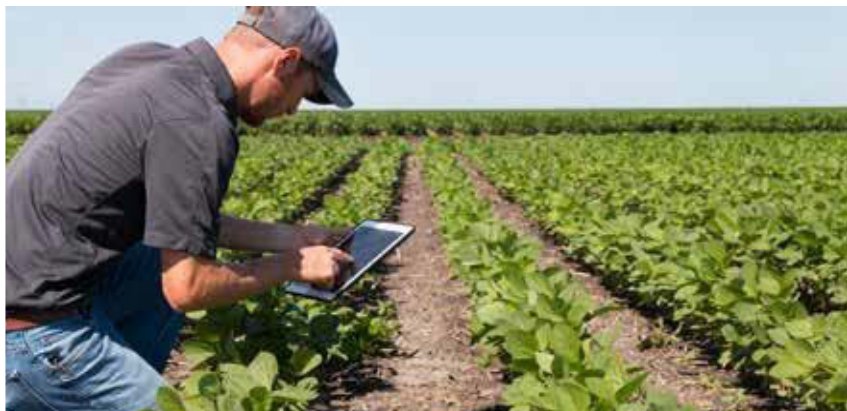
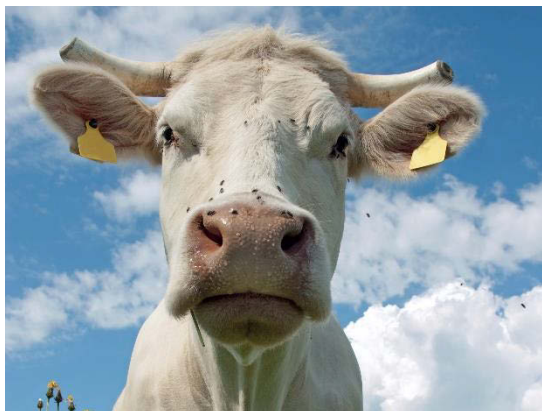




GA Pet Foods



Agricultural Land Classification

Plocks Farm, land beside River Douglas

July 2020



ADAS GENERAL NOTES

Project No.: 1010600 - a

Title: Agricultural Land Classification – Plocks Farm, land beside River Douglas

Date: 24/07/2020

Office: ADAS Gleadthorpe, Meden Vale, Mansfield, Nottinghamshire. NG20 9PD

Status: Final

Author	<u>Martin Worsley</u>	Technical reviewer	<u>John Grylls</u>
Date:	<u>24/07/2020</u>	Date:	<u>24/07/2020</u>
Project manager	<u>Martin Worsley</u>		
Date:	<u>24/07/2020</u>		

RSK ADAS Ltd (ADAS) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and ADAS. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by ADAS for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of ADAS and the party for whom it was prepared.

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK ADAS Ltd.

EXECUTIVE SUMMARY

ADAS has been instructed by GA Pet Foods to undertake an agricultural land classification survey of 39.7 ha of land situated between the Leeds & Liverpool Canal and the River Douglas, near Tarleton in Lancashire.

The survey has identified freely-draining permeable soils, moderately freely-draining permeable soils and poorly-draining slowly permeable soils. The soils form agricultural land of grade 1 (2.6 ha or 7%), grade 2 (23.9 ha or 60%) and subgrade 3b (13.2 ha or 33%) quality. The principal limitation to agriculture is soil wetness.

CONTENTS

1	INTRODUCTION.....	1
1.1	Site Environment	1
1.2	Agricultural Use.....	1
1.3	Published Information	1
1.3.1	Geology.....	1
1.3.2	Soils	1
1.3.3	Previous Agricultural Land Classification.....	2
2	METHODOLOGY.....	3
3	SOILS.....	4
3.1	Soil Types	4
3.2	Laboratory Analysis.....	5
4	AGRICULTURAL LAND CLASSIFICATION	6
4.1	Climate	6
4.2	Results	7
4.3	Summary of grade areas.....	8
5	CONCLUSION	9

Tables

Table 4.1: Agro-climatic variables	6
Table 4.3: Grade areas	6

Appendices

APPENDIX 1 – SOIL SURVEY DETAILS.....	
APPENDIX 2 – MAP 1: LOCATION OF OBSERVATIONS	
APPENDIX 3 – MAP 2: SOIL TYPES.....	
APPENDIX 4 – MAP 3: AGRICULTURAL LAND CLASSIFICATION.....	
APPENDIX 5 – PSD TEXTURE ANALYSIS	
APPENDIX 6 – ALC GRADES SYSTEM.....	

1 INTRODUCTION

ADAS have been instructed by GA Pet Foods to undertake an agricultural land classification survey. This report provides information on the soils and agricultural quality of 39.7 ha of land beside the River Douglas in Lancashire. The report is based on a survey of the land undertaken in July 2020.

1.1 Site Environment

The land surveyed is located to the south of Tarleton, Lancashire. The land is located immediately between the River Douglas and the Leeds & Liverpool Canal. The Canal forms the survey area's western boundary and the River forms its eastern boundary. To the north the land is bordered by the A 565, to the south it is bordered by Sollom Lane. The land of the survey area is formed of one agricultural field with an open drainage ditch running south to north, into the Canal. The land is predominantly flat, with short gentle slopes up to the levee bordering the River Douglas in the east. The land has an average elevation of approximately 5 m AOD.

1.2 Agricultural Use

At the time of survey the land was split between cereals and onions.

1.3 Published Information

1.3.1 Geology

1:50,000 scale BGS information¹ records the basal geology of the site as primarily Triassic sandstone of the Sherwood Sandstone Group, with a limited extent of Triassic mudstone in the north of the site. The basal geology is shown to be overlain throughout by Tidal Flat Deposits comprised of silt, clay and sand.

1.3.2 Soils

The district soil map, published at 1:63,360 scale, records the land of the survey area as being split between soils of the Hesketh Complex and the Douglas Complex. The Hesketh Complex is recorded over western and northern areas of the site. It is comprised of ground-water gley soils formed in recent estuarine alluvium. The Douglas Complex is recorded over the south-east of the site. It is comprised of dominantly fine textured ground-water gley soils formed in recent riverine alluvium².

¹ British Geological Survey, 2019. *Geology of Britain viewer*. Online resource: <http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>

² Crompton E., 1966. *The Soils of the Preston District of Lancashire*. Memoirs of the Soil Survey of Great Britain, England and Wales; Harpenden.

1.3.3 Previous Agricultural Land Classification

No detailed post-1988 agricultural land classification is publically available for this site. However, the provisional ALC map, published at 1:250,000 scale prior to the revision and subdivision of grade 3 in 1988, records the land as being of grade 1 quality in central and southern parts, and of grade 3 quality in the north³.

1.3.4 Flood risk

The land is considered by the Environment Agency to be at low risk of flooding by rivers and seas. The land is considered by the Environment Agency to predominantly be at very low risk of flooding by surface water, with some small areas of low risk and some very small areas of medium risk. A 'low risk' of flooding is defined by the Environment Agency as there being each year '*a chance of flooding of between 0.1% and 1%*'⁴. The information published by the Environment Agency indicates that flood risk offers no significant limitation to agricultural use of the land or to ALC grade.

³ Defra, 2020. *Interactive map of Great Britain*. Online resource: <https://magic.defra.gov.uk/MagicMap.aspx>

⁴ Environment Agency, 2020. *Long term flood risk*. Online resource: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

2 METHODOLOGY

A detailed soil survey was carried out in July 2020. 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 log of the details of each observation point is attached to this report as Appendix 1. A map showing the location of each observation point is attached to this report as Appendix 2 (Map 1).

Soil samples were taken representative of the top 25 cm of the soil profile and these were submitted to NRM for laboratory particle size distribution (PSD) analysis. Full details of the analysis is included in Appendix 4.

3 SOILS

3.1 Soil Types

The soils within the survey area vary in drainage status, permeability and texture. There are three principal soil types, these are freely-draining permeable soils, moderately freely-draining permeable soils and poorly-draining slowly permeable soils. The distribution of each principal soil type is shown in Map 2, attached to this report as Appendix 3, and a description of each is given below.

3.1.1 Freely-draining soils

These soils are found in the west and north, closest to the Leeds & Liverpool Canal, and in discontinuous bands on slight elevations in central areas of the site. The soils benefit from slightly better natural drainage than similar permeable soils at this site. In the north the soils have medium-textured topsoil, i.e. medium silty clay loam, whilst in other areas the topsoil is light-textured, i.e. fine sandy loam. The soils in the north may be influenced by cleaning of the parallel Canal and River, and this may be the reason for medium-textures as opposed to light-textures found elsewhere. The soils are not gleyed⁵ above 40 cm depth. The soils are stoneless.

An example soil profile is described below from the pit at observation 12 (see Map 1).

0-33 cm	Dark grey (7.5YR 4/1) fine sandy loam; stoneless; moderately developed coarse subangular blocky structure; friable; a few medium fleshy roots; wavy clear boundary to:
33-60 cm	Grey (7.5YR 5/1) and brown (7.5YR 5/2) fine sandy loam; stoneless; moderately developed medium angular blocky structure; friable; no roots; >0.5% macropores; wavy diffuse boundary to:
60-80+ cm	Grey (7.5YR 6/1) fine sandy loam with common medium strong brown (7.5YR 4/6) mottles; stoneless; weakly developed coarse angular blocky structure; friable; no roots; >0.5% macropores.

These soils are freely-draining and belong to soil Wetness Class I. They have a high capacity to absorb excess winter rainfall.

3.1.2 Moderately freely-draining soils

These soils are dominant over central and south-western areas of the site. They are permeable but slightly less well drained than the freely-draining soils previously described. The soils are gleyed within 40 cm depth. They are influenced by fluctuating groundwater and will stand wet within 70 cm depth for short periods of the year. Principally these soils are light-textured, with a fine sandy loam or occasional fine sandy silt loam topsoil. The soils are stoneless.

An example soil profile⁶ is described below from the pit at observation 22 (see Map 1).

⁵ Gleying is a greyish and ochreous colouring of the soil caused by periodic or permanent waterlogging.

⁶ Subsurface compaction caused by heavy cultivations is noted in this profile. In a closer to natural state this is a permeable soil throughout its profile.

0-18 cm	Dark grey (10YR 4/1) fine sandy loam; stoneless; moderately developed coarse angular blocky structure; friable; common medium fleshy roots; wavy abrupt boundary to:
18-31 cm	Dark grey (10R 4/1) fine sandy loam with common medium yellowish red (5YR 4/6) mottles; stoneless; weakly developed coarse subangular blocky structure; firm; common very fine fibrous roots; <0.5% macropores; permeability lost through heavy and/or poorly-timed cultivations; smooth abrupt boundary to:
31-65 cm	Grey (10YR 6/1) and light brownish grey (10YR 6/2) fine sandy loam with many medium yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; stoneless; strongly developed coarse platy structure, becoming weakly developed with depth; firm, becoming friable with depth; no roots; >0.5% macropores; smooth diffuse boundary to:
65-80+ cm	Grey (10YR 6/1) and light grey (N 7/1) fine sandy loam with many medium yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; stoneless; weakly developed coarse angular blocky structure; friable; no roots; >0.5% macropores.

These soils are moderately freely-draining and belong to soil Wetness Class II. They have a moderate capacity to absorb excess winter rainfall.

3.1.3 Poorly-draining soils

These soils are dominant in the south-east of the site and are also found over a limited continuous extent in the centre of the site. The soils have a clay loam topsoil overlying a clay loam or clayey upper subsoil over a poorly-structured, slowly permeable clayey lower subsoil. Typically the topsoil is medium-textured although in some areas it is heavy-textured. The soils are gleyed above 40 cm depth and slowly permeable within 55 cm depth. The soils are stoneless.

An example soil profile is described below from the pit at observation 31 (see Map 1).

0-30 cm	Dark grey (10R 4/1) medium clay loam; stoneless; weakly developed medium to coarse subangular blocky structure; friable; common fine fibrous roots; smooth clear boundary to:
30-45 cm	Grey (N 6/1) medium clay loam with common medium yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) mottles; stoneless; moderately developed coarse platy structure; firm; a few fine fibrous roots; >0.5% macropores; smooth clear boundary to:
45-80+ cm	Grey (N 5/1) silty clay with common medium yellowish brown (10YR 5/6) mottles; stoneless; weakly developed coarse prismatic structure; firm; no roots; <0.5% macropores.

These soils are poorly-draining and belong to soil Wetness Class IV. They have a low capacity to absorb excess winter rainfall.

3.2 Laboratory Analysis

Samples representative of the top 25 cm of the soil profile were taken from observations at points 12 and 31. These were submitted to NRM Laboratories for particle size distribution analysis. The textures were confirmed as sandy loam and medium clay loam respectively.

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 Classification⁷. The relevant site data for an average elevation of 5 m AOD is given below.

Table 4.1: Agro-climatic variables

Average Annual Rainfall (AAR)	896 mm
January-June Accumulated Temperature (AT0)	1438 day °C
Field Capacity Days (FCD)	203
Field Capacity Period	mid Oct-early May
Moisture Deficit Wheat (MDW)	83 mm
Moisture Deficit Potatoes (MWP)	70 mm
Climate (upper grade limit)	1

The site is located in coastal North-West England and there is no agro-climatic limitation to agriculture.

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 grade 1, grade 2 and subgrade 3b quality. The principal limitation to agricultural use is soil wetness.

Grade 1

This land grade is mapped over 2.6 ha of the site. This land is formed on freely-draining permeable soils such as those described in section 3.1.1. The soils that form this land belong to Wetness Class I and have light-textured topsoil.

There are no limitations to agricultural and such land can support a wide range of agriculture, including a wide range of horticultural crops, of which high average yields can be expected.

Grade 2

This land grade is mapped over 23.9 ha of the site. This land is principally formed on moderately freely-draining permeable soils such as those described in section 3.1.2. These soils belong to Wetness Class II and have light-textured topsoil. In the north of the site this land is formed on soils such as those described in section 3.1.1. These soils belong to Wetness Class I and have a medium-textured topsoil.

In both instances the principal limitation to agriculture is soil wetness. This is a minor limitation and such land can support a wide range of agriculture, including a wide range of horticultural crops. However, yields may be more variable than on grade 1 land due to difficulties in establishing and harvesting crops in wet conditions.

Subgrade 3a

No land of this quality has been mapped.

Subgrade 3b

This land grade is mapped over 13.2 ha of the site. This is the average land grade on poorly-draining fine loamy over clayey soils such as those described in section 3.1.3. These soils typically have a medium-textured topsoil and belong to Wetness Class IV.

The principal limitation to agriculture on such land is soil wetness. Safe opportunities for cultivation are limited to the autumn in most years, and early spring and late autumn grazing is restricted due to the risk of poaching. Such land is best suited to winter grown cereals and oilseeds, or grass.

Grade 4

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*.

Grade 5

No land of this quality has been mapped.

Non-agricultural

No land of this quality has been mapped.

Urban

No land of this quality has been mapped.

4.3 Summary of grade areas

The boundaries between the different grades of land are shown on Map 3, attached to this report as Appendix 4. The area occupied by each grade is shown below.

Table 4.3: Grade areas

Grade / subgrade	Area (ha)	Area (%)
Grade 1	2.6	7
Grade 2	23.9	60
Subgrade 3a	-	-
Subgrade 3b	13.2	33
Grade 4	-	-
Grade 5	-	-
Non-agricultural	-	-
Urban	-	-
Total	39.7	100

5 CONCLUSION

An agricultural land classification survey has been undertaken of 39.7 ha of land situated between the Leeds & Liverpool Canal and the River Douglas, near Tarleton in Lancashire.

The survey has identified freely-draining permeable soils, moderately freely-draining permeable soils and poorly-draining slowly permeable soils. The soils form agricultural land of grade 1 (2.6 ha or 7%), grade 2 (23.9 ha or 60%) and subgrade 3b (13.2 ha or 33%) quality. The principal limitation to agriculture is soil wetness.

APPENDIX 1 – SOIL SURVEY DETAILS

Land beside River Douglas – Details of each auger boring:

No.	Topsoil				Upper Subsoil				Lower Subsoil				Agricultural Land Classification			
	Depth (cm)	Colour	Texture	Stones (%)	Depth (cm)	Colour	Texture	Mottling	Depth (cm)	Colour	Texture	Mottling	(°)	W C	Grade	Principal Limitation
1	32	V Dk Gr	MZCL	<5	32-73	Br	ZL	o	73-90+	Li Br	FSL	x	1	I	2	WE
2	30	V Dk Gr	MZCL	<5	30-54	Dk Gr	MCL	o	54-60 60-90+	Gr + Pi Gr Dk Gr	FSL MCL	xxx xxxx	1	II	3a	WE
3	38	V Dk Gr	MZCL	<5	38-55	Li Rd Br	MZCL	xx	55-75 75-90 90+	Rd Br Li Rd Br Stopped on	C FSL on gravel	o xxx	1	I	2	WE
4	30	V Dk Gr	MZCL	<5	30-100+	Br	MZCL	o					<1	I	2	WE
5	26	Dk Gr	MCL	<5	26-70	V Dk Gr	M↓HCL	xx	70-100+	V Dk Gr	MZCL	xxx	<1	I	2	WE
6	30	Dk Gr	FSL	<5	30-100+	Gr + Pi Gr	FSL	xxx					<1	II	2	WE
7	26	Dk Gr	FSL	<5	26-40	Pl Br	FSL	xx	46-80 80-90+	Li Br Gr Gr	FSL FSL	xxx xxxx	<1	I	1	-
8	34	Dk Gr	FSL	<5	34-100+	Li Br Gr	FSL	xxx					<1	II	2	WE
9	31	Dk Gr	FSL	<5	31-100+	Li Br Gr + Pl Br	FSL	xxx					1	II	2	WE
10	30	Dk Gr	FSL	<5	30-46	Li Gr	FSL	xxxx	46-100+	Pl Br	FSL	xxxx	<1	II	2	WE

No.	Topsoil				Upper Subsoil				Lower Subsoil				Agricultural Land Classification			
	Depth (cm)	Colour	Texture	Stones (%)	Depth (cm)	Colour	Texture	Mottling	Depth (cm)	Colour	Texture	Mottling	(°)	W C	Grade	Principal Limitation
11	30	Dk Gr	FSL	<5	30-46	Pl Br	FSL	xxx	46-90+	Li Gr	FSL	xxxx	<1	II	2	WE
12	33	Dk Gr	FSL	<5	33-60	Gr + Br	FSL	xx	60-80+	Gr	FSL	xxxx	<1	I	1	-
13	34	Dk Gr	FSL	<5	34-63	Li Gr	FSL	xxx	63-100+	Li Br Gr	FSL	xxx	1	II	2	WE
14	40	Dk Gr	FSL	<5	40-75	Br	FSL	x	75-100+	Br + Pi Gr	FSL	xx(x)	<1	I	1	WE
15	25	Dk Gr	FSL	<5	25-100+	Gr	FSL	xxxx					<1	II	2	WE
16	30	Dk Gr	MZCL	<5	30-100+	Gr + Pl Br	C, fm	xxx					<1	IV	3b	WE
17	32	Dk Gr	ZL	<5	32-47	Gr	FSZL	xxxx	47-66 66-100+	Li Gr V Dk Gr	HZCL C	xxxx xxxx	<1	III/IV	3a/b	WE
18	30	Dk Gr	FSL	<5	30-120	Li Gr + Li Br Gr	FSL	xxx					1	II	2	WE
19	34	Dk Gr Br	HZCL	<5	34-65	Dk Gr Br	MCL	o	65-90 90-100+	Li Br Gr Bk	FSL H Pt	xxx -	4	II	3a	WE
20	27	Dk Gr	ZL	<5	27-41	Gr	FSL	xxx	41-75 75-100+	Pi Gr Dk Gr	(FS)ZL HZCL	xxx xxxx	<1	II	2	WE
21	30	Dk Gr	MZCL	<5	30-38	Dk Gr	HZCL	xxxx	38-60 60-80+	Dk Gr Br	C C, fm	xxxx xxx	<1	IV	3b	WE
22	31	Dk Gr	FSL	<5	31-65	Gr + Li Br Gr	FSL	xxx	65-80+	Li Gr	FSL	xxxx	<1	II	2	WE

No.	Topsoil				Upper Subsoil				Lower Subsoil				Agricultural Land Classification			
	Depth (cm)	Colour	Texture	Stones (%)	Depth (cm)	Colour	Texture	Mottling	Depth (cm)	Colour	Texture	Mottling	(°)	W C	Grade	Principal Limitation
23	30	Dk Gr	SCL	<5	30-42	Dk Gr	MSL	xxxx	42-62 62-90+	Li Gr Bk	LMS Pty S	xxxx -	<1	II	3a	WE
24	34	Dk Gr	MCL	<5	<u>34</u> -54	Dk Gr + Gr Br	C	xxx	<u>54</u> -62 62-120	Dk Gr + V Dk Gr Li Gr	C LMS	xxxx -	<1	IV	3b	WE
25	35	Dk Gr Br	FSL	<5	35-100+	Li Br Gr + Gr	FSL	xxx					<1	II	2	WE
26	28	Dk Gr	ZL	<5	28-75	Li Br Gr + Pl Br	FSL	xxx	75-80 80-90+	Gr Gr	FSL MZCL	xxxx xxxx	<1	II	2	WE
27	25	Dk Gr	MZCL	<5	25-43	Dk Gr	HZCL	xxxx	<u>43</u> -62 <u>62</u> -90+	Gr Gr	C HZCL	xxxx xxxx	<1	IV	3b	WE
28	36	Dk Gr	MCL	<5	<u>30</u> -53	Gr + Gr Br	C	xxx	<u>53</u> -66 66-90+	Dk Gr Bk	C H Pt	xxxx -	<1	IV	3b	WE
29	30	Dk Gr	FSZL	<5	30-54	Pl Br	FSZL	xxx	54-60 60-90+	V Dk Gr Gr	FSL FSL	xxxx xxxx	<1	II	3a	WE
30	27	Dk Gr	MZCL	<5	27-46	Li Br Gr	FSL	xxx	<u>46</u> -80+	Dk Gr	C	xxxx	<1	IV	3b	WE
31	30	Dk Gr	MCL	<5	30-45	Gr	MCL	xxxx	<u>45</u> -80+	Gr	ZC	xxxx	<1	IV	3b	WE
32	36	Dk Gr	MZCL (FSZL)	<5	36-61	Li Gr	FSZL	xxxx	61-90+	Li Br Gr	FSZL	xxx	<1	II	3a (2)	WE
33	30	Dk Gr Br	MZCL	<5	30-38	Dk Gr	HZCL	xxxx	<u>38</u> -80+	Dk Gr	C	xxxx	<1	IV	3b	WE
34	35	Dk Gr Br	HCL	<5	35-50	Gr	HCL	xxxx	<u>50</u> -100+	Bu Gr	C	xxxx	<1	IV	4	WE

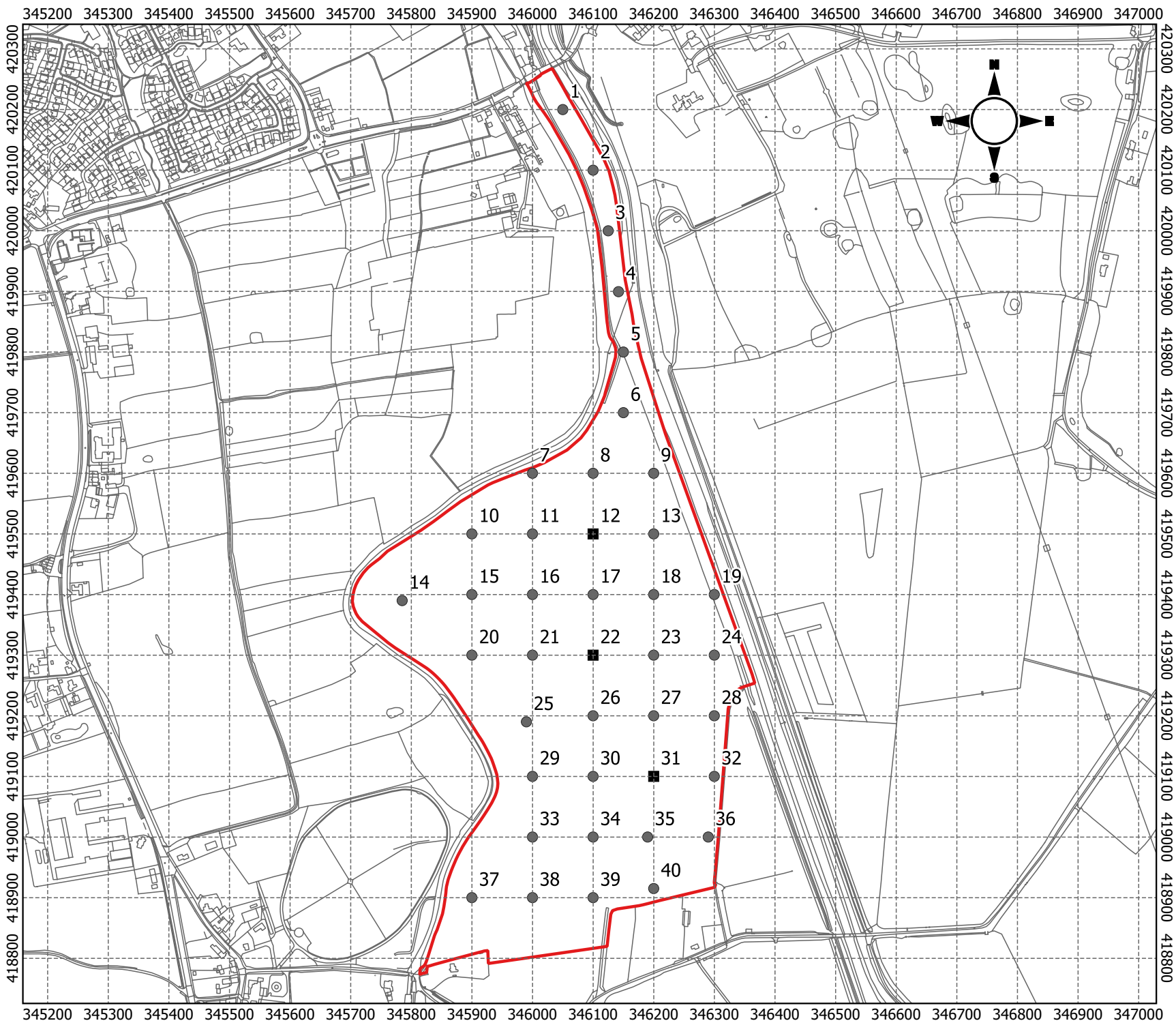
No.	Topsoil				Upper Subsoil				Lower Subsoil				Agricultural Land Classification			
	Depth (cm)	Colour	Texture	Stones (%)	Depth (cm)	Colour	Texture	Mottling	Depth (cm)	Colour	Texture	Mottling	(°)	W C	Grade	Principal Limitation
35	28	Dk Gr Br	FSZL	<5	28-50	Pi Gr	FSZL	xxx	50-80+	Gr	FSZL	xxxx	1	II	2	WE
36	26	Dk Gr	HZCL	<5	26-40	Dk Gr	HZCL	xxxx	40-58 58-90+	Gr + Gr Br V Dk Gr + Bk	ZC Pty L	xxxx xxxx	1	IV	4	WE
37	32	Dk Gr	FSL	<5	32-55	Dk Gr	FSL	xxxx	55-80+	Gr + Pi Gr	FSL	xxxx	<1	II	2	WE
38	30	Dk Gr	MZCL	<5	30-45	Br	C	xxx	45-90+	Pi Gr + Bk	C + H Pt	xxx	<1	IV	3b	WE
39	27	Dk Gr Br	HCL	<5	27-70	Dk Gr Br	HCL	xxx	70-90+	Li Gr	LMS	xxx	<1	III/IV	3b/4	WE
40	35	Dk Gr	HZCL	<5	35-68	Gr	ZC	xxxx	68-80+	V Dk Gr	HZCL	xxxx	<1	IV	4	WE







See overleaf for key to table.

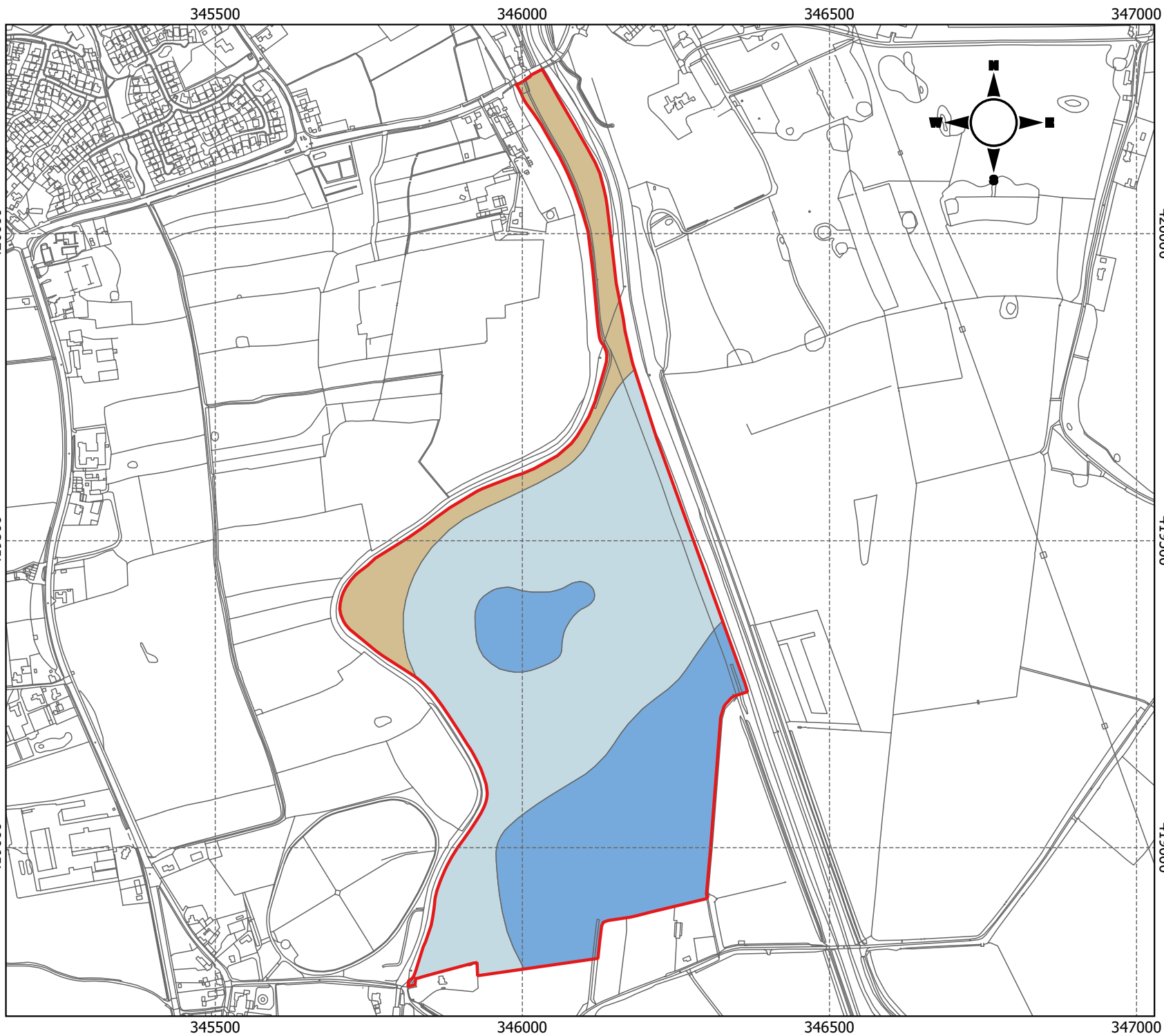
Key to auger records:

Colour	Texture	Texture suffixes	Mottle intensity	Limitations
Bk - black	C - clay	Calcareous:	o – unmottled.	CL - climate
Br - brown	ZC - silty clay	v sl ca - very slightly calcareous	x – a few to common rusty root channel mottles (topsoil) or a few ochreous mottles (subsoil).	DE - depth
Bu - blue	SC - sandy clay	sl ca - slightly calcareous	xx – common to many ochreous mottles and/or dull structure faces.	DR - droughtiness
Dk - dark	CL - clay loam (H-heavy, M-medium)	ca - calcareous	xxx – greyish or pale colours dominant in matrix or ped faces and common to many ochreous mottles (gleyed horizon).	ER - erosion
Du - dusky	ZCL - silty clay loam (H-heavy, M-medium)	v ca - calcareous	xxxx – dominantly grey, often with some ochreous mottles (gleyed horizon).	FL - flooding
Gn - green	SCL - sandy clay loam			GR - gradient
Gr - grey	SZL - sandy silt loam (F-fine, M-medium, C-coarse)	Stoniness (by volume):		MR - microrelief
Li - light	ZL - silt loam	v sl st - very slightly stony (1-5%)		ST - stoniness
Ol - olive	SL - sandy loam (F-fine, M-medium, C-coarse)	sl st - slightly stony (6-15%)		TX - texture
Pi - pink	LS - loamy sand (F-fine, M-medium, C-coarse)	m st - moderately stony (16-35%)		WE - wetness/workability
Pl - pale	S - sand (F-fine, M-medium, C-coarse)	v st - very stony (36-70%)		
Rd - red	Org - organic (S-sand, L-loam, C-clay)	ex st - extremely stony (>70%)		
St - strong	Pty - peaty (S-sand, L-loam)			
V - very	Pt - peat (S-sandy, L-loamy, H-humified, SF-semi-fibrous, F-fibrous)	Other:		
Wk - weak		fm – ferrimanganiferous concentrations		
Yl - yellow	R - bedrock			

Note: An underline, e.g. 50 cm, indicates the top of a slowly permeable layer; a dotted underline, e.g. 50 cm, indicates the top of a borderline slowly permeable layer.



Title Appendix 2: Map 1 Location of Observations	
Project	Plocks Farm, land beside the River Douglas
Client	 Pet Food Partners Our Expertise. Your Success
Key  Survey Area  OS Mastermap  Auger  Soil description pit	
Date: 24 / 07 / 2020	
Scale: 1 : 8,500 at A4	
ADAS Project: 1010600 - a	
 ADAS www.adas.uk	



Title

Appendix 3: Map 2 Soil Types




Project

Plocks Farm,
land beside the River Douglas

Client



Key

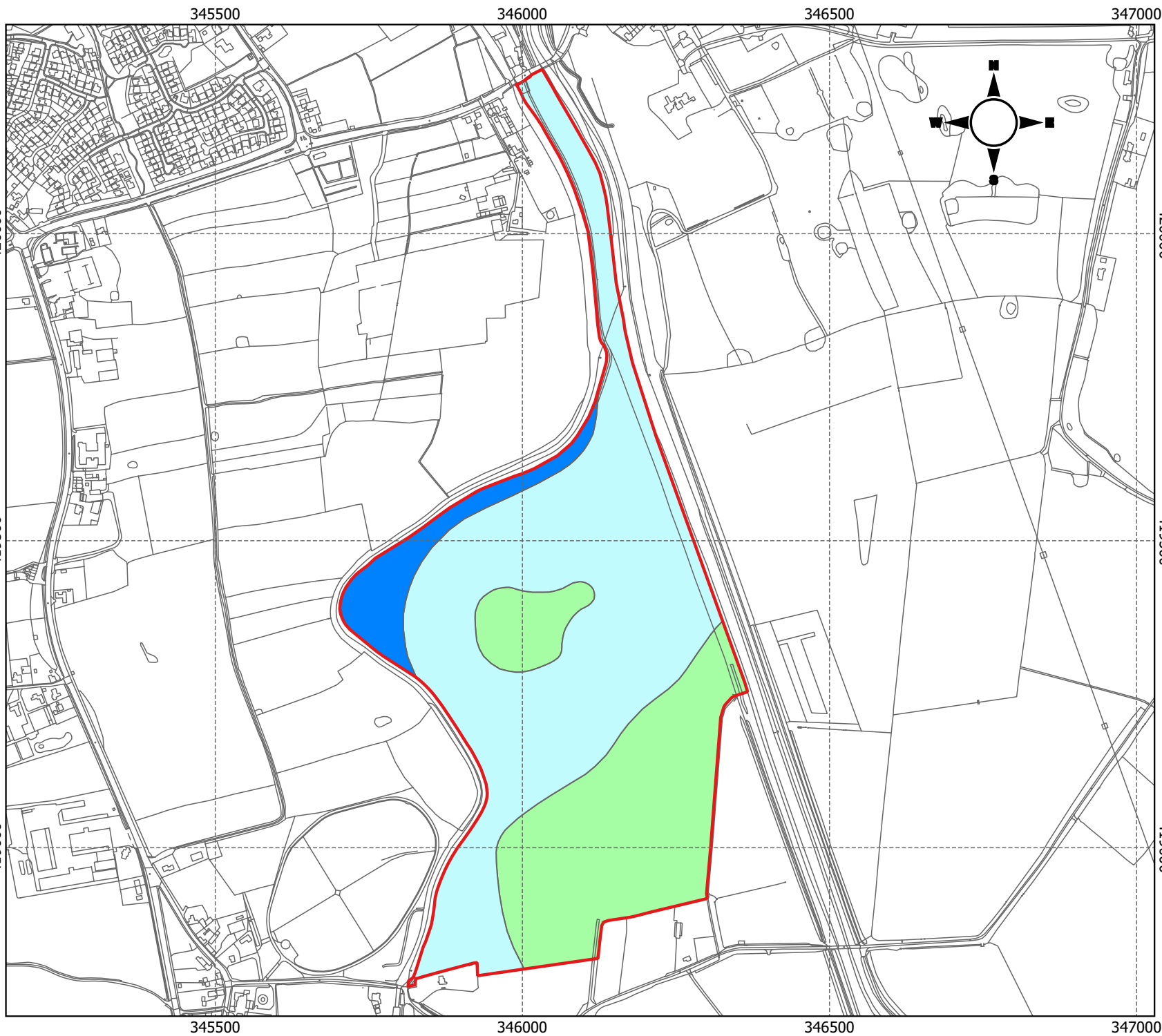
-  Freely-draining soils
-  Mod' freely-draining soils
-  Poorly-draining soils

Date: 24 / 07 / 2020

Scale: 1 : 8,500 at A4

ADAS Project: 1010600 - a





Title

Appendix 4: Map 3
Agricultural Land Classification










Project

Plocks Farm,
land beside the River Douglas

Client



Key

-  Survey Area
-  Grade 1
-  Grade 2
-  Subgrade 3a
-  Subgrade 3b
-  Grade 4
-  Grade 5
-  Non-agricultural
-  Urban

Date: 24 / 07 / 2020

Scale: 1 : 8,500 at A4

ADAS Project: 1010600 - a





ANALYTICAL REPORT

Report Number	15724-20	W195	MARTIN WORSLEY	Client	MARTIN WORSLEY
Date Received	22-JUL-2020		ADAS GLEADTHORPE		
Date Reported	28-JUL-2020		MEDEN VALE		
Project	1010600 PLOCKS FARM		MANSFIELD		
Reference	MARTIN WORSLEY		NOTTINGHAMSHIRE		
Order Number	P69101MW2107		NG20 9PD		

Laboratory Reference		SOIL484725	SOIL484726	SOIL484727							
Sample Reference		12 TOPSOIL	31 TOP SOIL	6 B TOPSOIL							
Determinand	Unit	SOIL	SOIL	SOIL							
Sand 2.00-0.063mm	% w/w	58	30	34							
Silt 0.063-0.002mm	% w/w	30	44	32							
Clay <0.002mm	% w/w	12	26	34							
Textural Class **		SL	MCL	HCL							

Notes	
Analysis Notes	<p>The sample submitted was of adequate size to complete all analysis requested.</p> <p>The results as reported relate only to the item(s) submitted for testing.</p> <p>The results are presented on a dry matter basis unless otherwise stipulated.</p>
Document Control	This test report shall not be reproduced, except in full, without the written approval of the laboratory.

Reported by	<p>** Please see the attached document for the definition of textural classes.</p> <p><i>Myles Nicholson</i></p> <p>Natural Resource Management, a trading division of Cawood Scientific Ltd.</p> <p>Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS</p> <p>Tel: 01344 886338</p> <p>Fax: 01344 890972</p> <p>email: enquiries@nrm.uk.com</p>
-------------	--

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 6 – 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 agricultural 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.