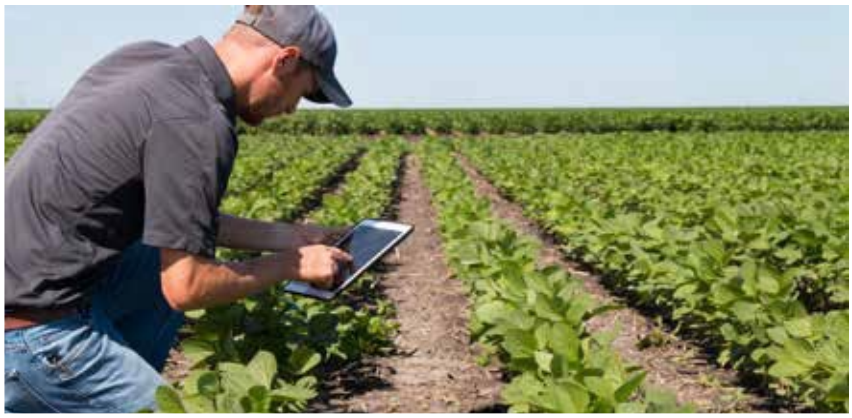
Hamilton Solar

Hamilton Solar

Agricultural Land Classification

October 2025

ADAS

ADAS GENERAL NOTES

Project No.: 1011522

Title: Hamilton Solar – Agricultural Land Classification

Date: 31/10/2025

Office: ADAS Rosemaund, Preston Wynne, Hereford HR1 3PG

Status: ed02

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Date:	13/03/2025	Date:	14/03/2025

EXECUTIVE SUMMARY

ADAS have been instructed by RE Projects Development (REPD) to undertake an Agricultural Land Classification survey of 7.7 hectare (ha) land east of Sutton-in-Ashfield, NG17 5LB (herein referred to as 'the site').

The survey has identified deep, red, slightly stony, sandy soils. These soils form agricultural land of Subgrade 3a (7.7 ha, 100%) quality.

The principal limitation to the agricultural use of the land is soil droughtiness.

CONTENTS

1 INTRODUCTION

ADAS have been instructed by RE Projects Development (REPD) to undertake an Agricultural Land Classification (ALC) survey. This report provides information on the soils and agricultural quality of 7.7 ha land east of Sutton-in-Ashfield, NG17 5LB. The report is based on a survey of the land undertaken in February 2025.

1.1 Site Environment

The site is located at the eastern outskirts of Sutton-on-Ashfield, bordered by Hamilton Road to the north west, A617, Sherwood Way to the north east, and Cauldwell Road to the south. The site comprises of one agricultural field and measures a total area of 7.7 ha.

The field slopes from 142 m in the northern corner to 153 m at the south eastern boundary.

The site is in a Low Flood Risk Zone. This zone is deemed to be at lowest risk of flooding from rivers or sea, with less than 1 in 1000 annual probability of flooding in any year (<0.1%)[1].

1.2 Agricultural Use

The site is currently utilised for arable crop production.

1.3 Published Information

1.3.1 Geology

1:50,000 scale BGS information[2] records one geological unit; Lenton Sandstone Formation, which underlies the entire site area. This is a sedimentary bedrock formed between 272.3 and 247.1 million years ago during the Permian and Triassic periods.

No superficial geology has been mapped for the area.

1.3.2 Soils

One soil has been mapped on the 1:250,000 scale National Soil Map[3]. The mapping records the site as belonging to the following soil association:

- **Cuckney 1 Association** – These are well drained sandy and coarse loamy soils, often over soft sandstone with a risk of wind erosion. All the soils are very permeable and well drained (Wetness Class I) so they readily absorb winter rain.

[1] Environment Agency - Flooding Service. Online resource at https://flood-map-for-planning.service.gov.uk/flood-zone-results-explained?zone=FZ1

[2] British Geological Survey, 2019. *Geology of Britain viewer*. Online resource: http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html

[3] Bulletin No. 12 *Soils and their use in Midland and Western England*. Soil Survey of England and Wales; Harpenden (1984). Regional 1:250,000 scale soil map Sheet 3 Midland and Western England. https://www.landis.org.uk/publications

1.3.3 Previous Agricultural Land Classification

The Natural England Regional Agricultural Land Classification Map[4] shows the survey area as Grade 3.

A previous detailed ALC survey was conducted in the surrounding area[5]. This land has been mapped as Subgrade 3a and Grade 2.

2 METHODOLOGY

A detailed soil survey was carried out in February 2025. The survey was based on observations at intersects of a 100 m grid, giving a sampling density of at least one observation per hectare. During the survey soils were examined via a combination of auger borings and a soil description pit to a maximum depth of 1.2 m. A map showing the location of each observation point is attached to this report as Appendix 1 and a log of the details of each observation point is attached to this report as Appendix 3.

One soil description pit was dug at this site. The pit was assessed following the methodology detailed in The Soil Survey Field Handbook[6]. For the pit a soil sample representative of the top 25cm was submitted to NRM laboratories for particle size distribution (psd) analysis by the pipette methodology to confirm site findings, as well as an upper subsoil sample. The results of this analysis are given in Section 3 and in Appendix 4 (Pit A).

[3] Natural England, 2023. Regional Agricultural Land Classification Map. Online resource: https://publications.naturalengland.org.uk/publication/144017?category=5954148537204736

[5] Natural England, 2016. Agricultural Land Classification detailed Post 1988 ALC survey, Mansfield, Rushley Farm, Nottingham Road (ALCC11695). Online resource: https://publications.naturalengland.org.uk/publication/5715302369722368

[6] Soil Survey Field Handbook, Hodgson, J.M. (1974)

3 SOILS

3.1 Soil Types

One soil type is found across the survey area. The survey area was found to be loamy medium sand topsoil over loamy medium sand or medium sand subsoils to depth. Two observation points showed clayey subsoils, however, since the pit in their immediate vicinity showed the predominant soil type, these two observation points have been considered local anomalies and mapped with the rest of the site.

3.1.1 Soil Type 1

These soils are deep, very slightly to moderately stony soils. They have loamy medium sand topsoil over loamy medium sand or medium sand, weakly developed subsoils.

An example soil profiles are described below from the pit:

0-32 cm	Dark brown (75YR3/3) loamy medium sand; slightly stony (7%); moderately developed medium subangular blocky structure; very friable; common fine fibrous roots; porosity >0.5% biopores greater than 0.5mm diameter; abrupt, smooth boundary to:
32-55 cm	Yellowish red (5YR4/6) and reddish brown (5YR5/3) loamy medium sand; moderately stony (20%); weakly developed medium subangular blocky structure; very friable; porosity >0.5% biopores greater than 0.5mm diameter; gradual, smooth boundary to:
55-120 cm	Reddish brown (5YR5/3 and 5YR5/4) loamy medium sand; very slightly stony (5%); weakly developed medium subangular blocky structure; very friable; porosity >0.5% biopores greater than 0.5mm diameter.

The soil profile is in a location with 167 FCDs and is a well-drained profile so falls into Wetness Class I. This profile is limited to Subgrade 3a because of a droughtiness limitation resulting from a reduced available water capacity because of the sandy soil texture causing low moisture balances (Moisture Balance, MB Wheat = -8.7 mm & MB Potatoes = -12.2 mm).

Photograph 1: Pit

3.2 Laboratory Analysis

A sample representative of the top 25 cm of the soil profile was taken from the pit (Pit A TS), as well as an upper subsoil samples (USS). These soils were submitted to NRM Laboratories for particle size distribution (PSD) analysis by the pipette methodology. The laboratory report is given in Appendix 4, the laboratory textures are given in the table below.

Table 3.2: PSD analysis results

Observation	PSD Analysis
Pit A TS	Loamy medium sand
Pit A USS	Loamy medium sand

4 AGRICULTURAL LAND CLASSIFICATION

The Agricultural Land Classification (ALC) system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use for food production. The limitations can operate in one or more of four principal ways; they may affect the range of crops which can be grown, the level of crop yield, the consistency of crop yield, and the cost of obtaining a crop.

The classification system gives considerable weight to flexibility of cropping, whether actual or potential, however the ability of some land to produce consistently high yields of a narrower range of crops is also taken into account.

The Agricultural Land Classification (ALC) system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced by the then Ministry of Agriculture, Fisheries and Food (MAFF) in the 1960s and revised in 1988. A description of the grades used in the ALC system is attached to this report as Appendix 5.

4.1 Climate

The agricultural climate is an important factor in assessing the agricultural quality of land, and the agricultural climate of this site has been calculated using the Climatological Data for Agricultural Land Classification[7]. The relevant site data for an average elevation of 147 m AOD is given below.

Table 4.1: Agro-climatic variables

	SK 515 587
Altitude(m)	147
Average Annual Rainfall (AAR)	725 mm
January-June Accumulated Temperature (AT0)	1278 day °C
Field Capacity Days (FCD)	167
Field Capacity Period	Early Nov – mid April
Moisture Deficit Wheat (MDW)	90 mm
Moisture Deficit Potatoes (MWP)	76 mm
Climate (upper grade limit)	2

The site has a climate limitation of ALC Grade 2.

[7] Meteorological Office, (1989). *Climatological Data for Agricultural Land Classification*.

4.2 Results

The results of the soil survey described in Section 3 were used in conjunction with the agro-climatic data above to classify the land according to the revised guidelines for Agricultural Land Classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food (now Defra)[8].

This report has identified agricultural land of Subgrade 3a quality. The principal limitation to agricultural use of the land is soil droughtiness.

Grade 1

No land of this quality has been mapped.

Grade 2

No land of this quality has been mapped.

Subgrade 3a

The entire area of 7.7 ha of Subgrade 3a land within the survey area is allocated to this grade. This land is principally formed of loamy medium sand topsoil over loamy medium sand or medium sand subsoils to depth. They are deep, well-draining soils and fall into Wetness Class I.

The moisture balances, excluding those for auger borings 7 & 8 which appeared anomalies as assessed from the Pit dug between these locations, fall between 0.4 mm and -8.7 mm for wheat and -4.7 mm and -12.2 mm for potatoes which place the land in Subgrade 3a based on droughtiness. Two observation points had clayey subsoil and therefore less of a droughtiness limitation, but since the detailed observation in their vicinity did not confirm this soil type, they have been considered local anomalies and mapped with the rest of the land.

The principal limitation to the agricultural use of the land is soil droughtiness.

Subgrade 3b

No land of this quality has been mapped.

Grade 4

No land of this quality has been mapped.

Grade 5

No land of this quality has been mapped.

Non-agricultural

No land of this quality has been mapped.

[8] MAFF, (1988). *Agricultural Land Classification for England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land*.

Urban

No land of this description has been mapped.

Not Surveyed

All land was surveyed.

4.3 Summary of grade areas

The boundaries between the different grades of land are shown in Appendix 2. The area occupied by each grade is shown below.

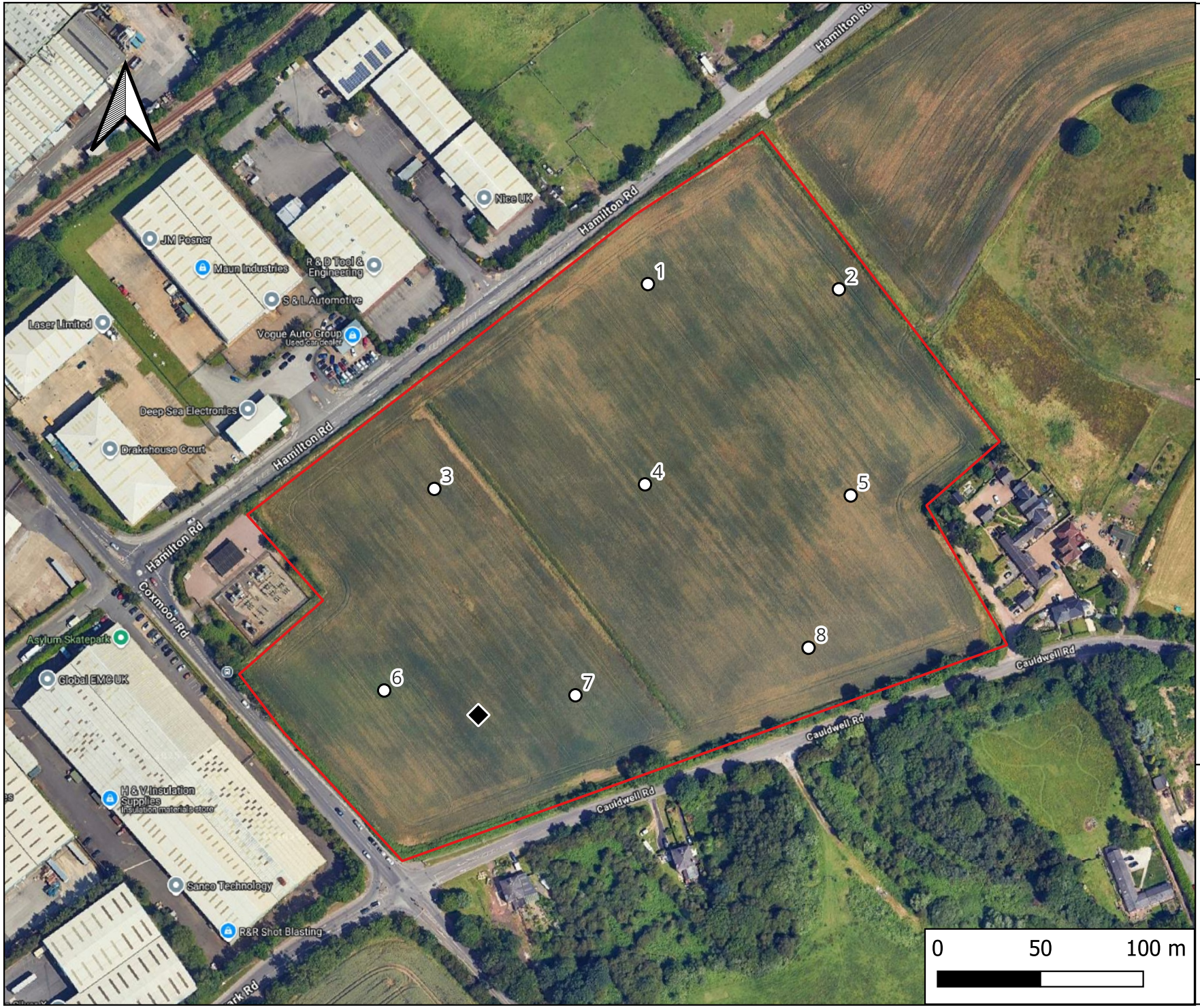
Table 4.3: Grade areas

Grade / subgrade	Area (ha)	Area (%)
Grade 1	-	-
Grade 2	-	-
Subgrade 3a	7.7	100 %
Subgrade 3b	-	-
Grade 4	-	-
Grade 5	-	-
Non-agricultural	-	-
Urban	-	-
Not Surveyed	-	-
Total	**7.7**	**100 %**

5 CONCLUSION

The survey has identified deep, red, slightly stony, sandy soils with loamy medium sand topsoil and loamy medium sand or medium sand subsoils. These soils form agricultural land of Subgrade 3a (7.7 ha, 100%) quality.

The principal limitation to the agricultural use of the land is soil droughtiness.



Appendix 1: Observation Location Map

Project

Hamilton Solar

Client

RE Projects Development

Key

- Pit
- Augers
- Red Line Boundary

Google Satellite Hybrid

ADAS

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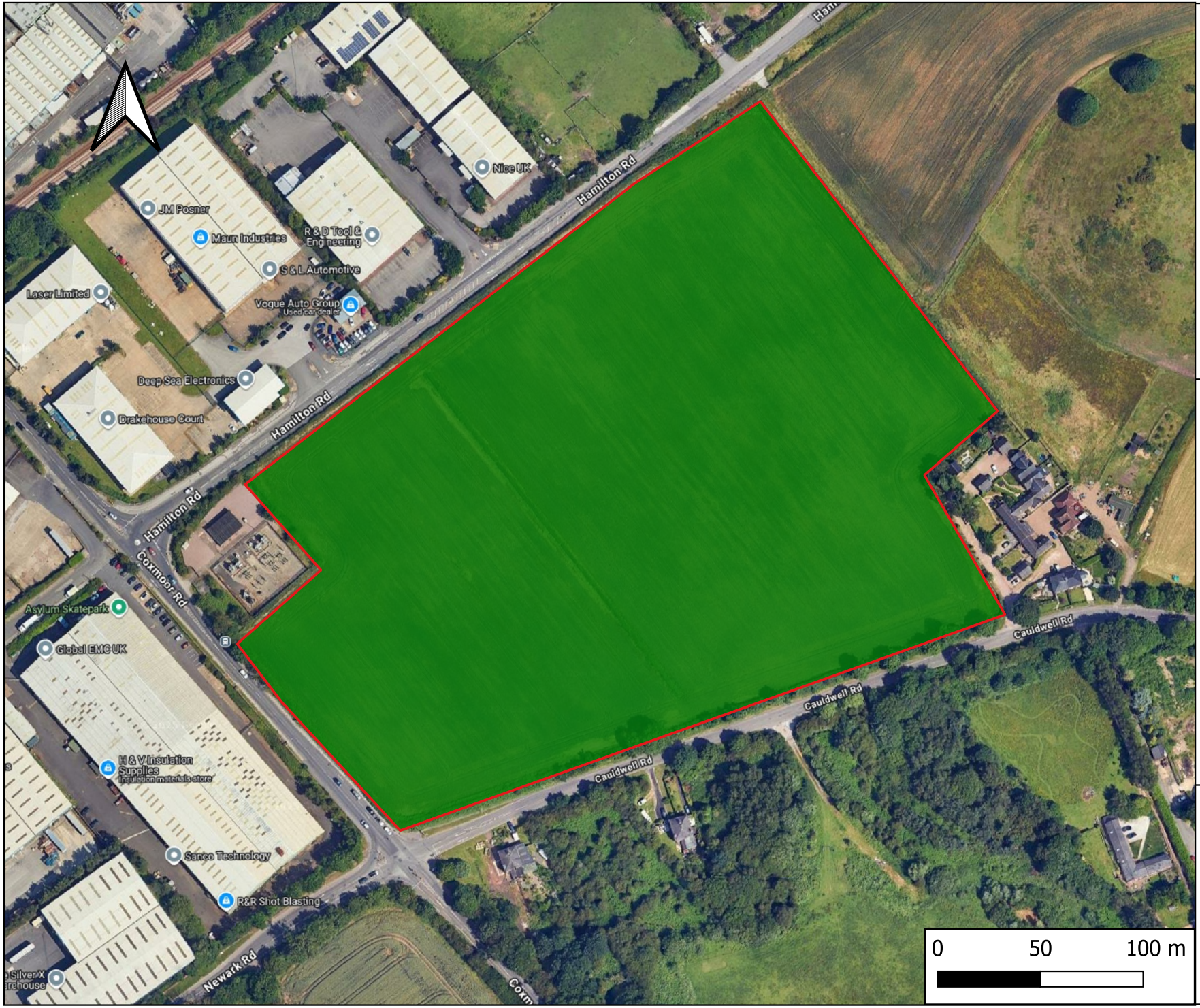

Appendix 2: Agricultural Land Classification Map

Project

Hamilton Solar

Client

RE Projects Development

Key

Red Line Boundary

ALC Grade

- 1
- 2
- 3a
- 3b
- 4
- 5
- Non agric
- Urban

Google Satellite Hybrid

ADAS

www.adas.co.uk

APPENDIX 3 – ALC SURVEY DETAILS

Key to auger records:

Texture		Principal limitation(s) to Agriculture		Stone lithology	
C	clay	CL	climate	1	hard rocks or stones
ZC	silty clay	DE	depth	2	soft, medium or coarse-grained sandstones
SC	sandy clay	DR	droughtiness	3	soft 'weathered' igneous or metamorphic rocks or stones
ZCL	clay loam (H - heavy, M - medium)	ER	erosion	4	soft oolitic or dolomitic limestones
SCL	silty clay loam (H - heavy, M - medium)	FL	flooding	5	soft fine-grained sandstones
SZL	sandy silt loam (F - fine, M - medium, C - coarse)	GR	gradient	6	soft, argillaceous or silty rocks or stones
ZL	silty loam	MR	microrelief	7	chalk or chalk stones
SL	sandy loam (F - fine, M - medium, C - coarse)	ST	stoniness	8	gravel with non-porous stones
LS	sand (F - fine, M - medium, C - coarse)	TX	texture	9	gravel with porous stones
S	sand (F - fine, M - medium, C - coarse)	WE	wetness		
Org	organic				
Pty	peaty				
Pt	peat (S - sandy, L - loamy, H - humified, SF - semi-fibrous, F – fibrous)				
R	bedrock				

Droughtiness Calculation		CaCO3		Other abbreviations	
MDW	moisture deficit wheat [mm]	non	non-calcareous	SPL	slowly permeable layer
MDP	moisture deficit potatoes [mm]	v sl ca	very slightly calcareous	FMCs	ferri-manganiferous concretions
MBW	moisture balance wheat [mm]	sl ca	slightly calcareous		
MBP	moisture balance potatoes [mm]	ca	calcareous		
Grade W	droughtiness grade for wheat	v ca	very calcareous		
Grade P	droughtiness grade for potatoes				

Appendix 3: Auger Boring Log

Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Texture	Primary Colour	Mottling	FMCs	Gleying	SPL	$CaCO_3$	Stones (%)		Slope (°)	WE Class	WE Grade	DR Grade	Overall Grade	Limit(s)
									Total	Litho'						
1	0 - 34	LMS	75yr31 (very dark grey)	None	None	No	-	non	2	1	4-7°	I	1	3a	3a	DR
Latitude:	34 - 60	LMS	75yr52 (brown)	None	None	No	No	non	5	1	Droughtiness Calculation					
53.124785	60 - 120	LMS	5yr44 (reddish brown)	Few	None	No	No	non	1	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											90	76	-2.5	-7.6	3a	2
-1.228815																
2	0 - 39	LMS	75yr32 (dark brown)	None	None	No	-	non	2	1	4-7°	I	1	3a	3a	DR
Latitude:	39 - 58	LMS	5yr54 (reddish brown)	None	None	No	No	non	2	1	Droughtiness Calculation					
53.12475333	58 - 120	MS	5yr52 (reddish grey)	None	Few	No	No	non	1	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											90	76	-4.1	-6.1	3a	2
-1.227428333																
3	0 - 38	LMS	75yr31 (very dark grey)	None	None	No	-	non	2	1	4-7°	I	1	3a	3a	DR
Latitude:	38 - 120	LMS	25yr46 (red)	None	None	No	No	non	5	1	Droughtiness Calculation					
53.1239											MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											90	76	-1.2	-5.5	3a	2
-1.230381667																
4	0 - 38	LMS	75yr31 (very dark grey)	None	None	No	-	non	2	1	4-7°	I	1	3a	3a	DR
Latitude:	38 - 120	LMS	25yr46 (red)	Few	None	No	No	non	5	1	Droughtiness Calculation					
53.12391											MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											90	76	-1.2	-5.5	3a	2
-1.228851667																
5	0 - 34	LMS	75yr32 (dark brown)	None	None	No	-	non	2	1	4-7°	I	1	3a	3a	DR
Latitude:	34 - 61	LMS	75yr53 (brown)	None	None	No	No	non	2	1	Droughtiness Calculation					
53.12385167	61 - 120	LMS	5yr53 (reddish brown)	Few	None	No	No	non	1	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											90	76	-2.1	-7.1	3a	2
-1.227358333																
6	0 - 34	LMS	75yr31 (very dark grey)	None	None	No	-	non	2	1	4-7°	III	2	2	2	DR,WE,CL
Latitude:	34 - 58	LMS	10yr52 (greyish brown)	None	None	No	No	non	5	1	Droughtiness Calculation					
53.12302167	58 - 120	C	25yr46 (red)	Common	Common	Yes	Yes	non	1	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											90	76	17.2	2.9	2	2
-1.230761667																
7	0 - 38	MSL	75yr32 (dark brown)	None	None	No	-	non	4	1	4-7°	I	1	1	2	CL
Latitude:	38 - 74	SCL	5yr46 (yellowish red)	None	None	No	No	non	7	1	Droughtiness Calculation					
53.12299167	74 - 87	LMS	5yr56 (yellowish red)	None	None	No	No	non	1	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:	87 - 120	C	25yr44 (reddish brown)	None	Few	No	No	non	1	1	90	76	43.7	31.0	1	1
-1.229373333																
8	0 - 40	LMS	75yr32 (dark brown)	None	None	No	-	non	4	1	4-7°	I	1	3a	3a	DR
Latitude:	40 - 68	LMS	5yr46 (yellowish red)	None	None	No	No	non	2	1	Droughtiness Calculation					
53.12318833	68 - 120	LMS	5yr56 (yellowish red)	None	None	No	No	non	1	1	MDW	MDP	MBW	MBP	Grade W	Grade P
Longitude:											90	76	0.4	-4.7	3a	2
-1.227676667																

APPENDIX 4 – LABORATORY ANALYSIS

ANALYTICAL REPORT

Report Number	**81876-25**	**L129**	**THEA NIEMANN**
Date Received	**04-MAR-2025**		**RSK ADAS LTD**
Date Reported	**12-MAR-2025**		**ADAS ROSEMAUND**
Project	**1011522**		**PRESTON WYNNE**
Reference	**THEA NIEMANN**		**HEREFORD**
Order Number			**HR1 3PG**

Laboratory Reference		**SOIL740057**	**SOIL740058**
Sample Reference		**HAMILTON PIT A TS**	**HAMILTON PIT A USS**
Determinand	**Unit**	**SOIL**	**SOIL**
Coarse Sand 2.00-0.63mm	% w/w	0	6
Medium Sand 0.63-0.212mm	% w/w	49	45
Fine Sand 0.212-0.063mm	% w/w	29	29
Silt 0.063-0.002mm	% w/w	13	13
Clay <0.002mm	% w/w	9	7
Textural Class **		LmS	LmS

Notes

Analysis Notes

The sample submitted was of adequate size to complete all analysis requested.
The results as reported relate only to the item(s) submitted for testing.
The results are presented on a dry matter basis unless otherwise stipulated.

Document Control

This test report shall not be reproduced, except in full, without the written approval of the laboratory.

** Please see the attached document for the definition of textural classes.

Reported by

Teresa Clyne

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Technical Information

ADAS (UK) Textural Class Abbreviations

The texture classes are denoted by the following abbreviations:

Class	Code
Sand	S
Loamy sand	LS
Sandy loam	SL
Sandy Silt loam	SZL
Silt loam	ZL
Sandy clay loam	SCL
Clay loam	CL
Silt clay loam	ZCL
Clay	C
Silty clay	ZC
Sandy clay	SC

For the *sand, loamy sand, sandy loam* and *sandy silt loam* classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

- vf Very Fine (more than 2/3's of sand less than 0.106 mm)
- f Fine (more than 2/3's of sand less than 0.212 mm)
- c Coarse (more than 1/3 of sand greater than 0.6 mm)
- m Medium (less than 2/3's fine sand and less than 1/3 coarse sand).

The subdivisions of *clay loam* and *silty clay loam classes* according to clay content are indicated as follows:

- M medium (less than 27% clay)
- H heavy (27-35% clay)

Organic soils i.e. those with an organic matter greater than 10% will be preceded with a letter O.

Peaty soils i.e. those with an organic matter greater than 20% will be preceded with a letter P.

APPENDIX 5 – DESCRIPTION OF ALC GRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. The *'best and most versatile agricultural land'* falls into grades 1, 2 and subgrade 3a – which collectively comprises about one-third of the agricultural land in England and Wales. About half the land in England and Wales is either of moderate quality (subgrade 3b) or poor quality (grade 4). Although less significant on a national scale, such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in grade 5, which mostly occurs in the uplands.

Grade 1 – excellent quality agricultural land

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

Grade 2 – very good quality agricultural land

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

Grade 3 – good to moderate quality land

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

Subgrade 3a – good quality agricultural land

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

Subgrade 3b – moderate quality agricultural land

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

Grade 4 – poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 – very poor quality agriculture land

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