THE DROVES
SOLAR FARM

The Droves Solar Farm

Chapter 11: Soils and Agriculture (Tracked)

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List of Contents

List of Tables

List of Plates

List of Appendices

11 Soils and Agriculture

11.1 Introduction

11.1.1 This chapter of the Environmental Statement (ES) presents the findings of the Environmental Impact Assessment (EIA) of effects on Soils and Agriculture as a result of the Scheme.

11.1.2 This chapter identifies and proposes measures to address the potential impacts and likely significant effects in relation to Soils and Agriculture, during the construction, operation and decommissioning phases.

11.1.3 The information presented within this chapter has been informed by the Scheme information provided in **ES Chapter 5: The Scheme [APP/6.1]**.

11.1.4 The following aspects have been considered within the Soils and Agriculture assessment process:

- An assessment of potential effects upon on agricultural land and agricultural land quality, as measured under the system of Agricultural Land Classification (ALC) (Ref 11-1). The assessment considers potential effects from construction and decommissioning works as well as any effects from ongoing management and maintenance during the operation phase
- An assessment of potential effects upon soils. The assessment considers disturbance effects of construction and decommissioning works as well as the potential for disturbance during the operation phase and the potential for beneficial effects to soils from being rested from continual arable use for the duration of the operation phase
- An assessment of the potential effects on local agricultural businesses, their economic and other benefits. The assessment considers the disturbance and disruption during the construction phase and decommissioning phases, and the long-term impacts of changes to farming operations through the operation phase; and
- An assessment of potential wider effects on food production and the wider rural economy. The assessment reviews current farming practices and potential farming practices and assesses the effects from changes to farming activities throughout the whole life of the Scheme.

11.1.5 This Soils and Agriculture chapter has been prepared by Kernon Countryside Consultants Ltd (see **ES Appendix 1.1: Statement of Competence [APP/6.4]**).

~~11.1.5~~11.1.6 This document has been updated at Pre-examination Additional Submission to amend broken in-text cross-references. The document references have not been updated from the original submission. Please refer to the **Guide to the Application [APP/1.3.1]** for the list of current versions of documents.

11.2 Consultation

Scoping Opinion

11.2.1 On 8 November 2024, the Applicant submitted a Scoping Opinion Request to PINS (see **ES Appendix 2.1: EIA Scoping Opinion Request [APP/6.4]**) in support of a request for a Scoping Opinion from the Planning Inspectorate (PINS) on behalf of the Secretary of State (SoS) pursuant to Regulation 10 of the EIA Regulations.

11.2.2 A Scoping Opinion (see **ES Appendix 2.2: Scoping Opinion [APP/6.4]**) was issued by PINS on 18 December 2024.

11.2.3 The issues raised in the Scoping Opinion relating to Soils and Agriculture are summarised and responded to within **ES Appendix 11.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4]** which demonstrates how the matters raised in the Scoping Opinion are addressed in this ES.

Statutory Consultation and Preliminary Environmental Information Report (PEIR)

11.2.4 Statutory consultation was held between 21 May 2025 and 9 July 2025. Relevant responses to the PEIR relating to Soils and Agriculture and how these have been addressed through the ES are set out within **ES Appendix 11.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4].**

Targeted Consultation

11.2.5 A further round of targeted consultation was undertaken between 3 September 2025 and 1 October 2025 following changes to the development boundary area of the Scheme presented in the PEIR and during Stage Two Statutory Consultation. Further detail regarding the targeted consultation is provided in **ES Chapter 1: Introduction [APP/6.1]**.

11.3 Legislation, Planning Policy and Guidance

11.3.1 A summary of applicable legislation, planning policy and other guidance documents against which the Scheme has been considered relating to Soils and Agriculture is set out in **ES Appendix 11.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4]**.

11.4 Assessment Assumptions and Limitations

11.4.1 The Soils and Agriculture assessment has considered the following assumptions:

- Land within the Order limits included for the purposes of skylark and curlew mitigation will continue to be farmed as arable land and there will be no additional soil disturbance than in its current use. As a consequence, the land quality of that area will be

unchanged, and is therefore not relevant to this assessment (although has been surveyed to provide a complete understanding of land within the Order limits); and

- The area shown on the Concept Masterplan (**ES Figure 5.1: Concept Masterplan [APP/6.3]**) for 'Potential temporary working area for grid connection infrastructure' within the Order limits is required temporarily for overhead cabling works, with no permanent land take. Land quality is not affected in this area and is therefore not relevant to this assessment. These areas, where they extend beyond the skylark and curlew mitigation areas, have not been surveyed for land quality.

11.4.2 The Soils and Agriculture assessment has considered the following limitations:

- Small parts of the areas of land identified as temporary working areas for Grid Connection Infrastructure (**Works Plan [APP/2.3]**) which will mostly only be affected by short term, fully reversible disturbance such as restringing or pulling zones, and have not been the subject of detailed ALC surveys; and
- Small parts of the areas of land identified as temporary working areas for Grid Connection Infrastructure (**Works Plans [APP/2.3]**) have also been assumed to be temporary, short term impacts and farming operational effects have not been assessed.

11.5 Assessment Methodology

11.5.1 This section sets out the scope and methodology for the assessment of the impacts of the Scheme on Soils and Agriculture.

Sources of Information

11.5.2 The following sources of information have been consulted in the preparation of this chapter:

- Provisional ALC mapping data (MAFF, 1983) (Ref 11-13) and (Ref 11-14), Likelihood of BMV mapping data (Natural England, 2017) (Ref 11-15) and available survey data from the Multi-Agency Geographic Information for the Countryside (MAGIC) mapping tool (available online)
- Detailed ALC field survey carried out by Amet Property Ltd, between August and November 2024, and in September 2025, and covering 799 ha of agricultural land within the Order limits (**ES Appendix 11.2: Agricultural Land Classification Survey [APP/6.4]**); and
- Farm interviews and a walk-over survey carried out by Kernon Countryside Consultants Ltd in January 2025, including relevant farm records provided at that time or subsequently.

Study Area

11.5.3 The Study Area for most of this assessment is limited to the Order limits, as there would be no impact on land use or soils beyond this extent. Information on agricultural land quality and soils has been collected for most of the Order limits, excluding areas of the Grid Connection

Infrastructure and potential temporary working area for grid connection infrastructure to the east of the A1065, to inform the baseline conditions for assessment. Farm information collected has covered wider areas farmed beyond the boundary of the Order limits by the businesses farming the Site to inform the assessment of farm business impacts; however, those areas do not need to be identified on any plans. Wider impacts on food production and for the cumulative assessment includes regional and national considerations.

Potential Impacts

11.5.4 Embedded mitigation measures being incorporated into the design and construction of the Scheme are set out in Section 11.7 below. Prior to the implementation of any mitigation (embedded and/or additional), the Scheme has the potential to have an effect (beneficial or adverse) on Soils and Agriculture receptors, during the construction, operation and decommissioning phases in the following ways:

- Adverse impacts on agricultural land quality. Agricultural land is generally resilient to vehicle movements (trafficking), but when soils are wet there can be impacts on soil structure, which may affect land quality. Impacts from compaction have to be considerable before land quality is downgraded, but there is the potential to affect land quality adversely whenever soil is moved, e.g. to create trackways, without careful handling and storing of soils; and
- Adverse and beneficial impacts on soils. Soils are an important resource with many functions in addition to biomass production. Soils can be adversely affected in terms of soil structure through being moved and handled in unsuitable conditions, and can deteriorate if stored in unsuitable conditions. Conversely resting soils from intensive arable use has the potential for benefits to soil structure and health.

Impact Assessment Methodology

11.5.5 The Soils and Agriculture assessment follows the approach to undertaking EIA as explained in **ES Chapter 2: EIA Process and Methodology [APP/6.1]**. The methodology for attributing sensitivity of receptors, magnitude of impacts and the significance of effects in relation to Soils and Agriculture is described further below in this chapter of the ES and is based on the ISEP Guide 'A New Perspective on Land and Soil in Environmental Impact Assessment' (Ref 11-12).

Sensitivity of Receptor

11.5.6 The assessment methodology identifies the sensitivity of the various receptors in terms of their importance (e.g. BMV land quality) and their susceptibility to damage when being trafficked (e.g. sensitive soil type).

11.5.7 Agricultural land quality in England and Wales is measured under a system of ALC. This determines the quality of land based on the long-term physical limitations of agricultural land for agricultural use, particularly climate, site and soil characteristics. The best quality land is Grade 1, the poorest Grade 5, with Grade 3 split into two subgrades (Grades 3a and 3b).

11.5.8 NPS EN-3 (Ref 11-4) identifies that Grades 1, 2 and 3a are the *"best and most versatile"*. These Grades, Natural England estimate, account for about 42% of all farmland in England, with an estimated 21% in Grades 1 and 2 and 21% in subgrade 3a. The resource is considered to be of national importance. The ISEP Guide considers land of ALC Grades 1 and 2 to be of "very high" sensitivity, subgrade 3a to be of "high" sensitivity, and land of Subgrade 3b to be of "medium" sensitivity. Land of Grades 4 and 5 is "low" sensitivity. As set out in the Scoping Report grades 1, 2 and 3a have all been placed in the highest sensitivity category.

11.5.9 Soils, as a resource, can be affected by construction activities and by land use, both negatively and positively. The potential for adverse effects on soils is highest when they are wet (in a plastic state), and soils with small particles (e.g. clays) are more susceptible to damage. The ISEP Guide places clay soils in wetter climate areas in a higher sensitivity to damage category, with sandy soils in drier regions least susceptible. Wetness of soils is measured by hand, but the ISEP Guide also references the Field Capacity Days (FCD) measure from the ALC methodology as a guide to when soils are saturated. As identified in the **Agricultural Land Classification Report** for the Site (**Appendix 11.2 [APP/6.4]),** the FCD for the Site is under 150 days per year, and as a result no soil types are within the High Sensitivity category in Table 11-1.

11.5.10 The sensitivity of likely impacted receptors defined depending on the vulnerability, recoverability and value/importance of the receptor, to potential effects arising from the Scheme is assessed as detailed in~~Error! Reference source not found.~~ this chapter. This draws from the ISEP Guide and professional judgement.

11.5.11 Based on the criteria set out in ~~Error! Reference source not found.~~ this chapter the sensitivities of identified receptors are shown below in Table 11-1.

Table 11-1 Sensitivity of Identified Receptor

Sensitivity	ALC Grade	Sensitivity of topsoil and subsoil	Agricultural businesses
High	Land of ALC Grades 1, 2 and subgrade 3a.	There are no soils of high sensitivity in this climatic area.	No farm businesses are considered to be of high sensitivity.
Medium	Land of ALC Subgrade 3b.	High clay soils where the FCD is <150, or medium textured soils where the FCD is <225.	Full-time businesses, and farm businesses where the location of land is particularly important such as dairy farms.
Low	Land of ALC Grades 4 and 5.	Soils with a high sand fraction where the FCD is <225.	Part-time farms or farms with low sensitivity to change, e.g. arable land held on

Sensitivity	ALC Grade	Sensitivity of topsoil and subsoil	Agricultural businesses
			short-term arrangements.
Negligible	Land of ALC Grades 4 and 5 with only indirect links.	No soils are considered to be of negligible sensitivity.	Agricultural land that is not farmed or does not form part of a farm business.
*Field Capacity Days: days when the soil is replete with water			

Magnitude of Impact

11.5.12 The categorisation of the magnitude of impact takes into account the following factors:

- Extent
- Duration
- Frequency; and
- Reversibility.

11.5.13 The magnitudes for impacts on Soils and Agriculture are based on the thresholds set out in the Scoping Report (**ES Appendix 2.1: Scoping Report [APP/6.4]**), as detailed in Table 11-24. A medium magnitude impact occurs when 20 hectares (ha) or more of land is lost, by permanent sealing or downgrading. This equates with the threshold for consultation with Natural England, as described in **ES Appendix 11.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4]**.

11.5.14 The ISEP Guide defines a "*temporary, reversible loss of soil-related features*" as a low magnitude impact and this has been adopted for this assessment.

11.5.15 The ISEP Guide does not provide magnitude definitions for farm businesses, although effects are described in paragraph 8.3.3 of the ISEP Guide. The criteria in Table 11-24 are based on professional judgement. The methodology considers farm businesses to be more resilient to change. Farm businesses are continually adapting to change, caused by external factors (weather, disease, government policy), internal factors (management, finances, personal wishes) and economic factors (crop prices, input costs). Some businesses are less resilient to change because of their relationship with land (e.g. a dairy herd needing access for cows to walk to grassland), others are more resilient (e.g. arable farms and access to arable fields). Full-time businesses that would be terminated by the Scheme are identified as a high magnitude of impact, with farm businesses less affected being identified as medium or low magnitude impacts.

11.5.16 The magnitude of impact is the level of change caused by the Scheme and is defined in Table 11-2. For soils and agricultural land the same magnitude thresholds are used.

Table 11-2 Criteria for Determining Magnitude of Impact

Magnitude of Impact	Definition	
	Effects on Soils and Agricultural Land	Effects on Agricultural Businesses
High	The Scheme would directly lead to the loss (including permanent sealing or land quality downgrading) of over 50ha of soil-related features; or potential for improvement in one or more soil functions over an area of more than 50ha.	The impact of development would render a full-time agricultural business non-viable.
Medium	The Scheme would directly lead to the loss (including permanent sealing or land quality downgrading) over an area of between 20 and 50ha of soil-related features; or potential for improvement in one or more soil functions over an area of between 20ha and 50ha.	The impact of the Scheme would require significant changes in the day-to-day management of a full-time agricultural business, or closure of a part-time agricultural business. Loss of buildings or impacts on drainage or water supplies affecting the potential for at least 5ha of adjacent land to be farmed fully.
Low	The Scheme would directly lead to the loss (including permanent sealing or land quality downgrading) of less than 20ha of soil-related functions; or potential for improvement in one or more soil functions over an area of less than 20ha; or temporary, reversible loss of soil-related features.	Land take would require only minor changes in the day-to-day management / structure of a full-time agricultural business or land take would have a significant effect on a part-time business. Minor effects, direct or indirect, on surrounding land beyond the boundaries of the Site.
Negligible	No discernible loss or reduction or improvement of soil functions or volumes.	Land take would require only negligible changes in the day-to-day management of a full-time agricultural business or land take would require only minor changes to a part-time farm business.

Categorising Scale of Effect

11.5.17 The predicted significance of the effect is determined through a standard method of assessment and based on professional judgement, considering both the sensitivity of the receptor and the magnitude of the impact, as shown in Table 11-3.

11.5.18 There are four categories demonstrating the scale of effect:

- Negligible
- Minor
- Moderate; and

- Major.

Table 11-3 Significance of Effect

Magnitude of Impact	Sensitivity			
	High	Medium	Low	Negligible
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Minor	Negligible
Low	Minor	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

11.5.19 The nature of effects is defined as either beneficial or adverse.

Determining Significance of Effect

11.5.20 Table 11-34 identifies that a high magnitude impact (the loss by permanent sealing or land quality downgrading of in excess of 50ha of land) on a high sensitivity Receptor (BMV agricultural land), results in a major scale of effect. A loss of 20 – 50 ha (medium magnitude of impact) of BMV (high sensitivity Receptor) results in a moderate scale of effect, as would the loss of >50 ha (high magnitude of impact) of Subgrade 3b land (medium sensitivity Receptor).

11.5.21 For the EIA, effects that are major or moderate in scale are considered to be significant. Effects that are minor or negligible in scale are considered to be not significant.

11.5.22 Effects are considered in terms of whether they are adverse or beneficial. Impacts are considered in terms of whether they are of national or local significance. Impacts on land of BMV quality are of national significance, whereas impacts on land of Subgrade 3b or lower, and impacts on farm businesses, are of local significance.

11.5.23 The assessment also considers whether the effects are temporary or permanent. This affects overall significance. The reversibility of an effect will influence the assessment of significance. Temporary short term impacts are less significant than temporary long-term impacts. Table 3 of the ISEP Guide places “temporary, reversible loss of soil-related features” in the low magnitude category. Accordingly temporary effects are no more than low magnitude.

11.5.24 All temporary effects are less significant than permanent impacts.

11.6 Baseline Conditions

The Order Limits

11.6.1 The Scheme is located within the administrative areas of Norfolk County Council (NCC) and Breckland Council (BC) who are the host authorities. The administrative area of Kings Lynn and West Norfolk lies adjacent. A full description of the Order limits is provided in **ES Chapter 5: The Scheme [APP/6.1]**.

Existing Baseline

11.6.2 The baseline conditions are assessed in this section. This includes a review of published information and presenting the results of field surveys. The baseline conditions assessed are:

- Agricultural land quality
- Soils and soil type; and
- Agricultural businesses and local agricultural circumstances.

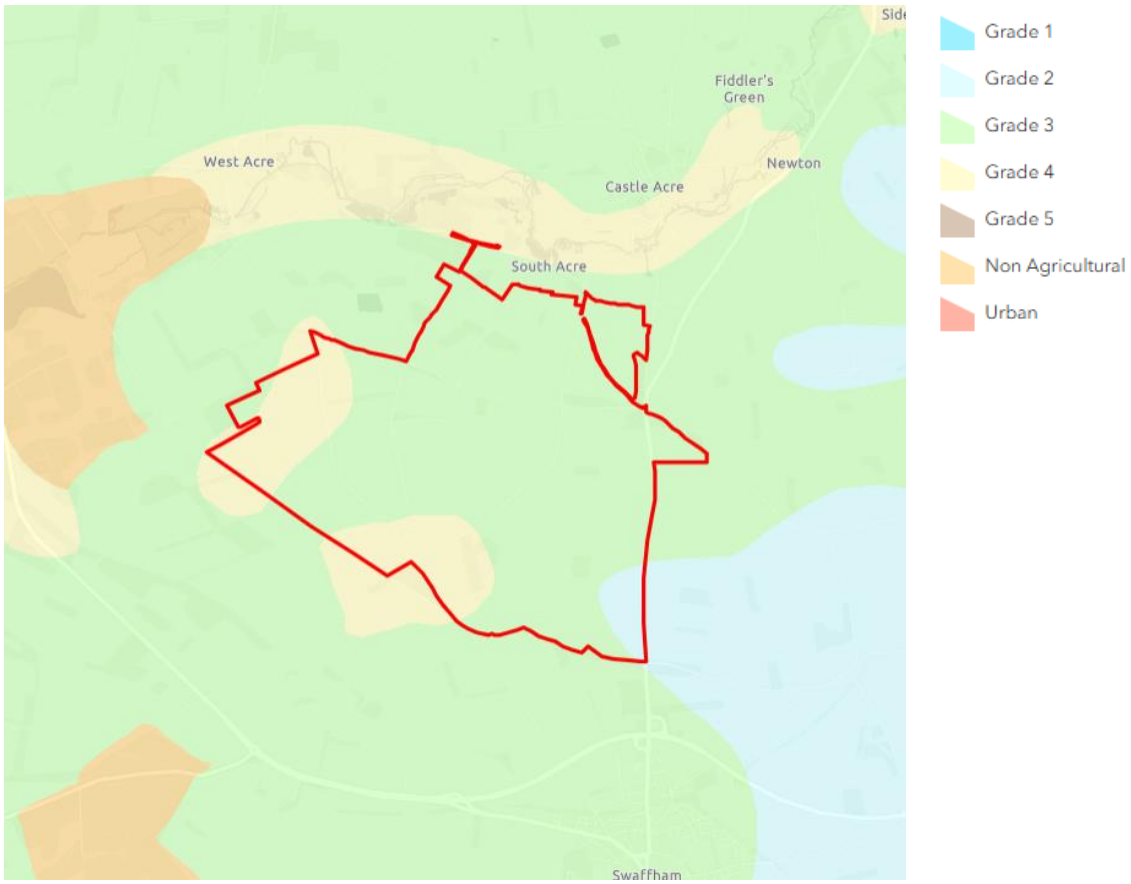
Agricultural Land Quality

11.6.3 Agricultural land is measured under a system of Agricultural Land Classification (ALC). This grades land based on the long-term physical limitations of land for agricultural use, including climate (temperature, rainfall, aspect, exposure and frost risk), site (gradient, micro-relief and flood risk) and soil (texture, structure, depth and stoniness) criteria, and the interactions between these factors determining soil wetness, droughtiness and utility. The system is described in Natural England's Technical Information Note TIN049 (2012) (Ref 11-10).

11.6.4 The Ministry of Agriculture, Fisheries and Food (MAFF) produced a series of "*provisional*" ALC maps in the 1970s (Ref 11-13). These were reprinted by Natural England in 2010 (Ref 11-13). These maps were produced at a scale of 1:250,000 and are for strategic purposes only. They do not show the subgrades of Grade 3. As described in TIN049 (Ref 11-10) these maps are not suitable for use in site specific circumstances, but they provide information for use in wider landscape planning.

11.6.5 The published provisional map for the East of England shows the Site to be mostly of undifferentiated Grade 3 with areas of Grade 4. There is a small area of Grade 2 shown on the eastern edge. Plate 11-1 below shows the provisional ALC map for the area, from the digitised version (Ref 11-14).

Plate 11-1 Provisional ALC Map for the Site and Surrounding Area



11.6.6 Grade 2, a small amount of which is shown on the published provisional map on the eastern edge of the Site (parts of Fields 20 and 21), is defined as “very good quality” land in the MAFF Methodology (Ref 11-1). Grade 3 is “good to moderate” quality. The maps were produced before Grade 3 was subdivided into subgrades. Accordingly, the subdivisions of Grade 3, which are 3a “good” and 3b “moderate”, are not shown on the map. Grade 4 is “poor quality” agricultural land.

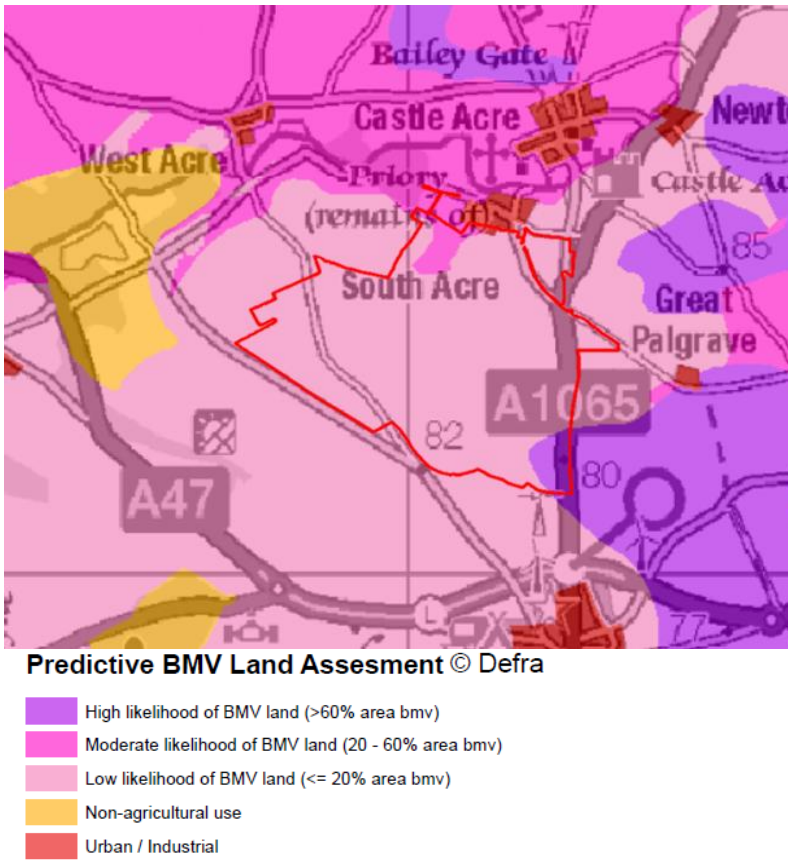
11.6.7 In 2017 Natural England published a series of maps, also at 1:250,000 scale, showing the likelihood of BMV land (Ref 11-15). These maps divide the country into three categories: low (<20% area BMV), moderate (20%-60% area BMV), and high (>60% area BMV). The Site is shown as almost wholly falling into the "low likelihood" category, as shown in Plate 11-2 ~~Error! Reference source not found.~~.

11.6.8 The Site therefore mostly falls within the lowest category for the likelihood of BMV land. At the very north of the site, near to Fingerhill Plantation, the land falls into the “moderate likelihood” (20-60% area BMV). Some of the mitigation area falls into this category, and areas of Grid Connection Infrastructure, but the land quality in these areas will not be affected. It is noted that some of the “moderate likelihood of BMV” land is in areas identified as provisional Grade 4, which is surprising, and highlights the limitations to both sets of maps. Along the

eastern boundary a small area of "high likelihood" (>60% area BMV) lies adjacent to the A1065.

11.6.9 The BMV Likelihood, from the 1:250,000 predictive map (Ref 11-15) is shown on Plate 11-2.

Plate 11-2 Extract Natural England's Predictive BMV



Predictive BMV Land Assesment © Defra

- High likelihood of BMV land (>60% area bmv)
- Moderate likelihood of BMV land (20 - 60% area bmv)
- Low likelihood of BMV land (<= 20% area bmv)
- Non-agricultural use
- Urban / Industrial

11.6.10 An Agricultural Land Classification (ALC) Survey of the Site (**ES Appendix 11-2: Agricultural Land Classification Survey [APP/6.4]**) has been carried out by the Applicant. The land quality has been assessed at a density of one auger sample per hectare, and in accordance with the ALC methodology (Ref 11-1). The ALC survey results are set out in Table 11-4~~6~~.

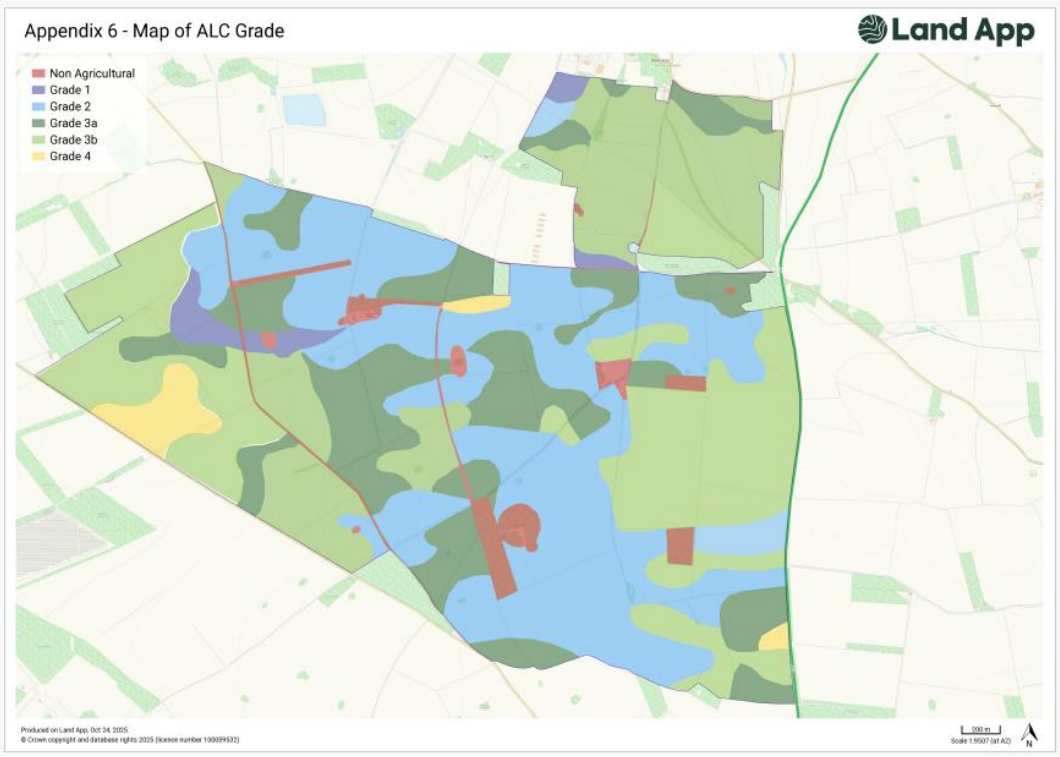
11.6.11 The surveyed area extends to 799 hectares, this largely covers the Solar PV Site (as shown on **ES Figure 1.3: Concept Masterplan [APP/6.3]**). This covers all land within the Order limits with the exception of the areas described below.

11.6.12 The ALC has identified a large range in the ALC grades found across the site, from two modest areas of Grade 1 to areas of Grade 4. The ALC pattern is very mixed.

11.6.13 The ALC results are shown in Plate 11-3 below, which is also included at (Appendix 6 of the ALC Survey Report) **ES Appendix 11-2: Agricultural Land Classification Survey [APP/6.4]**. Figures are rounded to the nearest whole hectare. The results show that, in broad terms, the eastern and western areas of the Site are generally moderate or poor quality land,

and the central areas, where the soils are more loamy and hold more water, are generally good or very good quality. The ALC survey includes some areas of woodland excluded from the Order limits. It does not include all of the Grid Connection Infrastructure, and it does not include the roads to the east. The results are set out in Table 11-4.

Plate 11-3 ALC Survey Results of the Site



11.6.14 Table 11-4 shows the results of the ALC and adds in the extra areas not within the ALC. The non-surveyed areas include the peripheral parts of the Grid Connection Infrastructure, the A1065 to the east, and small areas of woodland. The results are rounded to the nearest whole hectare, which reflects the surveying density of one auger per hectare, and the proportions are accordingly also rounded to the nearest whole percentage point.

Table 11-4 ALC Survey Results of the Site

Grade	Description	Area (ha)	Proportion of Site (%)
1	Excellent	18	2
2	Very good	276	33
3a	Good	161	19
3b	Moderate	324	39
4	Poor	20	2
5	Very poor	0	0

Grade	Description	Area (ha)	Proportion of Site (%)
NA	Non-agricultural (on ALC plan) and woodland (not on ALC plan)	13	2
NS	Not surveyed and roads	27	3
Total		839	100

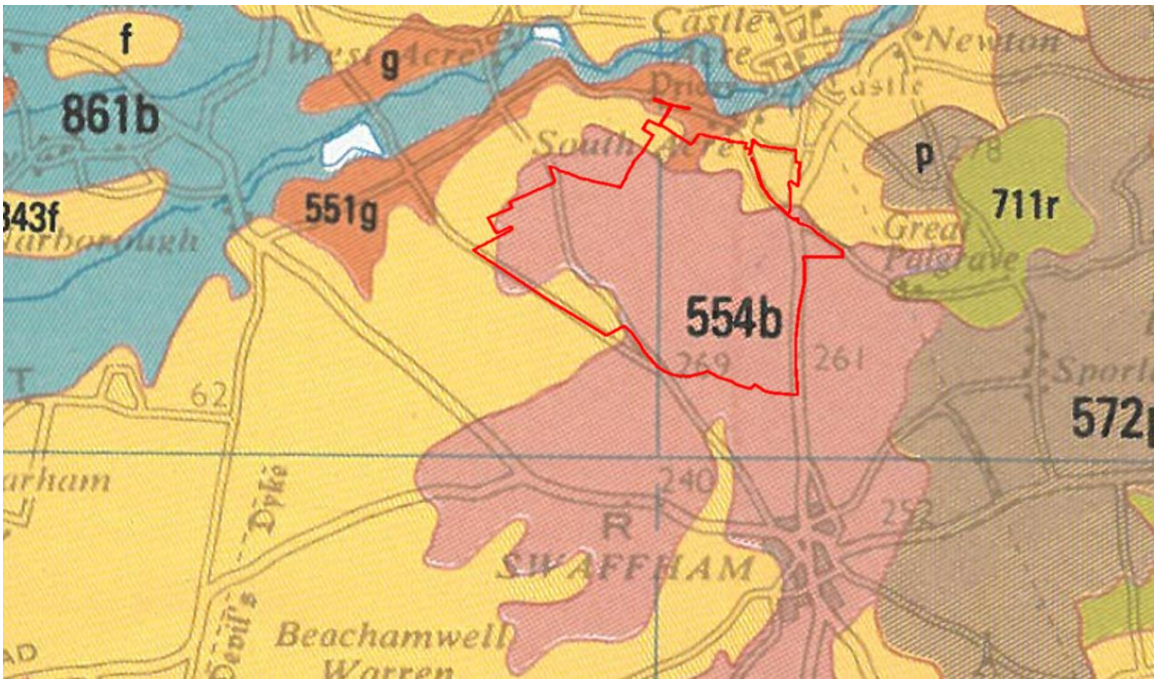
ALC

11.6.15 The land quality within the Site therefore includes BMV land at high sensitivity, Subgrade 3b of medium sensitivity, and land of Grade 4 which is of low sensitivity.

Soils and Soil Type

11.6.16 Soils have been mapped historically by the Soil Survey of England and Wales (SSEW) (Ref 11-16) at a 1:250,000 scale. The SSEW mapping for the Site identifies that the soils are expected to comprise mostly soils of the 554b Worlington Association, being deep, well-drained sandy soils, in places very acid with a subsurface pan, and at risk of wind erosion. In the west of the Site, soils are shown as 343f Newmarket 1, being shallow well-drained calcareous sandy over coarse loamy soils over chalk or chalk rubble. Just north of the Site and broadly coinciding with the “moderate likelihood of BMV” the soil is shown as 551g Newport 4 association soils, being deep, well-drained sandy soils. Plate 11-4 shows the SSEW map for the area.

Plate 11-4 Extract from the SSEW Map



11.6.17 The soils found across the Site are described in **ES Appendix 11-2: Agricultural Land Classification Survey [APP/6.4]**. Soils have been found to be more variable than indicated on the national soil map and in some fields can vary over short distances giving rise to several ALC grades within the same field. This makes agricultural activity difficult, with different soil types and textures requiring different management methodologies.

11.6.18 The soils in the loamier parts of the Site are generally found in the central part of the Site. Purely for illustrative purposes, examples of soils from some of the Grade 2 (this sample from Field 5) are shown in Plate 11-5 and 11-6.

Plate 11-5 and Plate 11-6 Soils (Grade 2) in Field 5

11.6.19 Whilst there is variability, as described in **ES Appendix 11-2: Agricultural Land Classification Survey [APP/6.4]**, as soils become sandier they hold less moisture for plant use and are graded lower quality as a result. Sandier soils, from Subgrade 3a in the centre of the Site, are shown in Plate 11-7 and Plate 11-8, again purely for illustration.

Plate 11-7 and Plate 11-8 Subgrade 3a Soils (Field 10)

11.6.20 Soils of Subgrade 3b are generally sandy or shallow. Outdoor pig rearing is taking place on the land of Grade 4 at present, but arable land of Subgrade 3b from the eastern side of the Site is illustrated in Plate 11-9 and Plate 11-10). The sandy nature of the soils, for illustration, can be seen in the crumbly nature of the topsoil.

Plate 11-9 and Plate 11-10 Subgrade 3b Soil Example (Field 25)

11.6.21 In places, as described in the ALC, the soils are shallow over limestone, with an example presented for illustration in Plate 11-11 and Plate 11-12 ~~Plate 11-11~~.

Plate 11-11 and Plate 11-12 Shallow Soils of Subgrade 3b (Field 1)

11.6.22 The climate of the area has a Field Capacity Days of under 150. Only medium and high clay soils would fall into the medium sensitivity in this climatic area (Table 11-3 with a full list in the ISEP Guide), and only 45 samples out of 761 were identified as sandy clay loam. There are two patches of mostly sandy clay loam (medium sensitivity soils), one covering parts of Fields 2, 3 and 5, and another covering Field 31 and parts of Fields 29 and 30. This is considered further in section 11.8. Overall, the soils are considered to be mostly of low sensitivity, with two areas of medium sensitivity.

Agricultural Business Circumstances

11.6.23 The soils are free-draining and there are no extensive under-field drainage schemes within the Order limits.

11.6.24 The land within the Order limits is farmed by a number of different businesses, partly in-hand (i.e. farmed by the owners) and partly on various short-term tenancy arrangements.

11.6.25 The majority of the land is used for arable cropping. This includes combinable crops such as wheat, barley, oilseed rape and arable break crops, as well as rye and vining peas. Part of the Site is let most years to different specialist growers who grow root crops (potatoes, carrots, parsnips) or onions. Parts of the Site are used for agri-environmental farming uses.

11.6.26 The western side of the Site is farmed in-hand. When vegetables are grown, they are grown on a licence arrangement. Within the Site are three areas of outdoor livestock production, which are tenanted to the livestock farmers.

11.6.27 Currently there are four fields used for rearing outdoor pigs (Fields 3, 12, 19 and 20). The rearing areas rotate around part of the farm, and are located on the driest and most free-draining sandy soils. The locations of the Site photographs are shown on Plate 11-13.

Plate 11-13 Location of Photographs

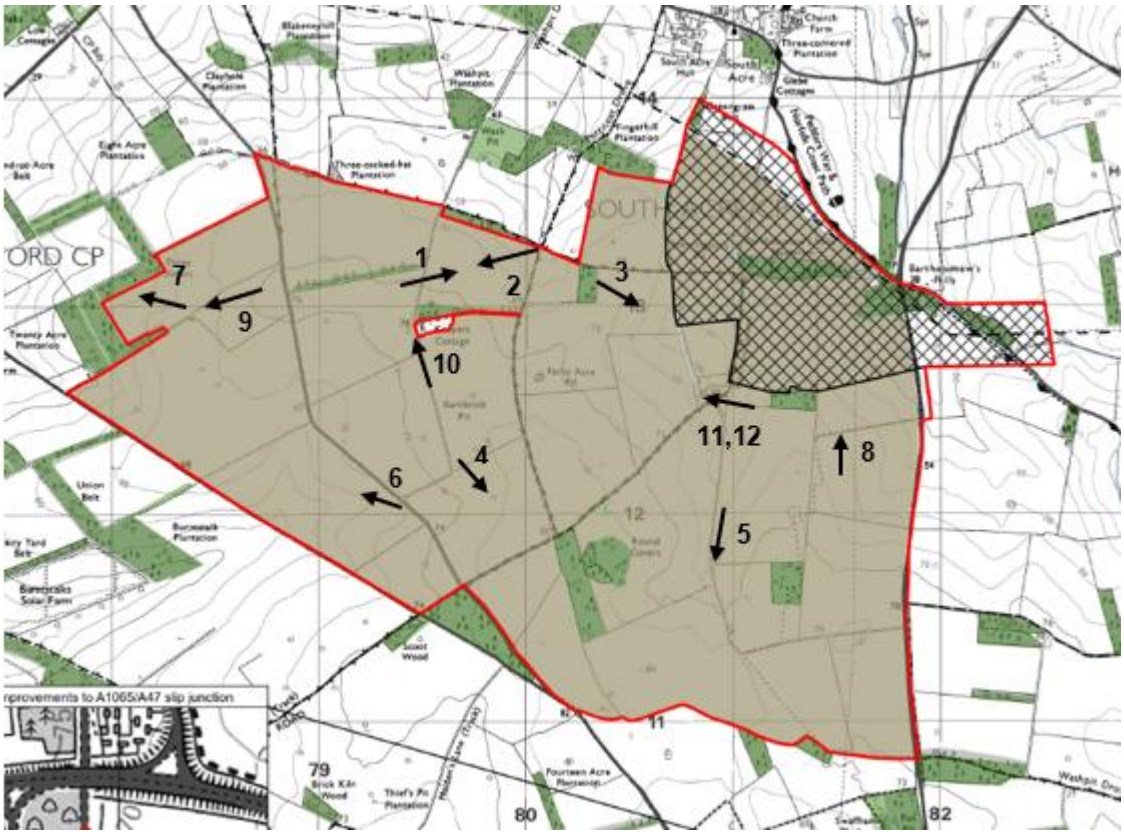


Plate 11-14 Outdoor Rearing of Pigs, View 1

Plate 11-15 Outdoor Rearing of Pigs, View 2

11.6.28 The majority of the Site is farmed as large, open arable fields. Illustrative photographs of parts of the Site are shown in Plate 11-16 to Plate 11-19.

Plate 11-16 Arable Land, View 3 (Field 31)

Plate 11-17 Arable Land, View 4 (Field 9)

Plate 11-18 Arable Land, View 5 (Field 24)

Plate 11-19 Arable Land, View 6 (Field 6)

11.6.29 Parts of the Site are grazed by sheep in the winter, on stubbles or on stubble crops (such as stubble turnips). These sheep are grazed temporarily, secured by electric fencing. Two such areas, one being grazed, are shown below in Plate 11-20 and Plate 11-21.

Plate 11-20 Sheep Fencing for Grazing, View 7 (Field 1)

Plate 11-21 Sheep Grazing a Stubble Crop, View 8 (Field 26)

11.6.30 There is one small brick building of limited use in the northern corner of Field 3, shown in Plate 11-22.

Plate 11-22 Brick Building Within the Site (Field 3)

11.6.31 The sensitivity of the agricultural businesses within the Site are assessed as follows:

- The two arable farms are considered to be of low sensitivity. They operate arable land within the Site, but the location of the land relative to the centre of each farm business is not critical and accordingly they are of low sensitivity (Table 11-3); and

- The three outdoor breeding areas are considered to be of medium sensitivity. These enterprises rotate onto new land every few years, which suggests low sensitivity, but whilst they are operating within the Site they are sensitive to any loss of access to land within the Site.

Future Baseline

11.6.32 The land within the Order limits is currently farmed by a mixture of arable cropping, agri-environmental land management, and areas of outdoor livestock production. In the absence of the Scheme, this is likely to continue. There will likely be changes to the type and mix of farming, influenced by many factors, but continued agricultural use is expected.

11.6.33 In the short to medium term, it is likely that greater areas within the Site will be used for agri-environmental or environmental land management, as indicated in line with predictions in HM Government's Land Use Consultation, January 2025 (Ref 11-17), which included an analysis that 18% of England's agricultural land may need to change to uses for environmental and climate benefits, of which half would likely retain some food production in combination, but half would not involve food production.

11.7 Embedded Mitigation

11.7.1 Based on the published "provisional" ALC maps, and the Likelihood of BMV maps, which represent all the available ALC information without field survey, the location for the Scheme was identified as likely to be some of the lowest quality land in the wider area. This is illustrated on Plate 11-23 (Provisional ALC) and Plate 11-24 (Likelihood of BMV). The general area of the Site is identified by the circle.

Plate 11-23 Provisional ALC, Site circled approx.

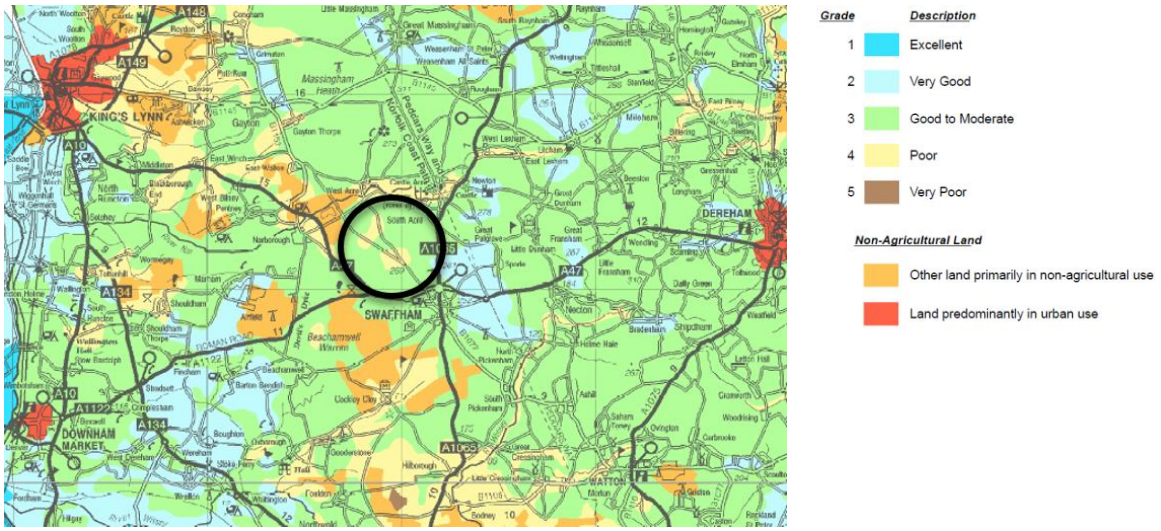
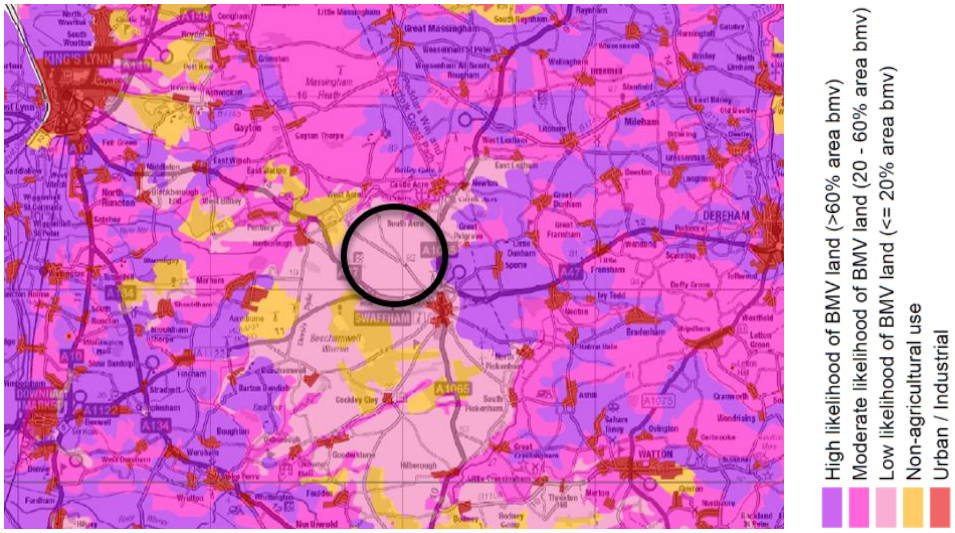


Plate 11-24 Likelihood of BMV, Site circled approx.



11.7.2 Subsequent detailed ALC survey and soil survey has identified the soils and land quality of the Order limits. This has identified areas of Grade 1 and Grade 2, contrary to the expectations of the published information. The Order limits has been revised to remove a Filed 22 which is of Grade 1 and 2 from the Scheme in the north, to the west of fields 33 and 34.

11.7.3 The likely or potential adverse effects have been minimised or avoided by good practice works embedded into the Scheme in the **outline Construction Environmental Management Plan** (oCEMP) **[APP/7.7]** and the **oSMP [APP/7.13]**, upon which the detailed equivalent management plans (i.e. the CEMP and SMP) will be produced, secured by respective requirements of the **draft DCO [APP/3.1]**.

11.7.4 Likely environmental effects have been or will be avoided, minimised, mitigated or reduced through design measures and/or management of the Scheme, as outlined in this section. Proposed environmental enhancements are also described where relevant.

11.7.5 The following embedded mitigation measures have been incorporated into the Scheme's design.

Embedded Construction Phase Mitigation

11.7.6 Construction effects may arise as a result of impacts on soils (and thereby on land quality), either from physical movement of the soils or physical movement across the soils by vehicles. As part of the Soils and Agriculture assessment, the **oSMP [APP/7.13]** has been developed to help guide good practice and minimise potential effects on soils and agricultural land quality. This has been submitted with the DCO Application and forms the basis for a detailed Soil Management Plan which would be produced and secured by a requirement of the **draft DCO [APP/3.1]**.

11.7.7 Construction of the Scheme will involve vehicle trafficking over agricultural land. There is the potential for the soil to be adversely affected by vehicular movement if not managed properly. However, the **oSMP [APP/7.13]** includes measures to mitigate adverse effects to soils (e.g. compaction).

11.7.8 A number of potential impacts are capable of mitigation by the careful use and handling of soils. These potential impacts are generally assumed to be mitigated during the construction phase in this assessment and are assumed to be capable of being controlled (for the purposes of mitigation and impact minimisation) through the detailed Soil Management Plan.

11.7.9 The following embedded mitigation measures have been incorporated into the Scheme's design for the construction phase:

- Minimising or avoiding vehicle movement over soils (trafficking) when soils are in a plastic, wet state
- Only moving soils, which is only necessary for limited areas such as to build tracks, the BESS and substation areas, when soils are dry
- For the small volumes of soils that need to be stored for subsequent restoration, placing them into storage bunds when they are dry, and managing and maintaining the bunds
- Minimising trench widths, replacing soils in the reverse order and preventing any adverse long-term effects on land quality; and
- oSMP.

Embedded Operational Phase Mitigation

11.7.10 The following embedded mitigation measures have been incorporated into the Scheme's design for the operation phase:

- Minimising travel over the land in vehicles when ground conditions are wet; and

- oSMP.

Embedded Decommissioning Phase Mitigation

11.7.11 The following embedded mitigation measures have been incorporated into the Scheme's design for the decommissioning phase:

- Following the same timing principles as are to be applied at the construction phase; and
- oSMP.

11.8 Assessment of Likely Effects

11.8.1 This section of the Soils and Agriculture chapter identifies and characterises potential impacts arising during the construction, operation and decommissioning phases of the Scheme.

11.8.2 Taking into account the embedded mitigation measures detailed in Section 11.7, the potential for the likely effects of the Scheme on Soils and Agriculture receptors has been assessed using the methodology detailed in Section 11.5 of this chapter. In the sections below, effects during the construction, operation and decommissioning phases of the Scheme are assessed for all the Soils and Agriculture receptors scoped into this ES assessment.

11.8.3 Any additional mitigation required to reduce these effects has been set out in Section 11.9. Thereafter, an assessment has been made of the significance of any residual effects after all mitigation measures have been accounted for.

Construction Phase

11.8.4 The construction phase impacts on soils, agricultural land and farm businesses are scoped into the assessment. This section considers these receptors in the following order:

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

Effects on Agricultural Land Quality

11.8.5 This section of the assessment focuses on the effects on agricultural land, in particular on the agricultural land quality. Works affecting agricultural land will also affect soils, as they are the same physical resource. Accordingly, the description focuses on land quality, but as a consequence the soil analysis that follows is short, drawing from similar impact assessments.

11.8.6 The potential for adverse effects on agricultural land quality resulting from the construction of the following elements of the Scheme have been assessed:

- Temporary construction compounds

- Access Tracks
- Ground Mounted PV Modules and associated
- Vehicle trafficking
- Cabling
- Customer Substation, National Grid Substation and Ancillary Buildings and BESS; and

- Green Infrastructure.

11.8.7 This section provides an outline description of the works involved with the various components of the Scheme in the following sections, focussing on the potential effects on agricultural land quality arising from those works. For each work the likely impacts and effect are assessed, and then the collective impacts and effects are drawn together at the end of the section.

Temporary Construction Compounds

11.8.8 The temporary construction compounds will require the removal of topsoil, which will be stored in low-level bunds on land adjacent to the compound. A matting will then be placed on the ground, and stone will be added. The matting will prevent any mixing of stone with the underlying subsoil. These areas will be restored by removing the stone and matting, loosening any compaction in the subsoil, and returning the topsoil to the area. An example compound is shown in Plate 11-25.

Plate 11-25 Example Construction Compound (being built)

11.8.9 The two Solar PV Construction Compounds will measure 100m x 100m (1.0ha, rounded up). One is proposed on an area of mostly Grade 2 land, shown below in Plate 11-26.

Plate 11-26 Looking North over Area for Primary Construction Compound, Field 21

11.8.10 Whilst there are areas of Subgrade 3b with access to the A1065, they are generally sloping or sightlines are not so good, and therefore a compromise has been necessary.

11.8.11 The soils at this location (auger point 673 in **Appendix 11.2 Agricultural Land Classification [APP/6.4**] are loamy medium sand over a medium sandy loam subsoil. These soils are capable of being trafficked (i.e. driven over or moved) for most of the year. As the soils are of a sandy nature they will restore readily even if handled when in sub-optimal conditions. Advice on assessing the suitability of soils for being moved is provided in the **oSMP [APP/7.13]**. As the soils are resilient to being handled and trafficked, the potential for adverse effects on the agricultural land quality is limited. Land quality will not be adversely affected by these temporary works.

11.8.12 A further Construction Compound measuring 100m by 100m (1.0ha, rounded up) is proposed on Subgrade 3b land on the edge of Field 3. The soils in this location are medium sand over a loamy medium sand upper subsoil (auger point 353 in **Appendix 11.2 Agricultural Land Classification** (**APP/6.4**], and similarly resilient to being handled, so that restoration without adverse effects on land quality will not be difficult.

11.8.13 Potentially a further four construction compounds of 100m by 100m are required to serve the Solar Site (total 4.0 ha). A further four construction compounds are required as follows. The locations are not yet determined and so it is assumed that each will involve, worst case, land of BMV quality:

- Grid Connection Infrastructure, 130m by 130m (1.7ha)
- Customer Substation 130m x 130m (1.7ha)
- NGET Substation 130m x 130m (1.7ha)
- BESS 130m x 130m (1.7ha).

11.8.14 In total, therefore, up to 11.1 ha of land is required for construction compounds. The works are temporary and short-term. They are fully reversible. Temporary, reversible impacts are defined as low magnitude (Table 11-4). The land quality is a mixture of BMV and Subgrade

3b and consequently of high and medium sensitivity (Table 11-3). This results in effects of minor adverse significance (Table 11-5), which is **not significant** in EIA terms.

Access Tracks

11.8.15 The Access Tracks, where possible, follow existing tracks around the Site. Currently there is a network of existing tracks for farm vehicles. Where new tracks are required, they will be constructed in a manner similar to the construction compounds, with topsoil scrapped off, matting added, and a layer of hardcore or gravel placed over a levelling layer of substrate. If required, scrapes for drainage will be provided.

11.8.16 The topsoil across the Site varies over short distances, as described in **ES Appendix 11-2: Agricultural Land Classification Survey [APP/6.4]**. To enable topsoil to be replaced in a similar location to its original location, soil will be stored in a low mound adjacent to the track. This will minimise handling and maximise the success of the restoration works, ensuring that the restored land quality will be the same as that pre-construction.

11.8.17 The topsoil will be removed to a typical depth of 25cm, so over a 3.5m width this equates to less than 0.9 cubic metres of soil per metre run. The resultant low mound will be readily grazed or mown.

11.8.18 The land areas by ALC grade affected temporarily by tracks is estimated as set out in Table 11-5. The layout is shown indicatively on **ES Figure 5.1: Concept Masterplan [APP/6.3]**. Based on this illustrative plan, the areas potentially affected by ALC grade have been measured. Whilst the final areas may vary (subject to detailed design post-consent), the variation is unlikely to be significant. The measurement excludes the access track to the National Grid Substation, which will remain in situ permanently.

Table 11-5 Estimate of Access Tracks by ALC Grade (rounded to the nearest 0.1ha)

ALC Grade	Area (ha)	Proportion (%)
1 Excellent	0.3	6
2 Very good	1.9	41
3a Good	1.6	35
3b Moderate	0.8	18
4 Poor	0	0
Total	**4.6**	**100**

11.8.19 The impact is the removal of 3.8ha of BMV for the duration of the Scheme. The works are fully reversible, however, and the impact is therefore of low magnitude, but on resources of

high, medium or low sensitivity. The effect is minor adverse, which is **not significant** in EIA terms.

11.8.20 A worst-case assessment is that, on decommissioning, some or all of these tracks may be left for agricultural use, if the landowners request them to be left. If all were left there would be a permanent loss of 3.8ha of BMV, which is a low magnitude impact on a resource of high sensitivity, which is a **minor adverse** effect, which is **not significant** in EIA terms.

Ground-mounted PV Modules

11.8.21 The start of the construction process involves marking out on the ground, which is done on foot. Teams then lay out the Mounting Structures ready for insertion. This stage is non-intrusive. A tractor and trailer will typically be used to transport the Mounting Structures to the fields, then each is lifted off by hand.

11.8.22 Construction workers then drive metal piles into the ground using small machinery. This is a swift process and has little impact on the soil because the piles are inserted into the soil with no removal of soil and the soil is simply pushed aside. An example of this construction activity is shown in Plate 11-27.

Plate 11-27 Mounting Structure Piles being Installed

11.8.23 The system of the ground-mounted PV modules varies, and both Fixed South Facing PV Arrays and / or Single Axis Trackers may be used in this Scheme, with the final decision to be made at the detailed design stage. Both options involve driving a Mounting Structure into the ground (unless concrete footings are required instead as illustrated in **ES Chapter 5: The Scheme [APP/6.1]**, so the installation process and effects on soils and agricultural land are similar. The limited impact of installing the piles on the underlying land is illustrated in Plate 11-28. The purpose of the photograph is to show that there is very little disturbance to the soils. The design above ground does not affect soils and therefore may vary from the example. The photograph shows the piles as they enter the ground demonstrating the absence of effects on soils and land from the construction method.

Plate 11-28 Mounting Structure Piles being Installed (taken at Tiln Farm, Retford, in

January 2023)

11.8.24 There is minimal damage caused by the next stage of the construction process, which is the assembling of the Mounting Structures and the bolting-on of PV panels to assemble the PV Tables. This stage requires the various framework and panel components to be transported to site. They are lifted off by hand and assembled by hand. Machinery travels down the lines between the ground-mounted PV modules being assembled. There is no ground disturbance, therefore the only risk comes from travelling over the land in typical agricultural-sized machinery.

Plate 11-29 Part Installed Panels (Bentham Farm, Purton)

11.8.25 The installation of the ground-mounted PV modules has a negligible adverse magnitude impact on agricultural land of high, medium and low sensitivity. This results in a **negligible** effect, which is **not significant** in EIA terms.

11.8.26 Associated Development and Ancillary Infrastructure such as Conversion Units / 33kV Sub-distribution Switch Rooms, will require the construction of bases. These items of equipment will be sited on a concrete slab, strips or footings, which will not require deep foundations. The physical works involved, and the potential effects on soils and land quality, will be limited.

11.8.27 It is estimated that each Integrated Conversion Unit will involve a hardstanding area of circa 100m^2. The number of Conversion Units by ALC grade, and the resultant area involved, is set out in Table 11-6.

Table 11-6 Conversion Units by ALC Grade

ALC Grade	No	Area (ha)
1 Excellent	3	<0.1
2 Very good	50	0.5
3a Good	34	0.3
3b Moderate	49	0.5
4 Poor	2	<0.1
Total	**138**	**1.4**

11.8.28 The impact of these items of fixed equipment is a low magnitude impact on resources of high and medium sensitivity, resulting in a **minor adverse** effect, which is **not significant** in EIA terms.

Vehicle Trafficking

11.8.29 There is the potential for construction traffic to cause short-term temporary damage to soil structure if operations take place when soils are wet. It is very unlikely that compaction of these sandy soils will not be capable of being alleviated readily using typical agricultural machinery, even between the rows of panels, and therefore any adverse effects on land quality are considered to be short-term, temporary and reversible (low magnitude impact).

There is not likely to be compaction and damage to soil structure to a degree that would affect land quality. The soils are resilient to machinery travel, as

11.8.30 Plate 11-30 of part of the Site following winter lifting of sugar beet shows. This area is ALC Grade 2, to the west of Keeper's Cottage in Field 5.

Plate 11-30 Grade 2 Soils on Site from which Sugar Beet has been Winter Harvested (Field 5)

11.8.31 The sandy soils within the eastern parts of the Order limits are more resilient to winter trafficking, and as shown in Plate 11-31. Soils show very little deformation from farm traffic.

Plate 11-31 Sandy Subgrade 3b Soils on Site following Sugar Beet Lifting (Field 25)

11.8.32 The magnitude of impact on soils and agricultural land quality resulting from the construction phase is subsequently negligible, on land of high, medium and low sensitivity, resulting in a **negligible** effect which is **not significant** in EIA terms.

Cabling

11.8.33 Cabling around the Solar PV Arrays is usually limited to the end of each row, connecting between the Solar PV panels and the Conversion Units/Switch Rooms, as described in **ES Chapter 5: The Scheme [APP/6.1]**. This cabling normally involves a narrow trench with soils replaced in the same order as they were removed, shortly after the trench is dug. Subject to good practice, as controlled through measures within the **oSMP [APP/7.13]**, this operation is short term and fully reversible.

11.8.34 The impact of cabling is temporary and reversible, and hence of low magnitude. It will impact on agricultural land of high, medium and low sensitivity. Accordingly, the effects will be **minor adverse**, which is **not significant** in EIA terms.

Customer Substation, National Grid Substation and BESS

11.8.35 As described in **ES Chapter 5: The Scheme [APP/6.1]**, the Customer Substation and the National Grid Substation are both expected to have a footprint of up to 4ha each. They will be located in Field 27.

11.8.36 As described in **ES Chapter 5: The Scheme [APP/6.1]**, the BESS could require an area up to 10.5ha across Fields 24 and 27. The base for the BESS is constructed similarly to that of the Construction Compounds, with topsoil stripped and stored in a bund, a matting laid down and stone added. The BESS requires a level base, however, and depending upon the location chosen, some subsoil moving to level the base may be required.

11.8.37 The maximum siting zone for these works are shown spatially on the **Works Plan [APP/2.3]** and are indicatively shown on the below excerpt from **ES Figure 5.1: Concept Masterplan [APP/6.3]** at Plate 11-32, and is followed by an excerpt from **ES Appendix 11-2: Agricultural Land Classification Survey [APP/6.4]** at Plate 11-33.

Plate 11-32 Excerpt from Figure 5.1: Concept Masterplan

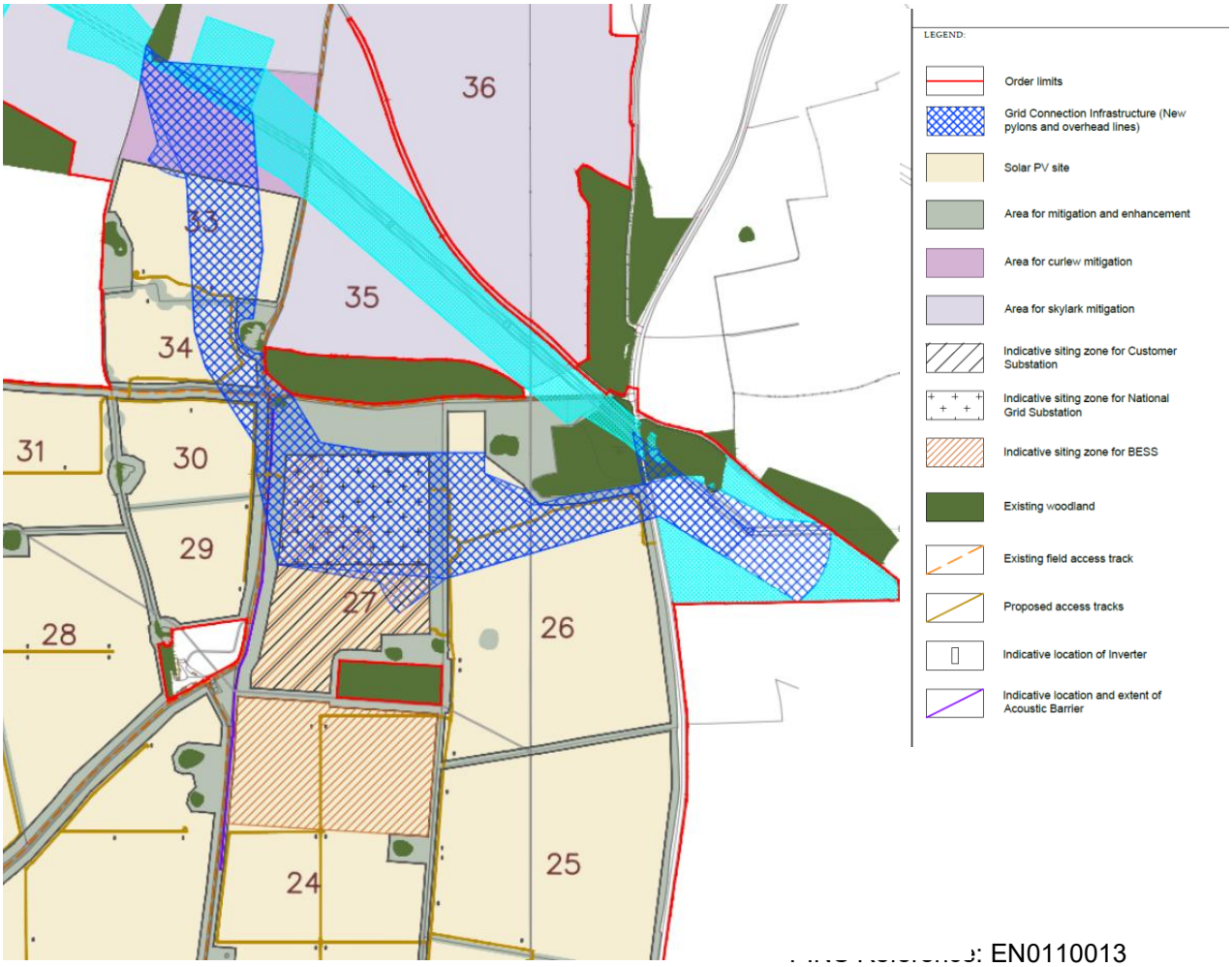
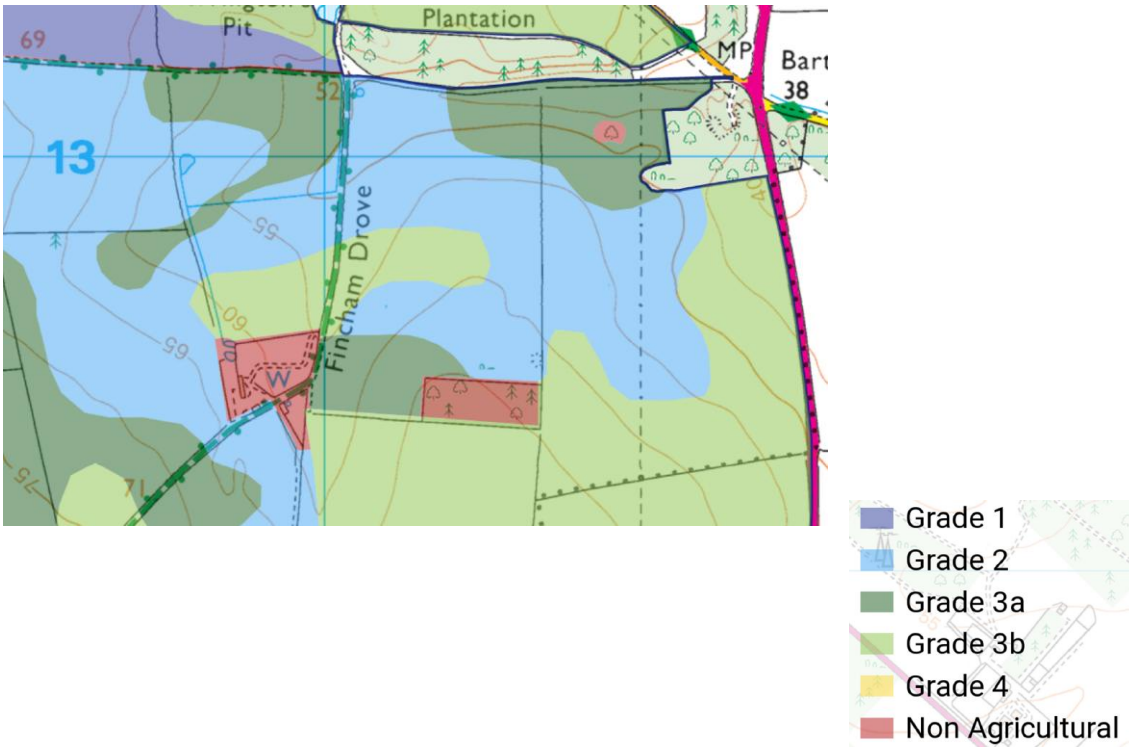
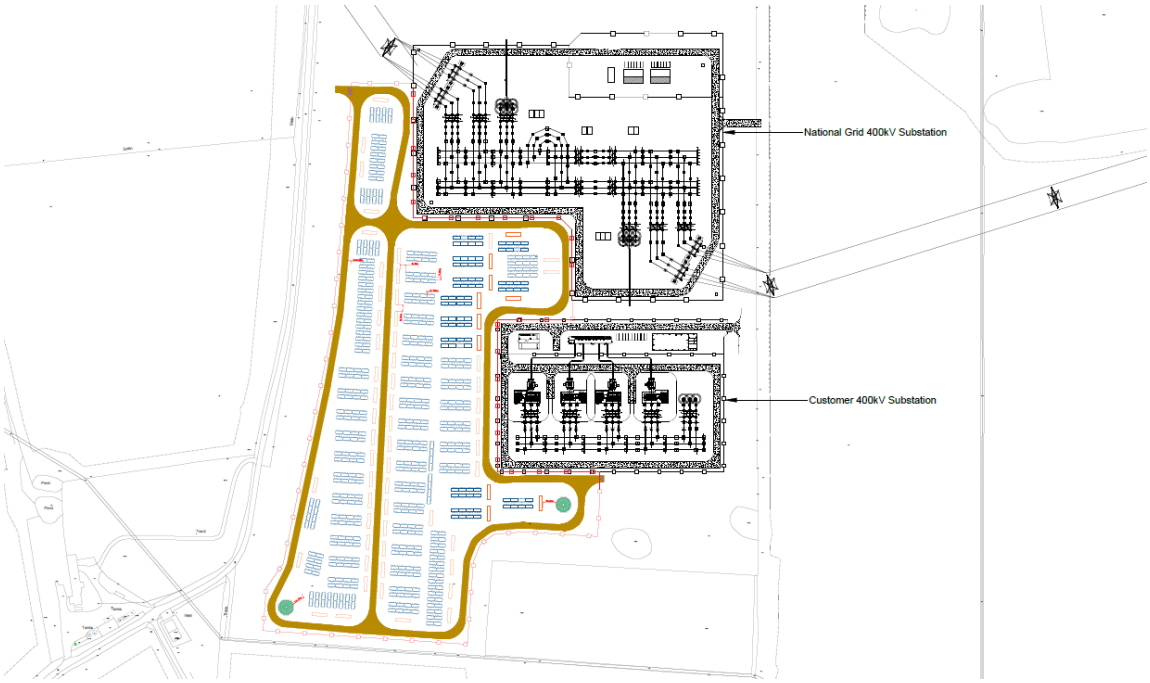


Plate 11-33 Excerpt from the ALC Plan



11.8.38 The illustrative proposals are shown on Plate 11-34 below.

Plate 11-34 Illustrative Proposal for Substations



11.8.39 The BESS is proposed within a largely level field, Field 24, and Field 27. Field 24 is shown in Plate 11-35 below, looking north. This Field slopes gently to the west at the western end, but is otherwise mostly level, so construction of the base for the BESS should involve only topsoil removal, not subsoil.

Plate 11-35 Looking North at the Site for the BESS (Field 24)

11.8.40 Field 27, identified as the indicative siting zone for the Customer Substation, the National Grid Substation and the BESS, is mostly level at the eastern end with a gentle slope to the west at the western end, shown looking north in Plate 11-36.

Plate 11-36 Looking North at the Western End of Field 27

11.8.41 The likely effects of these items of infrastructure are:

(i) BESS: long-term but reversible loss of up to 10.5ha of Subgrade 3b in Field 24, a low magnitude impact on a resource of medium sensitivity, resulting in a **minor adverse** effect, which is **not significant** in EIA terms and potentially 4.4ha of Grades 2 and 3a within Field 27; and

(ii) The Customer and National Grid substations could collectively involve up to 8ha, and this could all be of BMV. It is assumed that the Customer Substation will be decommissioned and removed, with the land returned to the landowner, but that the National Grid Substation and Grid Connection Infrastructure would be left in situ following the decommissioning of the Scheme. This may include small areas for new electricity pylons. The BESS could also be located within Field 27. Depending upon the earthworking needed to level the Site, provided the land can be suitably restored the impact of the Customer Substation and BESS could be a temporary impact of low magnitude (14.5ha) on a resource of high sensitivity (BMV), resulting in an impact of low magnitude on resources of high sensitivity. The potential permanent loss of 4ha of BMV for the National Grid Substation would be a permanent low magnitude impact on a high sensitivity resource. Both impacts are therefore **minor adverse**, which is **not significant** in EIA terms.

11.8.42 A reasonable worst-case impact would be that as a result of the earthworks required and the permanent retention of the National Grid substation and Grid Connection Infrastructure there is a mixture of permanent loss and permanent downgrading of land of BMV quality across the whole of Field 27. If so, this would result in the permanent loss or downgrading of 13.7ha of Grade 2, 5.2ha of Subgrade 3a and 2.8ha of Subgrade 3b. The permanent loss or downgrading of 18.9ha of BMV would be a low magnitude impact in isolation (less than 20ha) on a resource of high sensitivity, resulting in a **minor adverse** effect, which is **not significant** in EIA terms.

Green Infrastructure and Habitat Management

11.8.43 The Mitigation and Enhancement Areas are shown on the **Works Plan [APP/2.3]** and include management of existing habitats, the creation of new habitats through hedgerows, hedgerows with hedgerow trees, and woodland belt planting. These mostly follow existing field edges and do not affect future agricultural land use and will not affect agricultural land quality.

11.8.44 A new hedge is proposed at the northern edge of Field 11, as illustrated on the Green Infrastructure Strategy Plans which sit within the **oLEMP [APP/7.11]** Plate 11-37**.** This will create a small grassland paddock and will create a field that will not be readily suited to arable use after decommissioning, but the impact is low because an agricultural use can continue. The proposals and the existing are compared in the following plates.

Plate 11-37 Extract from the Green Infrastructure Strategy Plan

Plate 11-38 Google Earth of the Area

11.8.45 Neither of these will have any adverse impacts on agricultural land quality.

11.8.46 The mitigation areas will cover approximately 80ha of land (northern part of Fields 33 and Fields 35 – 38). These areas will continue to be managed or farmed, with the

mitigation taking the form of small 4m x 6m skylark plots (2 per ha) across most of the area, and 8.8ha of grassland used for grazing but which will provide habitat in addition for curlew.

11.8.47 Areas of planting are proposed at the northern edge of Field 27 and to the west of the copse and the northern edge of Field 26. Collectively these two areas account for 1.8ha of Grade 2 and 2.5ha of Subgrade 3a land.

11.8.48 The impacts of these works will be negligible. Within the Green Infrastructure areas, the land quality has been determined as mostly grade 3b but with modest areas of grades 1, 2 and 3a, and so of high and medium sensitivity, but it will not be affected. The consequence is a negligible impact on high and medium sensitivity resources, resulting in a **negligible** effect, which is **not significant** in EIA terms.

Collective Effect on Agricultural Land Quality

11.8.49 The effects on the components during the construction phase of the Scheme are summarised as follows:

(i) Temporary Construction Compounds: minor adverse, not significant in EIA terms

(ii) Access Tracks: minor adverse, not significant in EIA terms

(iii) Ground-mounted PV modules: negligible, not significant in EIA terms

(iv) vehicle trafficking: negligible, not significant in EIA terms

(v) Cabling: minor adverse, not significant in EIA terms

(vi) Customer Substation: minor adverse, not significant in EIA terms

(vii) National Grid Substation: minor adverse, not significant in EIA terms

(viii) BESS: minor adverse, not significant in EIA terms; and

(ix) Green Infrastructure: negligible, not significant in EIA terms.

Whilst individually these works are not significant in EIA terms,

11.8.50 Table 11-7 provides a summary of all the areas disturbed.

Table 11-7 Areas Disturbed by ALC Grade

Component	ALC Grade					
	1	2	3a	3b	4	Total
Short-term temporary						
Construction compounds (locations known)	0	1.0	0	1.0	0	2.0
Construction compounds (locations not known)	Worst case 9.1 BMV					9.1
Total	10.1ha BMV, 1.0ha non-BMV					
Long-term temporary						
Access tracks	0.3	1.9	1.6	0.8	0	4.6
Ground-mounted PV modules	<0.1	0.5	0.3	0.5	<0.1	1.4
Vehicle trafficking	0	0	0	0	0	0
Cabling	0	0	0	0	0	0
Customer Substation and BESS (Field 27)	0	9.2	5.2	2.8	0	17.2
BESS (Field 24)	0	0	0	10.5	0	10.5
Total	19.1ha BMV, 14.7ha non-BMV					
Permanent						
NG Substation	0	4.5	0	0	0	4.5
Mitigation planting	0	1.8	2.5	0	0	4.3
Total	8.8ha BMV					

11.8.51 Collectively the amount of BMV disturbed amounts to 38ha on a worst-case scenario (this assumes that the BESS is on BMV land within Field 24). A permanent impact of 38ha would exceed 20ha and accordingly would be a medium magnitude impact on BMV resources of high sensitivity. If permanent losses, this would result in an effect of moderate adverse significance if the impacts were permanent, which is **significant** in EIA terms.

11.8.52 As described in this section, the construction compounds and the works within the Solar Site will be removed with the possible exception of some tracks. A reasonable worst-case assessment would be that the access tracks and all of Field 27 are not restored on decommissioning, and this would result in the loss permanently of 22.7ha of BMV, plus 4.3ha of mitigation planting (27.0ha total). This would be a medium magnitude impact on land of high sensitivity, which is of moderate adverse significance, which is **significant** in EIA terms.

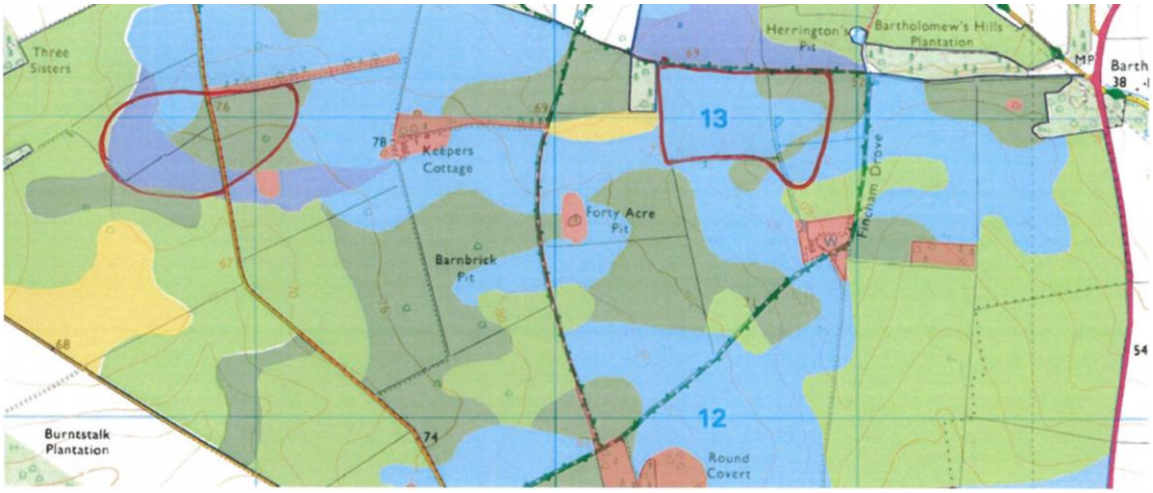
11.8.53 The likely scenario is that all but the National Grid Substation and Grid Connection Infrastructure will be restored to the original ALC grade on decommissioning, which would reduce the permanent loss to 4.5ha of BMV, which would be a low magnitude impact on a high sensitivity resource, which would be of **minor adverse** significance, which is **not significant** in EIA terms.

11.8.54 If the mitigation planting in Fields 26 and 27 is considered as a permanent loss, this would increase the permanent land loss to 8.8ha of BMV. This would therefore remain a low magnitude impact on a resource of high sensitivity, resulting in a **minor adverse** significance effect, which is **not significant** in EIA terms.

Effects on Soils

11.8.55 The potential effects on soils are broadly similar to the effects on agricultural land. The disturbance to soils is generally temporary and limited. The soils within the Order limits are mostly of low sensitivity across the Order limits, i.e. they are generally resilient to being handled and disturbed. Only a modest number of sample points were of medium sensitivity. Isolated points can be ignored due to a pattern limitation (i.e. they are not representative of the normal in that area), but the two areas below were mapped as sandy clay loam, and are of medium sensitivity (Plate 11-39).

Plate 11-39 Areas of Medium Sensitivity Soils



11.8.56 Soils are not generally disturbed during the construction phase. Disturbance to soils is mostly restricted to the physical moving of soils for the creation of tracks and bases, or cabling, as described in the preceding section reviewing the effects on land quality, or to

any adverse effects from the movement of machinery causing surface damage or, potentially, compaction.

11.8.57 The machinery involved in the construction and installation of the PV Tables is generally small, as reviewed in the consideration of the effect on land quality, and generally smaller than most farm machinery. There will not be a requirement for multiple trafficking across the same areas other than delivering the equipment (Mounting structures, PV Tables, PV panels) along the gaps between the Ground-mounted PV Modules, and any damage to the soil surface in those areas will generally be limited and can readily be remedied, as described in the **oSMP [APP/7.13]**.

11.8.58 The machinery required to construct the tracks, bases for the BESS, bases for the Conversion Units / 33kV Sub-distribution Switch Rooms, will be larger, and these works should be carried out when soils are sufficiently dry. This is described in the **oSMP [APP/7.13]**. The effect on soils will be temporary.

11.8.59 The effects on soils are assessed for each of the works for which land quality impacts were assessed:

- Temporary construction compounds: these will be temporary works on soils of low sensitivity, resulting in a low magnitude impact and a consequential **minor adverse** effect, which is **not significant** in EIA terms.

- Access tracks: greater care will be needed in the areas identified as of medium sensitivity, but overall the access tracks will result in low magnitude impacts on some medium but mostly low sensitivity soils, resulting in a **minor adverse** effect, which is **not significant** in EIA terms.

- Ground-mounted PV modules: the works of the modules will have little and a temporary impact on soils, and consequently a low magnitude impact on a mostly low sensitivity resource, result in a **minor adverse** effect, which is **not significant** in EIA terms.

- Vehicle trafficking: the greatest potential for damage to soils is from vehicle trafficking. The adverse impacts of trafficking when soils are unsuitable will be mitigated by good practice secured in the **oSMP [APP/7.13]**. In the two areas of medium sensitivity, where soils have a higher clay content, these soils will be less resilient when wet. The impacts will, however, be temporary and any structural damage can be made good, resulting in a low magnitude impact on medium and low sensitivity resources. This results in a **minor adverse** effect, which is **not significant** in EIA terms.

- Cabling: cabling works will similarly need to follow the **oSMP [APP/7.13]** principles, but should then result in temporary and reversible effects, which will be of low magnitude on medium and low sensitivity resources, resulting in **minor adverse** effects, which are **not significant** in EIA terms.

- Substations and BESS: the areas involved with these works are all on low sensitivity soils. By good management, following principles in the **oSMP [APP/7.13]** (for which a detailed

SMP is secured by Requirement of the **draft DCO [APP/3.1]**) soils will not be permanently affected. Long-term storage of low sensitivity soils should not result in any long-term loss of soil functions. Overall, notwithstanding the quantum of soil involved, the impact will be temporary and so of low magnitude on a low sensitivity resources, resulting in a **minor adverse** effect, which is **not significant** in EIA terms.

- Green infrastructure will have no impact on soils and therefore the effect is negligible, on low sensitivity soils, resulting in a **negligible** effect, which is **not significant** in EIA terms.

11.8.60 Therefore, the effects on soils (excluding the National Grid Substation and Grid Connection Infrastructure) are temporary. A temporary, reversible impact on soil-related features (including biomass production) is a low magnitude impact. The soils in the Order limits are of medium or low sensitivity; therefore the effect will be **minor adverse**, which is **not significant** in EIA terms.

Effects on Agricultural Businesses

11.8.61 Effects on the occupying farm businesses will commence and change during the construction phase. The effects on farm size and structure, and long-term operation, being the effects once the Scheme is constructed, are described under the operation phase section below.

11.8.62 Construction activity will be carefully controlled so that the use of the local highway network is not significantly affected, so travel between farmyards and agricultural land in the area will continue unhindered. There are no internal tracks within the area of the Scheme that serve other farmland, so the Scheme will not significantly affect any existing access routes between fields not within the Scheme.

11.8.63 There are only low or negligible construction phase impacts on agricultural businesses, which are of low sensitivity. Accordingly, the construction phase effects are **negligible**, which is **not significant** in EIA terms.

Summary of Construction Phase Effects

11.8.64 In respect of direct effects during the construction phase, it is concluded as follows:

11.8.65 **Agricultural land quality**. The majority of the Scheme will not affect agricultural land quality. Works that involve soil disturbance are limited in scale, temporary and mostly reversible, and therefore of low magnitude. BMV quality land within the Order limits accounts for approximately 54% of the agricultural land, but the quantum disturbed is potentially 38ha (10.1ha construction compounds, 19.1ha long-term, 8.8ha permanent). All but 4.5ha of this will be fully restored on decommissioning. Accordingly, the impact is of low magnitude on resource of high sensitivity, resulting in an adverse effect of **minor adverse** significance, which is **not significant** in EIA terms.

11.8.66 **Soils**. The soils are mostly of low sensitivity, with two areas of medium sensitivity. The soils will generally not be disturbed, and disturbance for installation of the solar PV

modules, trenching and cable laying will be temporary. Overall, the magnitude of impact is low, on resources of medium and low sensitivity, resulting in an adverse effect of **minor adverse** significance, which is **not significant** in EIA terms.

11.8.67 **Agricultural businesses**. Construction works are temporary and short-term, and there are only low or negligible adverse impacts on farms of medium or low sensitivity, resulting in **negligible** adverse effects, which is **not significant** in EIA terms.

Operational Phase

11.8.68 **The assessment of the Scheme's operational phase effects is based on the Scheme as outlined in ES Chapter 5: The Scheme [APP/6.1].**

11.8.69 **The potential effects during the operational phase of the Scheme are:**

- Effects on agricultural land from long-term grassland uses and the effects from site maintenance activities
- Effects on soils from long-term grassland use, the ground-mounted PV modules and site maintenance activities
- Effects on the operation of the farm businesses and local agricultural labour needs; and
- Food production and wider economic implications. This is generally an economic/ land use consideration.

Agricultural Land

11.8.70 There will be no further disturbance to soils during the operation phase of the Scheme; therefore, the agricultural land quality within the Order limits will not be physically affected during this phase of the Scheme.

11.8.71 There will be no requirement for heavy machinery to traffic soils during the operation phase. Accordingly, there will be no significant disturbance of soils affecting land quality. The combination of increasing organic matter levels (see below) and lack of machinery activity will allow a natural enhancement of the soil. This will not, however, alter the ALC grade of land within the Order limits.

11.8.72 Maintenance and cleaning machinery will be transported via a van or small tractor, which is generally lighter than most farm machinery. A typical cleaning machine is shown in Plate 11-40. If the soils are wet when access is taken, there is the potential for slight indentations to be made (such as shown in Plate 11-41 for a development similar in nature to the Scheme), but such effects on soils are not significant and will not alter the ALC grade. Typically, the machinery such as illustrated in Plate 11-40 is used, which is no heavier than a small tractor. Cleaning typically takes place in late spring, to clean the panels before the main solar generation period, when soils are normally dry and therefore not susceptible to

damage in any event, but cleaning is possible at any time of the year when ground conditions allow.

Plate 11-40 Cleaning of Solar Modules

11.8.73 There may occasionally be small rutting caused by agricultural vehicles (for example quads) or vans used by engineers. Typical light impacts are illustrated in Plate 11-41. These indents will normally be levelled by the feet of grazing sheep or will level naturally over time, but if there are deeper ruts they could be repaired by a lightweight roller in the spring.

Plate 11-41 Example of Minor Ruts Caused by Vehicles

11.8.74 There may be occasional need for works of repair which might disturb soils. These will be infrequent. This may be a need for panel replacement, but this will be a pre-planned activity that can take place when the land is suitably dry. include PV Panel repair or replacement, but vehicles would access the area via the internal tracks. If possible, any works

requiring soils to be driven over or moved should be timed for the summer period, following the guidance outlined in the **oSMP [APP/7.13]**. Any trenching, whether carried out in ideal conditions or not, rapidly recovers and is indistinguishable once grass cover has returned. These effects will be of negligible magnitude.

11.8.75 Therefore, there are no physical works required during the operation phase which will adversely affect agricultural land quality. The land quality will be unchanged. The impacts are therefore of negligible magnitude, on resources of medium or high sensitivity, resulting in an effect of **negligible** significance, which is **not significant** in EIA terms.

11.8.76 In terms of land use, there will be a change over most of the Order limits from arable (cereals and break crops mostly) to grassland. Once the elements of the Scheme have been installed, the land may be used by sheep for grazing (or otherwise managed grassland). Both land uses fall within the definition of agriculture (Ref 11-18). The change of agricultural land management from mostly arable farming with some outdoor livestock and sheep, to grazing and biodiversity management (as described in **ES Chapter 5: The Scheme [APP/6.1]**) is a land management consideration. Land use changes of this nature do not result in an adverse effect on agricultural land quality. As set out in Natural England's Technical Information Note TIN049 (Ref 11-10) "*the current agricultural use, or intensity of use, does not affect the ALC grade*".

11.8.77 The effect on agricultural land quality during the operation phase is therefore **negligible** on resources of high, medium and low sensitivity, resulting in a **negligible** effect, which is **not significant** in EIA terms.

Effect on Soils

11.8.78 There will be potential for beneficial effects on soil health and quality.

11.8.79 The majority of land within the Order limits is currently arable land fertilised with inorganic fertiliser, as well as spread with farmyard manure and liquid slurry. Livestock (pigs, poultry and sheep) are kept on rotation.

11.8.80 The land will be sown to grassland and managed, including potentially by being grazed with sheep, for the duration of the operation phase. This is expected to have a positive benefit for the soils.

11.8.81 Soil is an important resource. It is estimated by the Environment Agency that the UK's soils store about 10 billion tonnes of carbon, equal to about 80 years of greenhouse gas emissions, but that an estimated 4 million hectares are at risk of compaction and 2 million ha are at risk of erosion. Intensive agriculture has caused arable soils to lose 40 – 60% of their organic carbon (Ref 11-19).

11.8.82 The EA's report (Ref 11-19) notes that significant decreases in erosion risk occur when fields change from winter cereal use to permanent grassland. Organic matter in soils acts like a sponge and can hold 20 times its weight in water. In the British Society of Soil Science (Ref 11.20) note they identify that "*significant long-term land use change (eg.*

conversion of arable land to grassland or woodland) has by far the biggest impact on soil organic carbon (SOC)", and that soils with a higher rate of SOC are less prone to runoff and erosion, have greater water infiltration and retention, increased biological activity and improved nutrient supply.

11.8.83 Overall, therefore, for the majority of land within the Order limits, where arable soils will go into long-term grassland land coverage, there will be a significant benefit for soils. This will be a temporary benefit, however, in that the benefits would potentially be reduced or lost if arable farming activities recommence following decommissioning. Overall, therefore, the benefit is a temporary impact and of low magnitude, on a resource of medium and low sensitivity, resulting in a **minor beneficial** effect, which is **not significant** in EIA terms.

11.8.84 In respect of adverse effects, there will be no requirement for heavy machinery to traffic soils during the operation phase except during periods of ad hoc replacement of infrastructure. Accordingly, there will be no compacting of soils and the combination of increasing organic matter levels and lack of machinery activity will allow a natural enhancement of the soil. There will be no adverse impacts, therefore.

11.8.85 Water run-off from PV panels will reach the ground under the Solar PV Arrays. PV panels come in sections and water drains down between these sections. Soils will not be harmed during the operation phase due to lack of moisture. This can be seen in Plate 11-42 and Plate 11-43 where gaps between PV panels can be seen and grass growth below the panels is good.

Plate 11-42 Solar PV Arrays Showing Gaps Between PV panels

Plate 11-43 Grass Growth Below and Between Solar PV Arrays

11.8.86 There is therefore the potential for improvements in one or more soil functions. These are beneficial impacts. They are, however, temporary and could be reversed once soils are returned to arable cropping following decommissioning. Any adverse effects on soils during the operation phase will be negligible. The effects are therefore assessed as being of low or negligible magnitude, on resources of medium or low sensitivity, resulting in **minor** or **negligible beneficial** and **adverse** effects, which are **not significant** in EIA terms.

Agricultural Businesses

11.8.87 There are a number of farm businesses and enterprises operating in the Site. All are full-time businesses. The enterprises all relate to land within the Site, although all could and do also operate on other land. There are no effects of severance.

11.8.88 There are currently four fields in the Ground-mounted PV Modules areas (Fields 3, 12, 19 and 20) used for the rearing of free-range pigs. These enterprises are run separately to the principal arable farms. It is understood that these enterprises, which are rotated every 2-3 years in any event, will be able to relocate to land outside the Site. The impact on these businesses will be of medium magnitude, depending upon when works commence and how close to natural relocation the enterprises are at that time. All businesses will experience a significant change in day-to-day operations, either from reduced scale or the need to relocate. Taking a reasonable worst-case assessment the impacts are considered potentially of medium magnitude. Medium magnitude impacts on farm businesses of medium and low sensitivity result in a **minor adverse** effect, which is **not significant** in EIA terms.

11.8.89 Two substantial arable farming enterprises will be affected. One of these is in-hand. One is occupied on a short-term tenancy operation. The scale of impact is considerable, and both enterprises will be affected adversely to a medium magnitude of impact, being a significant adverse effect on the day-to-day operations of a farm business. The businesses will not be rendered unviable, however. There is the potential for replacement farming enterprises such as sheep grazing under and around the panels, which could be operated by different individuals, and overall the quantum of agricultural labour is not expected to be significantly different as a result of the change from arable production to sheep production. Both businesses are of low sensitivity, being arable holdings.

11.8.90 The impacts on the arable businesses will be adverse, and long-term temporary. Adverse effects from reduced arable production may be replaced by income from sheep production, but for this ES, a worst-case assessment is made. Both arable enterprises will have to reduce in scale, but neither will be rendered non-viable. No farm buildings or other key components of the enterprises will be affected. There will be no impacts on these holdings as a result of severance. Access to maintain irrigation and water supplies will be retained.

11.8.91 As such the worst-case magnitude of impact is assessed as a significant change in the day-to-day operations, which will be medium magnitude impact for both enterprises. However as both enterprises are arable operations but they are of low sensitivity. Consequently, for both arable enterprises the effects are of long-term temporary **minor adverse** significance, which is **not significant** in EIA terms.

11.8.92 Parts of the Site are used on short-term arrangements for vegetable growers. These are large agricultural business, and whilst there will be a need for them to source other land or otherwise to reduce their scale of operation, the reductions will be of low magnitude on low sensitivity resources, and therefore **minor adverse** and **not significant** in EIA terms.

11.8.93 The land is, in part, grazed by sheep, which are flocks grazing over winter stubble and stubble crops. Sheep grazing has the potential to continue, and expand, under and around the PV panels. In respect of the effect on the sheep business, these are expected to be beneficial impacts for the duration of the operation phase. They will be low magnitude, long-term temporary benefits, on enterprises of low sensitivity, which will be long-term temporary beneficial effects of **minor beneficial** significance, which is **not significant** in EIA terms.

Use of BMV and Food Production on a Regional Scale

11.8.94 In response to the Applicant's Scoping Opinion Request (**ES Appendix 2.1: EIA Scoping Opinion Request [APP/6.4]),** PINS set out in their Scoping Opinion (**ES Appendix 2.2: Scoping Opinion [APP/6.4]**) that confirmed the cumulative effect on food production and the use of BMV land on a regional scale should be included in the ES.

11.8.95 The Order limits extends to approximately 839ha. ALC information has been completed for 799ha of agricultural land (including hedges, field margins etc). The Order limits includes approximately 13ha of non-agricultural land, and approximately 27ha is roads or land that has not been surveyed. Within the Order limits approximately 455ha is of BMV quality. The solar PV site involves 608ha. This section of the Chapter sets out the potential effects of agricultural production changes on a wider scale. There is no policy that requires agricultural land to be farmed, or to produce food, and this section is included to cover the issue raised in the Scoping Response Report.

11.8.96 Norfolk as a County has an estimated area (from the provisional ALC maps from the 1970s) of the order of 479,000ha of agricultural land. Over 433,000ha of this is Grades 1, 2 and 3a. The ALC grade for Norfolk is broken down in Table 11-8, along with the figures for Breckland District.

Table 11-8 Provisional ALC Breakdown

	Norfolk		Breckland	
ALC Grade	Area (ha)	Proportion (%)	Area (ha)	Proportion (%)
1 excellent	45,529	8.4	0	0
2 very good	88,398	16.4	10,678	8.2
3 good to moderate	299,449	55.4	73,107	56.0
4 poor	45,662	8.5	23,535	18.1
5 very poor	112	0.0	65	0
NA non-agricultural	49,294	9.1	21,958	16.8
U urban	11,644	2.2	1,169	0.9
Total	**540,088**	**100**	**130,512**	**100.0**

11.8.97 Natural England estimate that 42% of agricultural land is BMV (see TIN049 Appendix 11.12). Statistically about 40% of undifferentiated Grade 3 is therefore anticipated to be subgrade 3a. Using that crude estimate, the proportion of BMV land in Norfolk is therefore approximately 53%, which is higher than the national average. For Breckland, the proportion is 37%, slightly below the national average.

11.8.98 The amount of land within the Site is approximately 0.15% of the land within the County. This is a negligible quantum on a regional basis. Therefore in terms of the use of BMV land, the regional impact is therefore considered to be **negligible**, which is **not significant**.

11.8.99 The UK Food Security Report (published 11 December 2024) (Ref 11.21) concludes that food production levels could be maintained or moderately increased alongside the land use change required to meet our Net Zero and Environment Act 2021 (Ref 11-28) targets and commitments. The UK is currently about 75% self-sufficient in indigenous foods (i.e. foods that we can grow). Overall, the UK production to supply ratio is about 62% for all food, up from 61% in 2023.

11.8.100 These proportions have been similar and stable for many years. Government sets no requirements or provides no incentives for land to be farmed for food. Agri-environmental incentives seek to take land out of arable cropping. At 1 June 2024, the most recent figures available, some 305,000ha of arable land was in agri-environmental (i.e. non-food producing) land uses (Ref 11.22), and this had increased to 444,000 by 1 June 2025 (Ref 11-29).

11.8.101 The Written Ministerial Statement "Solar and Protecting our Food Security and Best and Most Versatile Land" (Ref 11.23), stated that "even in the most ambitious scenarios (solar) would still occupy less than 1% of the UK's agricultural land". The Utilised Agricultural Area (UAA) of England is 8.7 million ha (Ref 11.22). Even if 1% of that was used for solar, some 87,000ha, it would represent less than 30% of the arable land currently being funded for non-food uses.

11.8.102 The OECD Outlook 2025 to 2034 (2025) (Ref 11.24) predicts that total global consumption of agricultural and fish commodities is expected to grow 13% by 2034, but to support growing demand agricultural and fish production is projected to expand by 14% over the same period. This will mostly be driven by productivity gains. 22% of calories consumed globally are expected to be traded across borders. In terms of cereals, by 2034 the OECD projection is that 40% of cereals will go to human consumption, 34% to animal consumption, and the remainder to biofuels and industrial use.

11.8.103 In the Solar Roadmap (June 2025) (Ref 11-25) it is noted in Part 2 (page 21) that "the biggest risk to food security and the natural environment is the climate and nature crisis. That is why it is important that the UK takes a leadership role, working with partners around the world, in accelerating to net zero, including by rapidly expanding solar power generation". In the solar misconceptions section it states that "the biggest threat to food security is crop failure due to climate change and solar farms are helping to tackle this directly".

11.8.104 In the consultation preceding the proposed Land Use Framework (Ref 11-17) page 15 sets out the approximate percentage of England's total agricultural land area that will need to change by 2050. This includes 5% changing mainly to environmental and climate benefit uses with limited food production, and 9% changing away from agricultural food production for environmental and climate change benefits.

11.8.105 In that context, the report comments on page 16 that "the Government is committed to maintaining food production. Our assessment is that, based on historical trends of productivity improvement, and supported by new and emerging innovations, the impact of these land use changes on domestic food production will be offset by productivity improvements. We expect that recent trends of increased productivity from agricultural land will continue. Working in partnership, Government will put in place a policy environment to support those changes". It comments on page 27 that "we need to build new homes and clean energy, water infrastructure and transport infrastructure at scale and at pace".

11.8.106 These statistics enable the following conclusions:

- Agricultural land quality in Norfolk is statistically better than the all-England average, and in Breckland the proportion is slightly lower than the England average
- The government's analysis shows that food self-sufficiency is stable and slightly improving, and that there is no cause for concern
- The world-wide predictions are that food supplies will improve over the next decade worldwide

- The UK government's funding on agri-environmental land uses currently funds non-food land uses over an area of about three times the area they anticipate is needed to meet our solar objectives; and

- Government expects land use change to be necessary to meet biodiversity and climate change obligations, but it expects that to be achieved without an adverse effect on food production.

11.8.107 Overall, the impacts on agricultural land use and food production on a local, regional and national scale are negligible. Food production is not a receptor for which magnitude of sensitivity has been ascribed, but a negligible impact will be a **negligible effect**, which is **not significant** in EIA terms.

The Economic and Other Effects from the use of BMV Land

11.8.108 NPS EN-3 (Ref 11.4) and the NPPF (Ref 11.7) advise that the economic and other benefits of the use of BMV land should be considered. To assess the economic benefits of BMV land, one methodology is to compare the economics of BMV land to poorer quality land, assuming that such land is used for PV panels as an alternative.

11.8.109 The Site is used for the growing of cereals, vining peas, sugar beet, maize for Anaerobic Digestion (AD), some vegetables, outdoor pig production, sheep grazing, free-range egg production and agri-environmental uses. Crops grown and their areas and end-users will vary over time.

11.8.110 Policy requires that the economic and other benefits of BMV land be recognised. The economic benefits of BMV to non-BMV land must be the incremental difference between the two, rather than the absolute production. Therefore, if BMV land yields a greater crop than non-BMV, the benefit of BMV is the difference between the two rather than the absolute production.

11.8.111 Table 11-9 shows the economic and production difference between high and average budgeting figures in a recognised budget book (Ref 11-26).

Table 11-9 Yield and Economic Differences

Item	Winter Wheat		Winter Barley	
	Average	High	Average	High
Yield (t/ha)	8.2t/ha	9.4t/ha	7.3/ha	8.4t/ha
Output (£)	£1,667/ha	£1,884/ha	£1,410/ha	£1,588/ha
Gross Margin (£)	£988/ha	£1,210/ha	£808/ha	£995/ha
Uplift (£)	-	£222/ha	-	£187/ha

11.8.112 The economic benefit of the 455ha of BMV within the Scheme would therefore, using this crude estimate, be of the order of £100,000 per year (£85,085 - £101,010). This

represents, crudely, the additional economic benefit from this being BMV land rather than non-BMV land.

11.8.113 In respect of production, taking a 3 wheats, 1 barley crop ratio, the food production benefits of 455ha of BMV to non-BMV land would be of the order of 530 tonnes/year (341ha wheat x 1.2t/ha, 114ha barley x 1.1t/ha). In 2024, which was a poor harvest year, the UK produced 11.1 million tonnes of wheat and 7.1 million tonnes of barley, so the incremental benefits from the BMV are negligible in terms of UK production.

11.8.114 There are no magnitude and sensitivity criteria for wider economic effects in Tables 11-3 and 11-4. However, in respect of the economic and other benefits of BMV land within the Scheme:

- The economic benefits are about £100,000 per annum but this is **negligible** on a regional basis which is **not significant**. A negligible impact results in a **negligible effect**, which is **not significant** in EIA terms; and

- The food production benefits are estimated at under 500 tonnes per annum incremental production benefit, which is **negligible** on a regional and national scheme. A negligible impact results in a **negligible effect**, which is **not significant** in EIA terms.

Decommissioning Phase

11.8.115 On decommissioning of the Scheme, most of the long-term temporary impacts will be removed. The adverse effects on food production will be removed. The beneficial impacts on soil health will cease. Only the National Grid Substation and the Grid Connection Infrastructure will remain in situ.

Effects on Agricultural Land Quality

11.8.116 The cabling connecting the ground-mounted PV Modules will be disconnected, the PV panels will be dismantled and removed and the framework unbolted. The piles will then be pulled out using machinery not dissimilar to that which installed the framework posts. This machinery will likely have tracks to dissipate ground pressure and will be operated in dry conditions.

11.8.117 Once the ground-mounted PV Modules have been removed the bases for the fixed infrastructure can be removed. This will involve removing the crushed stone bases and matting, loosening the soil to remove compaction, then returning topsoil to the areas. The topsoil will then be worked with normal agricultural machinery to create a tilth suitable for return to the landowner.

11.8.118 The approach to the removal of cables is set out in **ES Chapter 5: The Scheme [APP/6.1]**. Where cables are to be removed this will be by digging a narrow trench, removing topsoil to one pile, subsoil to another, removing the cable then replacing the soils. This will

result in an adverse impact on the soil structure, and hence land quality, but it will be temporary and fully reversible.

11.8.119 The soils across the Solar PV Site will then be returned to the farmers. These works will be set out in a detailed SMP to be secured by Requirement of the **draft DCO [APP/3.1]**.

11.8.120 There will be no adverse effects on land quality from these decommissioning works.

11.8.121 The removal of the tracks will involve removing the base material and matting, loosening the subsoil to break any compaction, and replacing the original topsoil which has been stored adjacent to the track for the duration of the operation phase.

11.8.122 Removal of the BESS will require all the material and bases to be removed. The stone can then be removed, and the matting taken away. The subsoil will then need mechanical ripping to alleviate any compaction, after which topsoil can be spread back over the area, and agricultural use can resume.

11.8.123 Similar restoration works are required for the Customer Substation. Where any levelling has occurred, it will be important to restore the original contour using subsoil prior to replacing the topsoil. The restoration of these areas, which are of BMV quality, will necessitate careful soil management when conditions are suitable. A detailed Soil Management Plan would be prepared substantially in accordance with the measures outlined in the **oSMP [APP/7.13]**, secured by the corresponding requirement in the draft DCO and approved by Breckland Council prior to restoration works taking place, so as to ensure comparable land quality restoration is achieved.

11.8.124 As described in **ES Chapter 5: The Scheme [APP/6.1]**, the National Grid Substation and Grid Connection Infrastructure will not be removed.

11.8.125 The impacts on land quality from the decommissioning works will all be temporary. Temporary and fully reversible impacts are of low magnitude. The agricultural land quality resources are of high, medium and low sensitivity across the Site. Low magnitude impacts on such resources result in **minor adverse** effects, which is **not significant** in EIA terms.

Soils

11.8.126 Decommissioning can be timed to be carried out when soil conditions are suitable, which is set out in the **oSMP [APP/7.13]**. Subject to suitable mitigation, decommissioning is therefore not anticipated to result in any effects greater than those during construction.

11.8.127 The impacts on soil are therefore of low magnitude, on resources of medium and low sensitivity, resulting in **minor adverse** effects, which are **not significant** in EIA terms.

Farm Businesses

11.8.128 There will be a period of 1-2 years during decommissioning when agricultural activity across the Site will be disrupted. This will be a short-term temporary disruption. The

agricultural enterprises that may be operating at the time of decommissioning will be based on sheep production. These will be of low sensitivity, in that sheep grazing can be moved to different areas. Accordingly, whilst the impact will be medium magnitude, the effect will be **minor adverse**, which is **not significant** in EIA terms.

11.9 Additional Mitigation Measures

Additional Construction Phase Mitigation Measures

11.9.1 No further mitigation measures have been incorporated into the Scheme's design for the construction phase, as the embedded mitigation measures ensure there is no need for any additional mitigation.

Additional Operational Phase Mitigation Measures

11.9.2 No further mitigation measures have been incorporated into the Scheme's design for the operation phase as the embedded mitigation measures ensure there is no need for any additional mitigation..

Additional Decommissioning Phase Mitigation Measures

11.9.3 No further mitigation measures have been incorporated into the Scheme design for the decommissioning phase.

11.10 Residual Effects

11.10.1 The locations of some short-term temporary construction compound works are not yet determined, so a worst-case assumption has been made that they will be on BMV land. The detailed layout of the substations and BESS within fields 24 and 27 are not yet determined, and a worst-case assumption that much of these fields will be affected has been made.

11.10.2 With those assumptions in place:

- Short-term temporary construction works could involve 6.8ha BMV and 1.0ha non-BMV
- Long-term temporary works could involve 19.1ha BMV and 4.2ha non-BMV
- Permanent works could involve 4.5ha BMV, plus 4.3ha of BMV for mitigation planting.

11.10.3 The residual effects are summarised as follows:

(i) Construction Phase

- **Agricultural land**. Collectively the amount of land of BMV quality that will be disturbed temporarily could be 38ha, which (as a worst-case scenario) would exceed the 20ha threshold in Table 11-3. The permanent loss will be 4.5ha for the National Grid Substation. The temporary loss of over 20ha of BMV is a low

magnitude impact on a resource of high sensitivity, resulting in a minor adverse effect. The permanent loss of 8.8ha (including 4.3ha of woodland) of BMV will be a low magnitude impact on a resource of high sensitivity, resulting in a minor adverse effect, which is **not significant** in EIA terms; and

- **Soils**. The soils are mostly of low sensitivity due to their high sand fraction, but there are two modest areas (less than 10% of the Site) of medium sensitivity. The effect of construction activities will be temporary and of low magnitude on resources of medium and low sensitivity, resulting in effects that are minor adverse, which is **not significant** in EIA terms.

(ii) Operational Phase

- **Agricultural land**. There will be no significant adverse effects on agricultural land during the operation phase. The impacts will be negligible on resources of high, medium and low sensitivity, resulting in negligible effects, which is **not significant** in EIA terms

- **Soils**. There will be beneficial impacts on soils resulting from long-term resting from arable production. There are no adverse impacts. The benefits are however temporary and so of low magnitude, on resources of medium and low sensitivity, resulting in minor adverse effects, which is **not significant** in EIA terms; and

- **Agricultural businesses**. There will be adverse impacts on a number of agricultural businesses, including two arable enterprises (low sensitivity), three pig units on short-term and rotation arrangements of medium sensitivity, periodic sheep grazing and rotation short-term vegetable cropping (all of low sensitivity). Overall, there will be medium and low magnitude impacts on resources of medium and low sensitivity, resulting in adverse effects that are minor adverse, which is **not significant** in EIA terms.

(iii) Decommissioning Phase

- **Agricultural land**. The impacts will mostly be temporary and reversible, and consequently of low magnitude on land of high, medium and low sensitivity. The permanent land-take associated with the National Gris substation and infrastructure will be less than 5ha of BMV and of low magnitude on high-sensitivity resources. The resultant effects are minor adverse, which is **not significant** in EIA terms

- **Soils**. The impacts on soils are similarly temporary and reversible, and of low magnitude. Most of the soils are of low sensitivity, but there are two areas of medium sensitivity. The resultant effect is minor adverse, which is **not significant** in EIA terms; and

- **Agricultural businesses**. The land will have sheep grazing enterprise(s), grazing parts of the Site. These enterprises are of low sensitivity and whilst the impact will

be of medium magnitude, the effect is minor adverse, which is **not significant** in EIA terms.

11.10.4 Overall, there are **no significant adverse effects** (in EIA terms) on soils and agriculture.

11.11 Cumulative Effects Assessment

11.11.1 This section presents an assessment of cumulative effects between the Scheme and other existing and/or approved developments.

11.11.2 As set out in **ES Chapter 2: EIA Process and Methodology [APP/6.1]**, a Cumulative Effects Assessment (CEA) has been undertaken as part of the EIA in accordance with PINS Advice on Cumulative Effects Assessment (September 2024) and has considered two types of cumulative effects:

- In combination effects: the combined effect generated by individual effects on a particular receptor (presented within **ES Chapter 17: In-Combination Effects [APP/6.2]**; and
- Cumulative effects: effects generated by the Scheme and other planned or approved developments on the same receptor (presented in **ES Volume 2, Chapters 6 – 16 [APP/6.2]**).

In-Combination Effects

11.11.3 In-combination effects occur when receptors are subject to effects under more than one environmental topic. As such, the effects presented in **ES Volume 2, Chapters 6 to 16 [APP/6.2]** (regardless of whether they are classed as significant or not significant) have been reviewed to identify receptors subject to one or more types of effect to ensure that the interrelationship between each of the aspects of the environment likely to be affected by the Scheme has been properly evaluated and considered.

11.11.4 These has been summarised and tabulated to demonstrate where these effects have the potential to occur and is presented in **ES Chapter 17: In-Combination Effects [APP/6.2]**.

11.11.5 No likely significant in-combination effects relating to Soils and Agriculture have been identified.

Cumulative Effects

11.11.6 Cumulative effects may arise as a result of effects associated with the Scheme combining with effects associated with other developments. The list of developments has been narrowed down to focus on those developments which are most likely to give rise to cumulative effects. A long-list was generated which was then refined following consultation with relevant local planning authorities. This short-list forms the basis of this assessment.

11.11.7 A short list of cumulative developments/allocations can be found in **ES Appendix 2.4: Cumulative Schemes [APP/6.4]**.

Relevant Developments

11.11.8 Those developments which have the potential to result in cumulative effects on Soils and Agriculture within the associated study area are set out in Table 11-10~~Error! Reference source not found.~~. The remaining schemes are not considered to have cumulative effects within the Soils and Agriculture study area.

11.11.9 The two shortlisted solar sites are described as follows:

(i) EN0110010 High Grove Solar Farm. The information is taken from the High Grove PEIR Chapter 5 (April 2025). There is 1,650ha of agricultural land within the proposal, a mix of loamy and sandy soils. The ALC survey results identified 354ha of Grade 2, 761ha of Subgrade 31 and 536ha of Subgrade 3b. The area expected to be permanently affected is less than 20ha; and

(ii) EN0110014 East Pye Solar. The information is taken from the East Pye PEIR Chapter 13 (January 2025). There is no published ALC information within the PEIR as surveys were still ongoing. The area of BMV expected to be temporarily affected will exceed 20ha, but the area permanently affected is expected to reduce to less than 20ha following decommissioning.

11.11.10 The effects of the shortlisted proposals are summarised in Table 11-10.

Table 11-10 Short List Developments/Allocations relevant to Soils and Agriculture

Short List Ref	Planning Ref	Description	Distance from the Scheme	Potential Effect
1	EN0110010	High Grove Solar Farm over 1,400ha	Adjoining	The land quality information has identified 1,115ha of Grade 2 and 3a, but less than 20ha is expected to be permanently affected.
2	EN0110014	East Pye Solar	Approx 40km	The land quality information is not yet published, but the permanent effect is expected to be less than 20ha.
3	EN010079	Norfolk Vanguard Offshore Windfarm onshore elements	6km	The Scheme involves mostly Grades 1, 2 and undifferentiated Grade 3, based on the provisional maps, but the works are

				temporary and no significant permanent effect is predicted.
4	EN010087	Norfolk Boreas Offshore Windfarm onshore elements	6km	The Scheme involves mostly Grades 1, 2 and undifferentiated Grade 3, based on the provisional maps, but the works are temporary and no significant permanent effect is predicted.

Construction Phase

11.11.11 No significant cumulative effects on agricultural land are anticipated, as the works are mostly temporary and therefore are of low magnitude on land of high and medium sensitivity resulting in a minor cumulative effect.

Operational Phase

11.11.12 The agricultural land area of Norfolk is of the order of 479,000 hectares based on the provisional ALC, as set out in Table 11-8. The utilised agricultural land area of England is about 70% of land, and whilst that may be higher in an arable county such as Norfolk, if that figure is used then of the order of 335,000 hectares are farmed across the County. The Droves, East Pye and High Grove will account for of the order of 3,300 hectares which is around 1% of farmed land in Norfolk.

11.11.13 No significant cumulative effects on the availability of agricultural land or on soils are anticipated. There will be additional impacts on agricultural land use for arable cropping from the High Grove Solar Farm and East Pye Solar, but the effects on food production regionally and nationally are expected to be negligible. The impacts are mostly temporary so of low magnitude, on resources of high and medium sensitivity, resulting in minor cumulative adverse effects.

Decommissioning Phase

11.11.14 Decommissioning works (for High Grove Solar and East Pye Solar) will mostly result in temporary and reversible impacts (low magnitude), on resources of high and medium sensitivity. The overall effect will be minor adverse, which is **not significant** in EIA terms.

11.11.15 All schemes are expected to involve small areas of permanent land take, for fixed infrastructure, or permanent mitigation areas. Consequently there is the potential for permanent land loss of BMV quality from all the developments to exceed 20ha, which would result in a cumulative impact of medium magnitude on resources of high sensitivity, resulting in a moderate adverse effect which would be **significant** in EIA terms

11.12 Conclusion

11.12.1 This chapter has set out and assessed the likely effects of the Scheme in relation to Soils and Agriculture. Likely effects have been assessed for the construction, operation and decommissioning phases of the Scheme. Following the implementation of embedded mitigation and additional as detailed in **Section 11.8**, residual effects have been identified in relation to Soils, Agricultural land and Agricultural Businesses during the construction, operation and decommissioning phases.

11.12.2 Table 11-11 sets out a summary of the Soils and Agriculture residual environmental effects.

Table 11-11 Summary of Residual Effects for Soils and Agriculture

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Embedded Mitigation	Scale and Nature of Effect (with embedded mitigation)	Additional Mitigation	Residual effect (with additional mitigation)	Monitoring requirement
Construction Phase								
Land of BMV quality	High	Long-term temporary loss of BMV land.	Low	OSMP	Low	None	Minor Adverse	No
Land of BMV quality	High	Permanent loss of BMV land	Low	OSMP	Low	None	Minor Adverse	No
Soils	Medium, mostly low	Effects on soil structure that cannot be ameliorated	Low	OSMP	Low	None	Minor Adverse	No
Agricultural Businesses	Low	Short-term disruption to activities	Low	None	Low	None	Negligible	No
Operational Phase								
Land of BMV quality	High	Damage / loss of BMV	Negligible	OSMP and SMP	Negligible	None	Negligible	No

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Embedded Mitigation	Scale and Nature of Effect (with embedded mitigation)	Additional Mitigation	Residual effect (with additional mitigation)	Monitoring requirement
Soils	Medium, mostly low	Effects to soil structure	Low	OSMP and SMP	Low	None	Minor Adverse and Beneficial	No
Agricultural Businesses	Medium and low	Economic effects	Medium and low	None	Medium and low	None	Minor Adverse	No
Food production	Low	Impacts on regional food production and security	Negligible	None	Negligible	None	Negligible	No
Decommissioning Phase								
Damage to Land	High	Disturbance and loss	Low	SMP	Low	None	Minor Adverse	No
Soils	Medium, mostly low	Damage to structure	Low	SMP	Low	None	Minor Adverse	No
Agricultural Businesses	Low	Temporary disruption to land use	Low	None	Low	None	Minor Adverse	No

11.13 References

Ref 11-1 Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land, MAFF (1988).

Ref 11-2 HMSO The Town and Country Planning (Development Management Procedure) (England) Order 2015, Statutory Instrument 2015 No 595 (2015)

Ref 11-3 National Policy Statement for Energy (NPS EN-1) (2024)

Ref 11-4 The National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2024)

Ref 11-5 Department for Environment, Food and Rural Affairs (Defra). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2009)

Ref 11-6 The National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2024)

Ref 11-7 The National Planning Policy Framework (NPPF) (2024)

Ref 11-8 Department for Energy Security and Net Zero, Clean Power 2030 Action Plan (December 2024)

Ref 11-9 Breckland Council, Breckland Local Plan (September 2023)

Ref 11-10 Natural England's Technical Information Note TIN049 "Protecting the Best and Most Versatile agricultural land, edition 2" (2012)

Ref 11-11 The Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings

Ref 11-12 Institute for Sustainability and Environmental Professionals (ISEP, formerly IEMA) Guide 'A New Perspective on Land and Soil in Environmental Impact Assessment', (2022)

Ref 11-13 Natural England 1:250,000 Series Agricultural Land Classification "East Region" (2010)

Ref 11-14 ALC as digitised 2020

Ref 11-15 Natural England 1:250,000 Likelihood of Best and Most Versatile (BMV) Agricultural Land "East Region" (2017).

Ref 11-16 Soil Survey of England and Wales 1:250,000 Sheet 4 soils of Eastern England (1983)

Ref 11-17 HM Government, Land Use Consultation (January 2025)

Ref 11-18 Town and Country Planning Act 1990, as amended, section 336

Ref 11-19 Environment Agency Summary of the State of the Environment: Soils (January 2023)

Ref 11-20 British Society of Soil Science, Science Note: Soil Carbon (2021)

Ref 11-21 Defra United Kingdom Food Security Report 2024 (2024)

Ref 11-22 Defra Agricultural Land Use in the United Kingdom at 1 June 2024 (September 2024)

Ref 11-23 Statement by the Secretary of State for Energy Security and Net Zero 'Solar and Protecting our Food Security and Best and most Versatile (BMV) Land, (15 May 2024)

Ref 11-24 OECD and Food and Agriculture Organisation of the United Nations, OECD-FAO Agricultural Outlook 2025-2034 (2025)

Ref 11-25 Department for Energy Security and Net Zero "Solar Road Map" (June 2025)

Ref 11-26 Nix Farm Management Pocketbook 2026 Edition (September 2025)

Ref 11-27 DLUHC Planning Practice guidance, renewable and Low Carbon Energy (last updated 14 August 2023)

Ref 11-28 HMSO, Environmental Act 2021 (2021)

Ref 11-29 Defra, Agricultural Land Use in the United Kingdom at 1 June 2025 (September 2025)

THE DROVES
SOLAR FARM