

Green Hill Solar Farm

Preliminary Environmental Information Report

Chapter 20 Agricultural Circumstances

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Date: November 2024

PINS reference: EN010170



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20 Agricultural Circumstances

20.1 Introduction

20.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the findings of the Environmental Impact Assessment (EIA) undertaken to date concerning the potential impacts of the Scheme on agricultural circumstances during the construction, operation and maintenance and decommissioning phases. The following aspects will be considered within the agricultural circumstances assessment process:

- Soils;
- Agricultural land quality; and
- Agricultural landholdings.

20.1.2 Further details about the Scheme are set out in **Chapter 4: Scheme Description** of this PEIR.

Appendices and Figures

20.1.3 This chapter is supported by the following appendix in PEIR **Volume 3**:

- **Appendix 20.1:** Agricultural Land Classification Technical Report

20.1.4 This chapter is supported by the following figures in PEIR **Volume 2**:

- **Figure 20.1:** National Soil Association Map;
- **Figure 20.2:** Agricultural Land Classification Map;
- **Figure 20.3:** Previous Detailed Agricultural Land Classification Map;
- **Figure 20.4:** Agri-environment Schemes Map; and
- **Figure 20.5:** Forestry and Woodland Schemes Map.

20.1.5 This chapter is supported by the following tables:

- **Table 20.1:** Summary of consultation and responses;
- **Table 20.2:** Sensitivity of impact on agricultural land and soils;
- **Table 20.3:** Sensitivity of impact on soils in relation to handling/disturbance;
- **Table 20.4:** Sensitivity of impact on agricultural landholdings;
- **Table 20.5:** Magnitude of impact on agricultural land and soils;
- **Table 20.6:** Magnitude of impact on agricultural landholdings;
- **Table 20.7:** Degree of Significance;
- **Table 20.8:** Landholder Information Breakdown;
- **Table 20.9:** ALC Grade Breakdown at each site;
- **Table 20.10:** Preliminary assessment of potential impact on soil;
- **Table 20.11:** Preliminary assessment of potential impact on agricultural land quality; and
- **Table 20.12:** Preliminary assessment of potential impact on agricultural landholdings.

20.2 Consultation

20.2.1 An EIA Scoping Report was submitted to the Planning Inspectorate (PINS) in July 2024, with a formal request for Scoping Opinion. PINS subsequently issued the Scoping Opinion on the proposed scope on 30th August 2024. Consultation undertaken throughout the pre-application and scoping phase for the Scheme has informed the approach to the agricultural circumstances assessment and the information provided within this chapter.



20.2.2 A summary of consultation and response to the Scoping Report are outlined below in **Table 20.1**.

Table 20.1: Summary of Consultation and Responses

Consultee and Date	Comment	Outcome and any further steps anticipated	Outcome and any further steps anticipated
<p>The Planning Inspectorate 30th August 2024 Scoping Opinion</p>	<p>ID 3.16.1 Agricultural land holding – construction and decommissioning (Table 21.7) No justification regarding the scoping out of this matter is provided within the SR therefore the Inspectorate is unable to agree to scope this matter out of further assessment. The ES should ensure that effects to agricultural land holdings are assessed over the entire lifetime of the Proposed Development including the construction, operational and decommissioning phases. Any deviation from this approach must be fully justified within the ES.</p>	<p>The agricultural land holdings will be assessed during construction, the operation duration of the Scheme and during decommissioning as part of the PEIR and ES.</p>	<p>20.8. Assessment of Likely Impacts and Effects</p>
<p>Scoping Opinion ID 3.16.2</p>	<p>Agricultural Land Classification (ALC) surveys (Paragraph 21.4.5) The Applicant states that a decision will be made regarding whether ALC surveys are required for the Cable Corridor once the route has been refined. The Inspectorate expects that an ALC for the whole site, including the Cable Corridor, will be undertaken to support the ES unless there is substantial justification dictating otherwise. The ES should contain a clear tabulation of the areas of land in each BMV classification to be temporarily or permanently lost as a</p>	<p>Justification for use of each grade within the Scheme will be provided within the ES. Maps of grades of the surveyed land within the Scheme have been provided in Figure 20.2. The refinement of the cable routes is under review to determine the most effective approach to assessing ALC grades within this area and this will be reported in the ES. The Soil management Plan will cover the whole Scheme, including the cable corridor, and as such good practice soil handling, storage and reinstatement will be applied to this aspect, ensuring that there is no change to the baseline soil or land condition.</p>	<p>Appendix 20.1 and Figure 20.2.</p>



Consultee and Date	Comment	Outcome and any further steps anticipated	Outcome and any further steps anticipated
	<p>result of the Proposed Development, with reference to accompanying map(s) depicting the grades. Specific justification for the use of the land by grade should be provided.</p> <p>Consideration should be given to the use of BMV land in the Applicant's discussion of alternatives.</p>		

20.3 Legislation, Planning Policy and Guidance

20.3.1 This section provides an overview of the legislation, planning policy and guidance against which the Scheme will be considered for agricultural circumstances.

Legislation

UK Legislation

Planning Act 2008

20.3.2 The Planning Act (Ref.1) outlines the planning requirements and regulations for development of national significant infrastructure. The act sets out the basis for the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. As part of the EIA process, the impact on agriculture and soils is assessed within this chapter.

The Agricultural Land (Removal of Surface Soil) Act 1953

20.3.3 The Agricultural Land (Removal of Surface Soil) Act 1953 (Ref.2) is the only relevant legislation that is specific to the assessment of Soils and Agriculture. The act outlines the offence and punishment as a result of removing surface soil without planning permission from agricultural land.

Planning Policy

National Planning Policy

National Policy Statement (NPS) for Energy (EN-1) (Ref.3)

20.3.4 NPS EN-1 paragraph 5.11.12 states that 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).'

20.3.5 Paragraph 5.11.13 states that '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.'

20.3.6 Paragraph 5.11.14 states that 'Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination. The sustainable reuse of soils needs to be carefully considered in line with good practice guidance where large quantities of soils are surplus to requirements or are affected by contamination.'

20.3.7 Paragraph 5.11.23 states that 'Although in the case of most energy infrastructure there may be little that can be done to mitigate the direct effects of an energy project on the existing use of the



proposed site (assuming that some of that use can still be retained post project construction) applicants should nevertheless seek to minimise these effects and the effects on existing or planned uses near the site by the application of good design principles, including the layout of the project and the protection of soils during construction.'

- 20.3.8 Paragraph 5.11.34 states the Secretary of State should *'ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. Where schemes are to be sited on best and most 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 land should be preferred to those of a higher quality.'*

NPS for Renewable Energy Infrastructure (EN-3) (Ref.4)

- 20.3.9 NPS EN-3 sets out guidance on agriculture land classification and land type for renewable energy infrastructure, as follows:
- 20.3.10 Paragraph 2.10.29 states *'While land type should not be a predominating factor in determining the suitability of the site location applicants should, where possible, utilise suitable previously developed land, brownfield land, contaminated land and industrial land. 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. "Best and Most Versatile" agricultural land is defined as land in grades 1, 2 and 3a of the Agricultural Land Classification.'*
- 20.3.11 Paragraph 2.10.31 states *'It is recognised that at this scale, it is likely that applicants' developments will use some agricultural land. Applicants should explain their choice of site, noting the preference for development to be on suitable brownfield, industrial and low and medium grade agricultural land.'*
- 20.3.12 Paragraph 2.10.32 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'.*
- 20.3.13 Paragraph 2.10.33 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'.*
- 20.3.14 Paragraph 2.10.34 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.'*
- 20.3.15 Paragraph 2.10.127 states *'The Defra Construction code of practice for the sustainable use of soils on construction sites provides guidance on ensuring that damage to soil during construction is mitigated and minimised. Mitigation measures focus on minimising damage to soil that remains in place, and minimising damage to soil being excavated and stockpiled. The measures aim to preserve soil health and soil structure to minimise soil carbon loss and maintain water infiltration and soil biodiversity. Mitigation measures for agricultural soils include use of green cover, multispecies cover crops - especially during the winter minimising compaction and adding soil organic matter.'*
- 20.3.16 Paragraph 2.10.145 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'.*

NPS for Renewable Electricity Networks Infrastructure (EN-5) (Ref.5)



20.3.17 Paragraph 2.9.25 states *'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 (including peat soils), particularly regarding Best and Most Versatile land, including development and implementation of a Soil Resources and Management Plan. 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.'*

National Planning Policy Framework

20.3.18 This ALC assessment is consistent with the direction given by paragraph 180 of the National Planning Policy Framework (NPPF) (Ref.6) as follows:

20.3.19 *'Planning policies and decisions should contribute to and enhance the natural and local environment by: (b) recognising 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.'*

20.3.20 The NPPF defines best and most versatile (BMV) agricultural land as land in grades 1, 2, and 3a of the Agricultural Land Classification (ALC) system.

20.3.21 The NPPF states in the footnote of paragraph 181, *'Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality. The availability of agricultural land used for food production should be considered, alongside the other policies in this Framework, when deciding what sites are most appropriate for development.'*

20.3.22 The Draft NPPF for Consultation suggests the following changes footnote paragraph 181 *'We do not want our proposals to undermine existing protections for best and most versatile agricultural land. Our proposals do not remove the requirement for planning policies and decisions to recognise the benefits of the best and most versatile agricultural land, and, where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality should be preferred.'*

Local Planning Policy

North Northamptonshire Joint Core Strategy 2011-2031

20.3.23 Paragraph 3.32 of North Northamptonshire Joint Core Strategy 2011-2031 (North Northamptonshire Council, 2016) (Ref.7) 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'*.

Policy 46S - Use of previously developed land and use of undeveloped land of Local Plan 2030

20.3.24 Policy 46S - Use of previously developed land and use of undeveloped land of Local Plan 2030 (Bedford Borough Council, 2020) (Ref. 8) states *'Where significant development is demonstrated to be necessary on agricultural land, poorer quality land should be used in preference to the best and most versatile agricultural land (grades 1-3a). Where the site is located on agricultural land outside of existing settlements, applicants will be required to provide evidence of the grade of agricultural land and, where that land is likely to be grade 3 or higher, undertake a detailed survey of land quality'*.

Bedford Local Plan 2030

20.3.25 Paragraph 9.1 of Bedford Local Plan 2030 (Ref.9) states *'Soil, air and water resources are non-renewable resources, and their use needs to be managed carefully to ensure that development is sustainable'*.

20.3.26 Milton Keynes Council Plan 2016-2031



20.3.27 Policy NE7 (Ref. 10) '*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.*'

20.3.28 West Northamptonshire Local Plan - 2041 (Regulation 18)

20.3.29 Policy EC5 (Ref.11) '*Development proposals which sustain and enhance the rural economy by creating or safeguarding jobs and businesses will be supported 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.*'

Guidance

Agriculture land classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.

20.3.30 The Ministry of Agriculture, Fisheries and Food (MAFF) (Ref.12) ALC system for grading land quality for land use planning divides agricultural land into five grades. These grades divide land according to the degree of limitation imposed on land use by the inherent characteristics of climate, site, and soils.

20.3.31 Protecting BMV agricultural land and the undertaking of an ALC assessment is supported by the Natural England Guide to assessing development proposals on agricultural land (Ref.13). GOV.UK outlines policies related to the protection of agricultural land and soil to protect BMV land and advice development proposals.

20.3.32 A description of each grade is set out below based on the ALC guidelines (Ref.12).

Grade 1 - excellent quality agricultural land.

20.3.33 Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land.

20.3.35 Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 – good to moderate quality agricultural land.

20.3.36 Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown the yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a - good quality agricultural land.

20.3.37 Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b - moderate quality agricultural land.

20.3.38 Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 – poor quality agricultural land.

20.3.39 Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields



of which are variable. In moist climates, yields of grass may be moderate to high, but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor-quality agricultural land.

- 20.3.40 Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

A New Perspective on Land and Soil in Environmental Impact Assessment (IEMA, 2022) (Ref.14)

- 20.3.41 The IEMA guidance outlines the assessment criteria to be used to assess the impact on soil and land as part of an Environmental Impact Assessment.

Institute of Quarrying (2024). Good Practice Guide for Handling Soils in Mineral Workings (Ref.15)

- 20.3.42 The guidance succeeds Defra's Good Practice for Handling Soils and outlines the approaches to soil reinstatement required in construction when using earth-moving machinery for soil stripping, storage and replacement.

Department for Environment, Food and Agriculture (Defra) (2009). Construction Code of Practice for Sustainable Use of Soils on Construction Sites (Ref.16)

- 20.3.43 The Code of Practice assists construction activities to better protect soil resources by providing guidance to help protect and enhance soil resources on site through pre-construction planning, soil management during construction and landscape, habitat or garden creation.

Natural England (2021). Guide to assessing development proposals on agricultural land (Ref.13)

- 20.3.44 The guide outlines appropriate resources and policy to help protect agricultural land and soils with the overarching aims to protect "the best and most versatile (BMV) agricultural land from significant, inappropriate or unsustainable development proposals" and "all soils by managing them in a sustainable way".

IEMA (2022). Guidance Note: Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (Ref.17)

- 20.3.45 The guidance outlines how the use of a soil management plan can assist the protection and management of soils during construction and planning.

British Standard Specification for Topsoil and Requirements for Use (Ref.18)

- 20.3.46 The standard outlines the set of requirements for topsoil classification regarding specific characteristics such as texture, acidity and contaminants.

British Standard Specification for Subsoil and Requirements for Use (Ref.19)

- 20.3.47 The standard outlines the set of requirements for subsoil classification regarding specific characteristics such as texture, acidity and contaminants.

20.4 Assessment Methodology

- 20.4.1 The methodologies described in the following section have been developed in line with the relevant planning policy and appropriate industry guidance for assessing potential effects from the Scheme on agricultural circumstances.

Study Area

- 20.4.2 The Study Area for the Scheme is defined by the Sites and has not, to date, included the Cable Route Search Area. As stated in the Scoping Report, the Cable Corridor within the Cable Route Search Area has currently not been defined and as such has not yet been subject to soil survey or farming circumstances assessment. An ALC survey, which places survey points at 100m



intervals, would be too widely spaced to assess soil variation within a narrow trench corridor. Once the Cable Corridor has been defined an assessment will be undertaken to define whether and when ALC surveys are required (based on extent and type of land use and the potential impacts). All proposed works within the Cable Corridor will be set out within, and covered by, the Soil Management Plan to minimise potentially negative impacts on soil quality or land grade. Additionally, the Scheme will seek agreement from local planning authorities and key stakeholders regarding scope of the ALC surveys within the Cable Corridor.

20.4.3 Agricultural occupancy and land use information for the cable route will need to be collected ahead of trenching work for the cable route 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 cable route. Any such mitigation measures, landowner agreements agreed or assumptions at a pre-determination stage will be monitored at post consent stage to make sure they still apply and are appropriate.

20.4.4 It is anticipated that there will be limited impact of the cable route on soils, agricultural land and farming activity. This is as the duration of cable laying works will be brief as it will be carried out along the Cable Corridor sequentially, 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, which typically are renewed after 40 years of operation.

Impact Assessment Methodology

20.4.5 The assessment of the impacts on soil and agricultural land will be undertaken in accordance with IEMA guidance, “A New Perspective on Land and Soil in Environmental Impact Assessment” published in 2022 (Ref.14). The Design Manual for Roads and Bridges (DMRB) LA112 (Ref.20) has been used to assess the impact on agricultural land holdings.

20.4.6 **Tables 20.2-20.6** set out the criteria which will be used to determine the sensitivity of receptors and the magnitude of impacts on agricultural land and soils as found in IEMA (Ref.14) and DMRB LA112 (Ref.20). **Table 20.7** provides the matrix for identifying, by reference to sensitivity and magnitude, the significance of effects.

Sensitivity of Receptors

20.4.7 The baseline information collected will be used to assess the sensitivity of soils and agricultural land in relation to their potential and there will be engagement with relevant disciplines to ensure the reported assessment of impacts aligns across all relevant EIA chapters. It should be noted that reference to biomass production is referring to the context of food production and is not exclusive to crop biomass facilities.

Table 20.2: Sensitivity of impact on agricultural land and soils

Sensitivity	Soil Resource and Soil Functions
Very High	<p>Biomass production: ALC Grades 1 and 2.</p> <p>Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected features within a European or international site (e.g., Special Area of Conservation (SCA), Special Protection Area, Ramsar site); 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;</p>



Sensitivity	Soil Resource and Soil Functions
	<p>Soils supporting community / recreational / educational access to land covered by National Park designation.</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, Site of Special Scientific Interest (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).</p> <p>Soils supporting community / recreational / educational access to RIGS and AONBs.</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 (SNCIs), 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 revealed by construction) archaeological interest; Soils supporting community/ recreational / educational access to land.</p> <p>Source of materials: Surface mineral reserves that would remain accessible for extraction.</p>
Low	<p>Biomass production: ALC Grade 4 and 5.</p> <p>Ecological habitat, soil biodiversity and platform for landscape: Soils supporting valued features within non-designated notable or priority habitats / landscapes. Agricultural soils.</p> <p>Soil carbon: Mineral soils.</p> <p>Soil hydrology: Pathway for local water flows and flood risk management.</p> <p>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.</p>



Sensitivity	Soil Resource and Soil Functions
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions.

Table 20.3: Sensitivity of impact on soils in relation to handling/disturbance

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. 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. 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 20.4: Sensitivity of impact on agricultural landholdings

Sensitivity	Description of impacts
Very High	Agricultural land holdings: 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	Agricultural land holdings: 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	Agricultural land holdings: 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	Agricultural land holdings:



Sensitivity	Description of impacts
	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	Agricultural land holdings: 1) Areas of land which are infrequently used on a non-commercial basis.

Magnitude of Impacts

20.4.8

The magnitude of impact on agricultural land and soils assesses the potential for loss of soil function or volume as well as loss of resources and potential effect on accessibility required for agricultural operation. The impacts may also be adverse or beneficial, with the descriptions for each set out in **Table 20.5** and **Table 20.6**.

Table 20.5: Magnitude of impact on agricultural land and soils

Magnitude of impacts	Description of impacts
High	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 20.2, 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 20.2, as advised by other topic specialists in EIA team (including effects from ‘temporary developments’*).
Medium	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 20.2, 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 20.2, as advised by other topic specialists in EIA team.
Low	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 20.2 above, as advised by other topic specialists in EIA team; or 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 20.2, as advised by other topic specialists in EIA team.
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.



Magnitude of impacts	Description of impacts
* Temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soils	

Table 20.6: Magnitude of impact on agricultural landholdings

Magnitude of impact	Description of impacts
High	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 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 2) Introduction (adverse) or removal (beneficial) of complete severance with no / full accessibility provision.
Medium	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 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 2) Introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision.
Low	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 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 2) Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision.
Negligible	Private property and housing, community land and assets, development land and businesses and agricultural land holdings: 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 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.

Assessment of Significance

20.4.9 Judging the significance of the effects on soils and agricultural land requires an assessment of the sensitivity of the baseline environment. The sensitivity will be assessed in relation to the susceptibility of the receptors to change. The magnitude of potential effects would then take into consideration the size and scale of effects; geographical extent; duration and reversibility.



- 20.4.10 The assessment of sensitivity and magnitude will then be combined to form a judgement regarding the overall significance of effect. This will be categorised as major, moderate, minor or negligible/no effect. 'Moderate' and 'major' effects are considered significant in the context of the EIA Regulations. The nature of effects will be described as positive (beneficial), neutral or negative (adverse).
- 20.4.11 The rationale for solar farm site position selection and the interaction with agricultural land (BMV) will be presented within **Chapter 5: Alternatives and Design Evolution** in the PEIR and Design Evolution and Alternatives chapter of the ES, these chapters will be used to inform the assessment of effects on soils and agriculture.
- 20.4.12 Impacts that are identified in the PEIR of moderate significance or greater will be considered significant.

Table 20.7: Degree of Significance

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

20.5 Assessment Assumptions and Limitations

- 20.5.1 This preliminary assessment is based on baseline and scheme design information available at the time of writing this chapter. A full assessment will be undertaken as part of the EIA, and the assessment will be developed and refined following statutory consultation and as additional information becomes available, with the final assessment presented within the ES.
- 20.5.2 Where the scheme designs and details are either not yet known or incomplete at this stage, either assumptions have been made based on professional judgment or, in the event that it is not possible to make any assumptions, no attempt at a full assessment has been made. This assessment is an iterative process and will be both expanded and made more specific as survey data is collected, analysed and reported on, and designs are further developed. This process will be carried out in conjunction with relevant consultees and third parties as necessary to achieve the most robust outcome.
- 20.5.3 The methodology for agricultural circumstances has no limitations identified.

20.6 Baseline Conditions

- 20.6.1 This section describes the baseline environmental characteristics for the Scheme and surrounding areas with specific reference to agricultural circumstances. Baseline conditions of the Scheme were established from a desk study and surveys using the following sources:
 - British Geological Survey (BGS) Geology Viewer (Ref. 21);
 - OS mapping and aerial photography with respect to current land use (Ref. 22);
 - Department for Environment, Food and Rural Affairs (Defra), Magic Map Application (Ref 23);
 - Climatological Data for Agricultural Land Classification (Meteorological Office, 1989) (Ref 24);
 - Detailed ALC survey (**Appendix 20.1: ALC Technical Report**) undertaken using published ALC guidance (Ref. 12). A total of 1083 auger bores were taken at a survey density of 1 auger per hectare (ha); and



- Agricultural landholding information gathering.

Existing Baseline

20.6.2 The existing baseline conditions are derived from a desk study and surveys the methodologies of which are given separately in Section 20.4.

Land Use

20.6.3 Aerial photography, OS mapping and preliminary field surveys of accessible areas indicate the land predominately comprises arable with some areas of grassland at all the Sites. Further information will be provided in the ES related to land use and landholder information.

Landholder Information

20.6.4 There is a total of 12 different landholders across the sites, a break down of the site ownership is listed below in **Table 20.8**. For the PEIR, personal information relating to the landholders has been removed and a coded system for each landholder has been used. All landholders have entered into, or agreed to enter into, an option agreement for the Scheme.

Table 20.8: Landholder Information Breakdown.

Green Hill Site	Owner	%	Owner	%
A	A1	100		
A.2	A.21	100		
B	B1	78	B2	22
BESS	BESS1	51		
C	C1	100		
D	DE1	100		
E	DE1	69	E2	30
F	F1	100		
G	G1	100		

Topography and relief

20.6.5 Available Ordnance Survey maps indicate the Sites are predominantly characterised by gentle slopes outlined below, with the exception of Green Hill D which is relatively level.

- Green Hill A gently slopes from northeast to southwest in the eastern half of the Site and west to east in the western half of the Site.
- Green Hill A.2 gently slopes from northeast to southwest in the eastern half of the Site and west to east in the western half of the Site.
- Green Hill B gently slopes northwest to southeast.
- Green Hill C gently slopes north to south and in the western half of the Site slopes northwest to southeast.
- Green Hill E gently slopes from northwest to southeast.
- Green Hill F gently slopes northeast to southwest in the north of the Site and both south to northwest and south to northeast in the south extent of the Site.
- Green Hill G gently slopes north to south.



20.6.6 The northern extent of Green Hill A has the highest elevation across the Sites at 137m Above Ordnance Datum (m AOD), with Green Hill F being characterised by the lowest elevation at 53m AOD in the north of the Site.

Geology

20.6.7 BGS (British Geological Survey) Geology Viewer (Ref. 21) indicates that there are ten bedrock formations and four superficial deposits across the Sites. The geology of the Sites is characterised as follows:

- Green Hill A: The bedrock is mapped as the Northampton Sand Formation with Whitby Mudstone Formation in the western part of the Site, and the Rutland Formation and Stamford member in the eastern part of the Site, overlain by superficial Diamicton of the Oadby Member and Glaciofluvial Deposits (Sand and Gravel).
- Green Hill A.2: The bedrock is mapped as the Wellingborough Limestone Member, Rutland Formation, and Stamford Member, overlain by superficial Diamicton of the Oadby Member.
- Green Hill B: The bedrock is mapped as the Rutland Formation, Stamford Member and Blisworth Limestone Formation in the most northern extent, overlain by superficial Diamicton of the Oadby Member.
- Green Hill C: The bedrock is mapped as the Stamford Member, Northampton Sand Formation and Wellingborough Limestone Member, overlain by superficial Diamicton of the Oadby Member.
- Green Hill D: The bedrock is mapped as the Rutland Formation, Stamford Member, Northampton Sand Formation and Wellingborough Limestone Member, overlain by superficial Diamicton of the Oadby Member.
- Green Hill E: The bedrock is mapped as the Blisworth Limestone Formation, Rutland Formation, Stamford Member, Northampton Sand Formation, Wellingborough Limestone Member and Whitby Mudstone, overlain by superficial Diamicton of the Oadby Member across the northern and central areas, with pockets of Glacio-Fluvial (Sand and Gravel) present in the southwest.
- Green Hill F: 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, overlain by superficial Diamicton of the Oadby Member, Bozeat Till, Milton Sand and Alluvium.
- Green Hill G: The bedrock is mapped as the Cornbrash Formation (Limestone), the Kellaways Clay Member and Kellaways Sand Member, overlain by superficial Diamicton of the Oadby Member in the central and northern areas of the Site. No superficial deposits are mapped in the south of the Site.

Soils

20.6.8 Across the Sites, there are seven different Soil Associations shown on available previous national survey mapping (**Volume 2, Figure 20.1**). These are described below.

- 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.
- 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.
- Fladbury 1 Association soils are found in the north of the Green Hill BESS and are described as stoneless clayey soils, in places calcareous variably affected by groundwater.



- Oxpasture Association soils are found in the middle of the Green Hill BESS and are described as fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.
- Waterstock Association soils are found in the south of the Green Hill BESS and are described as deep permeable mainly fine loamy soils variably affected by groundwater.
- 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.
- 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.
- Wick 1 Association soils are found in a small area in the south of Green Hill C.

20.6.9

The soil and ALC surveys undertaken have confirmed that the soil textures are generally clay, clay loams, sandy clay loams or sandy loams. Soils are shallow (20-45cm) at Green Hill E and Green Hill F where they have formed over limestone bedrock, but deep soil profiles were recorded at all other Sites. Across all the Sites the topsoils contained few hard stones; where present these comprised gravel, flint, pebble and cobble stones.

Agricultural Land Classification

As shown in **Volume 2, Figure 20.2** ALC Grades range from Grade 1 to 3b with a total of 1177.8ha and 66.6% BMV land.

Table 20.9: ALC Grade Breakdown at each site.

Site	Grade							
	1		2		3a		3b	
	%	ha	%	ha	%	ha	%	ha
A	3.4%	5.9	30.5%	52.3	42.4%	72.9	23.7%	40.7
A.2			7.8%	5.1	69.4%	45.2	22.9%	14.9
B			4.5%	2.8	37.5%	23.8	58.1%	36.9
C			9.2%	5.1	69.7%	38.4	21.0%	11.6
D			25.5%	10.7	64.6%	27.2	9.9%	4.1
E	2.7%	8.3	22.6%	68.8	35.5%	108.2	39.2%	119.3
F			34.2%	96.4	27.0%	76.1	38.9%	109.8
G			33.0%	55.5	42.7%	71.8	24.3%	41.0
BESS					38.3%	9.5	61.6%	15.3
Total	1.2%	14.2	25.2%	296.8	40.2%	473.2	33.4%	393.6

Future Baseline

20.6.10

This section considers changes to the baseline conditions, described above, that might occur in the absence of the Scheme and during the time period over which the Scheme would be in place. The future baseline scenarios are set out in **Chapter 2: EIA Process and Methodology**.

20.6.11

It is considered that the baseline in relation to soils and ALC grades would not change from that described in the baseline within the timeframe for the construction of the Project. While there may be potential changes in relation to climate change, including greater rainfall intensity and frequency of droughts, that could affect soil conditions, land grade, and farming practices, it is likely that these would only be visible over longer time frames.



20.6.12 There could potentially be future changes to land management practices and business approaches across the landowners/ land managers irrespective of whether this Scheme goes ahead; these cannot be known or assessed currently.

20.6.13 In absence of the Scheme, it is considered there will be no change to the future baseline for agricultural circumstances. The baseline details as presented above are not anticipated to change in the absence of the Scheme.

20.7 Embedded Mitigation Measures

20.7.1 The way that potential environmental impacts have been or will be prevented, avoided or mitigated to reduce impacts to a minimum through design and/or management of the Scheme is outlined in this section and will be taken into account as part of the assessment of the potential effects. Proposed environmental enhancements are also described where relevant.

20.7.2 The following embedded mitigation measures for construction/operation/decommissioning have been incorporated into the Scheme's design, with detailed proposals and locations to be submitted with the DCO application.

Embedded Construction Mitigation Measures

20.7.3 Embedded mitigation measures, comprising management activities and techniques, will be implemented during construction of the Scheme to limit effects through adherence to good practices and achieving legal compliance.

20.7.4 An Outline Construction Environment Management Plan (OCEMP) will be produced and submitted with the DCO Application. The below list of good practice measures relevant to Agricultural Circumstances will be included and referenced within the OCEMP.

- The OCEMP will be updated and a final CEMP approved prior to the defined 'commencement' of construction.
- A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
- Land used temporarily will be reinstated where practicable to its pre-construction condition and use (or a condition agreed with the landowner). Hedgerows, fences, and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, with landowner agreement.
- The Scheme will be constructed in compliance with the required Environmental Control Plans (ECPs). Those which are relevant to this chapter which are anticipated to be required include a Landscape and Ecological Management Plan (LEMP) and Soil Management Plan.
- Earthwork mounds and stockpiled soil will be protected (to minimise erosion and dust generation) by covering, seeding, or using water suppression where appropriate (to be determined by the soil types and the likely storage duration).
- Where necessary, stone pads will be installed in areas where heavy equipment, such as cranes, are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground by spreading loads and reducing soil compaction.
- Soil management measures will be detailed in a Soil Management Plan which will form part of the CEMP (an outline Soil Management Plan will be appended to the Outline CEMP). Measures will include but not be limited to the following:
 - Details of the soil resources present;
 - How the topsoil and subsoil will be stripped and stockpiled;



- Suitable conditions for when soil handling will be undertaken, for example avoiding handling of waterlogged soil;
 - Indicative soil storage locations;
 - How soil stockpiles will be designed taking into consideration site conditions and the nature/composition of the soil;
 - Specific measures for managing sensitive soils;
 - Suitable protective surfacing where soil stripping can be avoided, based on sensitivity of the environment and proposed works;
 - Approach to reinstating soil, including measures to remove compaction, where required; and
 - Details of measures required for soil restoration.
- Where practicable and safe to do so, existing access to and from residential, commercial, community and agricultural land uses will be maintained throughout the construction phase or as agreed through landowner discussions. This may require signed diversions or temporary restrictions to access. The means of access to affected properties, facilities and land parcels will be communicated to affected parties at the start of construction of the Scheme and at the start of the relevant sections, with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration because of construction, alternative field access will be provided in consultation with the landowner/occupier.
 - Existing water supplies for livestock will be identified before construction commences. Where supplies will be lost or access compromised by construction works, temporary alternative supplies will be provided where necessary. Water supplies will be reinstated following construction.
 - Consultation with affected landowners will be carried out to investigate the current extent of land drainage. If necessary, pre-construction land drainage will be explored with the intent of maintaining the efficiency of the existing land drainage system and to assist in maintaining the integrity of the working areas during construction. The Scheme may include a system of 'cut-off' drains which feed into a new header drain and the Scheme will also consider surface water runoff measures.
 - Should animal bones be discovered during construction, which may indicate a potential burial site, works will cease, and advice will be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.
 - All movement of plant and vehicles between fields will cease in the event of a notification of a disease outbreak in the vicinity of the Scheme that requires the cessation of activities. Advice will be sought from the relevant authorities to develop suitable working methods required to reduce the biosecurity risk associated with the continuation of works.
 - Where deemed necessary, clay bungs or other vertical barriers will be constructed within trench excavations by a suitably experienced person, to prevent the creation of preferential drainage pathways.
 - The mechanisms by which mitigation measures will be secured and delivered will be set out in the ES.

Embedded Operation Mitigation Measures

20.7.5 No embedded mitigation requirements have been identified beyond those identified for construction. An outline Soil Management Plan will be produced alongside the ES to provide details regarding proper soil handling and management practice during the operation of the Scheme.

**Embedded Decommissioning Mitigation Measures**

- 20.7.6 No embedded mitigation requirements have been identified beyond those identified for construction. A Soil Management Plan will be produced alongside the ES to provide details regarding proper soil handling and management practice during the decommissioning of the scheme.

20.8 Assessment of Likely Impacts and Effects

- 20.8.1 Taking into account the embedded mitigation measures as detailed in Section 20.7, the potential for the Scheme to generate effects was assessed using the methodology as detailed in Section 20.4 of this Chapter. In the sections below, associated impacts and effects during the construction, operation and decommissioning phases of the scheme are discussed.

Construction

- 20.8.2 During the construction phase the Scheme has the potential to affect soil function, land grade (according to the ALC system) and agricultural operations.
- 20.8.3 Soil function and land grade have the potential to be affected as a result of changes to soil characteristics, such as soil compaction, mixing of topsoil and subsoil resources, removal of topsoil, contamination or erosion. Contamination is covered further in **Chapter 11: Ground Conditions and Contamination**.
- 20.8.4 There are three major soil types identified at the Sites; heavy textured clays and medium clay loams; medium textured soils, predominantly medium clay loam textured; and soils with high sand fractions. The heavy and medium textured soils are found across all sites and the high sand fraction soils have been identified at Green Hill E and F. As the Field Capacity Days (FCD) across all the sites are below 150, the sensitivity of the heavy and medium textured soils is determined to be medium (i.e. they have medium resilience to structural damage). The sensitivity of the soils with high sand fractions is determined to be low as these soils have high resilience to structural damage. These sensitivities are summarised in **Table 20.10** below.
- 20.8.5 With effective good practice soil handling, reinstatement and re-use measures in place, secured by the Soil Management Plan, no permanent impacts on soil function are likely to be caused as a result of construction of temporary infrastructure (such as temporary haul routes), and as such the magnitude has been assessed as low resulting in an overall moderate/minor impact which is considered to be not significant.
- 20.8.6 The total land take required for infrastructure (i.e. substations and the BESS) due to the Scheme is 23.90ha; 9.91ha for access tracks, 1.73ha for converters, 7.22ha for BESS and 5.04ha for substations. Out of the total infrastructure take 11.8ha will be on BMV land (5.77ha of the access tracks, 3.93ha for BESS, 0.66ha for converters and 1.44ha for the substation). It is assumed that where possible, the land required for solar panel fields remain functional during operation of the Scheme, with options such as grazing being considered therefore the 684.90ha (471.10ha BMV) required for panels has been excluded from the total infrastructure land take.

Table 20.10: Preliminary assessment of potential impact on soil

Soil Type	Sensitivity	Magnitude	Significance	Potential effect
Clays and heavy clay loam	Medium	Low	Moderate/Minor	Not Significant
Medium textured soils	Medium	Low	Moderate/Minor	Not Significant
Soils with high sand fractions	Low	Low	Minor	Not Significant

- 20.8.7 Grade 1 and 2 land is found at all sites excluding Green Hill BESS and are a total of 26.4% and 310.9ha across all sites. Grade 1 and 2 land is included within BMV land and have very high sensitivity due to the high potential of biomass production. Grade 3a land is found at all the Sites



with a total of 40.2% and 473.1ha across all sites. Grade 3a land is also included within BMV land and has a high biomass production and therefore a high sensitivity. Grade 3b land is also found at all Sites and is a total of 33.4% and 393.6ha across all sites. Grade 3b land has an average potential for biomass production but is non BMV land and therefore the sensitivity is medium.

20.8.8 The magnitude of impact on all agricultural land grades across the Scheme is assessed as being low or negligible as any loss of the use of agricultural land is temporary and reversible. Following construction some agricultural use of the land will be possible (such as sheep grazing), and all land will be returned to agricultural use following decommissioning. All restoration of agricultural land will be undertaken following good practice approaches to ensure the land is returned to its pre-construction condition. The total infrastructure land take for Grades 1 and 2 land is 2.22ha, Grade 3a land is 9.58ha and Grade 3b is 7.74ha.

20.8.9 The assessment of impacts on agricultural land quality is set out in **Table 20.11**.

Table 20.11: Preliminary assessment of potential effects on agricultural land quality

ALC Grade	Sensitivity	Magnitude	Significance	Potential effect
1 and 2	Very High	Low	Major/Moderate	Significant
3a	High	Low	Moderate	Significant
3b	Medium	Low	Moderate/Minor	Not Significant

20.8.10 The sensitivity of the agricultural landholdings is assessed as being low as all comprise predominantly arable enterprises and there is no key infrastructure within the Scheme boundary that is required to be accessed on a frequent basis and there is no enterprise depended on the spatial relationship of land to key infrastructure within the Scheme. Following completion of construction some agricultural use will be possible, and the land will be returned to agricultural use following decommissioning. Further information on the impact on agricultural landholdings will be provided in the ES. As such, it is assessed that the magnitude of impact is low which would result in a minor effect which would be assessed as not significant. Details of the effect on each landholding are summarised in **Table 20.12**.

Table 20.12: Preliminary assessment of potential impact on agricultural landholdings

Landholding Code	Sensitivity	Magnitude	Significance	Potential effect
A1	Low	Low	Minor	Not Significant
A.21	Low	Low	Minor	Not Significant
B1	Low	Low	Minor	Not Significant
B2	Low	Low	Minor	Not Significant
BESS1	Low	Low	Minor	Not Significant
C1	Low	Low	Minor	Not Significant
DE1	Low	Low	Minor	Not Significant
E2	Low	Low	Minor	Not Significant
F1	Low	Low	Minor	Not Significant
G1	Low	Low	Minor	Not Significant

Significance of Effect

20.8.11 The heavy and medium textured soils are of medium sensitivity and the magnitude of impact on these soils would be low; as such the overall effect on these soil types would be moderate/minor (not significant). The soils with high sand fractions are of low sensitivity and, with a low magnitude impact the overall effect would be Minor (not significant).



20.8.12 Grade 1 and 2 agricultural land is of very high sensitivity. The magnitude of impact is low and as such the overall effect is major/moderate (significant). Grade 3a agricultural land has a high sensitivity. The magnitude of impact is medium and as such the overall effect is major/moderate (significant). Grade 3b agricultural land has a medium sensitivity. The magnitude of impact is moderate and as such the overall effect is moderate (significant).

20.8.13 Agricultural landholdings are of low sensitivity and the magnitude of impact is low. As such the overall effect is minor (not significant).

Operation

20.8.14 During the operation of the Scheme all construction activities will have ceased and agricultural practices could continue (for example sheep grazing).

20.8.15 During the operational phase, general maintenance and activities on the Sites will be minimal and would be restricted principally to vegetation management, equipment maintenance and servicing, ad hoc replacement of any components that fail, periodic fence inspection, and monitoring to ensure the continued effective operation of the Scheme.

20.8.16 Scheduled replacement activities of panels and batteries will be required throughout the lifetime of the Scheme, with panels expecting to be replaced once and batteries twice during the lifetime of the Scheme. Good soil handling practice would be followed throughout the duration of the scheme in line with the Soil Management Plan. Good practice and general site maintenance would be used to prevent or manage soil erosion.

20.8.17 As such, potential negative impacts on soils, agricultural land quality and agricultural landholdings are scoped out during the operational phase as there would be no further impacts to these receptors.

20.8.18 The conversion of land currently under arable production to permanent pasture during the operation phase has potential benefits in relation to soil health. Cessation of cultivation will remove disturbance effects on the soils and, along with the grassland vegetation, may result in an increase in soil organic carbon, better soil structure, increased infiltration and enhanced soil microbial populations. This is supported by research by Defra (Ref. 25) which showed that conversion of tillage land to permanent pasture had soil organic carbon and wider environmental benefits. As such, there would be a potential beneficial impact of medium magnitude on receptors of low sensitivity (mineral soils).

Significance of Effects

20.8.19 Maintenance, replacement and repair work that may result in the disturbance to soils during operation would be undertaken in accordance with standard good practice soil handling methods, in line with the Soil Management Plan. As such, no likely significant adverse effects are expected. Potential beneficial impacts relating to soil health would result in an overall minor beneficial effect which would be not significant.

Decommissioning

20.8.20 During the decommissioning phase of the Scheme, land will be required on a temporary basis and, following completion of decommissioning operations, all land would be reinstated and returned to the landholders to continue in agricultural use. All infrastructure will be removed to ensure there are no obstructions to cultivation.

20.8.21 The impacts on soils, agricultural land quality and agricultural landholdings are likely to be similar to those assessed for the construction phase, with continued compliance with the Soil Management Plan secured in the Decommissioning Environmental Management Plan.

Significance of Effects

20.8.22 The significance of effects is likely to be similar to that assessed for the construction phase.



20.9 Additional Mitigation Measures

- 20.9.1 Additional mitigation comprises measures over and above any embedded mitigation measures, for which assessment within this PEIR has identified a requirement to further reduce significant environmental effects.
- 20.9.2 The assessment undertaken within this PEIR has not identified any requirements for additional mitigation at this stage for agricultural circumstances. This will be reassessed and considered further for the ES to further evaluate any possible mitigation of the significant effects.

20.10 Residual Effects

- 20.10.1 This section summarises the residual significant effects of the Scheme following the implementation of embedded and additional mitigation as outlined in Sections 20.7 and 20.9 of this chapter.
- 20.10.2 Whilst at this stage of the project, residual effects have not been fully assessed, it is anticipated that through mitigation outlined above and the implementation of well-established good industry practises in construction for managing soils which will be incorporated into the Soil Management Plan there will be no significant residual adverse effects.

20.11 Cumulative Effects

- 20.11.1 The ES will give consideration to potential cumulative effects of the Scheme and other relevant projects within the vicinity of the Scheme on a single receptor/resource. The zone of influence for the impact on agricultural circumstances is 2km.
- 20.11.2 A list of cumulative projects can be found in **Volume 3, Appendix 2.2** of the PEIR, the list will be reviewed and refined in preparation of the DCO application submission through further consultation and will be presented and assessed in the ES. Cumulative effects will be listed within **Chapter 25: Cumulative Effects** of the ES.

Cumulative effects

- 20.11.3 There are considered to be potential significant cumulative effects in conjunction with other similar developments or as the combined effect of a set of developments following respective mitigation that would cumulatively impact the Scheme. All other developments are outside of the study area but within the 2km zone of influence.
- 20.11.4 Within the zone of influence there are five other developments all within North Northamptonshire (Wellingborough Area) at various stages of planning. Approximately 1.7km northeast of Green Hill D there is a validated application awaiting decision to build a residential-led mixed development with up to 1,000 homes. In the same location planning for up to 3000 dwellings, including retail and commercial facilities is also in the ongoing application stages. The land at this location is provisional Grades 2 and 3, therefore worst-case scenario indicates the entire development will have significant impact on BMV land.
- 20.11.5 There is an ongoing application to develop an employment park which would require demolishing the existing buildings located 0.7km east of Green Hill E. This development is not on agricultural land therefore the impact of this development is likely not significant.
- 20.11.6 Adjacent to Green Hill BESS there is associated infrastructure including drainage, access and landscape awaiting approval as well as agreed scope for a solar farm and associated development adjacent to Green Hill BESS. The ALC survey at Green Hill BESS indicated ALC grades 3a and 3b, land adjacent to this is expected to also comprise of Grades 3a (BMV) and 3b (non-BMV) as provisional ALC grade for this land is Grade 3. The impact of this development therefore will affect BMV land and infrastructure land take is likely greater than 5ha therefore impact is likely significant.
- 20.11.7 Overall, the cumulative effect of other developments within the zone of influence will likely cause a significant effect. This is due to the large proportion of BMV land within the area and developments resulting in significant permanent infrastructure where land take is likely greater than 20ha BMV land.



In-combination effects

- 20.11.8 The in-combination effects of Agricultural Circumstances generated from the Scheme will be fully assessed in the ES and likely to consist of:
- Compaction and contamination issues raised by **Chapter 22: Ground Conditions and Contamination**; and
 - Drainage issues impacting soil quality raised by **Chapter 10: Hydrology, Flood Risk and Drainage**.

20.12 Summary

- 20.12.1 This chapter of the PEIR has identified the existing environment in relation to Agriculture and Soil and the assessment work that has been undertaken to date including surveys and a desk study.
- 20.12.2 Preliminary mitigation measures including good practice measures for handling soils are being explored and have been described with potential residual effects outlined. CEMP and Soil Management Plan reports will be produced as part of the ES.



References

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