

# West Burton Solar Project

## Environmental Statement Chapter 19: Soils and Agriculture

Prepared by: Daniel Baird Soil Consultancy Ltd  
March 2023

PINS reference: EN010132  
Document reference: APP/WB6.2.19  
APFP Regulation 5(2)(a)



## Contents

<b>19</b>	<b>SOILS AND AGRICULTURAL LAND</b>	<b>4</b>
19.1	INTRODUCTION	4
19.2	LEGISLATION, PLANNING POLICY AND GUIDANCE	4
19.3	THE SCHEME	9
19.4	SCOPE OF THE ASSESSMENT	10
19.5	CONSULTATION	11
19.6	ASSESSMENT METHODOLOGY	14
19.7	SIGNIFICANCE CRITERIA	16
19.8	BASELINE CONDITIONS	19
19.9	POTENTIAL EFFECTS	22
19.10	MITIGATION AND LIKELY SIGNIFICANT RESIDUAL EFFECTS	26
19.11	CUMULATIVE EFFECTS	28
19.12	SUMMARY	29
19.13	REFERENCES	30

## Issue Sheet

Report Prepared for: West Burton Solar Project Ltd.  
DCO Submission

### Environmental Statement Chapter 19: Soils and Agriculture

**Prepared by:**

Name: Daniel Baird

Title: Soils Consultant M.I. Soil Sci.

---

Date: March 2023

Revision: 1

## 19 Soils and Agricultural Land

### 19.1 Introduction

19.1.1 This chapter provides an assessment of the likely significant Agricultural Land effects of the Scheme. Consideration is given within the chapter to the resources of agricultural land, the soil resource associated with that land, and the farm businesses operating at and around the Site.

19.1.2 The chapter provides a summary of relevant planning policy and guidance, and a description of the methodology adopted for the assessment. This is followed by a description of the relevant baseline conditions of the Site and the surrounding area, and an assessment of the potential effects of the Scheme during both construction and decommissioning, and during operation of the completed Scheme. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any adverse effects, following which a summary of the likely significant residual effects of the Scheme is provided, having regard to mitigation adopted. Some mitigation measures are embedded within the proposal rather than being a discrete measure added to it.

19.1.3 This chapter is supported by the following figures:

- **Figure 19.1** – West Burton 1 Agricultural Land Classification Grade Distribution [EN010132/APP/WB6.4.19.1];
- **Figure 19.2** – West Burton 2 Agricultural Land Classification Grade Distribution [EN010132/APP/WB6.4.19.2];
- **Figure 19.3** – West Burton 3 Agricultural Land Classification Grade Distribution [EN010132/APP/WB6.4.19.3];
- **Figure 19.4** – Farm Business Occupancy [EN010132/APP/WB6.4.19.4];
- **Figure 19.5** – Predictive Best and Most Versatile Land Assessment [EN010132/APP/WB6.4.19.5].

19.1.4 This chapter is supported by the following appendices:

- **Appendix 19.1** – Agricultural Land Quality, Soil Resources & Farming Circumstances [EN010132/APP/WB6.3.19.1];
- **Appendix 19.2** – Outline Soil Management Plan [EN010132/APP/WB6.3.19.2].

19.1.5 This chapter has been prepared by Daniel Baird Soil Consultancy Ltd (Baird Soil) (see Statement of Competence [EN010132/APP/WB6.3.1.1]).

### 19.2 Legislation, Planning Policy and Guidance

#### [Legislation and Planning Policy](#)

19.2.1 This section outlines the policy context relating to agricultural land and its development. There is no legislation of specific relevance to a soils and agriculture

assessment. Chapter 11 of the ES, Ground Conditions and Contamination [EN010132/APP/WB6.2.11], deals with issues of contaminated land and the relevant legislation that is not specific to agriculture.

19.2.2 The National Planning Policy Framework (updated July 2021) (Ref 19.1) seeks to conserve and enhance the natural environment, paragraph 7 stating: *"The purpose of the planning system is to contribute to the achievement of sustainable development."*

19.2.3 Paragraph 174 lists six means by which planning policies should achieve this, a, b, e, and f being relevant to soils and agricultural land resource:

*"Planning policies and decisions should contribute to and enhance the natural and local environment by:*

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- 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;*
- c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."*

19.2.4 Further to paragraph 174, the footnote to paragraph 175 states that *"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."*

19.2.5 The glossary of the NPPF gives the following definition for best and most versatile (BMV) agricultural land: "Best and most versatile agricultural land: Land in grades 1, 2 and 3a of the Agricultural Land Classification".

[National Planning Statements \(NPS\) for Energy Infrastructure \(Ref 19.2\)](#)

- 19.2.6 NPS's comprise the government's objectives for the development of nationally significant infrastructure in a particular sector. NPS for Energy Infrastructure are published by the Department of Business, Energy and Industrial Strategy (now Department for Energy Security and Net Zero). Paragraph 5.10.8 of the adopted overarching NPS for Energy (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) except where this would be inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination."*
- 19.2.7 A draft EN-1 (September 2021) document preserves the above guidance in Paragraph 5.1.8. Additional guidance is given for previously developed sites and the recommendation that applicants should develop and implement a Soil Management Plan to minimise potential land contamination.
- 19.2.8 The adopted NPS for Renewable Energy Infrastructure (EN-3) was published in July 2011 and does not refer to Solar Farms or BMV land. A Draft EN-3 was published in September 2021, paragraphs 2.48.13 to 2.48.15 concerning Agricultural Land Classification (ALC) and solar development. Paragraph 2.48.13 concludes that although there is a preference for brownfield and low grade agricultural land over BMV, land type should not be a predominating factor in determining the suitability of the site location.
- 19.2.9 Paragraph 2.48.14 notes that the soils data gathered for ALC survey can inform soil management planning for solar development, and that soils data should also be obtained for soil management planning of the underground cabling and access routes. This paragraph does not direct that an ALC survey of cable and access routes should accompany a planning application.
- 19.2.10 Paragraph 2.48.15 notes that development of ground mounted solar arrays is not prohibited on BMV agricultural land.
- [Planning Practice Guidance \(PPG\) \(Ref 19.3\)](#)
- 19.2.11 Paragraph 001 of the Natural Environment guidance reiterates the direction given by the NPPF that: *"Planning policies and decisions should take account of the economic and other benefits of the best and most versatile agricultural land."*
- 19.2.12 Paragraph 002 concerns soils and states that: *"Soil is an essential natural capital asset that provides important ecosystem services – for instance, as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution."*

- 19.2.13 Paragraph 005 addresses Green Infrastructure. It states that: *“Green infrastructure is a natural capital asset that provides multiple benefits, at a range of scales. For communities, these benefits can include enhanced wellbeing, outdoor recreation and access, enhanced biodiversity and landscapes, food and energy production, urban cooling, and the management of flood risk. These benefits are also known as ecosystem services.”*
- 19.2.14 Turning to the guidance specific to Renewable and Low Carbon Energy (published June 2015), the particular planning considerations that relate to large scale ground mounted solar are given in Paragraph 13. With regard to agricultural land, we summarise these as:
- a preference for use of brownfield and non-agricultural land ahead of agricultural land;
  - any use of agricultural land is shown to be necessary;
  - poorer quality agricultural land used in preference to higher quality land; and
  - continued agricultural use of land enabled.
- 19.2.15 The paragraph also notes *“that solar farms are normally temporary structures and planning conditions can be used to ensure that the installations are removed when no longer in use and the land is restored to its previous use”*.

[Local Planning Policy](#)

**Central Lincolnshire Local Plan – Adopted April 2017**

- 19.2.16 For the District of West Lindsey, the April 2017 adoption of the Central Lincolnshire Local Plan replaced the district’s own former local plan along with those of City of Lincoln and North Kesteven District Councils (Ref 19.4) and includes the policies for development in this area up to 2036.
- 19.2.17 The Central Lincolnshire Local Plan contains two policies that reference the best and most versatile agricultural land. The first is LP19: Renewable Energy Proposals. With specific reference to solar development it notes a presumption against solar farm proposals on the best and most versatile agricultural land. Non-wind renewable energy development will be supported where the benefit of the development outweighs the harm caused and it is demonstrated that any harm will be mitigated as far as is reasonably possible. This policy goes on to state that *“Proposals will be supported where the benefit of the development outweighs the harm caused and it is demonstrated that any harm will be mitigated as far as is reasonably possible.”*
- 19.2.18 Policy LP55: Development in the Countryside, also references best and most versatile agricultural land. Part G of this policy describes the criteria for permitting development proposals on best and most versatile land outside of allocated sites. These are:

*“a. There is insufficient lower grade land available at that settlement (unless development of such lower grade land would be inconsistent with other sustainability considerations); and*

*b. The impacts of the proposal upon ongoing agricultural operations have been minimised through the use of appropriate design solutions; and*

*c. Where feasible, once any development which is permitted has ceased its useful life the land will be restored to its former use, and will be of at least equal quality to that which existed prior to the development taken place (this requirement will be secured by planning condition where appropriate).”*

### **Bassetlaw District Planning Policy**

19.2.19 The western most grid connection crosses into Bassetlaw District. The Core Strategy for Bassetlaw District<sup>i</sup> was adopted in December 2011. Policy DM10: Renewable and Low Carbon Energy, references BMV land. The relevant section of the policy states:

#### *“A. Carbon Reduction*

*The Council will be supportive of proposals that seek to utilise renewable and low carbon energy to minimise CO2 emissions. Proposals for renewable and low carbon energy infrastructure will also need to demonstrate that they:*  
*ii. will not lead to the loss of or damage to high-grade agricultural land (Grades 1 & 2);”*

19.2.20 It should be noted however that the element of the proposed development that crosses into Bassetlaw district is only the grid connection, buried cable and electrical switchgear housing at the grid connection point. Solar panels would not be deployed within Bassetlaw District.

#### [Technical Guidance](#)

### **Technical Information Note 049: Agricultural Land Classification (ALC)**

19.2.21 Natural England Technical Information Note 049 (TIN049) Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land, provides guidance on the application of the Agricultural Land Classification Guidelines (Ref 19.5), including survey methodology.

### **Code of Practice for the Sustainable Use of Soils on Construction Sites**

19.2.22 The Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 19.6) provides guidance on the conservation of soil for beneficial reuse at development sites, safeguarding both the mass of the soil resource and its functional capacity. The application of this code of practice is voluntary, however it is referenced in the national Planning Practice Guidance at Paragraph 002. Following the guidance can deliver clear benefits in terms of the sustainable use of a finite soil resource, minimising the generation of waste and sediment from a construction site, and the cost effective delivery of the Scheme.



### **Farming Circumstances**

19.2.23 The NPPF does not provide direction on the potential effect of development on individual farm businesses. In the absence of such guidance, the farming circumstances assessment in this chapter follows the advice given by the superseded Planning Policy Guidance Note 7 (PPG7), and now broadly emulated by the Institute of Environmental Management and Assessment (IEMA) Guide: A New Perspective on Land and Soils in Environmental Impact Assessment (Ref 19.7). In section 8.3.3 it notes the important considerations for economic and social effects for agriculture are:

- land use changes;
- the proportion of a holding affected by land-take;
- the effect on land management; access to land severed (particularly by linear infrastructure development); and
- the loss of farm buildings and infrastructure.

### **19.3 The Scheme**

19.3.1 This Chapter considers the land comprising the Scheme which includes West Burton 1, West Burton 2 and West Burton 3 (the Sites); and the associated Cable Route Corridor. The extent of the Scheme is shown on the Site Location Plan **[EN010132/APP/WB2.1]** and the Works Plans **[EN010132/APP/W2.3]**. The Scheme, which is assessed in this chapter, is described in Chapter 4 of the ES **[EN010132/APP/WB6.2.4]**.

19.3.2 This section of this Chapter notes specific details of the proposal that have relevance to the potential impacts upon soils, agricultural land resource and farm businesses through construction, operation and decommissioning of the Scheme.

19.3.3 The proposed Scheme would comprise rows of Ground Mounted PV Modules. The frames would be secured by driving the legs into the ground to act as slim piles, with the exception of areas of high archaeological sensitivity, where they will sit on the surface secured with 'concrete feet'. The rows of panels are separated by clear ground to allow access for maintenance and to limit shading of panels. In addition, the mounting frame elevates the panel sufficiently that smaller livestock such as sheep can pass below and between rows.

19.3.4 Sufficient light passes through and between the panels to maintain a grass sward. It is desirable to maintain a green cover to promote rainfall infiltration and protect the soil surface from erosion. The length of the sward will be controlled by periods of sheep grazing and/or mowing. This will also prevent the establishment of shrubs and trees.

19.3.5 The Scheme will include substations and an Energy Storage System (sometimes referred to as 'BESS'), buried cabling within the sites, and other equipment and

security fencing; and the buried Cable Route Corridor. The combined area of the substations and BESS will be approximately 4.27ha, a small fraction of the 886.4ha scheme, with the Ground Mounted PV Modules occupying the majority of the area. The substation and power storage facilities will be modular and placed on a concrete base. Access tracks and hard standing will be hardcore laid over a geotextile mat, following stripping and storing of the topsoil.

- 19.3.6 The Cable Route Corridor connects the separate areas of the Sites together and to the electrical distribution grid. The cable runs below ground in a trench and sections of it may run through ducting within a shared grid connection route with other facilities.
- 19.3.7 The Cable Route Corridor has not yet been subject to soil survey or farming circumstances assessment. This is as the narrow cable trench will need a specific survey along its actual path to inform soil management planning of the trenching works. Detailed ALC survey of fields places sample points at 100m intervals, too widely spaced to monitor soil variation within the soil to be excavated for the trench.
- 19.3.8 Agricultural occupancy and land use information for the Cable Route Corridor will need to be collected ahead of trenching work to avoid, where possible, an active construction site at sensitive periods of time for land management, for instance anticipated harvest dates. Any such information collected preplanning will lose validity and need to be replaced once an approximate work start date is established post consent.
- 19.3.9 It is anticipated that there will be limited impact of the Cable Route Corridor works 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.
- 19.3.10 The operational life of the Scheme is anticipated to be 40 years, following which it will be decommissioned. Decommissioning will remove the solar panels and their mounting frames, pulling up the steel legs from the ground. Below ground cabling within the sites is anticipated to be decommissioned in situ to minimise environmental impacts unless they are unable to be removed without major disturbances, where they will be cut to 1m below the surface to enable future ploughing. After removal of the energy storage the concrete bases will be removed. Lastly the hardcore for the tracks and hard standing will be removed for reuse, and the geotextile removed. For the grid connection cable route corridor, the 132kV and 400kV cables may be left in situ, depending on the least environmentally damaging approach at the time. If these are removed this would be achieved by pulling the cables out of the ducts, limiting the locations where the surface would need to be disturbed.

## **19.4 Scope of the Assessment**

- 19.4.1 This chapter covers three key issues of relevance to Agricultural Land. Firstly, it considers the effects of the Scheme upon agricultural land as a resource, taking account of the land quality and versatility according to the Agricultural Land Classification (ALC) Guidelines referred to above. Secondly, the effects of the Scheme upon the soil resource are considered. The soil differs from the land that it is associated with in that it can be translocated. Lastly, it considers the effects of the Scheme upon farm businesses currently in operation upon the Site, and any effects the Scheme may have on the management of surrounding agricultural land.
- 19.4.2 The above effects typically occur at the construction stage of the Scheme. However, consideration is also given to any ongoing effects upon the agricultural land resource and farming activities once the Scheme is complete and operational, then following the decommissioning of the Scheme.
- 19.4.3 The ALC assessment is a quantitative assessment as it maps the extent of BMV land according to the prescribed ALC methodology. The assessment of likely effects upon a farm business is a qualitative assessment. The future management, marketplace or economic performance for a farm enterprise cannot be dictated or predicted.
- 19.4.4 The scope of the assessment meets the direction given by the NPPF, local planning policy, NPS and PPG, providing a detailed ALC assessment of the Sites, soils data for soil management planning within the sites, and farming circumstances for the agricultural businesses occupying the Sites. Informed by the detailed ALC results (contained in Appendix 19.1 [EN010132/APP/WB6.3.19.1]), the extent of the Sites has been modified, removing some areas of BMV land.
- 19.4.5 Soils data and farming circumstances for the Grid Connection Route will be obtained post consent as a requirement of the DCO. This data has not been collected at the pre planning stage as the duration of the Grid Connection Route land take is short and the width of the corridor is narrow. Rather than grid survey of soil with a 100m spacing (as for a detailed ALC assessment) soil should be assessed within the Grid Connection Route.

## 19.5 Consultation

- 19.5.1 A summary of consultation responses to date is provided in Table 19.2 below.

**Table 19.2: Summary of Consultations**

Consultee	Summary of response	How Response has been addressed
EIA Scoping Stage	Summary of response	How Response has been addressed
PINS – March 2022	Scoping Report paragraph 22.4.1 proposes to assess impacts to agricultural land resources, soil resources and farming	The Soils and Agriculture chapter addresses potential effects on agricultural land quality, farm businesses,

	<p>circumstances in the socio-economics, tourism and recreation and human health Chapter of the ES.</p> <p>The Inspectorate is content with this approach although the ES should signpost where effects to these receptors have been incorporated into the relevant Chapter assessments. Where impacts to soils and agricultural land is assessed in other relevant Chapters, this should include determining the degree and extent to which soils have been disturbed or damaged and any relevant mitigation measures employed to avoid/reduce impacts to soils; these should be secured via the DCO.</p>	<p>and the soil resource with regard to its function of supporting crop production (Sections 19.9 and 19.10 below). Soil has other functions including hydrological, cultural heritage and habitat. These soil functions and the potential effect on these soil functions are addressed in separate chapters of the ES.</p> <p>Mitigation measures that may impact across several soil functions are also addressed in each relevant ES chapter.</p>
Lincolnshire County Council – response to EIA Scoping, 2 <sup>nd</sup> March 2022	<p><b>Cumulative Impacts</b></p> <p>Consideration needs to be given to the other NSIP schemes in the area for solar farms (Cottam, Gate Burton and Heckington in North Kesteven). Whilst it is accepted that these schemes are also at the pre-application stage and full details are not yet available, indicative plans have been produced and therefore the ES should include commentary on the cumulative impacts on the topics included in the ES from the other solar schemes in the area particularly with regard to loss of agricultural land.</p>	<p>Heckington Fen, Mallard Pass, Gate Burton and Cottam solar applications have now been submitted. All contain best and most versatile land, however as none of this agricultural land resource is lost to these temporary solar farm development limiting potential for any adverse cumulative effects.</p>
<b>Statutory Consultation Stage</b>	<b>Summary of response</b>	<b>How Response has been addressed</b>
Lincolnshire County Council 1 <sup>st</sup> August 2022 consultation response.	<p>Loss of Agricultural Land – all arable land of whatever agricultural classification produces food, whether for animal feed or human consumption and this should be protected for its own sake. Within the project boundary is land that is</p>	<p>A detailed ALC assessment of the Sites has identified areas of BMV land. As detailed in Tables 5.6 to 5.9 of Chapter 5, Alternatives and Design Evolution, the extent of the Sites has been</p>

	<p>classed as the best and most versatile. The use of such land by this project would result in it being taken out of agricultural production for at least 40 years. Therefore, the use of the best and most versatile land should be kept to a minimum to reduce impact on UK food security.</p> <p>Cumulative impacts – this is an important issue given the number of other NSIP projects currently programmed across Lincolnshire which includes six other solar energy parks, and the need for a full assessment of environmental and social-economic impacts of the cumulative impacts of the West Burton scheme in conjunction with these other projects. This must include all the other NSIPs in the West Lindsey District area including the most recent Tillbridge Solar proposal that has not been taken into consideration in the preparation of the PEIR documents.</p>	<p>adapted to reduce the extent of BMV land included where possible.</p> <p>On decommissioning there will be no loss of agricultural land as land for tracks, hard standing and switchgear housings will all be restored to the baseline ALC Grade. .</p> <p>Agricultural land is likely to remain available through the operational phase, managed as low input pasture that can be grazed by sheep.</p> <p>The Applicant does not consider that the Scheme would result in food security impacts either alone or cumulatively. The UK annual balance of domestically produced food is sensitive to non-planning factors including weather and markets. The relevant assessment for policy purposes (and therefore decision-making purposes under the Planning Act 2008) is one that is based on the grade of the agricultural land, rather than its current use and the intensity of that use.</p> <p>As noted above the ALC surveys for submitted applications along with the regional Predictive BMV plan are used to estimate the cumulative impact of other proposed solar renewable energy sites.</p>
--	---	--

19.5.2 The Lincolnshire County Council consultation response is noted above and which states “... *all arable land of whatever agricultural classification produces food, whether for animal feed or human consumption...*”. Arable land is used for a variety of uses including for growing energy crops. Examples include fuel crops such as biodiesel and miscanthus grass, and energy substrate crops such as maize for anaerobic digestion, or grain for ethanol manufacture. There are no food security or planning policy constraints on growing these energy crops on arable land, just as there are no food security policy constraints on the use of agricultural land for solar PV. Studies have shown solar PV also produces more kWh per hectare than other renewable energy crops<sup>ii</sup>. This is also achieved with land remaining in agricultural production, fattening lambs, and without the environmental and land degradation hazards of the most popular energy crop, maize<sup>iii</sup>.

19.5.3 Arable land is also used to produce non-food crops for markets including industrial oils, cosmetics, pharmaceuticals and Christmas trees. The relevant assessment for policy purposes is the ALC grade of the agricultural land, not its current use or the intensity of that use.

## **19.6 Assessment Methodology**

### Assessment of Agricultural Land Quality

19.6.1 A detailed ALC survey has been undertaken on the agricultural land found within the Sites. The ALC report by the surveyor is attached as an annex to the Agriculture Baseline Report, Appendix 19.1 **[EN010132/APP/WB6.3.19.1]**. This survey work has followed the guidance given by Natural England in TIN049 for a detailed ALC assessment (Ref 19.4).

19.6.2 ALC guidelines and criteria require that the following factors be investigated:

- Climate: Average Annual Rainfall (AAR) and Accumulated Temperature above 0°C between January and June (AT0);
- Site: Gradient, Micro Relief and Flooding;
- Soils: Texture, Structure, Depth, Stoniness, and Chemical Toxicity; and
- Interactive Factors: Soil Wetness, Soil Droughtiness and Liability to Erosion.

19.6.3 Climatological data for ALC are provided for 5km intersections of the National Grid by the Meteorological Office, in collaboration with the National Soil Resources Institute. The data from these points is interpolated providing climate data for specific sites. Interpolated climate data has been calculated for three separate locations representative of the geographic spread of the development site. Two additional climate data points are given in the surveyors ALC report that relate to land that is no longer included within the Sites.

19.6.4 The interactive factors of soil wetness, soil droughtiness and liability to erosion are assessed according to the ALC criteria from the climate and soil profile data.

- 19.6.5 The ALC methodology does not assess the fertility or economic value of farmland, or the quality of the current land management. It is deliberately limited to features of the land and soil that are beyond the practical influence of land management and that can limit the versatility of land to support a range of different agricultural enterprises.

[Assessment of Soil Resources](#)

- 19.6.6 The Code of Practice for the Sustainable Use of Soils on Construction Sites recommends the use of the soil physical characteristics data, collected as part of an ALC survey, to identify topsoil and subsoil units for separate handling and beneficial reuse. This approach, used in this assessment, continues the practice that was used by the former MAFF ALC survey teams for minerals sites to advise on appropriate land restoration.

- 19.6.7 The ALC detailed survey data includes information on the depth, clay content and stoniness of topsoil and subsoil horizons, enabling the mapping of the extent of soil units appropriate for separate stripping, storage and beneficial reuse. The survey data is included with the ALC survey reports attached as annexes to Appendix 19.1 of this ES **[EN010132/APP/WB6.3.19.1]**. Mapping of soil units would form part of a Soils Management Plan that would be secured by a Requirement of the DCO. An Outline Soil Management Plan for the site is given at Appendix 19.2 to this Chapter **[EN010132/APP/WB6.3.19.2]**.

[Farming circumstances](#)

- 19.6.8 The assessment methodology for farming circumstances is taken from the IEMA publication, A New Perspective on Land and Soils in Environmental Impact Assessment. It broadly continues the guidance from the now superseded planning guidance PPG7 which had remained a common approach for EIA in England, and was for a time included in the Design Manual for Roads and Bridges.

- 19.6.9 Four farm businesses occupy the Sites. Information on the size and nature of these farm businesses has been obtained from the agricultural occupancy the landowners' land agents. Additional farm businesses occupy land crossed by the Cable Route Corridor where the interruption to current land management is considerably shorter compared to land within the Sites. More detailed and contemporary information on specific cropping and timing of operations specific to the route of the Cable Route Corridor will need to be obtained to inform the final Construction Environmental Management Plan, to minimize issues of land severance from cable route works and make appropriate temporary access measures.

[Limitations and Assumptions](#)

- 19.6.10 As directed by TIN049 (Ref 19.4), soil characteristics for the detailed ALC survey were gathered at sample points at 100m intervals. This limits the mapping of ALC grades to a scale of 1:10,000 and the calculation of extents to the nearest 0.1ha to avoid

presenting spurious accuracy. The detailed ALC survey scale is appropriate for informing planning and EIA. However as with minerals and built development work, experienced excavator operators and monitoring by soil scientists may be required to identify localized variation in soil characteristics when excavating cable trenches and recovering topsoil from access tracks.

## **19.7 Significance Criteria**

- 19.7.1 Best and most versatile agricultural land is a strategic, finite and irreplaceable national resource with longstanding policy to prevent the unnecessary loss of such land to non-agricultural development. Land in ALC Grades 1, 2 and 3a is considered to be the nation's best and most versatile land. Paragraph 174 of the NPPF directs that planning should consider the economic and other benefits of the best and most versatile agricultural land.
- 19.7.2 Although soil characteristics are an important factor of agricultural land quality, there are other factors including climate and topography, that are specific to the location. For all practical intents and purposes, agricultural land cannot be created or translocated, nor can a compensatory area of land have its ALC grade enhanced. There is therefore no viable potential for beneficial effect or mitigation with regard to agricultural land quality.
- 19.7.3 Land has a soil resource associated with it. This soil has a functional capacity that can be improved, degraded or lost (for instance as a result of contamination of soil) in addition to the potential for loss of the soil material itself. Some functions of soil, such as the preservation of cultural artefacts and the support of biodiverse habitats, are covered elsewhere in this ES, for example Ecology and Biodiversity (ES Chapter 9) [EN010132/APP/WB6.2.9], Hydrology, Flood Risk and Drainage (ES Chapter 10) [EN010132/APP/WB6.2.10], and Cultural Heritage (ES Chapter 13) [EN010132/APP/WB6.2.13]. For this chapter, the function of the soil for agricultural production is the primary issue.
- 19.7.4 Soil is for all practical intents and purposes a non-renewable resource. Therefore, the preservation and beneficial reuse of this resource is desirable in its own right.
- 19.7.5 For farming circumstances, the sensitivity of individual farm enterprises can be highly specific to the nature of the effect. For instance, a dairy enterprise will have far greater sensitivity to temporary disruption of access than an arable enterprise. Effects of development on a farm business can extend beyond the extent of land lost for production, for instance the fragmentation of a field or holding, and the establishment of a new land use in close enough proximity to cause a nuisance (for instance dust generation impacting on forage palatability).
- 19.7.6 IEMA guidance provides guidance on receptor sensitivity for both soil resource and soil functions, with agricultural land quality being included referred to as the soil function of 'biomass production' – the growing of food, fibre and fuel. Tables 19.3



and 19.4 below summarise the IEMA suggested sensitivity of receptor and magnitude of change for agricultural land.

**Table 19.3: Sensitivity of Receptor: Agricultural Land Resource**

Sensitive/value of receptor	Criteria
Very High	ALC Grades 1 and 2
High	ALC Grade 3a
Medium	ALC Grade 3b
Low	ALC Grades 4 and 5

**Table 19.4: Magnitude of Impact: Agricultural Land Resource**

Magnitude of impact	Criteria
Major	Permanent loss of over 20ha
Moderate	Permanent loss of 5 to 20ha
Minor	Permanent loss of less than 5ha
No Change	No discernible loss of agricultural land

- 19.7.7 The 20ha threshold is an arbitrary area but has been in use for several decades. MAFF used the threshold of 20ha of BMV land to inform interventions in planning including use of independent call in powers. It should be noted that use of a fixed area as a threshold may not be applicable to all scales of development. In this instance the Sites contain approximately 754.7ha of agricultural land, but any permanent loss of land from the proposed development will be a small fraction of this extent. It is therefore appropriate to diverge from the magnitude of change criteria given in Table 19.4 that focus on the permanent loss or sterilisation of the agricultural land resource.
- 19.7.8 The IEMA guidance provides suggested sensitivity and magnitude criteria for a range of other soil functions such as ecological habitat and archaeology, that are dealt with in their respective chapters of this ES. Development of agricultural land can impact the soil resource beyond loss of the agricultural resource. The soil resources sensitivity and magnitude criteria given below relate to soil disturbances from development such as the stripping, storage and respreading of soil, and structural degradation from the passage of plant. These are the activities that present the greatest risk of soil degradation in the construction, operation and decommissioning of a solar farm.

**Table 19.5: Sensitivity of Receptor: Soil Resources**

Sensitive/value of receptor	Example Criteria
Very High	Disturbing heavy textured soil in plastic condition
High	Disturbing medium textured soil in plastic condition
Medium	Disturbing medium textured soil in friable condition.
Low	Disturbing light textured soil in friable condition

**Table 19.6: Magnitude of Change Criteria: Soil Resources**

Magnitude of change	Example Criteria
High	Disposal of topsoil or loss of productive functional capacity e.g. land contamination (Adverse).
Medium	Loss of topsoil for agricultural production but retained for beneficial reuse, or degradation of productive capacity e.g. puddled topsoil (Adverse).
Low	Loss of subsoil for agricultural production but retained for beneficial reuse (Adverse).
Negligible	Marginal loss of soil material e.g. light erosion from construction easement (Adverse).

19.7.9 Tables 19.7 and 19.8 give example sensitivity and magnitude of change criteria for farming circumstances receptors. IEMA does not provide sensitivity of receptor or magnitude of change criteria for agricultural enterprises. Sensitivities of various agricultural enterprises vary markedly between different effects, for instance a livestock enterprise may have very high sensitivity to trespass with dogs, whereas an arable enterprise may be medium to low sensitivity. Assessors experience and judgement is required to identify the agricultural activities that are sensitive to the likely effects, and determine the appropriate sensitivity and magnitude of change. As noted above the sensitivities of certain farm enterprises can be highly specific to the nature of the change.

**Table 19.7: Sensitivity of Receptor: Farming Circumstances**

Sensitive/value of receptor	Example Criteria
Very High	Breeding livestock and stock with biosecurity restrictions
High	High value vegetable and fruit crops.
Medium	Dairy requiring daily collection of perishable milk.

Low	Housed livestock
-----	------------------

**Table 19.8: Magnitude of Change Criteria: Farming Circumstances**

Magnitude of change	Example Criteria
High	Termination of a farm business (Adverse) Creation/expansion of primary farm enterprise (Beneficial)
Medium	Termination of a farm enterprise (Adverse) Creation/expansion of a farm enterprise (Beneficial)
Low	Constraint of a farm enterprise (Adverse) Enhancement of existing farm enterprise (Beneficial)
Negligible	Minor interruption to farm enterprise planning, such as delay to turning out livestock (Adverse) Temporary enhancement of existing farm enterprise (Beneficial)

**Table 19.9: Effects Significance Matrix**

Sensitivity of receptor	Very High	High	Medium	Low
Magnitude of change				
High	Major	Major-Moderate	Moderate	Moderate to Minor
Medium	Major-Moderate	Moderate	Moderate-Minor	Minor
Low	Moderate	Moderate-Minor	Minor	Minor
Negligible	Moderate-Minor	Minor	Negligible	Minor

19.7.10 Major and Moderate effects in Table 19.9 are considered to be **'Significant Effects'** for impact assessment.

## 19.8 Baseline Conditions

### Existing baseline

19.8.1 **Appendix 19.1** provides details of the agricultural assessment work for the agricultural soil survey area. These details are summarised below.

Future Baseline

- 19.8.2 ALC grading is insensitive to land management, and should only change if there is a major intervention outside the scope of normal agricultural practice, for instance significant contamination of the soil with a persistent toxin. The future baseline of agricultural land quality is therefore effectively fixed.
- 19.8.3 Soil health under standard arable rotations, as found within the Sites, has become depleted, with soil organic matter falling towards a low equilibrium. For the future baseline, soil organic matter will continue to decline towards this low equilibrium.

Agricultural Land Resources

- 19.8.4 The detailed ALC surveys of the Site found agricultural land in grades 1, 2, 3a and 3b. Grade 3b predominates, with Grades 1 and 2 being limited in extent. Table 19.10 below shows the extent of ALC Grades found by the detailed survey covering the agricultural soil survey area. The distribution of ALC grades is shown on Figure 19.1, Figure 19.2 and Figure 19.3 [EN010132/APP/WB6.4.19.1 - WB6.4.19.3].

**Table 19.10: ALC Grade Distribution within the Study Area**

ALC Grade	Area (ha)	Area (%)
Grade 1	17.6	2.3
Grade 2	9.5	1.3
Grade 3a	172.4	22.8
Grade 3b	557.0	73.5
Non Agricultural	1.3	0.2
Total	757.8	100

- 19.8.5 The detailed ALC survey of the agricultural soil survey area found agricultural land in Grades 1, 2, 3a and 3b. No area of land was found at the detailed scale that could be mapped out as Grades 4 or 5.
- 19.8.6 Grade 3b land covers the majority of the Sites. The land typically has a heavy textured (high clay content) topsoil that is vulnerable to structural degradation if disturbed when wetted to a plastic consistence. Clayey subsoil impedes drainage of excess water down through the soil profile resulting in seasonal water logging (Wetness Class III). As a result the opportunities for cultivation and carrying livestock are limited by the risk of incurring persistent soil degradation, particularly in the autumn and spring periods for arable cultivation and sowing. This soil wetness and workability limitation is sufficient to limit the land to ALC Grade 3b.
- 19.8.7 For Grade 3a land, soils are broadly similar to those on the Grade 3b land. Topsoil clay content is lower (medium textured) and/or there is a significant presence of

naturally occurring calcium. This topsoil has greater resilience to structural degradation than the heavy textured topsoil of the Grade 3b land. As a result the soil wetness and workability limitation restricts this land to Grade 3a. Pockets of land with a lighter textured soil are also encountered where there is a drought limitation to Grade 3a.

- 19.8.8 Where Grade 1 and 2 land is found the slowly permeable subsoil starts at a greater depth or is not found within the 1.2m assessment depth. Soils are Seldom Wet (Wetness Class II) to Rarely Wet (Wetness Class I), reducing the period that excess water is held in the topsoil. This in turn reduces the severity of the soil wetness and workability limitation, to Grade 2 or no limitation (Grade 1). No Grade 1 and 2 land is found in the West Burton 1 area. A small pocket of Grade 2 land is found in West Burton 2 and two fields of Grades 1 and 2 land is present in the south of the West Burton 3 area.
- 19.8.9 An ALC assessment has not been undertaken for the Cable Corridor Route. This is as the development proposed is a buried cable, with the interruption of the existing agricultural use limited to the brief cable laying operation.

#### Soil Resource

- 19.8.10 The soil resource within the study area is predominantly heavy textured (high clay content) topsoil and subsoil.
- 19.8.11 Topsoil and subsoil material differ in their organic matter content. The higher organic matter in topsoil improves soil structure, porosity and moisture retention as well as providing nutrients for plant growth. It is therefore of greater value as a growth medium than the underlying subsoil. This organic matter also makes the topsoil more vulnerable to becoming anaerobic (reduced oxygen conditions detrimental to plant root growth) if aeration is excessively restricted, such as by flooding, compaction or burying in a storage bund.
- 19.8.12 The majority of land within the study area is under conventional arable management with ploughing each year for crop residue incorporation, weed control and preparation of a seed bed. The loosening and inversion of soil aerates it, speeding the metabolization of organic matter sufficiently that the topsoil organic matter will continue to decline to a low equilibrium irrespective of the quantity of additional organic matter that can be practically applied to the land.

#### Farming Circumstances

- 19.8.13 Four farm businesses own and occupy the agricultural land within the Sites as shown on Figure 19.4. Baseline information on these farm businesses has been gathered through interviews with the farmers or their land agent. Farming circumstances information has not yet been obtained for the Cable Route Corridor. To minimise disruption to agricultural operations by cable laying works, cropping and occupancy information on the cable route will need to be current, for instance the specific crop in each field and critical dates for that crop. Farming Circumstances

information will be collected before the detailed design of the cable trenching works and construction programme are finalised.

- 19.8.14 Land use is predominantly arable growing standard combinable crops (cereals, oilseeds and beans). Some farms grow a wider variety of crops on land away from the Sites, but consider the heavy land unsuitable for their late harvest and/or root and tuber crops. Farm Business D recently transitioned to arable having wound up a dairy business in preparation for the farmer's retirement. A summary of each farm business is given below, with further detail in Appendix 19.1.

#### **Farm Business A**

- 19.8.15 Farm Business A is a large farm business with land spread across several units. Its land within the Sites is in arable production, growing combinable crops. The heavy land within the Sites is unsuited to the potato, carrot, parsnip and beetroot crops that the farm grows elsewhere on lighter land that benefits from irrigation.
- 19.8.16 The farm business also has pig fattening and grain merchant enterprises using facilities away from the Sites, that will be unaffected by the Scheme.

#### **Farm Business B**

- 19.8.17 Farm Business B is a large farm business with two farm yards. The Primary farm yard adjoins the Sites. As for Farm Business A above, the land is used for combinable crops, the land being too heavy to include the maize and sugarbeet crops that Farm Business B grows on lighter land elsewhere.
- 19.8.18 Farm Business B has a poultry enterprise with broiler hens in barns. Land and premises outside of the Sites is let to a Livery tenant, and the farm has a self storage unit diversified enterprise.

#### **Farm Business C**

- 19.8.19 Farm Business C occupies land across three farm units. All land is under combinable crops except for a small paddock. This farm uses agricultural contractor services for all land management with no staff or machinery of its own.
- 19.8.20 Farm Business C also has agricultural land in a separate solar farm DCO application - as part of the Cottam Solar Project.

#### **Farm Business D**

- 19.8.21 Farm Business D had been a dairy unit but this enterprise was terminated in 2018. This was terminated as the farmer is approaching retirement age and a dairy unit of this scale was considered to have little prospect of sufficient financial stability to attract a successor. The farm now manages land for combinable crops with assistance from agricultural contractors for some landwork.

## **19.9 Potential Effects**

### [Construction Effects](#)

### **Agricultural Land Resource**

- 19.9.1 Construction work will start the temporary curtailment of arable production within the Sites. Construction work is described in detail in Chapter 4 of this ES. With specific regard to agricultural land the predominant works will entail laying temporary access tracks (hardcore on geotextile after topsoil stripped and stored), mounting solar panels on narrow steel piles and laying cables in trenches. In areas of archaeological sensitivity piles will be replaced by concrete feet sitting on the surface, with cables suspended from the solar mounts. The land does not cease to be agricultural land if cropping or grazing is suspended while construction work is taking place.
- 19.9.2 Substation and energy storage facilities will cover the soil surface for the minor area they occupy. Together the substations and Battery Energy Storage System (BESS) will comprise approximately 6ha, less than 1% of the Sites. Decommissioning work will include the removal of the substations and BESS including any foundations, with stripped and stored soil from these areas being reinstated.
- 19.9.3 The majority of the agricultural land resource within the Sites is ALC Grade 3b (73.5%). Sensitivity of the agricultural land resource is Very High by the IEMA suggested criteria owing to the presence of land in Grades 1 and 2. As there will be no permanent loss of agricultural land, regardless of ALC Grade, , the magnitude of change is considered to be Minor. .
- 19.9.4 The resulting permanent and local effect of the construction work on the Agricultural Land Resource will therefore be a Minor Impact, not significant.

### **Soil Resource**

- 19.9.5 Solar panel construction work will involve trafficking the land in a similar manner to the current arable land use where high axle load vehicles like combine harvesters and grain trailers are regularly used. Heavy plant use will include excavators for digging trenches and cranes for placing substation and storage modules. The degree of soil compaction will depend upon a number of factors including vehicle weight, use of low ground pressure tyres/tracks, use of temporary protective surfaces, number of vehicle movements, soil texture and soil moisture content.
- 19.9.6 The Soil Management Plan is considered to be embedded mitigation. This will limit trafficking over and handling of soil following rainfall until soil moisture content has fallen below the plastic limit. It will also specify the depth of topsoil stripping operations to avoid incorporation of subsoil, and appropriate design and management of topsoil storage bunds within the site. These measures will conserve the functional capacity of both stripped and undisturbed soils for supporting agricultural production.
- 19.9.7 The most sensitive topsoil corresponds to the ALC Grade 3b land, limited to grade by soil wetness and workability. Heavy textured topsoil in a friable condition has a

medium sensitivity, and with all topsoil retained for beneficial, agricultural reuse, the magnitude of change is low.

- 19.9.8 The resulting short term, reversable and local effect of construction disturbance on the soil resource within the Sites will be a Minor Impact, not significant.

#### **Farming Circumstances**

- 19.9.9 As for the agricultural land resource, the start of construction work will mark the start of the temporary curtailment of arable management at the Sites for each of the four Farm Businesses. While construction work is taking place the land will not be available for grazing livestock either.
- 19.9.10 The sensitivity of the arable enterprises of the four farm businesses to a reduction in cropped area will be medium. With the arable enterprises constrained rather than terminated, the magnitude of change is low.
- 19.9.11 The resulting short term, reversable and local effect of construction disturbance on the farm businesses occupying land within the Sites will be a Minor Impact, not significant.

#### Operational Effects

#### **Agricultural Land Resource**

- 19.9.12 During the operational phase of the development there will be no loss of agricultural land resource. With no change there will be Negligible Impact, not significant.

#### **Soil Resource**

- 19.9.13 While the Scheme is operational, the soil resource at the Site will remain under a perennial green cover. Benefits to the soil resource during the operational period of green cover with no ploughing will include:
- No bare soil surfaces vulnerable to wind and water erosion;
  - Improved infiltration of rainwater reducing erosive surface water runoff;
  - Greater exploitation of subsoil by perennial plant roots, improving drainage and loosening compacted subsoils; and
  - Recovery of topsoil organic matter to a higher equilibrium, improving aggregate stability, water holding capacity and plant nutrient availability.
- 19.9.14 The delivery of these benefits to soil health is supported by a 2009 Defra research project, Best Practice for Managing Soil Organic Matter (SOM) in Agriculture - SP08016<sup>iv</sup>. This project found that conversion of tillage land to permanent grassland was very effective at improving soil organic matter content and highly beneficial in terms of wider environmental impact across a very wide range of soil types.
- 19.9.15 By facilitating a recovery in topsoil organic matter, this enforced fallow period will enhance the functional capacity of the soil resource for future arable production.



Additional benefits from the recovery of soil organic matter include carbon sequestration and hydrological function but this assessment centres on the soil's functional capacity for agricultural production.

- 19.9.16 The benefit of recovery of soil functional capacity for agricultural production is of medium magnitude, with the clay loam textured topsoil having high sensitivity to this change.
- 19.9.17 The soil resource will therefore experience a medium term, reversible, local effect of Moderate Impact, a significant beneficial effect.

#### **Farming Circumstances**

- 19.9.18 During operation, grass below and between the solar panels will need to be managed. This management can include grazing by livestock where appropriate.
- 19.9.19 All four farm businesses will receive income from the Scheme's occupation of their land, a new diversified enterprise. This diversified enterprise will provide a new income stream independent of variations in profitability of arable production.
- 19.9.20 The sensitivity of the farm businesses to this creation of a new farm enterprise will be medium (beneficial) with the magnitude of change being medium. For the operational phase there will be a reversible moderate impact, a significant beneficial effect for the medium term.

#### Decommissioning Effects

#### **Agricultural Land Resource**

- 19.9.21 Decommissioning work will allow the land to be managed for arable production again after an extended fallow period of low input grassland. All piles and surface 'feet' securing solar panels will be removed along with buried cables within the Sites. No obstructions will be left in the soil that could interfere with cultivation. No changes to the physical characteristics of the land or the soil associated with it will have taken place that could influence ALC Grade. For instance, there will be no change in topography, soil depth, clay content or subsoil permeability.
- 19.9.22 Removal of hard standing and access tracks will be followed by reinstatement of the stripped and stored topsoil to restore this agricultural land.
- 19.9.23 With no loss of agricultural land the magnitude of change is no change. There will be Negligible Impact, not significant.

#### **Soil Resource**

- 19.9.24 As for construction, decommissioning will involve trafficking the land in a similar manner to the current arable land use where high axle load vehicles like combine harvesters and grain trailers are regularly used. Heavy plant use will include excavators for digging out cable trenches and cranes for removing substation and storage modules.

- 19.9.25 The Soil Management Plan is considered to be embedded mitigation. This will limit trafficking over and handling of soil following rainfall until soil moisture content has fallen below the plastic limit. It will also specify the depth of topsoil reinstatement. These measures will conserve the functional capacity of both reinstated and undisturbed soils for supporting agricultural production.
- 19.9.26 Heavy textured topsoil in a friable condition has a medium sensitivity, and with all topsoil retained for beneficial reuse, the magnitude of change is low.
- 19.9.27 The resulting short term, reversable and local effect of construction disturbance on the soil resource within the Sites will be a Minor Impact, not significant.

### **Farming Circumstances**

- 19.9.28 Decommissioning of the Scheme will allow a return to arable management of the land. As is currently the case, the actual management of the farmland is a decision for farm managers that draws upon forecasts of market conditions, opportunities and the regulatory environment. There is no obligation for land to return to arable production just as at present there is no obligation to maintain arable management.
- 19.9.29 Arable enterprises will have a medium sensitivity to any change in managed area with the magnitude of change being low.
- 19.9.30 The resulting short term, reversable and local effect of decommissioning on the return of agricultural land to the farm businesses will be a Minor Impact, beneficial and not significant.

## **19.10 Mitigation and Likely Significant Residual Effects**

### Embedded Mitigation

- 19.10.1 A Soil Management Plan (SMP) will be agreed as a requirement of a Development Consent Order. An outline SMP is provided as Appendix 19.2 to the Environmental Statement [EN010132/APP/WB6.3.19.2]. The aim of the SMP is the preservation of the soil resource at the site - avoiding both the loss of soil material from the site and the loss of soil functional capacity at the site. The SMP provides guidance to achieve this aim through the construction, operational and decommissioning phases of the development, covering the appropriate selection of plant, physical characteristics of the soil and safe removal of all below ground features (including piles and cables) at decommissioning that could interfere with subsequent cultivation. Measures identified in the SMP are also incorporated into the Outline Landscape and Ecological Management Plan [EN010132/APP/WB7.3]. This guidance can be incorporated into agreed and detailed Construction, Operational, Decommissioning and Landscape and Ecological management plan documents prior to construction of the Scheme.

### Construction Effects

### **Agricultural Land Resource**

- 19.10.2 There is no effective mitigation for the loss of BMV agricultural land, and there is no actual loss of agricultural land resource. Therefore, the residual effect of the construction of the Scheme will remain minor, not significant.

**Soil Resource**

- 19.10.3 The outline SMP (Appendix 19.2 [\[EN010132/APP/WB6.3.19.2\]](#)) is an embedded mitigation that aims to conserve the soil resource through construction activity. No additional mitigation is proposed.
- 19.10.4 Therefore the residual effect of the construction phase remains minor, not significant.

**Farming Circumstances**

- 19.10.5 There are no mitigation measures specific to the farm businesses for the Construction Phase of the Scheme, so the impact will remain minor, not significant.

[Operational Effects](#)

**Agricultural Land Resource**

- 19.10.6 There is no additional loss of agricultural land in the operational phase of the development, and no mitigation proposed. The residual effect remains a Negligible Impact, not significant.

**Soil Resource**

- 19.10.7 The outline SMP (Appendix 19.2 [\[EN010132/APP/WB6.3.19.2\]](#)) is an embedded mitigation that aims to conserve the soil resource through construction activity. No additional mitigation is proposed. The residual effect remains a Moderate Impact, a significant beneficial effect.

**Farming Circumstances**

- 19.10.8 Opportunities for farm enterprises to utilize the land within the sites will be limited to periods of grazing small livestock. No further mitigation is proposed. The residual effect will remain a moderate impact, a significant beneficial effect.

[Decommissioning Effects](#)

**Agricultural Land Resource**

- 19.10.9 No agricultural land will be lost to the decommissioning works, and no mitigation is proposed. The residual effect remains a Negligible Impact, not significant.

**Soil Resource**

- 19.10.10 The Outline Soil Management Plan [\[EN010132/APP/WB6.3.19.2\]](#) measures also apply to decommissioning and land restoration works, with advice specific to the decommissioning phase covering the appropriate handling of stored soil material as it is returned, appropriate aftercare of the land, and the identification and

remediation of any areas of compacted subsoils. The Soil Management Plan is however an embedded mitigation and no further mitigation is proposed.

- 19.10.11 The residual effect will remain a Minor Impact, not significant.

#### **Farming Circumstances**

- 19.10.12 Decommissioning work will return agricultural land in the Sites to the arable enterprises of the occupying farm businesses. No further mitigation is proposed. The residual effect will remain a Minor Impact, beneficial and not significant.

### **19.11 Cumulative Effects**

- 19.11.1 Figure 19.5 [EN010132/APP/WB6.4.19.5] shows the extent of the Order Limits superimposed on an extract of the regional plan of Predictive BMV Land Assessment (Ref 19.8). This series of 1:250,000 scale maps display the likelihood of BMV agricultural land in three broad categories, alongside non agricultural land urban land. These categories are High Likelihood of BMV (> 60% area BMV), Moderate Likelihood of BMV (20% to 60% area BMV) and Low Likelihood of BMV (< 20% area BMV). As can be seen the Order Limits occupy an area mapped as Moderate Likelihood of BMV.
- 19.11.2 Figure 19.5 [EN010132/APP/WB6.4.19.5] also shows the approximate extent of six solar renewable energy sites, two where planning applications have not yet been submitted. The submitted sites are Cottam Solar Project, Gate Burton Energy Park and Heckington Fen Solar, and Mallard Pass Solar. The sites not yet accepted for examination are Temple Oaks Renewable Energy Park and Tillbridge Solar.
- 19.11.3 The Cottam Solar site has approximately 4.1% best and most versatile land in ALC Grades 2 and 3a. The Heckington Fen site has approximately 49% best and most versatile land, in ALC grades 1, 2 and 3a. Land within Mallard Pass Solar is approximately 42% best and most versatile with ALC Grades 2 and 3a present. Gate Burton Energy Park has approximately 11% best and most versatile land which is all Grade 3a.
- 19.11.4 On the Predictive BMV Land assessment (Figure 19.5) the Temple Oaks Renewable Energy Park and the Tillbridge Solar sites occupy predominantly Moderate Likelihood of BMV land (between 20% and 60% best and most versatile agricultural land) as for the West Burton Solar Project Order Limits
- 19.11.5 The explanatory note that accompanies the Predictive BMV Land map series notes that the plans are not suitable for site specific assessment. Site specific assessment is required to determine ALC Grade for an individual site. However, in the absence of such assessment results in the public domain for two of the sites, these plans indicate the general disposition of land quality within a region, and provide the best published reference to assess likely cumulative impact on the agricultural land resource.

- 19.11.6 No meaningful data is available to appraise farming circumstances for the two pre planning cumulative sites but for Heckington Fen, Mallard Pass, Gate Burton and Cottam the Environmental Statements report no significant adverse effect. Similarly for soil resources, the Environmental Statements available report no significant adverse effects. Limited soils data is available at the 1:250,000 scale on the national soil map for the two pre planning sites. However, detail of soil information available from this national soil map is insufficient to justify any variation between the cumulative sites in predicted effect of a solar farm development on the Soil Resource.
- 19.11.7 For the Loss of Agricultural Land Resource, all six cumulative effect sites will be will be decommissioned, with no loss of agricultural land. Therefore, the residual effect of each of these six sites on the agricultural land resource is predicted to be not significant, as for West Burton.
- 19.11.8 One farm business that is the owner occupier of land within the Scheme is also known to be the owner occupier of land within the Cottam application. As an arable unit with land managed through contractor services, this farm business is not sensitive to the cumulative loss of land. It will for instance have no redundant capacity in manpower or machinery due to the reduction in arable area for the duration of the solar farms. There will be no interaction of impact for soils or agricultural land resource between any of the sites. There is therefore no significant cumulative effect identified for soils and agriculture for the six cumulative sites.

## 19.12 Summary

- 19.12.1 The potential effects, mitigation and significance of likely significant residual effects is described in Table 19.11 below.

**Table 19.11: Summary of Potential Effects and Residual Effects**

Description of Effect	Potential Effect	Mitigation	Residual Effect
<b>Construction</b>			
Loss of Agricultural Land Resource	Minor. Not Significant.	None	Minor. Not Significant.
Loss and Degradation of the Soil Resource	Minor. Not Significant.	None	Minor. Not Significant.
Loss of Land to the Farm Business and Disruption to Agricultural	Minor. Not Significant.	None	Minor. Not Significant.

Occupants Outside the Site			
<b>Operation</b>			
Loss of Agricultural Land Resource	Negligible. Not Significant.	None	Negligible. Not Significant
Recovery of Soil Health Under Extended Fallow	Moderate Beneficial, Significant	None	Moderate Beneficial, Significant
New Diversified Enterprise	Moderate Beneficial, Significant	None	Moderate Beneficial, Significant
<b>Decommissioning</b>			
Loss of Agricultural Land Resource	Negligible. Not Significant	None	Negligible. Not Significant
Loss and Degradation of the Soil Resource	Minor. Not Significant	None	Minor. Not Significant
Return of Land to Farm Businesses	Minor Beneficial. Not Significant	None	Minor Beneficial. Not Significant

### 19.13 References

- Ref 19.1 National Planning Policy Framework  
<https://www.gov.uk/government/publications/national-planning-policy-framework-2#history>
- Ref 19.2 National Policy Statements for Energy Infrastructure. Department of Energy and Climate Change. <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>
- Ref 19.3 Central Lincolnshire Local Plan, Adopted April 2017 <https://www.n-kesteven.gov.uk/central-lincolnshire/>
- Ref 19.4 TIN049. Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural
- Ref 19.5 Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land. MAFF 1988.  
<http://archive.defra.gov.uk/foodfarm/landmanage/land-use/documents/alc-guidelines-1988.pdf>

- Ref 19.6 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Defra 2011 <https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites>
- Ref 19.7 A New Perspective on Land and Soil in Environmental Impact Assessment. IEMA, February 2022.
- Ref 19.8 Likelihood of Best and Most Versatile (BMV) Agricultural Land - Strategic scale maps. Natural England,  
[REDACTED]

---

<sup>i</sup> Bassetlaw District Adopted Core Strategy December 2011 <https://www.bassetlaw.gov.uk/planning-and-building/planning-services/planning-policy/core-strategy-and-development-policies/core-strategy-adopted-development-plan/what-is-the-core-strategy/>

<sup>ii</sup> Geyer, R et al: Spatially Explicit Life Cycle Assessment of Sun-to-Wheels Transportation Pathways in the US (*Environ. Sci. Technol.*, 2013, 47 (2), pp 1170–1176)

<sup>iii</sup> Defra Future Farming – Manage Maize to Reduce Runoff and Erosion.  
<https://defrafarming.blog.gov.uk/sustainable-farming-incentive-pilot-guidance-manage-maize-to-reduce-runoff-and-erosion/>

<sup>iv</sup> Defra 2009. Best Practice for Managing Soil Organic Matter (SOM) in Agriculture - SP08016  
<https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectId=15536>