts on the physical health of vulnerable groups who may be within the impact area for dust, pollution, or smoke from fires.</p>
Water quality or availability	<p>Construction, Operation and Decommissioning</p> <p>The Hydrology and Flood Risk chapter will assess how the Scheme affects water resources. The project would adopt standard best practice to minimise pollution risk issues. The potential resultant effects on the health of vulnerable groups will be included into the Human Health and Wellbeing chapter if the Hydrology and Flood Risk chapter indicates significant effects to human health.</p>
Land quality	<p>Construction, Operation and Decommissioning</p> <p>The Ground Conditions and Contamination chapter will assess how the Scheme may affect risks of ground-based pollutants or contaminants. The project would adopt standard best practice to minimise onward contamination risks to vulnerable people or receptors. The potential resultant effects on the health of vulnerable groups will be included into the Human Health and Wellbeing chapter if the Ground Conditions and Contamination chapter indicates significant effects to human health.</p>
Noise and vibration	<p>Construction, Operation and Decommissioning</p> <p>The Noise and Vibration chapter will assess how the Scheme affects the existing sound environment and associated impacts from the Scheme’s construction and operation. The Human Health and Wellbeing chapter will assess the effect of noise and vibration on health of the identified receptors (including mental wellbeing), and will cross reference to the Noise and Vibration chapter where appropriate.</p>
<b>Institutional and built environment</b>	
Health and social care services	<p>Construction (and Decommissioning)</p> <p>There would be a larger workforce on site during the construction phase. Whilst the vast majority of the workforce are expected to already be residents of the Zol with existing access to healthcare, some may want to temporarily register with local GP facilities, particularly if temporarily relocating closer to the Scheme. As such, the Human Health and Wellbeing chapter will assess the effect on GP availability, and</p>



Health Effect	Consideration and Discussion
	emergency healthcare availability during the construction phase.
Wider societal infrastructure and resources	<p>Operation</p> <p>The project will contribute towards clean and resilient electricity infrastructure to generate the energy which society depends on for good population health. A reliable supply of renewable electricity is required in relation to numerous societal factors such as food production and safety, thermal comfort, healthcare, education, income generation and socialising. As will be outlined throughout the ES, it could provide significant contributions in terms of economic development, climate change mitigation, and protection or enhancement of the natural environment (e.g. biodiversity, access to natural spaces and habitats). The Human Health and Wellbeing chapter will assess the effect in health terms of the Scheme’s contribution towards wider societal infrastructure and will cross-reference to other ES chapters where appropriate.</p>

**Scoped Out**

19.5.3

The potential effects on wider determinants of health used by IEMA and the Office for Health Improvement and Disparities, which are considered should be scoped out from detailed assessment are listed in Table 19.6.

**Table 19.6: Health Effects to be Scoped Out**

Health Effect	Consideration and Discussion
<b>Health-related behaviour</b>	
Physical activity	<p>Construction, Operation and Decommissioning</p> <p>Physical activity is a recognised important determinant of health, however, to avoid duplication, this is considered under 'open space, leisure and play', and 'transport modes, access and connections'.</p>
Risk taking behaviour	<p>Construction, Operation and Decommissioning</p> <p>During all phases, all people based on the Scheme will be professional workers and all contractors and operators on site will have strict health and safety protocols enforced. These policies and practices can cover issues including alcohol, cigarettes, non-prescribed drugs, problem gambling and communicable illness.</p>
Diet and nutrition	<p>Construction, Operation and Decommissioning</p> <p>The proposal will result in the temporary long-term reduction in agricultural land. As the Scheme covers less than 0.006% of the UK’s Utilised Agricultural Area it is unlikely to significantly affect the availability and affordability of food. However, some of the Scheme may constitute as Best and Most Versatile Agricultural Land, and any likely significant effects of the Scheme on</p>





Health Effect	Consideration and Discussion
	agricultural land will be assessed within the Agriculture and Soils chapter.
<b>Social environment</b>	
Housing	<p>Operation</p> <p>The operational workforce will comprise a very small number of permanent staff, most of whom are anticipated to already live in the Zol, limiting the potential for any likely significant adverse impacts on housing or access to suitable accommodation, that could result in a significant health effect.</p>
Relocation	<p>Construction, Operation and Decommissioning</p> <p>The Scheme would not involve the compulsory acquisition or temporary possession of any homes or community facilities: no relocation is therefore necessary.</p>
Community safety	<p>Construction, Operation and Decommissioning</p> <p>Good practice measures in terms of safety, such as a risk assessment prior to the start of works, would be secured through suitable management plans during construction and so the risk to the local community from accidental injury is scoped out. Safe working practices will be secured through a Construction Environmental Management Plan (CEMP) (an outline CEMP will be submitted as part of the DCO application).</p> <p>Security will be managed through perimeter fencing, CCTV and lighting and secured through a CEMP and Operational Environmental Management Plan (OEMP). Given the nature of the Scheme and its rural location, it is anticipated that potential for widespread actual or perceived crime that could affect population health is unlikely.</p>
Social participation, interaction and support	<p>Construction, Operation and Decommissioning</p> <p>Social participation, interaction and support are not anticipated to be directly impacted by the Scheme as there are no proposed impacts on social or community facilities or venues for social interaction. Any indirect impacts on access to these spaces are considered under 'transport modes, access and connections'.</p>
<b>Bio-physical environment</b>	
Climate change mitigation and adaptation	<p>Construction (and Decommissioning)</p> <p>The impact of the Scheme on climate change from construction activities and the manufacturing and transport of materials for use on the Scheme is not anticipated to induce human health impacts, particularly when considered in parallel to the likely improvements to carbon emissions offsetting, climate change mitigation and climate resilience as a result of the operational lifetime of the Scheme.</p>
Radiation	Construction, Operation and Decommissioning



Health Effect	Consideration and Discussion
	<p>Construction works would not include using, or making material changes to, active major electrical infrastructure producing electro-magnetic fields (EMF).</p> <p>Long-standing exposure limit and health protection guidelines for electric and magnetic fields (EMF), have been developed by the International Commission on Non-Ionizing Radiation Protection and have a high safety margin. The Scheme will comply with these guidelines and will include suitable buffer zones from high voltage cables and substation equipment to sensitive receptors to ensure no impacts on human health are anticipated.</p> <p>Whilst fears of a causal link between EMFs and health impacts can generate community anxieties, these can be suitably addressed with a robust community engagement process. This will include non-technical information to explain how the balance of scientific evidence suggests EMFs are safe.</p>
<b>Institutional and built environment</b>	
Health and social care services	<p>Operation</p> <p>The operational workforce will comprise a very small number of permanent staff, most of whom are anticipated to already live in the Zol. Workers required for replacement of equipment will be far fewer than for construction, limiting the potential for any adverse impacts on access to healthcare and social care services, that could result in a significant health effect.</p>
Built environment	<p>Construction (and Decommissioning)</p> <p>The construction phase of the Scheme is unlikely to significantly affect existing features of the built environment in terms of population health. Where cables are to be laid, these will be routed to avoid existing buried services where necessary, or crossed by trenchless (drilled) techniques to ensure risk of severance of utilities (including telecommunications, sanitation, and energy utilities) is minimised. The design of cable routing will be secured through the CEMP and directed by a Crossing Schedule provided as part of the DCO application. On this basis, this health effect is proposed to be scoped out.</p> <p>Operation</p> <p>The location of the Scheme is within a rural and semi-rural setting, although the electricity generated by the Scheme will predominantly be used to temporarily power the built environment. The landscape and visual impacts on the natural environment will be considered in the Landscape and Visual chapter, with mitigation measures secured to minimise impacts. The community response to visual landscape change is assessed under the ‘Community identity, culture, resilience and influence’ determinant of human health.</p>



Health Effect	Consideration and Discussion
Wider societal infrastructure and resources	<p>Construction (and Decommissioning)</p> <p>This Scheme is not projected to generate public health benefits, nor adversities, at this stage in respect of infrastructure important to societal health. Nevertheless, Scheme benefits regarding economic development are included under the determinant 'Employment and income'.</p>

## 19.6 References

- Ref.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, 2017 No.572.
- Ref.2 IEMA (2022). Effective Scoping of Human Health in Environmental Impact Assessment. London: Institute of Environmental Management and Assessment. Available at [www.iema.net/resources](http://www.iema.net/resources)
- Ref.3 IEMA (2022). Determining Significance For Human Health In Environmental Impact Assessment. London: Institute of Environmental Management and Assessment. Available at [www.iema.net/resources](http://www.iema.net/resources)
- Ref.4 The Planning Act 2008, 2008 c.29
- Ref.5 Department of Energy Security & Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). London: The Stationery Office.
- Ref.6 Department of Energy Security & Net Zero (2023). National Policy Statement for Renewable Energy Infrastructure (EN-3). London: The Stationery Office.
- Ref.7 Department of Energy Security & Net Zero (2023). National Policy Statement for Electricity Networks Infrastructure (EN-5). London: The Stationery Office.
- Ref.8 Department for Levelling Up, Housing & Communities (2023). National Planning Policy Framework. London: The Stationery Office.
- Ref.9 North Northamptonshire Joint Planning Unit (2016). North Northamptonshire Joint Core Strategy 2011-2031. Corby: North Northamptonshire Joint Committee.
- Ref.10 Borough Council of Wellingborough (2019). The Plan for the Borough of Wellingborough. Wellingborough: Borough Council of Wellingborough.
- Ref.11 West Northamptonshire Joint Planning Unit (2014). West Northamptonshire Joint Core Strategy Local Plan (Part 1). Northampton: West Northamptonshire Joint Committee.
- Ref.12 Daventry District Council (2020). Settlements and Countryside Local Plan (Part 2) For Daventry District 2011-2029. Daventry. Daventry District Council.
- Ref.13 South Northamptonshire District Council (2020). South Northamptonshire Local Plan (Part 2) 2011-2029. Towcester. South Northamptonshire District Council.
- Ref.14 Milton Keynes Council (2019). Plan:MK 2016-2031. Milton Keynes. Milton Keynes City Council.
- Ref.15 Bedford Borough Council (2020). Local Plan 2030. Bedford: Bedford Borough Council.
- Ref.16 Department for Levelling Up, Housing & Communities (2023). Planning Practice Guidance: Health and safe communities. Available at <https://www.gov.uk/guidance/health-and-wellbeing>



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- Ref.17 Milton Keynes Council (2021). Health Impact Assessment Supplementary Planning Document. Milton Keynes. Milton Keynes City Council.
- Ref.18 Office for Health Improvement & Disparities (2024). Public health profiles. Available at <https://fingertips.phe.org.uk/>
- Ref.19 North Northamptonshire Council (2024). Joint Strategic Needs Assessment. Available at <https://www.northnorthants.gov.uk/health-and-wellbeing-board/reports-and-assessments>
- Ref.20 West Northamptonshire Council (2024). Joint Strategic Needs Assessment. Available at <https://www.westnorthants.gov.uk/health-and-wellbeing-board/joint-strategic-needs-assessment-jsna>
- Ref.21 Milton Keynes City Council (2024). Joint Strategic Needs Assessment. Available at <https://bmkjsna.org/milton-keynes/jsna/>
- Ref.22 Bedford Borough Council (2024). Joint Strategic Needs Assessment. Available at <https://bmkjsna.org/bedford/jsna/>



## 20 Arboriculture

### 20.1 Introduction

20.1.1 This chapter describes the known arboricultural assets within or within influencing distance of the Scheme. These include: individual trees, groups of trees and woodlands. Hedgerows are considered separately in Chapter 8 (Ecology and Biodiversity) as well as in Chapter 7 (Landscape and Visual).

20.1.2 Relevant arboricultural legislation and policy is provided below as well as the proposed approach for surveys and sensitive Scheme design. The possible arboricultural impacts of the Scheme during construction, operation and decommissioning are described followed by the proposed mitigation and compensation options. An Assessment Methodology is provided for arboricultural impacts that cannot be avoided and this chapter then concludes which possible effects on trees will be scoped into the Environmental Impact Assessment and considered within the Environmental Statement (ES).

20.1.3 A Preliminary Arboricultural Impact Assessment and Outline Arboricultural Method Statement will accompany the DCO submission to confirm the anticipated effects, mitigation and compensation once the final layout and construction details are available and all surveys have been completed.

### 20.2 Legislation, Policy and Guidance

20.2.1 This chapter has considered the following relevant legislation, policy and guidance:

- Overarching National Policy Statement (NPS) for Energy (EN-1) (Ref.1): Designated January 2024 paragraph 5.4.32 (Ancient Woodland and Veteran Trees) requires proposals to *"include measures to mitigate fully the direct and indirect effects of development on ancient woodland, ancient and veteran trees or other irreplaceable habitats during both construction and operational phases"*;
- Paragraph 5.11.27 of EN-1 requires existing trees and woodlands to be retained wherever possible. Paragraph 5.11.27 also states that *"Mitigation may include, but is not limited to, the use of buffers"* and *"Where woodland loss is unavoidable, compensation schemes will be required, and the long-term management and maintenance of newly planted trees should be secured"*;
- The National Policy Statement for Renewable Energy Infrastructure (EN-3) (Ref.2Ref.1) Designated January 2024 paragraph 2.10.100 requires proposals to *"protect and retain, wherever possible, the growth of vegetation on site boundaries, as well as the growth of existing hedges, established vegetation, including mature trees within boundaries"*. Paragraph 2.10.101 of EN-3 also states that the impacts of a proposed development should be informed by a tree survey and arboricultural assessment;
- National Planning Policy Framework (NPPF) (Ref.3) paragraph 186 part c). It should be noted that in the context of DCO applications, the NPPF is only an important and relevant consideration and applications are decided in accordance with the NPSs.;
- Planning Policy Guidance for Tree Preservation Orders and Conservation Areas (Ref.4);
- Natural England and Forestry Commission, Ancient woodland, ancient trees and veteran trees: advice for making planning decisions (Ref.5); and
- British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction' (BS 5837:2012).

20.2.2 Ancient woodland and ancient and veteran trees are *"irreplaceable habitats"* within NPS EN-1 (paragraphs 5.4.14-5.4.15) which is consistent with the NPPF. In accordance with



paragraph 5.4.53 of NPS EN-1, impacts to such trees, such as loss or deterioration, should only be permitted for "*wholly exceptional reasons*", for example where the public benefit of a development outweighs the loss or deterioration, and a suitable compensation strategy exists. Given this strong policy protection and the difficulties in establishing a suitable compensation strategy for such features, particular emphasis on identifying and then avoiding impacts to ancient and veteran trees is being applied in the arboricultural approach to ensure such any potential impacts are avoided from the outset.

### 20.3 Baseline Conditions

- 20.3.1 Baseline arboricultural surveys are currently being undertaken. For Green Hill A-F (excluding A.2), surveys have been completed and, at the time of writing, tree surveys on Green Hill BESS Green Hill A.2 and G are ongoing. The Cable Route Search Area is currently undergoing an optioneering process (Section 3.4). Arboricultural surveys will then be undertaken when the Cable Route Search Area is narrowed down to approximately 100m and potential impacts to trees have been identified following a desk study and review of aerial imagery.
- 20.3.2 A desk-based assessment has found that there are no existing records of ancient and veteran trees (Ref.6), and no records of Tree Preservation Orders or Conservation Areas (Ref.7) within Green Hill A-G and BESS or the Cable Route Search Area.
- 20.3.3 Within 50m of the Sites and Cable Route Search Area, there are:
- No ancient/veteran tree records;
  - Mears Ashby Conservation Area (approximately 50m from Site E);
  - Easton Maudit Conservation Area (approximately 5m from Site F); and
  - TPO T9/21 WBC (Easton Maudit) TPO 1985 (approximately 35m from Site F however, all protected trees are located on the opposite side of Easton Way in a private residence and are therefore unlikely to be impacted during construction, operation or decommissioning).
- 20.3.4 Green Hill A-G and BESS do not contain any registered ancient woodlands, however, there are six ancient woodlands within 100m of the Sites (Ref.8):
- Horn Wood, located 750m south-west of Bozeat, is located directly adjacent to Site F;
  - Sywell Wood, located to the north of Sywell Aerodrome, is also located directly adjacent to Site C and the Cable Route Search Area;
  - Hardwick Wood, located east of the A43 and to the north of Sywell Wood is also adjacent to the Cable Route Search Area;
  - Three Shire Wood located directly adjacent to the eastern boundary of Site G;
  - Nun Wood located directly adjacent to the eastern boundary of Site G; and
  - Barslay Spinney located 25m west of Site G on the opposite side of the A509 (within the Cable Route Search Area).
- 20.3.5 Cable routes within the Cable Route Search Areas (**Figures 3.2.1-3.2.3**) are currently still being determined and therefore the proximity of the Cable Corridor to these ancient woodlands is still to be determined.
- 20.3.6 Ground level tree surveys on Green Hill A-E (excluding A.2) have so far recorded 217 individual trees, 16 of which have been classified as veteran and one of these is also ancient. Processing of Green Hill F tree data is ongoing and Green Hill A.2 and G have not yet been surveyed. The Sites are largely arable in character and therefore the majority of individual trees are located on arable field boundaries and often incorporated into hedgerow features. The most common species recorded to date are ash *Fraxinus excelsior*, followed by oak *Quercus robur* and less frequently poplar *Populus*



*sp.*, aspen *Populus tremula*, white willow *Salix alba* and crack willow *Salix fragilis*. A significant proportion of the ash recorded are showing signs of decline due to ash dieback.

- 20.3.7 Woodland belts and tree groups have been occasionally recorded within the survey areas although most significant features are located outside of the Scheme area.

## 20.4 Assessment Methodology

- 20.4.1 It should be noted that early baseline conditions surveys for Green Hill A.2, the potential extension of Green Hill A, have not been completed prior to the submission of this Scoping Report. Due to its proximity to Green Hill A, the baseline conditions for Green Hill A.2 are assumed for the purpose of this Scoping Report to be equivalent to Green Hill A. If Green Hill A.2 is taken forward and included in the Scheme, the baseline conditions will be shared with key stakeholders and any differences from the Site A baseline identified, and will be presented in the PEIR for statutory consultation ahead of the submission of the completed ES as part of the future DCO submission.

- 20.4.2 Whilst the baseline conditions for Green Hill A.2 are not yet available, due to its proximity to Green Hill A, it is proposed that the assessment of likely significant environmental effects from Green Hill A.2 is to be carried out in the same manner as for Green Hill A. In the event any characteristics of Green Hill A.2 are found to differ from the baseline for Green Hill A, the differences identified between the baseline surveys will be shared with key stakeholders and, will be assessed in full in the ES.

### Tree Survey and Design

- 20.4.3 A full tree survey in accordance with BS5837:2012 is being undertaken at Green Hill BESS and other targeted areas at Green Hill A-G and along the Cable Route Search Areas where the potential exists for arboricultural impacts such as incursions into rooting zones, facilitative pruning or tree removal as a last resort as identified through desk study. Trees within the Easton Maudit Conservation Area and within 15m of Green Hill F will also be surveyed to establish buffers for these trees
- 20.4.4 For the remainder of Green Hill A-G, trees within influencing distance of those areas (15m of the Sites/and focus areas along the within 100m of the cable routes) will be surveyed by the project Arboriculturist to record all ancient and veteran trees as well as the largest tree (by stem diameter and resulting root protection area) on each field boundary in accordance with BS 5837:2012.
- 20.4.5 The stem locations, Root Protection Areas and canopy spreads of recorded trees will inform the protection offsets for the Scheme design in addition to buffers advised for ecological constraints. For veteran and ancient trees, a buffer zone of 15 times the diameter at breast height of the tree, or 5 metres from the edge of the tree's canopy, whichever is greater, will be followed in accordance with guidance from Natural England and the Forestry Commission (Ref.9) For all non-veteran trees, buffer zones will be 12 times the diameter at breast height.
- 20.4.6 Early establishment of tree buffers will provide mitigation by facilitating sensitive constraints-led design around existing tree assets. Further Arboriculturist input into the design process will ensure that existing trees and their buffers are avoided in most instances. Unavoidable tree effects will be detailed in the Preliminary Arboricultural Impact Assessment with required mitigation and compensation measures detailed in the Outline Arboricultural Method Statement to be submitted with the DCO application.
- 20.4.7 A further check with Local Planning Authorities will also be undertaken to ensure that all TPO and Conservation Area information online is valid and up to date.

## 20.5 Potential Effects

- 20.5.1 Possible effects to trees from the construction of the Scheme include tree removal, pruning and root loss/damage from:



- Temporary construction access routes and visibility splays;
- Permanent access routes and visibility splays;
- Temporary construction compounds/parking areas/materials storage areas;
- Permanent parking areas and compounds;
- Installation of cables, services, security fencing and ancillary equipment; and
- Movements of tall and/or heavy machinery.

20.5.2 Possible effects to trees from the operation of the Scheme include tree pruning to maintain permanent access routes, visibility splays, parking areas and compounds as well as any pruning to reduce shading to solar panels. The risks of these impacts during operation are likely to be minor given that suitable offsets from trees will be applied during the design stage.

20.5.3 Proposed effects to trees from the decommissioning of the Scheme are anticipated to be negligible given that the Scheme's infrastructure is likely to be removed via pre-established permanent access routes and is therefore unlikely to require any additional tree removal, pruning or root loss.

## 20.6 Arboricultural Mitigation and Compensation Approach

20.6.1 The primary method for mitigating the above listed potential impacts to trees will be through considered constraints-led design and layout of the Scheme to avoid buffer zones, canopy spreads and shade patterns of existing trees. It is considered highly feasible for the Scheme to achieve these offsets given that the nature of the Scheme requires the arrays to have access to unobstructed light. Potential mitigation options for the installation of the cables include horizontal directional drilling (HDD), micrositing around tree Root Protection Areas and canopies and hand digging within Root Protection Areas. Tree removal and compensatory planting will be undertaken as a last resort.

20.6.2 Damage to trees, groups, woodlands and hedges will be mitigated primarily via the installation of tree protection fencing and other forms of fit for purpose tree protection (e.g. ground protection), installed to the specifications recommended in BS 5837:2012 prior to the commencement of construction, and the maintenance of this protection for the duration of construction. In places, it may be appropriate for security fencing to act as the tree protection fencing, provided that all construction activities will take place inside of the fencing and the fencing installation will be the first activity on site, before the arrival of any vehicles, plant or machinery.

20.6.3 Mitigation will be secured within an Outline Arboricultural Method Statement to be incorporated within the Outline Construction Environment Management Plan (OCEMP) and submitted with the DCO application. Tree Protection Plans may be required in certain areas where security fencing will not offer sufficient protection for retained arboricultural assets. Arboricultural oversight during construction will be secured with specific provisions to be included within the OCEMP. Compensation will be secured through proposed new planting to be secured in the Landscape and Ecology Mitigation and Enhancement Plan which will compensate for any tree losses and ensure the long-term sustainability of the existing tree resource given the presence of extensive ash dieback across the Schemes.

20.6.4 Unavoidable tree impacts will be assessed by first establishing the value/sensitivity of the arboricultural feature as per Table 20.1 below.

**Table 20.1 Criteria for Value/Sensitivity of Arboricultural Resource**

Value/Sensitivity	Description
Very High	Ancient and veteran trees.





Value/Sensitivity	Description
High	Trees protected by a Tree Preservation Order and/or classified as Category A in BS 5837:2012.
Medium	Trees protected by a Conservation Area designation and/or classified as Category B in BS 5837:2012.
Low	Trees classified as Category C in BS 5837:2012
Very Low	Trees classified as Category U in BS 5837:2012.

20.6.5 Once the value/sensitivity of an impacted arboricultural feature has been ascertained, the magnitude of impact to that feature will be assessed as per Table 20.2 below.

**Table 20.2 Criteria for Determining Magnitude of Impact**

Magnitude of Impact	Description
High	Tree removal or significant tree pruning which alters the value/sensitivity of an arboriculture feature.
Medium	Canopy or root impacts which do not alter the value/sensitivity of an arboricultural feature but may have a medium to long term impact on tree condition, health and safe life expectancy.
Low	Canopy or roots impacts which do not meet the definitions of 'high' or 'medium' above and are likely to have a temporary/short term impact on tree condition, health and safe life expectancy.
Negligible	Very minor impact to a tree which does not meet the definitions of high, medium or low magnitude.
Neutral	No feasible impact to a tree.

20.6.6 'Significant' arboricultural effects, for the purposes of the Environmental Statement, will be defined as effects which are 'medium' or 'high' as defined in Table 20.3 below.

**Table 20.3 Significance of Effect**

Magnitude of Impact	Arboricultural Value/Sensitivity				
	Very High	High	Medium	Low	Very Low
High	High	High	Medium	Low	Neutral
Medium	High	Medium	Low	Low	Neutral
Low	Medium	Medium	Low	Low	Neutral
Negligible	Medium/Low	Low	Low	Neutral	Neutral
Neutral	Low	Neutral	Neutral	Neutral	Neutral



## 20.7 Conclusions on Scoping

- 20.7.1 The primary impacts on trees will be avoided through embedded mitigation included within the design stage in order to minimise potential design conflicts between trees and the Scheme.
- 20.7.2 The OCEMP will include an Outline Arboricultural Method Statement to minimise damage to trees during construction, and this will be monitored by a qualified arboricultural professional. A Landscape and Ecological Management Plan will be produced to manage and minimise impacts to trees during operation however it is anticipated that impacts to trees will be minimal through sensitive design around tree constraints and buffers.
- 20.7.3 Table 20.4 below summarises which elements are proposed to be scoped in or out of the Environmental Statement.

**Table 20.4 Scoping Summary**

Assessment	Scoped In or Out	Justification
Impacts to Trees in Sites A-G and BESS	Scoped Out	There are no pre-existing records of ancient or veteran trees (16 veteran trees and 1 ancient tree have been recorded so far during surveys) nor any TPOs within these Sites. Further surveys being carried out within the remaining unsurveyed Sites will identify any additional ancient or veteran trees. In view of the embedded mitigation of designing the Scheme to avoid impacts on these trees, and further mitigation that will be included within the OCEMP, no impacts to trees within these Sites are likely to occur during construction, operation or decommissioning.
Cable Route Search Area	Scoped In	Given that the Cable Route Search Area is still to be refined and the potential for arboricultural impacts from construction activities, it is not proposed to scope out the impacts to trees within the Cable Corridor at this point. However, in light of the extensive embedded mitigation, and that the potential for arboricultural impacts will be a relevant factor in how the Cable Route Search Area is refined, the potential for impacts may be unlikely. The Cable Route Search Area will therefore be kept under review, and it is proposed that the assessment of impacts within the Cable Corridor may be scoped out of the EIA with stakeholder agreement.



## 20.8 References

- Ref.1 Department for Energy Security and Net Zero (March 2023). Overarching National Policy Statement for Energy (EN-1). Available at: [https://assets.publishing.service.gov.uk/media/64252f3b60a35e00120cb158/NPS\\_EN-1.pdf](https://assets.publishing.service.gov.uk/media/64252f3b60a35e00120cb158/NPS_EN-1.pdf)
- Ref.2 Department for Energy Security and Net Zero (March 2023). National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: [https://assets.publishing.service.gov.uk/media/64252f5f2fa848000cec0f52/NPS\\_EN-3.pdf](https://assets.publishing.service.gov.uk/media/64252f5f2fa848000cec0f52/NPS_EN-3.pdf)
- Ref.3 Department for Levelling Up, Housing and Communities (December 2023). National Planning Policy Framework.
- Ref.4 Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (6 March 2014). Guidance – Tree Preservation Orders and Trees in Conservation Areas. Available at: <https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas>
- Ref.5 <https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions>
- Ref.6 The Woodland Trust. Ancient Tree Inventory. Available at: <https://ati.woodlandtrust.org.uk/tree-search/>
- Ref.7 North Northamptonshire Council. NNC Interactive Mapping. Available at: <https://experience.arcgis.com/experience/d8840a7cf90248daa7675c43bc167b39/> and West Northamptonshire Council. WNC Interactive Mapping. Available at: <https://westnorthants.cloud.cadcorp.com/WebmapPublic/Map.aspx?MapName=WN CMap>
- Ref.8 DEFRA. Magic Maps. Available at: <https://magic.defra.gov.uk/magicmap.aspx>
- Ref.9 Natural England and the Forestry Commission (14th January 2022). Guidance – Ancient Woodland, Ancient and Veteran Trees: Advice for Making Planning Decisions. Available at: <https://www.gov.uk/guidance/ancient-woodland-ancient-trees-and-veteran-trees-advice-for-making-planning-decisions>



## 21 Agricultural Circumstances

### 21.1 Introduction

21.1.1 This chapter sets out the proposed scope for the EIA in relation to agriculture and soils. It outlines the existing baseline data, policy and guidance followed, proposed methodology, potential significance of effects and conclusions of scoping.

21.1.2 This chapter is supported by **Figure 21.1** – National Soil Survey Maps.

21.1.3 The identified receptors in relation to agriculture and soils are:

- Agricultural landholdings;
- Agricultural land quality (as defined by the Agricultural Land Classification (ALC) system); and
- Soils.

### 21.2 Legislation, Policy and Guidance

#### Legislation

21.2.1 The Agricultural Land (Removal of Surface Soil) Act (1953) (Ref 17) sets out the legislation in place for removal of surface soil. The act is relevant as it outlines the guidance required to be followed when removing soil from an agricultural environment and agricultural practice is being discontinued, even if soil removal is temporary for a period of over three months.

#### National Policy Statement (NPS)

21.2.2 Chapter 5 Legislation Context and Energy Policy sets out the overarching policy relevant to the Scheme including the NPS EN-1 (DESNZ, 2024) (Ref 4). This is supported by NPS EN-3 (DESNZ, 2024) (Ref 5) and NPS EN-5 (DESNZ, 2024) (Ref 6). EN-1 states that energy projects have the potential to have adverse effects on agricultural land and soils which has been considered within this chapter.

21.2.3 Paragraph 5.11.12 of EN-1 states 'Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5)'.

21.2.4 Paragraph 5.11.13 of EN-1 states 'Applicants should also identify any effects and seek to minimise impacts on soil health and protect and improve soil quality taking into account any mitigation measures proposed'.

21.2.5 Paragraph 5.11.34 of EN-1 states 'The Secretary of State should ensure that applicants do not site their scheme on the best and more versatile agricultural land without justification. Where schemes are to be sited on best and more versatile agricultural land the Secretary of State should take into account the economic and other benefits of that land. Where development of agricultural land is demonstrated to be necessary, areas of poorer quality should be preferred to those of a higher quality'.

21.2.6 NPS EN-3 sets out guidance on agriculture land classification and land type for renewable energy infrastructure.

21.2.7 Paragraph 2.10.29 of EN-3 states 'Where the proposed use of any agricultural land has been shown to be necessary, poorer quality land should be preferred to higher quality land avoiding the use of "Best and Most Versatile" agricultural land where possible'.

21.2.8 Paragraph 2.10.32 of EN-3 states 'Where sited on agricultural land, consideration may be given as to whether the proposal allows for continued agricultural use and/or can be co-



located with other functions (for example, onshore wind generation, storage, hydrogen electrolyzers) to maximise the efficiency of land use'.

- 21.2.9 Paragraph 2.10.33 of EN-3 states ' The Agricultural Land Classification (ALC) is the only approved system for grading agricultural quality in England and Wales and, if necessary, field surveys should be used to establish the ALC grades in accordance with the current, or any successor to it, grading criteria and identify the soil types to inform soil management at the construction, operation, and decommissioning phases in line with the Defra Construction Code'.
- 21.2.10 Paragraph 2.10.34 of EN-3 states ' Applicants are encouraged to develop and implement a Soil Resources and Management Plan which could help to use and manage soils sustainably and minimise adverse impacts on soil health and potential land contamination. This should be in line with the ambition set out in the Environmental Improvement Plan to bring at least 40% of England's agricultural soils into sustainable management by 2028 and increase this up to 60% by 2030'.
- 21.2.11 Paragraph 2.10.81 of EN-3 states ' Where soil stripping occurs, topsoil and subsoil should be stripped, stored, and replaced separately to minimise soil damage and to provide optimal conditions for site restoration'.
- 21.2.12 Paragraph 2.10.145 of EN-3 states 'The Secretary of State should take into account the economic and other benefits of the best and most versatile agricultural land. The Secretary of State should ensure that the applicant has put forward appropriate mitigation measures to minimise impacts on soils or soil resources'.
- 21.2.13 NPS EN-5 sets out limited policy in relation to soils and agriculture. In relation to electric and magnetic fields (EMFs) it states in paragraph 2.9.58 EN-5 that 'There is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences'.
- 21.2.14 Paragraph 2.9.25 (final bullet point) of NPS EN-5 in relation to proposals for undergrounding states in that they should consider: '...the applicant's commitment, as set out in their ES, to mitigate the potential detrimental effects of undergrounding works on any relevant agricultural land and soils, particularly regarding Best and Most Versatile land. Such a commitment must guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code of Practice for Sustainable Use of Soils on Construction Sites'.

#### Other National Policy

- 21.2.15 Although the Scheme would be determined in accordance with the National Policy Statements referred to above, this Scoping Report has also considered the following national policy which are likely to be important and relevant considerations in the decision-making process:
- Environmental Improvement Plan (Defra, 2023) (Ref 18); and
  - The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities, 2023). (Ref 14).

#### Local Policy

- 21.2.16 Paragraph 3.32 of North Northamptonshire Joint Core Strategy 2011-2031 (North Northamptonshire Council, 2016) (Ref 15) states ' Soils are an important asset in geodiversity, providing a growing medium for many resources including food and non-food crops. Soils should be protected from pollution and the best and most versatile agricultural land should be safeguarded, wherever possible'.
- 21.2.17 Paragraph 5.1.11 of Settlements and Countryside Local Plan for Daventry District 2011-2019 (Ref 1) states 'The policy supports proposals that create or safeguard jobs where



they are of an appropriate scale for their location, respect the environmental quality and character of the rural area and protect the best and most versatile agricultural land'.

- 21.2.18 Policy NE7 of the Milton Keynes Council Plan: MK 2016-2031(2019) (Ref 19) states that 'In assessing proposals for the development of greenfield sites, the Council will take into account the economic and other benefits of the best and most versatile agricultural land. Development involving the loss of agricultural land should seek to use areas of poorer quality land (grades 3b, 4 and 5 of the Agricultural Land Classification) in preference to that of a higher quality unless other sustainability considerations suggest otherwise'.

#### Relevant Guidance

- Safeguarding our Soils: A Strategy for England (Defra, 2009); (Ref 20)
- Guidance related to protection of Best and Most Versatile Agricultural Land can be found on GOV.UK (Natural England, 2021); (Ref 21)
- Guide to assessing development proposals on agricultural land (Natural England, 2021); (Ref 12)
- Guidance Note: Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (The British Society of Soil Science, 2022); (Ref 22)
- British Standard Specification for Topsoil and Requirements for Use (BS3882:2015); (Ref 23)
- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009); (Ref 2)
- Good Practice Guide for Handling Soils (Institute of Quarrying 2021); (Ref 24)
- Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land (MAFF, 1988); (Ref 10) and
- A new perspective on land and soil in Environmental Impact Assessment (IEMA, 2021). (Ref 8)

### 21.3 Baseline Conditions

- 21.3.1 The baseline conditions outline the relevant information for the scheme related to land use, soil and ALC. Land use refers to how the land is currently used for agricultural operations. The soils are described according to the different Soil Associations which is based on the physical and chemical characteristics of the soil profile. The ALC baseline conditions set out the ALC grades based on available mapping.

#### Land Use

- 21.3.2 Satellite imagery indicates that the agricultural land within the Sites and Cable Route Search Area is predominantly arable land with a few areas of grassland.

#### Soils

- 21.3.3 Across the Sites, there are seven different Soil Associations shown on available previous national survey mapping (**Figure 21.1**). These are described below.
- 21.3.4 Hanslope Association soils are found within Green Hill A, A.2, B, C, D, E, F and G which are described as slowly permeable calcareous or non-calcareous clayey soils with slight risk of water erosion.
- 21.3.5 Banbury Association soils are found in Green Hill A, C, D and E and are described as well drained brashy fine and coarse loamy ferruginous soils over ironstone.



- 21.3.6 Fladbury 1 Association soils are found in the north of Green Hill BESS and are described as stoneless clayey soils, in places calcareous variably affected by groundwater.
- 21.3.7 Oxpasture Association soils are found in the middle of Green Hill BESS and are described as fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.
- 21.3.8 Waterstock Association soils are found in the south of Green Hill BESS and are described as deep permeable mainly fine loamy soils variably affected by groundwater.
- 21.3.9 Moreton Association soils are found in Green Hill D, E, F and G and are described as well drained calcareous clayey and fine loamy soils over limestone, in places shallow and brashy. Some deeper slowly permeable calcareous clayey soils.
- 21.3.10 Ragdale Association soils are found in Green Hill C, F and G and are described as slowly permeable seasonally waterlogged clayey and fine loamy over clayey soils.
- 21.3.11 Wick 1 Association soils are found in a small area in the south of Green Hill C.
- 21.3.12 The soil types described above are included within the Cable Route Search Area which would be identified in further detail as the Cable Corridor is refined.

#### **Agricultural Land Classification**

- 21.3.13 Provisional ALC mapping (Defra, 2023) (Ref 3) (also see **Figure 7.4** in **Appendix 7.1** of Chapter 7: Landscape and Visual Impact) shows that the Sites comprise large extents of Grade 3 land and smaller extents of Grade 2 land. Grade 3 land is mapped as being present across the entire areas of Green Hill A, A.2, B, G and BESS, the majority of Green Hill D and F and part of E. Grade 2 land is located within the southern part of Green Hill C, the northern part of D, the majority of E and a small part in the northeast of F.
- 21.3.14 The Provisional ALC mapping does not split Grade 3 land into Subgrades 3a and 3b. Subgrade 3a land, along with Grade 1 and Grade 2 land, comprises Best and Most Versatile (BMV) agricultural land. This distinction can only be confirmed through a detailed ALC survey which will be completed May-July 2024.
- 21.3.15 A detailed ALC survey has been conducted at Green Hill BESS. The northern and central fields as well as the southern corner of south field are graded as ALC 3b, whilst the larger section of the south field is graded as 3a.
- 21.3.16 Two post-1988 ALC surveys from MAGIC (Defra, 2023) (Ref 3) have been found within vicinity and outside of the Sites as follows:
- A detailed ALC survey undertaken adjacent to the north of Green Hill D and close to the north of Green Hill E shows these areas to comprise Grade 3a and 3b land lying just outside the scoping boundary.
  - A detailed ALC survey has been undertaken adjacent to the north of Green Hill F which shows the land to comprise Grade 2, Grade 3a and Grade 3b land.

## **21.4 Assessment Methodology**

- 21.4.1 The assessment methodology outlines the methodology used to collect data to complete the ALC assessment as well as sensitivity on agricultural land, soil quality and agricultural land holding as a result of the scheme. Additionally, the likely cumulative and in-combination effects are outlined as well as assumptions made throughout scoping and potential mitigation strategies.

#### **Data Collection**

- 21.4.2 The EIA would be supported by an initial collation and review of available baseline data. This includes:



- Soil data and map from National Soils Resources Institute at Cranfield University (NSRI);
- Provisional ALC map;
- Post-1988 ALC survey data and map;
- Climate data sets for ALC assessment; and
- Agricultural landholding Information.

21.4.3 Field data collection at the Sites will be undertaken through ALC surveys. The survey outcomes will be used to determine the impact on agricultural land and soils as a result of the Scheme.

21.4.4 The ALC survey and assessment will be undertaken in accordance with the Soil Survey Field Handbook (Hodgson, 2022) (Ref 7) and the ALC guidelines (Ministry of Agriculture, Fisheries and Food, 1998) (Ref 10) and will characterise soil properties based on an examination of soil profiles, from which agricultural land grade as well as soil resilience can be calculated and assessed.

21.4.5 The Cable Corridor within the Cable Route Search Area has currently not been defined. The Cable Corridor has therefore not yet been subject to soil survey or farming circumstances assessment. The ALC survey of fields places sample points at 100m intervals which is too widely spaced to monitor soil variation within soil to be excavated for the trench. Once the Cable Corridor has been defined an assessment will be undertaken as to whether and when ALC surveys are required (based on extent and type of land use and the potential impacts).

21.4.6 Agricultural occupancy and land use information for the Cable Corridor will need to be collected ahead of trenching work for the installation of electrical cables to avoid, where possible, an active construction site at sensitive periods of time for land management (for instance anticipated harvest dates) and compensation will be agreed with landowners for any crop loss associated with the construction phase of the electrical cables. Any such information collected preplanning will lose validity and need to be replaced once an approximate commencement date is established post consent.

21.4.7 It is anticipated that there will be limited impact within the Cable Corridor on soils, agricultural land and farming activity. This is as the duration of cable laying works will be brief, without the need to transfer all soil material to then recover from soil storage bunds. The cable laying work will be similar to that for the existing routine practice of installing agricultural field drains, typically renewed after 40 years of operation.

**EIA Criteria**

21.4.8 The Institute of Environmental Management and Assessment (IEMA) guidance (2022) (Ref 8) would be used to assess the impact on agricultural land and soils. The DMRB LA112 (National Highways, 2020) (Ref 13) would be used to assess the impact on agricultural land holdings and is the only available industry assessment guidance for assessing impacts on agricultural landholding.

21.4.9 Tables 21.1-21.5 set out the criteria which would be used to determine the sensitivity and the magnitude of impacts on agricultural land and soils through assessing soil quality, BMV land and agricultural landholdings. Table 21.6 provides the matrix for identifying, by reference to sensitivity and magnitude, the significance of effects in EIA terms.

**Table 21.1. Guidance on Sensitivity of Agricultural Land**

Sensitivity	Soil Resource and Soil Functions
Very High	Biomass production: ALC Grades 1 & 2; Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected features within a European site (e.g., SAC,





Sensitivity	Soil Resource and Soil Functions
	<p>SPA, Ramsar); Peat soils; Soils supporting a National Park, or Ancient Woodland;</p> <p>Soil carbon: Peat soils;</p> <p>Soils with potential for ecological / landscape restoration;</p> <p>Soil hydrology: Very important catchment pathway for water flows and flood risk management;</p> <p>Archaeology, Cultural Heritage, Community Benefits and Geodiversity: Scheduled Ancient Monuments (SAMs) and adjacent areas; World Heritage and European designated sites; Soils with known archaeological interest; Soils supporting community / recreational / educational access to land covered by National Park designation; and</p> <p>Source of materials: Important surface mineral reserves that would be sterilised (i.e., without future access)</p>
High	<p>Biomass production: ALC Grade 3a;</p> <p>Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected features within a UK designated site (e.g., United Nations Educational, Scientific and Cultural Organisation (UNESCO) Geoparks, SSSI or area of Outstanding Natural Beauty (AONB), Special Landscape Areas (SLAs) and Geological Conservation Review sites); Native Forest and woodland soils; Unaltered soils supporting seminatural vegetation (including the UKBAP Priority habitats or Section 6 habitats in Wales);</p> <p>Soil carbon: Organo-mineral soils (e.g., peaty soils);</p> <p>Soil hydrology: Important catchment pathway for water flows and flood risk management;</p> <p>Archaeology, Cultural Heritage, Community Benefits and Geodiversity: Soils with probable but as yet unproven (prior to being revealed by construction) archaeological interest; historic parks and gardens; Regionally Important Geological Site (RIGS); Soils supporting community / recreational / educational access to RIGS and AONBs; and</p> <p>Source of materials: Surface mineral reserves that would be sterilised (i.e., without future access).</p>
Medium	<p>Biomass production: ALC Grade 3b;</p> <p>Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected or valued features within non-statutory designated sites (e.g., LNRs, Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNICIs), SLAs; Non-Native Forest and woodland soils;</p> <p>Soil carbon: Mineral soils;</p> <p>Soil hydrology: Important minor catchment pathway for water flows and flood risk management;</p> <p>Archaeology, Cultural Heritage, Community Benefits and Geodiversity: Soils with possible but as yet unproven (prior to being</p>



Sensitivity	Soil Resource and Soil Functions
	revealed by construction) archaeological interest; Soils supporting community/ recreational / educational access to land; and  Source of materials: Surface mineral reserves that would remain accessible for extraction.
Low	Biomass production: ALC Grade 4 and 5;  Ecological habitat, soil biodiversity and platform for landscape: Soils supporting valued features within non-designated notable or priority habitats / landscapes. Agricultural soils;  Soil carbon: Mineral soils;  Soil hydrology: Pathway for local water flows and flood risk management;  Archaeology, Cultural Heritage, Community Benefits and Geodiversity: Soils supporting no notable cultural heritage, geodiversity nor community benefits; Soils supporting limited community / recreational / educational access to land; and Source of materials: Surface mineral reserves that would remain accessible for extraction.
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions

**Table 21.2. Guidance on Sensitivity of Soils**

Sensitivity	Definition
High Sensitivity (low resilience to structural damage)	Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams) and organo-mineral and peaty soils where the FCD are 150 or greater;  Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where the FCDs are 225 or greater; and  All soils in wetness class (WCV or WCVI).
Medium Sensitivity (medium resilience to structural damage)	Clays, silty clays, sandy clays, heavy silty clay loams, heavy clay loams, silty loams and organo-mineral and peaty soils where the FCDs are fewer than 150;  Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where FCDs are fewer than 225; and  Sands, loamy sands, sandy loams and sandy silt loams where the FCDs are 225 or greater or are in wetness classes WCIII and WCIV.
Low sensitivity (high resilience to structural damage)	Soils with a high sand fraction (sands, loamy sands, sandy loams and sandy silt loams) where the FCDs are fewer than 225 and are in wetness classes WCI to WCII.



**Table 21.3. Sensitivity Criteria for Sensitivity of Agricultural Land Holding**

Sensitivity	Agricultural Land Holdings
Very High	1) Areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on a frequent basis (daily).
High	1) Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on a frequent basis (weekly).
Medium	1) Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly).
Low	1) Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent).
Negligible	1) Areas of land which are infrequently used on a non-commercial basis.

**Table 21.4. Magnitude Criteria for Impact on Agricultural Land and Soils**

Magnitude of Impact	Description of Impacts
Major	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20ha or loss of soil-related features set out in Table 21.1, as advised by other topic specialists in EIA team (including effects from 'Temporary Developments'*); or  Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20ha or gain in soil-related features set out in Table 21.1, as advised by other topic specialists in EIA team (including effects from 'temporary developments'*).
Moderate	Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20ha or loss of soil-related features set out in Table 21.1, as advised by other topic specialists in EIA team (including effects from 'Temporary Developments'*); or  Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20ha or gain in soil-related features set out in Table 21.1, as advised by other topic specialists in EIA team.



Magnitude of Impact	Description of Impacts
Minor	<p>Permanent, irreversible loss over less than 5ha or a temporary, reversible loss of one or more soil functions or soil volumes), or temporary, reversible loss of soil related features set out in Table 21.1 above, as advised by other topic specialists in EIA team; or</p> <p>Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement, or temporary gain in soil-related features set out in Table 21.1, as advised by other topic specialists in EIA team.</p>
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

\* Temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soils

**Table 21.5. Magnitude Criteria for Impact on Agricultural Land Holding**

Magnitude of Impact	Description of Impacts on private property and housing, community land and assets, development land and businesses and agricultural land holdings
Major	<p>1) Loss of resource and/or quality and integrity of resource; Severe damage to key characteristics, features or elements. e.g., direct acquisition and demolition of buildings and direct development of land to accommodate highway assets; and/or</p> <p>2) Introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision.</p>
Moderate	<p>1) Partial loss of/damage to key characteristics, features or elements, e.g., partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings; and/or</p> <p>2) Introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision.</p>
Minor	<p>1) A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g., amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, businesses, community assets or agricultural holdings; and/or</p> <p>2) Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision.</p>
Negligible	<p>1) Very minor loss or detrimental alteration to one or more characteristics, features or elements. e.g., acquisition of non-operational land or buildings not directly affecting the viability of property, businesses, community assets or agricultural holdings; and/or</p>



Magnitude of Impact	Description of Impacts on private property and housing, community land and assets, development land and businesses and agricultural land holdings
	2) Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision.
No Change	No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

**Table 21.6. Degree of Significance**

Sensitivity	High	Medium	Low	Negligible
Magnitude				
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Negligible
Negligible	Moderate/Minor	Minor	Negligible	Negligible
Neutral	Neutral	Neutral	Neutral	Neutral

- 21.4.10 Major Significance: This level indicates that the proposed project or activity is likely to cause severe, irreversible, and widespread adverse impacts on the environment. Extensive assessment and mitigation measures, often leading to significant redesigns, are necessary to minimise adverse effects.
- 21.4.11 Moderate Significance: This level indicates that the project or activity is likely to cause adverse impacts on the environment. These impacts may be localised, temporary, or reversible, requiring mitigation measures.
- 21.4.12 Minor Significance: This level indicates that the proposed project or activity is expected to have minimal adverse impacts on the environment, typically involving minor disturbances, they generally do not pose significant environmental risks.
- 21.4.13 Negligible Significance: This level indicates that the project or activity is not expected to have any discernible adverse impacts on the environment, with impacts so minor that they can be disregarded. Negligible significance impacts generally require no mitigation measures or further assessment.
- 21.4.14 Neutral Significance: The level of impact where the project/ activity has neither positive nor negative effects on the environment.
- 21.4.15 Impacts that are identified in the ES of moderate significance or greater will be considered significant.

## 21.5 Likely Effects

### Embedded Mitigation Measures

- 21.5.1 Relevant embedded measures would be developed to avoid and minimise the impact on agricultural land, soils and agricultural landholdings. Measures would be included in the design process of the Scheme. An outline Soil Management Plan (OSMP), which, would be informed by ALC survey results, would form part of the CEMP. The OSMP will be



further developed into a detailed Soil Management Plan (SMP) pre-construction following design evolution.

**Potential Effects Scoped into EIA**

- 21.5.2 The Scheme would potentially result in a large area of BMV land (approximately over 100ha of BMV land) taken out of arable farming for 60 years according to Provisional ALC mapping. The arising effect on agricultural land could potentially be adversely significant due to a large area of BMV land out of arable farming. Therefore, the assessment of effects on agricultural land at the stages of construction, operation and decommissioning is scoped into the EIA.
- 21.5.3 The construction of the Scheme could potentially cause severance and disruption to farming activities and subsequently impact farm businesses. As such agricultural landholdings are scoped in.
- 21.5.4 The Scheme would potentially result in soil quality compromise during stages of construction, operation and decommissioning. During the operational phase the Scheme would potentially improve soil quality due to the cessation of arable cultivation. Due to clayey soils predominantly in the Scheme and disturbance on soils in large scale, significant effect on soils cannot be ruled out, soils are scoped into the EIA.

**21.6 Cumulative and In-Combination Effects**

- 21.6.1 A cumulative and in-combination assessment will be assessed as part of the Soil and Agriculture Assessment.
- 21.6.2 The cumulative and in-combination impacts arising from the Scheme will be assessed in combination with other relevant development criteria in Table 21.1 -21.6 will be applied. The local and national guidance related to protection of agriculture and soils regulates against detrimental impacts. Therefore, at this stage the risk of in-combination and cumulative effects impacting agriculture and soil are negligible. Any in-combination impacts identified will be considered within the Agricultural Circumstances Chapter 21 of the ES and cumulative effects will be considered in the Cumulative Effects Chapter 23 of the ES.

**21.7 Conclusions on Scoping**

- 21.7.1 The proposed scope of the Soils and Agriculture assessment to be included within the ES is outlined in the below Table 21.7.

**Table 21.7. Proposed EIA Scope**

Receptor	Likely Significant Effects	Stage	Scoped In/Out
Agricultural land (including BMV land)	Loss of agricultural land (including BMV land) and potential change to land quality.	Construction Operation Decommissioning	Scoped In
Agricultural Land Holding	Potential significant effects arising from severance and disruption to farming activities.	Construction	Scoped In
Soils	Loss or improvement of one or more soil functions or soil volumes	Construction Operation Decommissioning	Scoped In



## 21.8 References

- Ref.1 Daventry District Council (2011) Settlements and Countryside Local Plan (Part 2)For Daventry District 2011-2029.
- Ref.2 Defra (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
- Ref.3 Defra (2023). Magic Map. Available at Magic Map Application (defra.gov.uk) (Accessed 7 March 2024).
- Ref.4 DESNZ (2024). Overarching National Policy Statement for Energy (EN-1).
- Ref.5 DESNZ (2024). National Policy Statement for renewable energy infrastructure (EN-3).
- Ref.6 DESNZ (2024). National Policy Statement for electricity networks Infrastructure (EN-5).
- Ref.7 Hodgson, J.M. (2022). Soil Survey Field Handbook: Describing and Sampling Soil Profiles. Cranfield: Cranfield University.
- Ref.8 IEMA (2022). A New Perspective on Land and Soil in Environmental Impact Assessment.
- Ref.9 Institute of Quarrying (2024). Good Practice Guide for Handling Soils in Mineral Workings. Soils Guidance (quarrying.org) (Accessed 26 March 2024).
- Ref.10 MAFF (1988). Agricultural Land Classification of England and Wales.
- Ref.11 MAFF (2000). Good Practice Guide for Soil Handling, UKCP18.
- Ref.12 Natural England (2021). Guide to assessing development proposals on agricultural land Guide to assessing development proposals on agricultural land - GOV.UK (www.gov.uk) (Accessed 7 March 2024).
- Ref.13 National Highways (2020). Design Manual for Roads and Bridges (DMRB) LA112: Population and human health.
- Ref.14 The National Planning Policy Framework (NPPF) (2023). National Planning Policy Framework - GOV.UK (www.gov.uk) (Accessed 7 March 2024).
- Ref.15 North Northamptonshire Council (2016). North Northamptonshire Joint Core Strategy 2011-2031.
- Ref.16 Ragg, J.M. (1984). Soils and their use in Midland and Western England (Bulletin / Soil Survey of England and Wales).
- Ref.17 The Agricultural Land (Removal of Surface Soil) Act (1953)
- Ref.18 Defra (2023). Environmental Improvement Plan
- Ref.19 Milton Keynes Council Plan: MK 2016-2031(2019)
- Ref.20 Defra (2009). Safeguarding our Soils: A Strategy for England;
- Ref.21 Natural England (2021). Guidance related to protection of Best and Most Versatile Agricultural Land can be found on GOV.UK
- Ref.22 The British Society of Soil Science (2022). Guidance Note: Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction
- Ref.23 British Standard Specification for Topsoil and Requirements for Use (BS3882:2015);
- Ref.24 Institute of Quarrying (2021). Good Practice Guide for Handling Soils



## 22 Other Environmental Matters

### 22.1 Introduction

22.1.1 This chapter considers topics that are proposed to be scoped out of the Environmental Statement. The topics included within this chapter are:

- Light Pollution;
- Major Accidents and Disasters;
- Telecommunications, Utilities and Television Receptors; and
- Waste.

### 22.2 Legislation, Policy and Guidance

#### Legislative Context

- The Planning Act 2008 sets out the process for the consenting of major infrastructure projects and is the principal legislation governing an application for a Nationally Significant Infrastructure Project (NSIP).
- The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 sets out the regulatory framework for Environmental Impact Assessments in connection with development consent order applications, to include screening, scoping and the requirements in respect of their content.

#### National Policy Context

- National Policy Statement for Energy (EN-1), designated January 2024 which sets out national policy statement for energy infrastructure
- National Policy Statement for Renewable Energy Infrastructure (EN-3), designated January 2024, which provides the primary policy basis for decisions on renewable energy DCO applications, including Section 2.10 which specifically pertains to solar photovoltaic generation.
- National Policy Statement for Electricity Networks Infrastructure (EN-5), designated January 2024 which, when taken together with EN-1, provides the primary policy for decisions taken by the Secretary of State on applications it receives for electricity networks infrastructure.
- National Planning Policy Framework (NPPF) December 2023: The NPPF sets out primary planning policies for England, including provisions that are related to telecommunications.

#### Local Policy Context

- Waste:
  - Northamptonshire Minerals and Waste Local Plan (adopted July 2017) (Ref.19): provides strategic and development planning policy for waste across both North and West Northamptonshire. This document is also supported by the December 2020 Waste Needs Assessment and annual monitoring reports;
  - Milton Keynes Waste Development Plan Document 2007 – 2026 (adopted February 2008) (Ref.21): provides strategic and development planning policy for waste across the Milton Keynes City Council area.





### 22.3 Light Pollution

- 22.3.1 Schedule 4, Paragraph 1(d) of the EIA regulations sets out that the EIA contains "*an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.*"
- 22.3.2 Operational lighting – As described in Chapter 4 of this Scoping Report, there would be no permanent external lighting installed as part of the Scheme. Security lighting would be infrared, and the limited lighting associated with the substations and within the BESS facility would be used for occasional maintenance/ emergency use only.
- 22.3.3 Construction lighting – This will be temporary in nature, directional and only in use during working hours or in contingencies such as an emergency. The Outline Construction Environmental Management Plan (OCEMP) and Outline Decommissioning Environmental Management Plan (ODEMP) to be submitted with the DCO will include a lighting strategy to minimise light spill to receptors. These measures will include for lighting control measures along the Cable Corridor, and at the Point of Connection.
- 22.3.4 Use of artificial lighting across the Scheme has the potential to cause environmental effects in relation to ecology and landscape.
- 22.3.5 Any likely significant effects on receptors caused by the use of artificial lighting by the Scheme will be assessed as part of the other environmental topics considered in the ES, for example ecology and landscape. The Landscape and Visual chapter of the ES will consider the lighting strategy required for the Scheme including details of directionality, intermittent lighting, and an assessment of associated effects. It will also describe any measures necessary to avoid or mitigate lighting effects. The Landscape and Visual chapter will also consider the conclusions of the Glint and Glare chapter in association with an assessment of the magnitude of landscape and visual impacts.
- 22.3.6 It is not considered necessary to include a specific chapter on light pollution within the ES because the likely significant effects of artificial lighting will be assessed within the Landscape and Visual chapter of the ES.

### 22.4 Major Accidents and Disasters

- 22.4.1 Schedule 4, Paragraph 5(d) of the EIA Regulations requires that the EIA contain "*a description of the likely significant effects of the development on the environment resulting from the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*" and Schedule 4, Part 8 requires that the EIA contain "*a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned*".
- 22.4.2 The Institute of Environmental management and Assessment (IEMA) (Ref 1) define major accidents and disasters as follows.

**Table 22.1: IEMA Definitions**

<b>Major Accident</b>	Events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.
<b>Disaster</b>	This may be a natural hazard (e.g. earthquake) or a manmade/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.



22.4.3 The aim of the scoping stage, as described by the IEMA Primer is ‘to determine in more detail whether there is potential for significant effects as a result of major accidents and/or disasters associated with a development, and the resulting scope of and approach to the assessment if required.’ (Ref 2)

22.4.4 A desk based review was undertaken to identify the possible major accidents and disasters that could be relevant to the Scheme. Consideration was placed upon the location of the Scheme to screen major accidents and disasters. The major accidents and disasters taken forward for further consideration are shortlisted below:

- Flooding;
- Fires and explosion;
- Road Accidents;
- Aviation Incidents;
- Damage or cut-off of utilities;
- Unstable ground conditions; and
- Vegetation pests and diseases.

22.4.5 **Table 22.2** presents a short list of major accidents or disasters that are considered further within the EIA. Where the major accidents and disasters identified are not already being considered within the scope of existing technical assessments, they will be reviewed with the design team to ensure the risks are understood and addressed through design as necessary. However, it is anticipated that as the design of the Scheme will evolve during preparation of the DCO application. Given this likelihood, it is proposed to scope out assessment of such major accidents or disasters from the ES.

**Table 22.2: Major Accidents and Disasters shortlisted for consideration**

Major Accident or Disaster	Potential Receptor	Comments
Flooding	Properties and people in areas of increased flood risk.	Both the vulnerability of the Scheme to flooding, and its potential to exacerbate flooding, will be addressed in the Hydrology, Flood Risk and Drainage Chapter of the ES.  The Scheme does not propose large expanses of hardstanding that would be likely to cause significant increase to surface water flooding.
Fires and explosions	Local residents, habitats and species.	There may be some potential for fire as a result of the battery storage element of the Scheme. Battery technology has built in safety features including fire resistant construction, fire detection, suppression systems, emergency stop functions and isolation monitoring, which are designed to regulate temperatures to within safe conditions to minimise the risk of fire. This will be addressed within the supporting Outline Battery Safety Management Plan. Although rare, fires and associated explosions have the potential to cause safety concerns to human health, including anyone working on site, or within the area of fire spread/associated contamination fall out. Fires also have the potential to have an impact



Major Accident or Disaster	Potential Receptor	Comments
		on the natural environment including the habitats and species on site and surrounding area.
Road accidents	Road users	<p>The risk of road collisions and accidents will be addressed in the Transport Assessment.</p> <p>Road accidents could occur during the construction or decommissioning phases that involve hazardous substances. The risk posed by spillage from hazardous loads as a result of a road traffic accident during construction or decommissioning will be explored as part of the ecological, drainage and contamination topics.</p> <p>The potential for glint and glare to affect road users will be considered within the Glint and Glare chapter 15 of the ES if any risks are identified. Mitigation will be considered and, where necessary, incorporated into the Scheme design.</p>
Aviation incidents	Pilots and aircrafts	<p>The National Policy Statement for Renewable Energy Infrastructure EN-3 confirms that some evidence suggests glint and glare from solar farms can be experienced by pilots and air traffic controllers in certain conditions, but that there is no evidence that glint and glare from solar farms results in significant impairment on aircraft safety. The potential for glint and glare to affect aviation will be considered within the Glint and Glare chapter 15 of the ES. Mitigation will be considered and, where necessary, incorporated into the Scheme design.</p>
Damage/ cut-off of utilities	Employees and local residents	<p>The construction of the Scheme has the potential to cause utility accidents, potentially damaging or cutting off the supply of utilities such as gas, electricity, water, sewage, and telecommunications. Depending on the nature of the accident this could cause supply disruption to users, and/or present a risk of danger to people and the natural environment on site and in the surrounding area via contamination or potential fire or explosion.</p> <p>Discussions are in progress with utility and infrastructure providers to ascertain the locations of all assets, and the provider’s required offset distances will be implemented in the Scheme design to minimise this risk. Contractor practice and working guidelines will also be implemented to minimise the risk of such accidents occurring, and to minimise the severity of an impact in the event an asset is disturbed which will be secured in the Outline Construction Environment Management Plan (OCEMP).</p>



Major Accident or Disaster	Potential Receptor	Comments
Unstable ground conditions	Employees and local residents	There is potential for unstable ground conditions within the Scheme as a result of current and past mineral mining and extraction activity. A full planning history search will be checked with the Minerals authorities in relation to mining history of the Scheme. However, Walgrave Lodge Sand Pit (located in Site A and identified in the 'Mining and Quarrying' section 2.2 of Appendix 10) has been filled and unused for over 50 years and thus any settlement is likely to have already occurred and any risk is considered unlikely. This will minimise the risk to people working on site, in terms of land collapse, throughout all phases of the project.
Vegetation pests and diseases	Habitats and Species	The new planting proposed can be susceptible to disease and pests. Changing conditions due to climate change may exacerbate this. The failure of planting presents a risk to the natural environment with potential impacts on biodiversity and landscape character. The landscape planting strategy will take account of the need to plant a diverse range of species that will be tolerant to climate change.

22.4.6 Where design mitigation is unable to remove the potential interaction between a major accident or disaster and a particular topic, the relevant ES chapter will identify the potential consequence for receptors covered by the topic and give a qualitative evaluation of the potential for the significance of the reported effect to be increased as result of a major accident or disaster.

22.4.7 Based on the above, any effects in respect of potential accidents and disasters will be reported in the relevant topic chapter, and this will negate the need for a specific major accidents or disasters topic chapter in the ES. Nevertheless, there will be signposting of major accident or disaster impacts in the ES to enable these to be identified.

## 22.5 Telecommunications, Utilities and Television Receptors

22.5.1 There are several cables, pylons and pipelines that cross the Sites and Cable Route Search Area.

22.5.2 There are properties, including homes, schools and businesses, in the surrounding area to the Sites and Cable Route Search Area that benefit from access to utilities, telecommunications and television connections, for which many existing utilities run across or adjacent to the Site.

22.5.3 Initial discussions have been undertaken with utilities, telecommunications and television providers, to identify assets across the Sites and Cable Route Search Area.

22.5.4 The Scheme has the potential to affect above and below ground telecommunications, utilities and television receptor infrastructure through the disruptive effects of electromagnetic interference (EMI) from inverters and power electronics and potential damage to underground infrastructure during installation. Any potential impacts are most likely to be direct physical in-situ impacts to existing infrastructure, rather than indirect impacts as a result of the development.



- 22.5.5 Where above ground utilities and telecommunications infrastructure exists within or adjacent to the Sites and Cable Route Search Area, there is the potential for development to encroach upon the relevant safeguarded areas. This is unlikely to occur as discussions and negotiations with the relevant landowners and undertakers will be concluded prior to submission of the application, meaning safeguarding distances and measures will be fully incorporated into the development parameters.
- 22.5.6 The same discussions with undertakers will allow for appropriate safeguarding and setbacks to be provided in the proposals for below ground utilities, too.
- 22.5.7 Further safeguarding will be secured within the DCO to protect infrastructure, alongside any relevant provisions should any infrastructure need to be re-routed.
- 22.5.8 High voltage cable works will be undertaken by a mix of open trenching and trenchless methods (which could include methods such as horizontal directional drilling). The Cable Corridor will be designed to reduce intersections with preexisting telecommunications and utilities, therefore minimising direct interference to services. The construction of cabling to the point of connection will be undertaken to appropriate standards and regulations, and will be controlled through the measures set out in the proposed Crossing Schedule and OCEMP.
- 22.5.9 It is concluded that significant effects on telecommunications, utilities and television receptors are not likely and it is therefore not considered necessary to include a chapter on Telecommunications, Utilities and Television Receptors within the ES. The ES will identify and contain information on existing utilities relevant to the Scheme under the topic of “Other Environmental Matters”. The ES will describe how the proposals will impact upon these utilities, and where appropriate avoidance or mitigation measures have been incorporated into the development. Furthermore, the DCO will contain a Crossing Schedule that identifies where the proposed inter-Site and grid connection cables will cross existing buried and overhead utilities and telecommunications infrastructure.

## 22.6 Waste

- 22.6.1 The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions, with specific reference to quantities and types of waste produced during the construction and operation phases.
- 22.6.2 The construction, operation and decommissioning of solar infrastructure create very little waste in comparison to other types of development. There is minimal waste generated from demolition or excavation. Typically, solar farms result in less than 1% of the site area containing any form of ground intrusive development.

### Likely Significant Environmental Effects

#### Construction

- 22.6.3 At this stage the exact quantities and types of waste likely to be generated during the construction and decommissioning stages are not known. However, it is expected that the waste streams will include:
- General waste from site offices and welfare facilities;
  - Packaging waste from incoming materials; and
  - Other waste from construction of fencing, access roads and other supporting infrastructure
- 22.6.4 A Construction Environmental Management Plan (CEMP) will be developed and submitted with the application. The CEMP will include measures to minimise waste, such as a waste hierarchy, and will set out site management procedures such as waste management, recycling opportunities, and off-site disposal. This will include what will happen to any soil excavated to bury cabling. These will be assessed as part of the ES in the relevant chapter, such as vehicles removing waste as part of the Transport chapter.



- 22.6.5 Good practice measures will be set in place to ensure responsible processing of waste is adhered to for works at the point of connection. This will be secured through the OCEMP.
- 22.6.6 A Site Waste Management Plan (SWMP) will be prepared in outline and appended to the ES. The DCO application will confirm how the SWMP will be secured through the DCO Requirements procedure.
- 22.6.7 All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste hauliers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them.

**Operation**

- 22.6.8 Waste generation will generally be low during the operation of the Scheme, as PV panels do not generate any waste as part of the energy production process.
- 22.6.9 Once the Scheme is operational, waste will be associated with occasional maintenance work and the replacement of panels and batteries.
- 22.6.10 The Scheme will operate for up to 60 years. The components of the Scheme are anticipated to have the following approximate lifespans:
- 22.6.11 Photovoltaic Panels –40 years
- 22.6.12 Batteries – 20 years
- 22.6.13 It is therefore estimated that the solar panels could require replacement once and the batteries twice during the operation of the Scheme. The replacement of these will be considered within the assessment of operational impacts of the Scheme in the ES.

**Decommissioning**

- 22.6.14 At the end of the Scheme’s operational life, it will be decommissioned. Recycling procedures for the development at the end of its lifetime (including any installed energy storage) will be in line with best practice industry guidelines at the time. At the present time it is envisaged almost all of the solar panels will be able to be recycled and reused. As this is expected to be at least 60 years in the future, it is not possible to identify at this stage either the waste management routes or specific facilities that would be used.

**Conclusion**

- 22.6.15 Considering the above, it is concluded that significant waste impacts are not expected during either construction, operation or decommissioning, and hence the need for a separate waste chapter has been scoped out of the EIA. However, estimates of by type and quantity, of expected residues and emissions and quantities and types of waste produced during the construction and operation phases will be provided as required under Schedule 4 of the EIA Regulations.

**22.7 Conclusions on Scoping**

- 22.7.1 The following items will be scoped in or out of the Environmental Statement:-

**Table 22.3: Elements to be scoped in/out of EIA**

Proposed elements to be scoped in	Proposed elements to be scoped out
None	Light Pollution Potential major accidents and disasters Telecommunications, Utilities and Television Receptors Waste- The ES will provide estimates of by type and quantity, of expected residues and emissions and quantities and types of waste produced during the



Proposed elements to be scoped in	Proposed elements to be scoped out
	construction and operation phases will be provided as required under Schedule 4 of the EIA Regulations.

## 22.8 References

- Ref.1 Major Accidents and Disasters in EIA: An IEMA Primer
- Ref.2 Institute of Environmental Management and Assessment (IEMA). (2012). Effective EIA Scoping, Chapter 3: Assessing Potential Effects of Major Accidents and Disasters. IEMA Publications. <https://www.iema.net/articles/effective-eia-scoping>
- Ref.3 Northamptonshire County Council (2017). Northamptonshire Minerals and Waste Local Plan. Northampton: Northamptonshire County Council.
- Ref.4 Milton Keynes Council (2008). Milton Keynes Waste Development Plan Document 2007 – 2026. Milton Keynes: Milton Keynes Council.



## 23 Cumulative Effects

### 23.1 Introduction

23.1.1 Schedule 4, paragraph 5 of the EIA Regulations states that the ES should include “a description of the likely significant effects of the development on the environment resulting from... (e) 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”.

23.1.2 Following the above screening criteria, the cumulative effects assessment will follow ‘PINS Advice Note Seventeen: cumulative effects assessment relevant to Nationally Significant Infrastructure Projects’ (PINS Advice Note 17). The staged approach detailed in PINS Advice Note Seventeen 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.

23.1.3 Cumulative effects occur as a result of several impacts on an environmental receptor which may overlap or act together. The following types of cumulative effects will be considered in accordance with the EIA Regulations and best practice guidance:

- In-combination effects (or intra-project combined effects): the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Scheme affecting a receptor; and
- Cumulative effects (or inter-project cumulative effects): the combined residual (post-additional mitigation) effects of the Scheme and another project or projects on a single receptor/resource.

23.1.4 There is no widely accepted methodology for assessing cumulative effects, although various best practice and guidance documents exist. However, relevant guidance has been considered, including from the Institute of Environmental Management and Assessment (IEMA) (Ref 1) and the assessment guidance set out in PINS Advice Note 17.

23.1.5 The following approach will be adopted for the assessment of cumulative effects, based on previous experience, the types of receptors being assessed, the nature of the Scheme, the other developments under consideration and the information available to inform the assessment.

### 23.2 In-combination Effects

23.2.1 The approach to the assessment of interactions of environmental effects (in-combination effects) will consider the changes in baseline conditions at common sensitive receptors (i.e., receptors that have been identified in more than one ES chapter as experiencing likely significant environmental effects due to the Scheme). The assessment will be based upon residual (post-additional mitigation) effects of ‘moderate’ or greater significance only (‘negligible’, ‘minor’ and ‘neutral’ residual effects will not be considered). The assessment will consider whether the different effects on the same receptor could combine so as to become a significant effect. The Study Area for the assessment of in-combination effects will be informed by the Study Areas for the individual environmental factor assessments.

23.2.2 The assessment of the in-combination effects will be undertaken using a two-stage approach:

#### **Stage 1 – Screening**

23.2.3 Screening will be undertaken to determine whether a sensitive receptor is exposed to more than one type of residual (post-additional mitigation) effect during the construction, operation and decommissioning phases of the Scheme. Those common





sensitive receptors exposed to two or more types of residual (post-additional mitigation) effects, with significance of 'minor' or greater, will be taken forward to Stage 2 of the assessment.

- 23.2.4 If there is only one type of effect on a sensitive receptor (i.e., only one environmental factor assessment chapter has identified effects on that sensitive receptor), then it will be considered that there are no potential in-combination effects and the sensitive receptor will not be taken forward to Stage 2 of the assessment.

### **Stage 2 – Assessment of In-combination Effects**

- 23.2.5 An assessment of the overall significance of the in-combination effects on common sensitive receptors identified at Stage 1 will be undertaken within each topic chapter, based on technical information provided in the environmental factor assessment chapters and supporting appendices, as well as professional judgement. Given that the types of effects may be very different in some cases, a quantitative assessment may not be possible, and it may be necessary to apply professional judgement in determining the significance of each individual effect.
- 23.2.6 The evaluation at the receptor level will consider: the magnitude of change at the common receptor; previously identified sensitivity; duration and reversibility of interaction. The focus will be on determining a change in the level of effect likely to be experienced and whether this is significant or not.

## **23.3 Assessment of Cumulative Effects**

- 23.3.1 The PINS Advice Note 17 on the assessment of cumulative effects identifies a four-stage approach as follows:

- Stage 1 – Establishing the long list of 'other existing development and/or approved development'
- Stage 2 - Establishing a shortlist of 'other existing development and/or approved development'
- Stage 3 - Information Gathering
- Stage 4 – Assessment

### **Stage 1 – Establish the NSIP's ZOI and identify long list of 'other development.'**

- 23.3.2 A review of other developments will be undertaken, initially encompassing a 'zone of influence' (ZOI) defined by the environmental topic specialists to prepare a long list of 'other development'. At this stage, it is anticipated that the long list will be based on up to a 5km area of search which aligns with the Study Area for landscape and visual amenity and the likely maximum range of any potential significant effects.
- 23.3.3 The long list of 'other development' to be included in the assessment of cumulative effects will be reviewed and developed in consultation with the local planning authorities, statutory consultees and other relevant organisations.
- 23.3.4 Development will be included in the initial long list based on the following criteria:

#### **Tier 1 – most certainty**

- under construction;
- permitted application(s), whether under the PA2008 or other regimes, but not yet implemented;
- submitted application(s) whether under the PA2008 or other regimes but not yet determined;



### Tier 2

- projects on the Planning Inspectorate’s Programme of Projects where a scoping report has been submitted;

### Tier 3 – least certainty

- projects on the Planning Inspectorate’s Programme of Projects where a scoping report has not been submitted;
- identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption) recognising that there will be limited information available on the relevant proposals; and
- identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

23.3.5 It should be recognised that many of the projects that will fall within the Tier 3 categories and may be so small that cumulative effects would be highly unlikely. An example of this would be a home extension or minor commercial development. Using professional judgement, projects will therefore be screened for their potential to result in inter-project effects with the Proposed Development with only those where such potential exists will be considered further. This screening exercise will be detailed within the ES and will also be consulted upon as part of pre-application discussions with North Northamptonshire, West Northamptonshire and Milton Keynes Councils.

### **Stage 2 – Identify shortlist of ‘other development’**

23.3.6 At Stage 2, any developments of a nature or scale without the potential to result in cumulative impacts will be excluded, following discussion with the local planning authorities and consideration of the likely ZOI for each environmental topic. The justification for including or excluding developments from the long list will be provided in a matrix, modelled on the example given within Matrix 1 (Appendix 1) of the PINS Advice Note 17.

### **Stage 3 - Information gathering**

23.3.7 Information relating to other developments will be collected from the appropriate source (which may include the local planning authorities, PINS or directly from the applicant/developer) and will include, but not be limited to:

- proposed design and location information;
- proposed programme of demolition, construction, operation and/or decommissioning; and
- environmental assessments that set out baseline data and effects arising from ‘other development’.

### **Stage 4 - Assessment**

23.3.8 The assessment will include a list of those developments considered to have the potential to generate a cumulative effect together with the Scheme, and this will be documented in a matrix, in line with Matrix 2 (Appendix 2) of the PINS Advice Note 17 (Ref. 15) which includes the following:

- a brief description of the development;
- an assessment of the cumulative effect with the Scheme;
- proposed mitigation applicable to the Scheme including any apportionment; and
- the likely residual cumulative effect.



- 23.3.9 The criteria for determining the significance of any cumulative effect will be based upon the:
- duration of effect, i.e. will it be temporary or permanent;
  - extent of effect, e.g. the geographical area of an effect;
  - type of effect, e.g. whether additive or synergistic;
  - frequency of the effect;
  - 'value' and resilience of the receptor affected; and
  - likely success of mitigation.
- 23.3.10 In reporting the overall significance of cumulative effects, it is appropriate to also acknowledge the relative contributions different projects make to a cumulative effect and carefully consider whether the cumulative effect is significant. For example, where a large-scale project is predicted to result in significant effects and a smaller proposed development would not have significant effects, the cumulative assessment should only conclude there is a significant cumulative effect if effects from both projects together are of greater significance than the larger project in isolation. Consequently, care will be taken to not simply define such effects as being cumulative, but rather to focus on the nature and scale to which genuine cumulative effects might result.
- 23.3.11 Where significant cumulative effects are identified, the assessment will identify measures to reduce or avoid these, as well as any necessary monitoring arrangements, where practicable. There may also be the potential to work with other developers to identify ways to mutually mitigate cumulative impacts depending on the nature of the mitigation and anticipated construction programmes.

## 23.4 References

- Ref.1 IEMA (2011). The State of Environmental Impact Assessment Practice in the UK. Available at [iema.net](http://iema.net)



## 24 Summary

### 24.1 The Request

- 24.1.1 The Applicant confirms that they will be providing an Environmental Statement (ES) to accompany their DCO application, and this Scoping Report therefore constitutes notice under Regulation 8(1)(b) of the EIA Regulations.
- 24.1.2 This Scoping Report also forms a request for a Scoping Opinion under Regulation 10(1) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations').
- 24.1.3 A summary of the issues to be scoped in and scoped out of the EIA are provided below

### 24.2 Summary of Scoping

**Table 24.1: Topics to be scoped in/out of EIA**

Environmental Topic	Proposed Elements to be scoped in	Proposed Elements to be scoped out
Climate Change	<p>Green House Gas Emissions: Construction Emissions; Operational Emissions; Decommissioning Emissions.</p> <p>In Combination Climate Change Assessment: Temperature Change; Precipitation Change; Extreme Weather Conditions (wind).</p> <p>Climate Change Resilience: Temperature Change; Precipitation Change; Extreme Weather Conditions (wind).</p>	<p>In Combination Climate Change Assessment: Sea Level Rise.</p> <p>Climate Change Resilience: Sea Level Rise.</p>
Landscape and Visual	<p>Landscape and Visual Receptors within 0.5km of Cable Corridor Study Area and 1km of Local Study Area.</p> <p>Landscape and Visual Receptors (Visual receptors identified with direct, extensive and/or open views towards the Scheme) between 1km-2km Wider Study Area.</p> <p>Landscape Receptors between 2km and 5km Outer Study Area.</p>	<p>Visual Receptors (Visual receptors identified with no direct, extensive and/or open views towards the Scheme) between 1km- 2km Wider Study Area.</p> <p>Visual Receptors between 2km and 5km Outer Study Area.</p> <p>Landscape and Visual Receptors beyond 5km.</p>



Environmental Topic	Proposed Elements to be scoped in	Proposed Elements to be scoped out
Ecology & Biodiversity	<p>Potential Impact Pathways - Impacts of EMFs on aquatic species from cables within the Sites and within the Cable Route Search Area.</p> <p>Ecological Receptors - Upper Nene Valley Gravel Pits SPA and Ramsar; National Statutory Designated Sites within 5km of the Scheme; Local Statutory and Non-Statutory Designated Sites within 2km of the Scheme; Habitats of Principal Importance and Local Priority Habitats; Badgers; Bats; Otters and Water Vole; Other Mammals (Brown Hare, Harvest Mice, Hedgehog and Polecat only); Amphibians (including Great Crested Newts); Reptiles; Non-breeding birds; Breeding birds; Invertebrates; Plants; Invasive and Non-Native Species and Fish.</p>	<p>Potential Impact Pathways - Impacts of EMFs on terrestrial species and impacts of EMFs resulting from cables within the Scheme</p> <p>Ecological Receptors - Local Statutory and Non-Statutory Designated Sites within 2km of the Scheme, designated solely for geological interest; Hazel Dormice.</p>
Hydrology, Flood Risk and Drainage	<p>Flood Risk and Drainage summary:</p> <ul style="list-style-type: none"> <li>• Construction and Decommissioning Phase: Mud and Debris Blockages; Temporary Increase in Impermeable Area; Compaction of Soils.</li> <li>• Operational Phase – Increase in Permanent Impermeable Area; Increase in Discharge to Local Watercourses; Blockage of Drainage Networks.</li> </ul>	n/a



Environmental Topic	Proposed Elements to be scoped in	Proposed Elements to be scoped out
	<p>Water Resources summary:</p> <ul style="list-style-type: none"> <li>• Construction/ Decommissioning Phase: Silt-laden Runoff; Spillages, Leakages and Pollutant; Inappropriate Wastewater Disposal from Welfare Facilities.</li> <li>• Operational Phase: Diffuse Pollution Contained in Urban Runoff; Diffuse Pollution, Contained in Fire Water Runoff; Increase in Highway Routine Runoff; Increase in Highway Spillage Risk; Increased Demand on Water Supply; Disposal of Surface and Foul Water from the Scheme.</li> </ul>	
Ground Conditions & Contamination	n/a	<p>Construction/ Decommissioning Phase: Exposure to contamination through direct contact/ingestion and inhalation of dust, vapours and asbestos fibres; Mobilisation of existing contamination via vertical/lateral migration through permeable deposits below the site; Spillages or leakages of fuels and chemicals. Leaching of chemicals from faulty battery Incidents (fire damage, ash deposition and extinguishing waters).</p> <p>Operational Phase: Exposure to</p>



Environmental Topic	Proposed Elements to be scoped in	Proposed Elements to be scoped out
		contamination through direct contact/ingestion and inhalation of dust, vapours and asbestos fibres, Spillages or leakages of fuels and chemicals. Leaching of chemicals from faulty battery incidents (fire damage, ash deposition and extinguishing waters) via vertical/lateral migration through permeable deposits below the site; Hazardous ground gases to accumulate and migrate into buildings, enclosed spaces and sub-floor voids, with subsequent asphyxiation and/or the potential for explosion.
Minerals	Construction, Operation and Decommissioning; Safeguarded Mineral Resource; sites with Planning Permission or Allocated in Development Plan.	n/a
Cultural Heritage	Impact to Archaeological Remains During the Construction Phase; Impact to Built Heritage During the Construction, Operation and Decommissioning Phases.	Impact to Archaeological Remains During the Operation and Decommissioning Phase.
Transport and Access	Construction Phase and Operational Phase: Severance of communities; non-motorised user delay; Non-motorised user amenity; Fear and intimidation on and by road users; Road vehicle driver and passenger delay; Road user and pedestrian safety; Hazardous large loads	Decommissioning Phase in its entirety.



Environmental Topic	Proposed Elements to be scoped in	Proposed Elements to be scoped out
	(where relating to abnormal loads)	
Noise and Vibration	Vibration from Construction; Noise from Construction; Noise from Construction Traffic; Operational Noise	Vibration from Operation; Operational Traffic.
Glint and Glare	Operational Phase: Dwellings; Road Infrastructure; Aviation Infrastructure	Operational Phase: Rail Infrastructure; Public Rights of Ways; Horse Facilities and all Receptors during Construction and Decommissioning;
Electromagnetic Fields	Cable Corridor during Construction and Operation of the Scheme.	Impacts arising from the BESS, substations, transformers and PV inverters for the Scheme during Construction, Operation and Decommissioning; Cable Corridor during Decommissioning of the Scheme.
Air Quality	Construction Dust Assessment; Air Quality Fire Assessment; Construction Vehicle Assessment	Operational Vehicle Assessment.
Socio-Economics, Tourism and Recreation and Human Health	Socio-Economic Impacts During Construction; Socio-Economic Impacts during Operation; Socio-Economic Impacts During Decommissioning; Impacts on Tourism and recreation During Construction and Operation.	Socio-Economic Impacts During Decommissioning; Tourism and Recreation during Decommissioning; Specific matters (property value and Crime)
Human Health	Social Environment: Housing; Open space, Leisure and play; Transport Modes, Access and Connections; Community identity, culture, resilience and influence.	Health-Related Behaviour: Physical Activity; Risk Taking Behaviour; Diet and Nutrition.  Social Environment: Housing; Relocation; Community Safety, Social Participation; interaction and support.





Environmental Topic	Proposed Elements to be scoped in	Proposed Elements to be scoped out
	<p>Economic Environment: Education and Training; Employment and Income.</p> <p>Bio-physical environment: Climate change mitigation and adaptation; Air Quality, Water quality and availability; Land Quality; Noise and Vibration</p> <p>Institutional and Built Environment: Health and Social Care Services; Wider Societal Infrastructure and resources.</p>	<p>Bio-Physical Environment: Climate Change mitigation and Adaptation; Radiation.</p> <p>Institutional and Built Environment: Health and Social Care Services; Built Environment; Wider Societal Infrastructure and Resources</p>
Arboriculture	Impacts within the Cable Corridor	Impacts to Trees in Green Hill A-G and BESS
Soils and Agricultural Circumstances	Agricultural Land (including BMV land); Agricultural Land Holding; Soils.	n/a
Other Environmental Matters	n/a	Light Pollution; Potential Accidents and Disasters; Waste; Telecommunications Utilities and Television Receptors.



## 25 Glossary

25.1.1 Table 25.1 sets out a glossary of terms used throughout this report including technical topic specific terminology.

**Table 25.1: Glossary of Terms**

Term	Definition
*A* Weighting (dB(A))	The human ear does not respond uniformly across the audible frequency range. The *A* weighting is commonly used to simulate the frequency response of the ear.
Agricultural Land Classification (ALC)	A means of assessing the quality of farmland. Its assessment is based on physical limitations of the land, such as climate, site characteristics (for example gradient) and soil. The assessment gives an indication of the versatility and expected yield of the land. The system classifies agricultural land in 5 grades. The best and most versatile land is classified as 1, 2 and 3a. The Agricultural Land Classification was developed by the former Ministry of Agriculture, Fisheries and Food (MAFF) in 1988 and revised in 1996.
Air Quality Management Area (AQMA)	Places where air quality objectives are not likely to be achieved. Where an AQMA is declared, the local authority is obliged to produce
Ambient noise Level, LAeq,T	The total sound in a certain situation at a given time usually composed of sound from many sources, near and far.
Annual Average Daily Traffic (AADT)	Traffic data obtained by calculating daily traffic flows and then calculating the annual average. Often used in predicting noise levels and air quality, usually in conjunction with other parameters such as average vehicle speed and percentage heavy vehicles.
Annual Average Weekly Traffic (AAWT)	Traffic data obtained by calculating weekly traffic flows and then calculating the annual average. Often used in predicting noise levels and air quality, usually in conjunction with other parameters such as average vehicle speed and percentage heavy vehicles.
Annual Exceedance Probability (AEP)	The probability of a certain accumulation being exceeded in a particular year.
Applicant	Green Hill Solar Farm Limited
Associated Development	BESS, grid connection cables to be located in a Cable Corridor within the Cable Route Search Area, grid connection infrastructure and any other infrastructure and works integral to the construction, operation, maintenance and decommissioning of the Scheme.
Background Noise Level LA90,T	The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a



Term	Definition
	given time interval, T, measured using the fast time weighting, F, and quoted to the nearest whole number.
Baseline Conditions	The environment as it appears (or would appear) immediately prior to the implementation of the Scheme together with any known or foreseeable future changes that will take place before completion of the Scheme.
Battery Energy Storage Facility (BESS)	Battery Energy Storage Systems (BESS), is used to describe the battery storage installation to allow for the storage, importation, and exportation of energy to the National Grid. For the purposes of the Environmental Impact Assessment, it has been assumed battery technology will be adopted for the BESS.
Biodiversity	The biological diversity of the earth’s living resources. The total range of variability among systems and organisms at the following levels of organisation: bioregional, landscape, ecosystem, habitat, communities, species, populations, individuals, genes and the structural and functional relationships within and between these different levels.
Biodiversity Net Gain (BNG)	Development that leaves biodiversity in a better state than before and involves an approach where developers work with local governments, wildlife groups, landowners and other stakeholders in order to support their priorities for nature conservation.
Bund	An embankment structure
Cable circuit	An electrical conductor necessary to transmit electricity between two points within the Scheme and may include one or more auxiliary cables for the purpose of gathering monitoring data, earthing cables, cables for auxiliary supply, optical fibre and other types of communication cables, cables connecting to direct current boxes.
Cable Corridor	An area of land identified for the cable route within which the trench or trenches and working width for the cable circuits, the cables themselves and associated cable ducts, will be sited. It is anticipated that this will be approximately 50m wide for the extent of the Scheme at the point of submission.
Cable Route Search Area	A swathe of land, still to be refined through further study, between the Sites and Point of Connection at Grendon Substation, within which the Cable Corridor will be located.
Conservation Area	An area of special environmental or historic interest or importance, of which the character or appearance is protected (Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990).



Term	Definition
Conversion Units	Conversion Units incorporate the inverters, transformers and switchgear and are required to manage the electricity generated by the PV Panels. These would either be standalone equipment or they would be housed ('integrated') together within a container.
County Wildlife Sites (CWS)	CWS designation is non-statutory but is recognition of a site's high value for wildlife, with many sites being of county and often regional or national importance. They often support characteristic or threatened species and habitats included in Local and National Biodiversity Action Plans
Cumulative Effects	Effects upon the environment that result from the incremental impact of an action when added to other past, present or reasonably foreseeable actions.  Each impact by itself may not be significant but can become a significant effect (in EIA terms) when combined with other impacts.
Decibel (dB)	The decibel is a logarithmic ratio of two values of a variable. The range of audible sound pressures is approximately $2 \times 10^{-5}$ Pascals (Pa) to 200 Pa. Using decibel notation presents this range in a more manageable form, 0 dB to 140 dB.
Design Manual for Roads and Bridges (DMRB)	A series of 15 volumes authored by Highways England that provide standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads, including motorways in the United Kingdom, and, with some amendments, the Republic of Ireland.
Decommissioning Environmental Management Plan (DEMP)	A specific plan developed to ensure that appropriate environmental management practices are followed during the decommissioning phase of a project.
Development Consent Order (DCO)	Development consent is required pursuant to the Planning Act 2008 for Nationally Significant Infrastructure Projects. A development consent order is a statutory instrument containing powers that enable the applicant to carry out the construction, operation, maintenance and decommissioning of the Nationally Significant Infrastructure Project. Applications for DCOs are made to, and decided by, the relevant Secretary of State.
Electric field	An electric field is the physical field that surrounds electrically charged particles and exerts force on all other charged particles in the field, either attracting or repelling them. Measured in volt per meter (Vm-1) or newton per coulomb (NC-1).



Term	Definition
Electromagnetic field (EMF)	Property of space caused by the motion of an electric charge and is the product of mutual interaction between electric fields and magnetic fields. As such, these are produced in the surrounding area of anywhere there is an electric current.
Energy from waste (EFW)	A process that involves converting non-recyclable waste materials into usable heat, electricity, or fuel through various methods, such as combustion, gasification, and anaerobic digestion.
Environmental effect	The consequence of an action (impact) upon the environment.
Environmental impact	The change in the environment from a development such as the removal of a hedgerow.
Environmental Impact Assessment (EIA)	A process, underpinned by legislation, by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making. For certain projects, EIA is a statutory requirement.
Environmental Impact Assessment (EIA) Regulations	Regulations that give planning authorities a means of ensuring that they can take account of the environmental, economic and social implications of individual developments in their decisions on planning applications.
Environmental Statement	A document produced in accordance with the EU's EIA Directive (2011/92/EU as amended by 2014/52/EU) as transposed into UK law (for DCO projects) by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 to report the results of an EIA.
Flood Zone	Flood Zone definitions are set out in the National Planning Policy Guidance. There are three flood zones which refer to the probability of river and sea flooding, not taking account of the presence of flood defences.
Frequency (Hz)	The number of cycles per second (i.e., the number of vibrations that occur in one second); subjectively this is perceived as pitch.
Frequency Spectrum	The relative frequency contributions that make up a noise.
Generating Station	The elements of the project that generate the electricity output, namely: solar modules fitted to mounting structures; DC electrical cabling; conversion units including inverters, transformers, switchgear, and monitoring and control systems; and electrical and



Term	Definition
	communications cabling connecting the generating station to a sub-station.
Green Infrastructure	A network of multi-functional green space and other green features, urban and rural, which can deliver quality of life and environmental benefits for communities.
Grendon Substation	The existing 400kV substation located approximately 1km north-west of the village of Grendon.
Ground mounted PV Modules	Solar photovoltaic (PV) modules attached to structures that are fixed to the ground.
Important Ecological Features (IEFs)	Each habitat, species or site of 'Site' importance or above.
Inverter	Inverters convert the direct current (DC) electricity into alternating current (AC), which allows the electricity generated to be exported to the national grid.
Jointing bay	Underground structures constructed at regular intervals along the cable route to join sections of the cable circuits and facilitate installation of the cable circuits into the buried ducts.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity. The LVIA is usually reported as a chapter to the Environmental Statement, including appendices and figures.
Level LA10,T	The A-weighted sound pressure level exceeded for 10% of a given time interval, T, measured using the fast time weighting, F.
Lowest Observed Adverse Effect Level	This is the level of noise above which adverse effects on health and quality of life can be detected.
Magnetic field	A magnetic field is a vector field that describes the magnetic influence on moving electric charges, electric currents, and magnetic materials. The magnetic flux density of the field is measured in tesla (T), based on the SI unit kilogram per second squared per ampere (kgm <sup>-2</sup> A <sup>-1</sup> ).
Mitigation	Measures including any process, activity, or design to avoid, reduce, or remedy for negative environmental impacts or effects of a development.
Mounting Structures	The metal frames onto which the PV Panels are attached.
National Grid Substation	A National Grid substation is a large installation where 275 kV and 400 kV overhead power lines or underground



Term	Definition
	cables are switched and where electricity is transformed to 33/132 kV for distribution to surrounding areas.
Nationally Significant Infrastructure Projects (NSIP)	NSIPs are large scale developments (as defined in sections 14-30A of the Planning Act 2008) such as certain new harbours, power generating stations (including wind farms), highways developments and electricity transmission lines, which require a type of consent known as 'development consent' which is governed by the Planning Act 2008 (and amended by the Localism Act 2011).
National Policy Statement (NPS)	National Policy Statements are produced by government in accordance with Part 2 of the Planning Act 2008. They comprise the government's central policy documents for the development of nationally significant infrastructure
On-site cables as earthing cables and optical fibre cables.	The low or medium voltage cables within the Solar Farm, which transmit electricity between solar PV Modules to inverters and transformers, and from there to the proposed on-site substation and BESS. These cables consist of 33, 132 and 400 kilovolt cables, as well as earthing cables and optical fibre cables.
Order limits	The land shown on the Works Plans within which the Scheme can be carried out.
Outline Battery Fire Safety Management Plan (OBSMP)	This document identifies the measures required to avoid and reduce the risk of fire from the batteries within the Scheme, as well as how to effectively manage a fire should the event occur.
Outline Construction Environmental Management Plan (OCEMP)	A site-specific plan which is developed to ensure that appropriate environmental management practices are followed during the construction phase of a Scheme.
Outline Landscape and Ecological Management Plan (OLEMP)	The OLEMP sets out the landscape and ecological management actions for the Scheme, outlining how mitigation measures, identified within the Environmental Statement, will be delivered through future landscape works and management.
Outline Operation Environmental Management Plan (OOEMP)	The OOEMP identifies environmental mitigation measures required during operation of the Scheme that have been identified as part of the EIA. It defines those environmental commitments and actions that will be implemented during the operation and maintenance of the Scheme.
PA 2008	Planning Act 2008
Photovoltaic (PV)	The process of converting sunlight to electrical energy.



Term	Definition
Point of Connection (POC)	The Grendon 400kV National Grid Substation, which the scheme connects to, to transfer the energy generated to the grid.
Planning Inspectorate	The Planning Inspectorate for England is an executive agency of the Department for Levelling Up, Housing and Communities of the United Kingdom Government with responsibility for making decisions and providing recommendations and advice on a range of land use planning-related issues across England.
Preliminary Environmental Information	Preliminary Environmental Information is defined in the EIA Regulations as: 'information referred to in regulation 14(2) which –  (a) has been compiled by the applicant; and  (b) is reasonably required for the consultation bodies to develop and informed view of the likely significant environmental effects of the development (and of any Associated Development).
Principal Aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability – meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
PV Panel	Solar photovoltaic panel designed to convert solar irradiance to electrical energy
Receptor	A component of the natural or man-made environment (including people) that is affected by an impact.
Reference Time Interval, Tr	The specified interval over which an equivalent continuous A-weighted sound pressure level is determined.
Relevant Representation	A relevant representation is a summary of a person's view on an application, made in writing.
Scheduled Monument	A 'nationally important' archaeological site or historic building, given protection against unauthorised change and included in the Schedule of Monuments kept by the Secretary of State for Culture, Media and Sport. The protection given to scheduled monuments is given under the Ancient Monuments and Archaeological Areas Act 1979.
Scheme	A nationally significant infrastructure project comprising a ground mounted solar photovoltaic generating station with a gross electrical capacity of over 50 megawatts, comprising of ground mounted solar arrays and Associated Development.





Term	Definition
	The Scheme will be known as 'Green Hill Solar Farm'.
Setting	The surroundings within which a heritage asset is experienced and any element which contributes to the understanding of its significance.
Significant Observed Adverse Effect Level	This is the level of noise above which significant adverse effects on health and quality of life occur.
Site/Sites	The sites (Green Hill A, A.2, B, C, D, E, F, G and BESS) which accommodate the ground mounted solar photovoltaic generating station and Associated Development, excluding the Cable Route Search Area.
Solar Arrays	A term used to describe the land or Sites that accommodate the Solar PV modules and Associated Development.
Source Protection Zone (SPZ)	Source Protection Zones ("SPZ") show the risk of contamination from any activities that might cause pollution to groundwater sources such as wells, boreholes and springs used for public water supplies. The closer the activity, the greater the risk. SPZs can comprise of up to three main zones (inner, outer and total catchment). A fourth zone of special interest can also occasionally be applied to a groundwater source.
Statements of Common Ground (SoCG)	A written statement containing factual information about the proposal which is the subject of the appeal that the appellant reasonably considers will not be disputed by the local planning authority.
Study Area	The area in which a particular assessment or survey targets. The Study Area will vary depending on the nature of the technical assessment. Where relevant, these are defined within the relevant technical chapter of the ES.
Substation	<p>A substation is a part of an electrical generation, transmission, and distribution system. Substations transform voltage from high to low, or the reverse, or perform any of several other important functions. Between the generating station and consumer, electric power may flow through several substations at different voltage levels.</p> <p>The Scheme has variety of different substations at the following voltages: 400kV, 132kV and 33kV</p>
Switchgear	A combination of electrical disconnect switches, fuses or circuit breakers used to control, protect, and isolate electrical equipment.
Transformers	Transformers increase and decrease the voltage of the electricity.



Term	Definition
Tesla (T)	Unit of measurement for the magnetic flux density of a magnetic field. Usually scaled to micro Tesla ( $\mu\text{T}$ ) for everyday applications
Underground Cable Ducting	Underground ducting refers to the protective pipework through which essential utility pipes and cables are run underground to provide buildings with power, water and gas etc.
Visual Effects	Effects on specific views and on the general visual amenity experienced by people.
Volt per metre ( $\text{Vm}^{-1}$ )	Unit of measurement for the strength of an electric field. Usually scaled to kilovolts per meter ( $\text{kVm}^{-1}$ ) for measuring electric fields around electrical infrastructure.
Water Framework Directive (WFD)	The Water Framework Directive introduced a new system for monitoring and classifying the quality of surface and ground waters. The Directive requires that Environmental Objectives be set for all surface waters and groundwater to enable them to achieve Good Ecological Potential/Status by a defined date.
Works Plans	The plans submitted with the Application known as the Works Plans and which delineate the Order limits for the Scheme.
Written Scheme of Investigation (WSI)	A Written Scheme of Investigation outlines known and potential archaeological features and deposits or built heritage elements on a site and suggests a structure for exploring them using the latest, most appropriate and cost-effective archaeological techniques.
Zone of Influence (ZOI)	An area established for the purposes of EIA in respect of a particular environmental topic over which the impacts of a particular project on receptors will be assessed. Zones of Influence are variable depending on the environmental matter being assessed.
Zone of Theoretical Visibility (ZTV)	A map, usually digitally produced, showing areas of land within which, the Scheme is theoretically visible, which are used to inform Landscape and Visual Impact Assessment