Environmental Statement

Appendix 10.3: Agricultural Soils Assessment

Land at Lower Berse Farm, Wrexham

On behalf of Redrow Homes Ltd

July 2024

Redrow Homes






Ruthin Road, Wrexham

Agricultural Land Classification

September 2021

ADAS

ADAS GENERAL NOTES

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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 have been instructed by Redrow Homes to undertake an agricultural land classification survey of 76.1 ha of land south of Ruthin Road, Wrexham.

The survey has identified permeable coarse loamy soils, permeable fine loamy soils, slowly permeable fine loamy and fine loamy over clayey soils, and slowly permeable poorly reinstated soils.

These soils form agricultural land of grade 1 (3.4 ha, 4%), grade 2 (21.9 ha, 29%), subgrade 3a (36.3 ha, 48%), subgrade 3b (6.1 ha, 8%) and grade 4 (1.6 ha, 2%) quality. The principal limitations to agriculture are soil wetness and soil droughtiness.

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1 INTRODUCTION

ADAS have been instructed by Redrow Homes to undertake an agricultural land classification survey. This report provides information on the soils and agricultural quality of 76.1 ha of land south of Ruthin Road, Wrexham. The report is based on a survey of the land undertaken in April, May and July 2021.

1.1 Site Environment

The survey area spans 18 agricultural fields plus some small wooded areas, hedgerows, farm tracks, Lower Berse Farm, a residential property and a small area of radio equipment. The survey area is bordered to the north by Ruthin Road, to the west by Berse Lane, B5098 and the A438, to the south by Bersham Lane, B5099 and a number of residential properties and to the east by Homestead Lane and adjoining agricultural land and football pitches.

Mostly the land is level (0-1°) to gently sloping (2-3°), with an average elevation of approximately 100 m AOD.

1.2 Agricultural Use

At the time of survey the agricultural land of the survey area was under cereals, maize and grass.

1.3 Published Information

1.3.1 Geology

1:50,000 scale BGS information[1] records the basal geology of the site as split between Carboniferous mudstone of the Etruria Formation and interbedded Carboniferous mudstone, siltstone and sandstone of the Pennine Coal Measures. Overlaying surface deposits are recorded as glacial till, comprised of clay, silt, sand and gravel, in central areas, glaciofluvial deposits, comprised of sand and gravel, in the east and west, and alluvium, comprised of clay, silt, sand and gravel, over a limited extent in the far north-east.

1.3.2 Soils

The national soils map, published at 1:250,000 scale, records the site as belonging to the Wick 1 soil association and the Nercwys soil association.

The Wick 1 soil association is mapped in northern and eastern areas. This association is principally comprised of freely-draining coarse loamy and sandy soils, locally over gravel, formed in glaciofluvial deposits or river terrace drift. Some soils are affected by fluctuating groundwater and are moderately freely-draining.

The Nercwys soil association is mapped in central, southern and western areas. This association is principally comprised of moderately freely-draining to imperfectly-draining fine loamy soils with slowly permeable subsoil, formed in in glacial till derived from Paleozoic

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

and Mesozoic sandstone and shale. Some soils have slowly permeable subsoil at shallower depth and are poorly-draining.

Immediately to the west of the site soils are shown to belong to Neutral Restored Opencast. These soils are found on restored opencast coal workings. Typically they are slowly permeable and seasonally waterlogged fine loamy and clayey soils, often with thin topsoils[2].

1.3.3 Previous Agricultural Land Classification

The Welsh Government predictive agricultural land classification map records the site as being a mix of grade 2, subgrade 3a and subgrade 3b agricultural land, and non-agricultural land. This grading is derived from a survey undertaken by MAFF in the early 1990s which was undertaken at a density of one auger per two hectares[3].

[2] Rudeforth C.C. et al.; 1984. *Soils and their use in Wales*. Soil Survey of England and Wales; Harpenden.

[3] Welsh Government, 2021. *Predictive Agricultural Land Classification (ALC) Map 2*. Online resource: https://datamap.gov.wales/layers/inspire-wg:wg_predictive_alc2

2 METHODOLOGY

A detailed soil survey was carried out in April, May and July 2021. The survey work was undertaken by Martin Worsley and Ruth Metcalfe of ADAS. The survey work in April and May was undertaken after dry weather when subsoils in many areas were dry and very firm.

The survey was based on observations at intersects of a 100 m grid, giving a sampling density of one observation per hectare. During the survey soils were examined via a combination of auger borings and soil pits to a maximum depth of 1.2 m. A log of the details of each observation point is attached to this report as Appendix 4. A map showing the location of each observation point is attached to this report as Appendix 1, Map 1.

Four soil pits were dug at this site. Eight topsoil samples were submitted to NRM laboratories for particle size distribution analysis by the pipette methodology. The results of the laboratory analysis are given in Section 3 and in Appendix 5.

3 SOILS

3.1 Soil Types

Soils at this site vary quite considerably –this is principally a reflection of the variable glacial deposits in which they are formed. There are five principal soil types: permeable freely-draining coarse loamy soils; permeable freely-draining fine loamy soils; slowly permeable imperfectly-draining fine loamy and fine loamy over clayey soils; slowly permeable poorly-draining fine loamy and fine loamy over clayey soils; slowly permeable poorly reinstated soils.

These soils are described in greater depth below. Their distribution is shown in Map 2, Appendix 2.

3.2 Permeable soils

3.2.1 Freely-draining coarse loamy soils

These soils are mainly found in the east of the site. These soils tend to have a sandy loam topsoil and upper subsoil over loamy sand and sand lower subsoil, although some profiles, such as in the north east, have sandy loam to greater depth. Stone content is variable. Some soils are very slightly stony (0-5%) throughout and some soils are moderately stony (16-35%) at shallow depth but generally these soils are slightly stony (6-15%) in the topsoil and upper subsoil increasing to moderately stony in the lower subsoil. Stones are mainly very small, small, medium and large subrounded hard pebbles. These soils show little or no signs of gleying[4] and are permeable to at least 80 cm depth.

An example soil profile is described below from the pit at observation 46a (see Map 1).

0-30 cm	Very dark greyish brown (10YR 3/2) medium sandy loam; slightly stony (c. 5%); with common small and medium hard subrounded pebbles; weakly developed fine subangular blocky structure; friable; many fine fibrous roots; clear smooth boundary to:
30-50 cm	Brown (10YR 4/3) medium sandy loam; slightly stony (10-15%), with common small, medium and large subrounded hard pebbles; weakly developed medium subangular blocky structure; friable; common fine fibrous roots; >0.5% macropores; clear smooth boundary to:
50-120 cm	Yellowish brown (10YR 5/4) loamy medium sand; moderately stony (20-30%), with many very small, small, medium and large subrounded hard pebbles; weakly developed fine subangular blocky structure; friable; a few very fine fibrous roots; >0.5% macropores.

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

3.2.2 Freely-draining fine loamy soils

These soils are mainly found in central and eastern areas. The topsoil is medium-textured, either a medium clay loam or a sandy clay loam. These soils have permeable clay loam, sandy clay loam and sandy loam horizons to at least 80 cm depth. The subsoil tends to be reddish.

[4] Soil colouring indicative of periodic or permanent waterlogging.

Some profiles are gleyed within 70 cm depth – this is likely a reflection of seasonally fluctuating groundwater or surface water perched above a slowly permeable horizon beneath 80 cm depth. These soils are no more than slightly stony.

An example soil profile is described below from the pit at observation 38a (see Map 1).

0-35 cm	Greyish brown (10YR 5/2) medium clay loam; very slightly stony (3%), with a few hard stones; friable; smooth clear boundary to:
35-40 cm	Dark brown (7.5YR 3/3) medium clay loam with a few ferrimanganiferous concentrations; very slightly stony (3%), with a few hard stones; weakly developed medium subangular blocky structure; friable; >0.5% macropores; smooth clear boundary to:
40-50 cm	Dark reddish brown (5YR 3/3) medium clay loam; very slightly stony (c. 5%), with a few hard stones; weakly developed medium subangular blocky structure; friable; >0.5% macropores; smooth clear boundary to:
50-70+ cm	Brown (7.5YR 5/4) fine sandy loam; slightly stony (5-10%), with common hard stones; friable; >0.5% macropores.

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

3.3 Slowly permeable soils

3.3.1 Imperfectly draining fine loamy and fine loamy over clayey soils

These soils are predominant in southern, western and northern areas. The topsoil is medium-textured, either a medium clay loam or a sandy clay loam. The soils have permeable upper subsoil overlying poorly structured, slowly permeable lower subsoil. The soils are gleyed and slowly permeable within 70 cm depth. The lower subsoil tends to be reddish. These soils are no more than slightly stony.

An example soil profile is described below from the pit at observation 65 (see Map 1).

0-28 cm	Very dark greyish brown (10YR 3/2) sandy clay loam; very slightly stony (0-5%), with a few small, medium and large hard pebbles; weakly developed medium subangular blocky structure; friable; many fine fibrous roots; clear smooth boundary to:
28-42 cm	Brown (7.5YR 5/4 + 5/3) sandy clay loam; very slightly stony (0-5%), with a few small, medium and large hard pebbles; weakly developed coarse subangular blocky angular blocky structure; friable; >0.5% macropores; clear smooth boundary to:
42-60 cm	Pinkish grey (7.5YR 6/2) heavy clay loam with many medium strong brown (7.5YR 5/8) mottles and common ferrimanganiferous concentrations; very slightly stony (0-5%), with a few small, medium and large hard pebbles; weakly developed medium angular blocky structure; firm; no roots; <0.5% macropores; abrupt smooth boundary to:
60-85+ cm	Reddish grey (5YR 5/2) and reddish brown (5YR 5/3) clay with common fine strong brown (7.5YR 5/8) mottles; stoneless; massive structure; very firm; <0.5% macropores.

These soils are imperfectly draining and belong to Wetness Class III. They have a moderate capacity to absorb excess winter rainfall.

3.3.2 Poorly draining soils

These soils are found on low lying ground beside a stream in the north of the site and around a plateau in the centre of the site. In the north the soils have heavy-textured topsoil. In the centre the soils have medium-textured topsoil. The soils are gleyed within 40 cm depth and slowly permeable within 53 cm depth. The lower subsoil tends to be reddish. These soils are no more than slightly stony.

An example soil profile is described below from the pit at observation 32 (see Map 1).

0-30 cm	Very dark greyish brown (10YR 3/2) medium clay loam; very slightly stony (0-5%), with a few small, medium and large subrounded hard pebbles; weakly developed medium subangular blocky structure; friable; many fine fibrous roots; clear smooth boundary to:
30-50 cm	Light brownish grey (10YR 6/2) medium clay loam with many medium strong brown (7.5YR 5/8) mottles; very slightly stony (0-5%), with a few small, medium and large subrounded hard pebbles; weakly developed medium angular blocky structure; friable to firm; common fine fibrous roots; >0.5% macropores; abrupt smooth boundary to:
50-80 cm	Light reddish brown (5YR 6/3) and reddish brown (5YR 5/3) heavy clay loam with many medium strong brown (7.5YR 5/8) mottles and common ferrimanganiferous concentrations; stoneless; massive structure; very firm; no roots; <0.5% macropores.

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

3.3.3 Poorly reinstated soils

These soils are found in the far west of the site, between Berse Lane, B5098 and A483. These soils have a light or medium textured topsoil and a highly compacted fine loamy subsoil within 40 cm depth. The compaction is either the result of reinstatement following opencast coal works or engineering for the neighbouring roads or perhaps both. Surface water will be held above the compacted subsoil and these soils are likely to suffer waterlogging at shallow depth for long periods during winter.

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

3.4 Laboratory Analysis

Samples representative of the top 25 cm of the soil profile were taken from observations at 9, 18, 22, 32, 40, 46a, 58 and 65. These soils were submitted to NRM Laboratories for particle size distribution (PSD) analysis. The textures are confirmed in the table below.

Table 3.4: PSD analysis results

Observation	PSD Analysis
9	Medium clay loam
18	Sandy loam
22	Medium clay loam
32	Medium clay loam
40	Sandy loam
46a	Sandy clay loam
58	Medium clay loam
65	Sandy loam

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 6.

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[5]. The relevant site data for an average elevation of 100 m AOD is given below.

Table 4.1: Agro-climatic variables

Average Annual Rainfall (AAR)	837 mm
January-June Accumulated Temperature (AT0)	1364 day °C
Field Capacity Days (FCD)	194
Field Capacity Period	mid Oct - late Apr
Moisture Deficit Wheat (MDW)	88 mm
Moisture Deficit Potatoes (MWP)	74 mm
Climate (upper grade limit)	1

The site is located in lowland east Wales and there is no agro-climatic limitation to agriculture.

[5] 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)[6].

This report has identified agricultural land of grade 1, grade 2, subgrade 3a, subgrade 3b and grade 4 quality. The principal limitations to agricultural use of the land are soil wetness and soil droughtiness.

Grade 1

There are 3.4 ha of grade 1 land at this site. This land is formed on freely-draining coarse loamy soils such as those described in section 3.2.1. These soils have light-textured topsoil and belong to Wetness Class I.

The coarse loamy soils which form grade 1 land, as opposed to grade 2 land, have sandy loam subsoil to greater depth and lower stone content. There is higher crop available water and no droughtiness limitation as a result.

This is excellent quality agricultural land which could be used for a very wide range of agricultural and horticultural crops.

Grade 2

There are 21.9 ha of grade 2 land at this site. This land is formed on freely-draining coarse loamy soils such as those described in section 3.2.1. These soils have light-textured topsoil and belong to Wetness Class I. This land is also formed on freely-draining fine loamy soils such as those described in section 3.2.2. These soils have medium-textured topsoil and belong to Wetness Class I.

The coarse loamy soils which form grade 2 land tend to have sandy lower subsoil and are slightly to moderately stony. There is slightly less crop available water than on grade 1 land and soil droughtiness is the principal limitation to agriculture.

The fine loamy soils which form grade 2 land have medium-textured topsoil. Under the reasonably wet local climate this leads to some working restrictions during wet periods. Soil wetness is the principal limitation to agriculture.

This is very good quality agricultural land which could be used for a wide range of agricultural and horticultural crops.

Subgrade 3a

There are 36.3 ha of subgrade 3a land at this site. This land is principally formed on imperfectly-draining fine loamy and fine loamy over clayey soils such as those described in section 3.3.1. These soils have medium-textured topsoil and belong to Wetness Class III.

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

On such land the principal limitation to agriculture is soil wetness. The medium-textured topsoil and impeded subsoil drainage means that opportunities for safe cultivation in spring may be limited, particularly in wet years.

This is good quality agricultural land which could support moderate to high average yields of a narrow range of arable crops, especially cereals, or moderate average yields of a wider range of crops, including grass, oilseeds, potatoes and sugar beet.

Subgrade 3b

There are 6.1 ha of subgrade 3b land at this site. This land is formed on poorly-draining fine loamy and fine loamy over clayey soils such as those described in section 3.3.2. These soils have medium-textured topsoil and belong to Wetness Class IV. This land is also formed on poorly-draining, poorly reinstated soils such as those described in section 3.3.3. These soils have light or medium textured topsoil and belong to Wetness Class IV.

On both soil types the principal limitation to agriculture is soil wetness. Surface water is likely to be held at shallow depth for long periods during winter and opportunities for cultivation in spring are likely to be limited, with autumn cultivations preferred.

This is moderate quality agricultural land which could support moderate average yields of a narrow range of crops, principally cereals and grass, or lower average yields of a wider range of crops.

Grade 4

There are 1.6 ha of grade 4 land at this site. This land is formed on poorly-draining fine loamy over clayey soils such as those described in section 3.3.2. These soils have heavy-textured topsoil and belong to Wetness Class IV.

On such land the principal limitation to agriculture is soil wetness. This is poor quality agricultural land with severe limitations which may be best suited to improved grassland only.

Grade 5

No land of this quality has been mapped.

Non-agricultural

There are 6.8 ha of non-agricultural land at this site. This area accounts for the small wooded areas, hedgerows, farm tracks, Lower Berse Farm, a residential property and small area of radio equipment within the survey boundary.

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 Appendix 3, Map 3. The area occupied by each grade is shown below.

Table 4.3: Grade areas

Grade / subgrade	Area (ha)	Area (%)
Grade 1	3.4	4
Grade 2	21.9	29
Subgrade 3a	36.3	48
Subgrade 3b	6.1	8
Grade 4	1.6	2
Grade 5	-	-
Non-agricultural	6.8	9
Urban	-	-
Total	**76.1**	**100**

5 APPENDICES

Appendix 1 – Map 1: Location of Observations

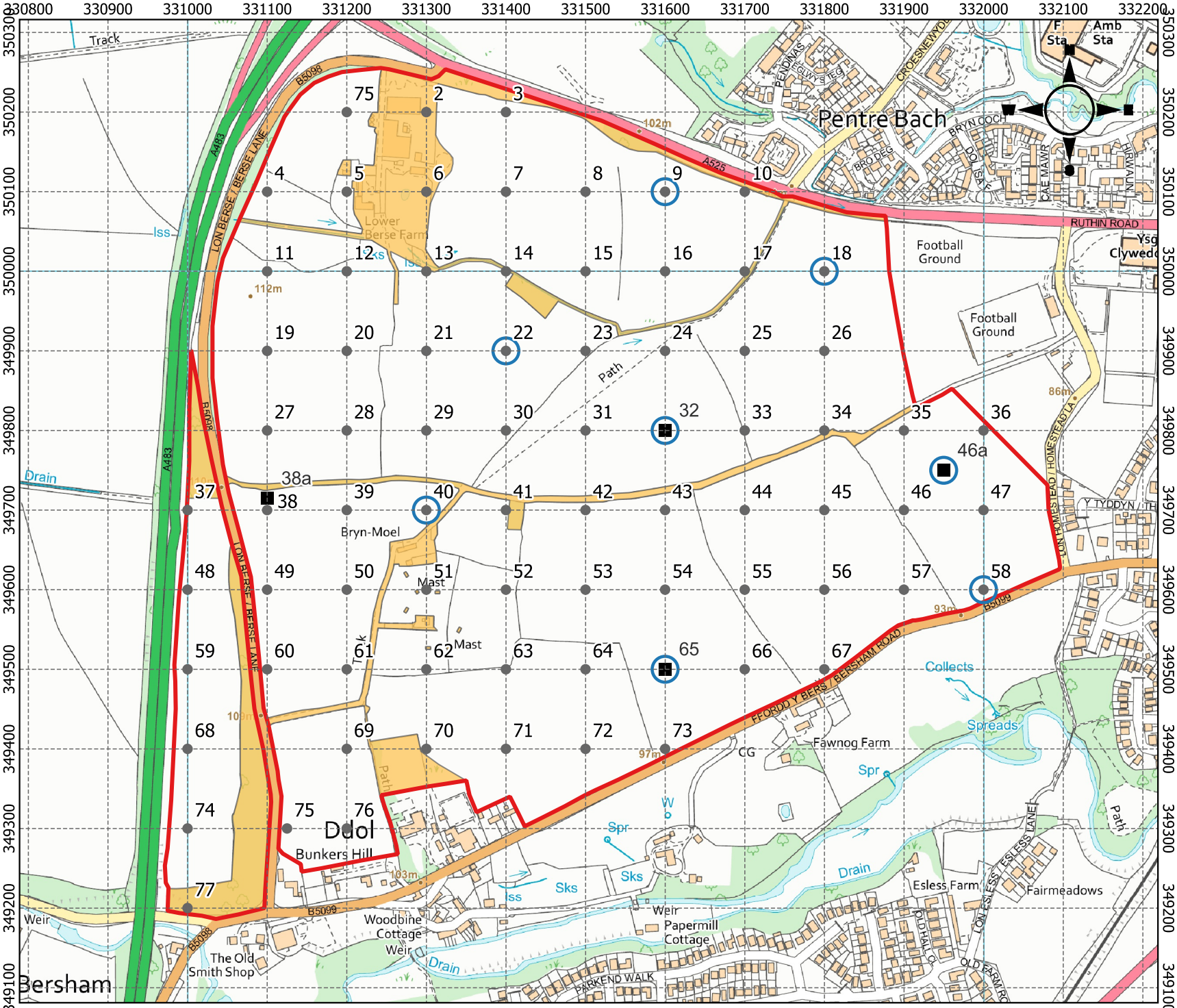
Appendix 2 – Map 2: Soil Types

Appendix 3 – Map 3: Agricultural Land Classification

Appendix 4 – ALC Survey Details

Appendix 5 – PSD Analysis

Appendix 6 – Description of ALC Grades



Title

Appendix 1: Map 1
Location of Observations

Project

Ruthin Road, Wrexham

Client

REDROW PLC

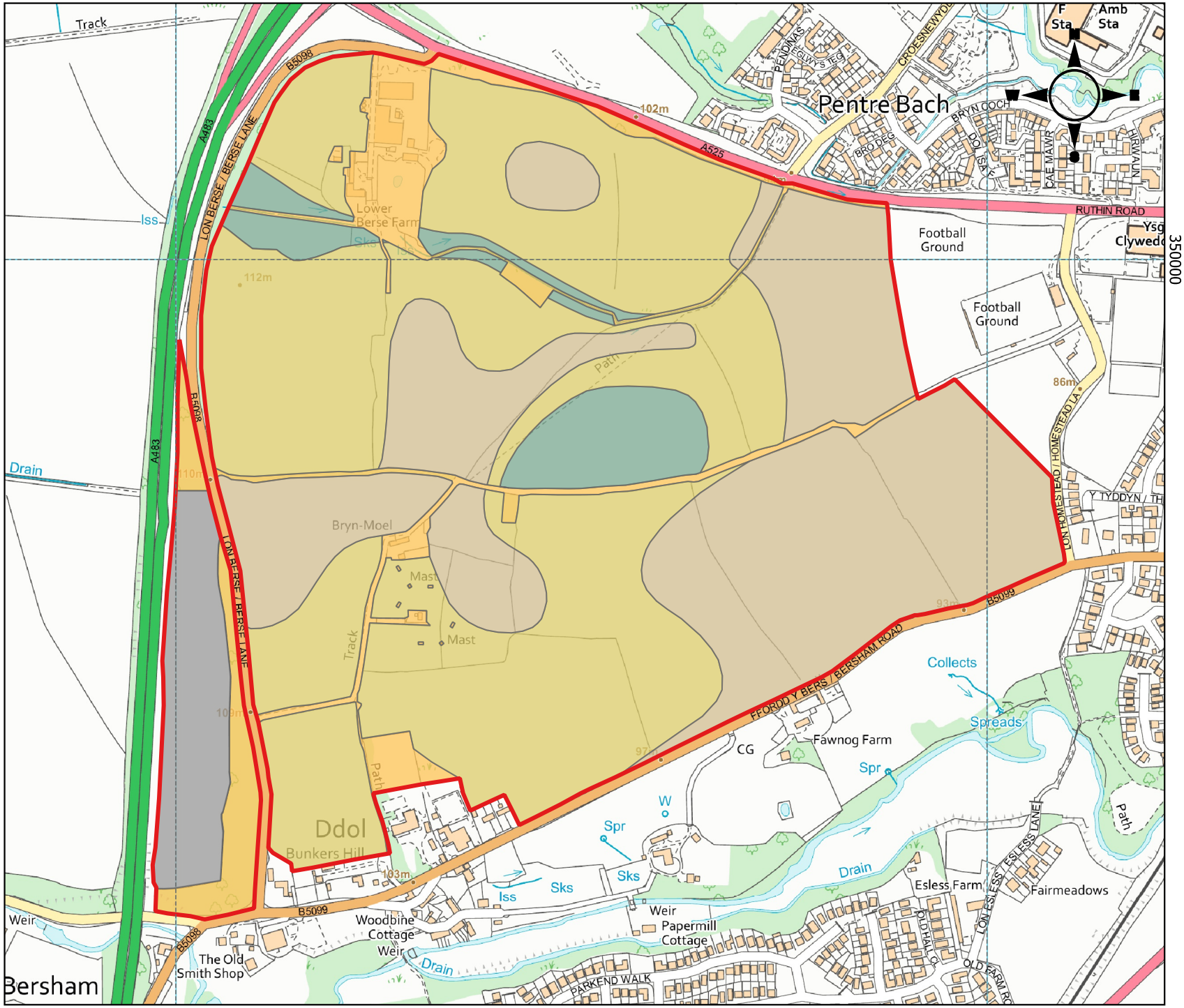
Key

- Survey Area
- Soil pit
- Soil auger
- Soil sample

Date: 23 / 08 / 2021

Scale: 1 : 6,500 at A4

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Title

Appendix 2: Map 2
Soil Types

Project

Ruthin Road, Wrexham

Client

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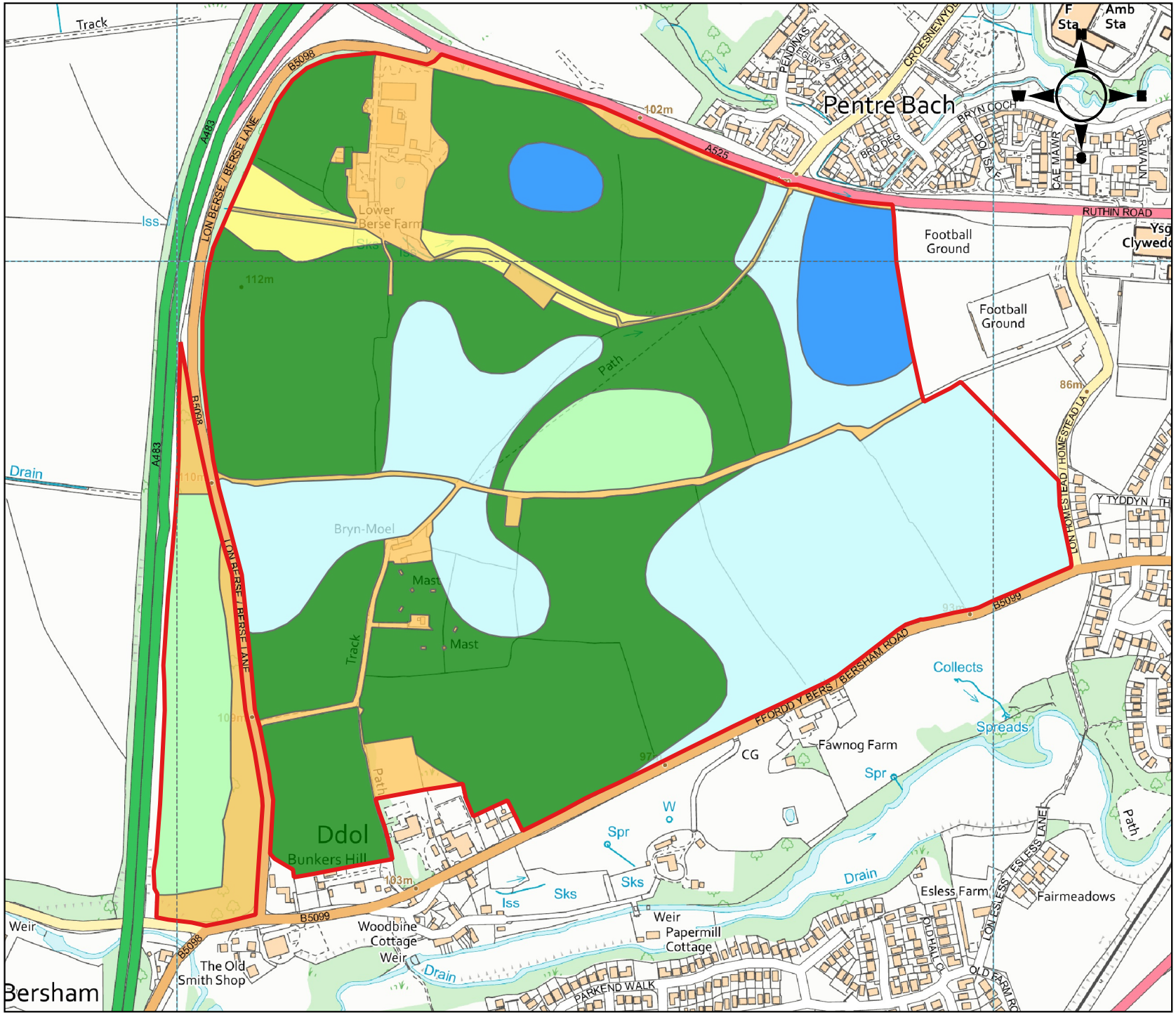
Key

- Survey Area
- Permeable soils, WC I
- Slowly permeable soils, WC III
- Slowly permeable soils, WC IV
- Poorly reinstated soils
- Non-agricultural land

Date: 23 / 08 / 2021

Scale: 1 : 6,500 at A4

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Title

Appendix 3: Map 3
Agricultural Land Classification

Project

Ruthin Road, Wrexham

Client

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Key

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

Date: 23 / 08 / 2021

Scale: 1 : 6,500 at A4

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Appendix 4: Survey Details

Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
1	0 - 30	V Dk Gr Br	MCL	-	-		1					2	II	3a	1	3a	WE
	30 - 40	Br	MCL	o	no		5					Droughtiness Calculation					
	40 - 75	Br	HCL	o	no		0					MDW	MDP	MBW	MBP	Grade W	Grade P
	75 - 90	Br	C	xxx	yes		0					88	74	73.0	62.5	1	1
2	non-agricultural - not surveyed																
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
3	0 - 28	Dk Gr Br	MCL	-	-		0				3	1	III	3a	1	3a	WE
	28 - 38	Li Yl Br	MCL	o	no		0					Droughtiness Calculation					
	38 - 55	Li Yl Br	MCL	xxx	no		0					MDW	MDP	MBW	MBP	Grade W	Grade P
	55 - 80	Rd Br + Br	M-HZCL	xxx	yes		0					88	74	82.6	42.6	1	1
	80 - 100	Pi Gr + Gr	FSZL	xxx	no		0										
4	0 - 20	V Dk Br	HCL	-	-		0					1	IV	4	1	4	WE
	20 - 50	Dk Gr	C	xxxx	yes		0					Droughtiness Calculation					
	50 - 70	Dk Gr Br	C	xxx	yes	v ca	0					MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	36.0	27.0	1	1
5	0 - 30	V Dk Gr Br	MSL	-	-		5			1		2	I	1	1	1	
	30 - 70	V Dk Gr Br	MSL	o	no		5			1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	38.1	39.4	1	1
6	non-agricultural - not surveyed																
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	-88.0	-74.0	4	4
7	0 - 28	V Dk Gr Br	MCL	-	-		0					1	II	3a	1	3a	WE
	28 - 36	Li Yl Br	MCL	xx	no		0					Droughtiness Calculation					
	36 - 44	Pl Br + Li Br Gr	MCL	xxx	no		0					MDW	MDP	MBW	MBP	Grade W	Grade P
	44 - 90	Rd Br + Rd Gr	FSL	xxx	no		0					88	74	89.8	48.8	1	1

Appendix 4: Survey Details

Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
8	0 - 27	V Dk Gr Br	MSL	-	-	0						2	1	1	1	1	
	27 - 48	Br	MSL	o	no	0						Droughtiness Calculation					
	48 - 90	Rd Br	FSL	xxx	no	0						MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	88.2	47.2	1	1
9	0 - 28	V Dk Gr Br	MCL	-	-	0						2	IV	3b	1	3b	WE
	28 - 80	Rd Br + Rd Gr	HCL	xxx	yes	5				1	Very firm	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	34.3	24.5	1	1
10	0 - 28	V Dk Gr Br	MSL	-	-	0						4	II	2	1	2	WE
	28 - 63	Yl Br	MSL	o	no	0						Droughtiness Calculation					
	63 - 75	Li Gr	FSL	xxxx	no	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	75 - 120	Br + Rd Br	SCL	xxx	yes	5				1	Very firm	88	74	63.8	45.7	1	1
11	0 - 30	V Dk Gr Br	MSL	-	-	5	5			1		2	(III)	(3a)	(1)	(3a)	(WE)
	30 - 40	Dk Br	MSL	o	no	5				1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
12	0- 33	Dk Br	MZCL	-	-	0						2	III	3a	1	3a	WE
	33 - 45	Rd Br	HCL	o	no	0						Droughtiness Calculation					
	45 - 65	Rd Br	C	o	no	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	65 - 80	Rd Br	C	xxx	yes	0						88	74	52.4	46.4	1	1
13	0 - 35	Dk Br	MCL	-	-	0						2	III	3a	1	3a	WE
	35 - 40	Rd Br	MCL	o	no	0						Droughtiness Calculation					
	40 - 70	Br	HCL	xx	no	0					Stopped on stones Assume SPL below 70 cm	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	56.5	47.5	1	1
14	0 - 20	Dk Br	HCL	-	-	0						1	IV	4	1	4	WE
	20 - 60	Rd Br	C	xxx	yes	0						Droughtiness Calculation					
	60 - 70	Rd Br	C	xxx	yes	0						MDW	MDP	MBW	MBP	Grade W	Grade P

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
												88	74	36.0	27.0	1	1
15	0 - 28	Dk Gr Br	MCL	-	-		0					4	III	3a	1	3a	WE
	28 - 55	Br	HCL	o	no		0					Droughtiness Calculation					
	55 - 85	Rd Gr + Pi Gr	HCL-C	xxx	yes		5			1		MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	46.0	36.8	1	1
16	0 - 28	V Dk Gr Br	MCL	-	-		0					3	III	3a	1	3a	WE
	28 - 58	Li Yl Br	MCL	x	no		0					Droughtiness Calculation					
	58 - 80	Rd Br	HCL	xxx	yes		5			1		MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	47.0	38.1	1	1
17	0 - 30	V Dk Gr Br	MCL	-	-		0					3	I	2	1	2	WE
	30 - 90	Br	MCL	x	no		5			1		Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	63.2	41.0	1	1
18	0 - 30	V Dk Gr Br	MSL	-	-		0					2	I	1	1	1	
	30 - 65	Yl Br	MSL	o	no		5			1		Droughtiness Calculation					
	65 - 100	Pl Br	MSL	xx	no		5			1		MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	71.6	40.9	1	1
19	0 - 35	Dk Br	MSL	-	-		5			1		2	(III)	(3a)	(1)	(3a)	(WE)
	35 - 40	Rd Br	MSL	o	no		10			1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
20	0 - 38	Dk Br	MCL	-	-		1			1		2	III	3a	1	3a	WE
	38 - 45	Rd Br	MCL	o	no		0					Droughtiness Calculation					
	45 - 70	Br	HCL	xxx	yes		0					MDW	MDP	MBW	MBP	Grade W	Grade P
	70 - 90	Br	C	xxx	yes		0					88	74	51.8	40.8	1	1
21	0 - 35	Dk Br	MCL	-	-		0					1	I	2	1	2	WE
	35 - 80	Br	MCL	o	no		0					Droughtiness Calculation					

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	76.5	62.5	1	1
22	0 - 28	V Dk Gr Br	MCL	-	-	0						2	III	3a	1	3a	WE
	28 - 58	Pi Gr	MCL	xxx	no	0						Droughtiness Calculation					
	58 - 80	Rd Gr + Rd Br	HCL	xxx	yes	0						MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	49.0	38.8	1	1
23	0 - 36	Dk Br	MCL	-	-	3				1		2	I	2	1	2	WE
	36 - 40	Rd Br	MCL	o	no	0						Droughtiness Calculation					
	40 - 60	Rd Br	MCL	xxx	no	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	60 - 80	Br	MCL	xxx	no	0						88	74	57.4	45.4	1	1
24	0 - 27	V Dk Gr Br	MSL	-	-	15	12			1		3	I	1	1	3a	ST
	27 - 45	Br	MSL	o	no	20				1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	36.6	17.3	1	1
25	0 - 28	V Dk Gr Br	MCL	-	-	0						1	II	3a	1	3a	WE
	28 - 55	Li Yl Br	MCL	x	no	0						Droughtiness Calculation					
	55 - 72	Pl Br	MCL	xxx	no	0					FMCs	MDW	MDP	MBW	MBP	Grade W	Grade P
	72 - 90	Rd Gr	HCL	xxx	yes	5				1	Stopped on stones	88	74	64.6	57.1	1	1
26	0 - 30	V Dk Gr Br	MSL	-	-	0						1	I	1	1	1	
	30 - 72	Li Yl Br	MCL	xx	no	0						Droughtiness Calculation					
	72 - 120	Rd Br	HCL	xxx	yes	0						MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	50.6	41.0	1	1
27	0 - 35	Br	MCL	-	-	0						2	III	3a	1	3a	WE
	35 - 40	Rd Br	MCL	xx	no	0						Droughtiness Calculation					
	40 - 70	Rd Br	HCL	xxx	yes	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	70 - 80	Rd Br	HCL	xxx	yes	0						88	74	56.5	47.5	1	1
28	0 - 38	Br	MCL	-	-	5				1		2	(III)	(3a)	(1)	(3a)	(WE)

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
	38 - 50	Br	MCL	o	no		5			1	Stopped on stones						
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
29	0 - 30	Dk Br	MSL	-	-		0					1	I	1	2	2	DR
	30 - 45	Dk Rd Br	MSL	o	no		0										
	45 - 70	Rd Br	LMS	o	no		0					Droughtiness Calculation					
	70 - 90	Rd Br	MS	o	no		0					MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	27.7	26.5	2	1
30	0 - 36	Dk Br	MSL	-	-		2			1		2	(I)	(1)	(2)	(2)	(DR)
	36 - 50	Br	MSL	o	no		5			1	Stopped on stones						
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
31	0 - 35	Rd Br	MSL	-	-		0					2	IV	3b	1	3b	WE
	35 - 80	Rd Br	C	xxx	yes		0										
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	40.0	31.0	1	1
32	0 - 30	V Dk Gr Br	MCL	-	-		3			1		3	IV	3b	1	3b	WE
	30 - 50	Li Br Gr	MCL	xxx	no		3			1							
	50 - 85	Li Rd Br + Rd Br	HCL	xxx	yes		3			1		Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	44.7	34.9	1	1
33	0 - 30	V Dk Gr Br	MCL	-	-		0					0	III	3a	1	3a	WE
	30 - 62	Br	MCL	xxx	no		0										
	62 - 90	Pi Gr	HCL	xxx	yes		0					Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	50.6	40.8	1	1
34	0 - 30	V Dk Gr Br	MCL	-	-		0					1	I	2	1	2	WE
	30 - 72	Br	MCL	o	no		5			1	Stopped on stones						
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	78.8	60.0	1	1

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
35	0 - 35	Dk Br	SCL	-	-		6	6		2		2	(I)	(2)	(1)	2	ST, (WE)
	35 - 40	Dk Br	SCL	o	no		8			2	Stopped on stones						
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
36	0 - 30	Dk Br	SCL	-	-		10	9	2			2	(I)	(2)	(2)	2	ST, (WE), (DR)
	30 - 40	Dk Br	SCL	o	no		10				Stopped on stones				#		
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
37	0 - 40	Dk Gr Br	MCL	xxx	-		10			1	Stopped on stones	2	IV	3b		3b	WE
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
38	0 - 35	Gr Br	MCL	-	-		3			1		2	(I-II)	(2-3a)	(1)	(2-3a)	(WE)
	35 - 40	Br	MCL	o	no		2			1		Droughtiness Calculation					
	40 - 55	Rd Br	MCL	xx	no		5			1	FMCs. Stopped on stones	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
38a	0 - 35	Gr Br	MCL	-	-		3			1		2	I	2	1	2	WE
	35 - 40	Dk Br	MCL	o	no		3			1		Droughtiness Calculation					
	40 - 70	Dk Rd Br	MCL	o	no		5			1	Stopped on stones	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	77.7	57.4	1	1
39	0 - 35	V Dk Gr Br	SCL	-	-		0			1		2	I	2	1	2	WE
	35 - 40	Dk Br	MCL	o	no		0			1		Droughtiness Calculation					
	40 - 50	Rd Br	MCL	x	no		0			1	FMCs	MDW	MDP	MBW	MBP	Grade W	Grade P
	50 - 70	Rd Br	MCL	o	no		10			8	Stopped on stones	88	74	73.6	55.0	1	1
40	0 - 30	V Dk Gr Br	MCL	-	-		8	8	3	1		2	I	2	1	2	WE, ST
	30 - 45	Dk Br	MCL	o	no		2			1		Droughtiness Calculation					
	45 - 90	Rd Br	SCL	xxx	no		2			1	FMCs	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	68.9	43.6	1	1

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Soil Profile												Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
41	0 - 35	Dk Br	MCL	-	-	0						2	III-IV	3a-b	1	3a-b	WE
	35 - 40	Rd Br	MCL	xxx	no	0					FMCs	Droughtiness Calculation					
	40 - 55	Rd Br	HCL	xxx	yes	0					FMCs	MDW	MDP	MBW	MBP	Grade W	Grade P
	55 - 80	Rd Br	C	xxx	yes	0						88	74	44.0	34.5	1	1
42	0 - 35	Dk Br	MCL	-	-	3				1		2	III	3a	1	3a	WE
	35 - 40	Br	MCL	o	no	0						Droughtiness Calculation					
	40 - 58	Rd Br	HCL	o	no	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	58 - 80	Rd Br	C	xxx	yes	0						88	74	51.1	42.1	1	1
43	0 - 35	Dk Br	MSL	-	-	0						2	III	3a	1	3a	WE
	35 - 50	Rd Br	MCL	o	no	0						Droughtiness Calculation					
	50 - 70	Rd Br	HCL	o	no	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	70 - 90	Rd Br	C	xxx	yes	0					FMCs	88	74	66.0	59.0	1	1
44	0 - 30	Dk Rd Br	MSZL	-	-	3				1		2	I	1	1	1	
	30 - 40	Dk Br	MSZL	o	no	3				1		Droughtiness Calculation					
	40 - 75	Rd Br	MSZL	o	no	3				1		MDW	MDP	MBW	MBP	Grade W	Grade P
	75 - 90	Rd Br	MSL	o	no	5				1		88	74	91.6	55.2	1	1
45	0 - 35	V Dk Gr Br	SCL	-	-	5	5	1	1			2	I	2	1	2	WE
	35 - 40	Br	SCL	o	no	5				1		Droughtiness Calculation					
	40 - 70	Rd Br	SCL	o	no	5				1	Stopped on stones	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	67.8	46.1	1	1
46	0 - 30	V Dk Br	SCL	-	-	5	5	2	1			2	(I)	(2)	(1)	(2)	(WE)
	30 - 40	Dk Br	SCL	o	no	5				1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
46a	0 - 30	V Dk Gr Br	MSL	-	-	3				1		1	I	1	2	2	DR
	30 - 50	Br	MSL	o	no	13				1		Droughtiness Calculation					
	50 - 80	Yl Br	LMS	o	no	25				1		MDW	MDP	MBW	MBP	Grade W	Grade P

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
	80 - 120	Yl Br	MS	o	no		25			1		88	74	20.3	20.2	2	1
47	0 - 35	V Dk Br	MSL	-	-		8	8		1		2	I	1	(2)	2	ST, (DR)
	35 - 40	Dk Br	MSL	o	no		10			1		Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
48	0 - 30	Dk Br	MCL	-	-							2	III-IV	3a-b		3a-b	WE
	30 - 40	V Dk Gr Br	MCL	o	no		10				Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
49	0 - 28	V Dk Gr Br	SCL	-	-		5			1		2	I	2	1	2	WE
	28 - 60	Br	SCL	xx	no		10			1		Droughtiness Calculation					
	60 - 100	Rd Gr	SCL	xxx	no		15			1	FMCs	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	47.8	27.8	1	1
50	0 - 30	Dk Br	MCL	-	-		0					2	III	3a	1	3a	WE
	30 - 48	Dk Br	MCL	xx	no		0				FMCs	Droughtiness Calculation					
	48 - 90	Rd Br	C	xxx	yes		0					MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	46.4	37.4	1	1
51	0 - 20	V Dk Gr Br	MCL	-	-		0					2	III	3a	1	3a	WE
	20 - 45	Li Br	MCL	x	no		0					Droughtiness Calculation					
	45 - 67	Br	MCL	xxx	no		0					MDW	MDP	MBW	MBP	Grade W	Grade P
	67 - 120	Br + Rd Gr	HCL	xxx	yes		5			1		88	74	60.9	53.1	1	1
52	0 - 27	V Dk Gr Br	SCL	-	-		0					1	I	2	1	2	WE
	27 - 67	Br	SCL	o	no		0					Droughtiness Calculation					
	67 - 120	Yl Br	MSZL	o	no		5			1		MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	91.0	53.3	1	1
53	0 - 35	Dk Br	MCL	-	-		5	5		1		2	III	3a	1	3a	WE
	35 - 45	Rd Br	MCL	o	no		0					Droughtiness Calculation					

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
	45 - 70	Rd Br	HCL	o	no	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	70 - 75	Rd Br	C	xxx	yes	0						88	74	66.5	59.5	1	1
54	0 - 28	V Dk Gr Br	SCL	-	-	0						2	I	2	1	2	WE
	28 - 65	Br	SCL	o	no	0						Droughtiness Calculation					
	65 - 85	Rd Br	SCL	xx	no	5				1	Stopped on gravel.	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	66.8	51.1	1	1
55	0 - 30	Dk Br	MCL	-	-	3				1		2	(I)	(2)	(1)	(2)	(WE)
	30 - 40	Dk Br	MCL	-	no	2				1		Droughtiness Calculation					
	40 - 50	Dk Br	MCL	xx	no	10				1	FMCs. Stopped on stones	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
56	0 - 30	Dk Br	MCL	-	-	6	6			1		2	(I)	(2)	(1)	(2)	(WE)
	30 - 40	Dk Br	MCL	o	no	6				1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
57	0 - 30	Dk Br	SCL	-	-	5	5			1		2	1	2	1	2	WE
	30 - 40	Dk Br	SCL	o	no	5				1		Droughtiness Calculation					
	40 - 45	Br	SCL	o	no	5				1		MDW	MDP	MBW	MBP	Grade W	Grade P
	45 - 50	Br	SCL	o	no	5				1	Stopped on stones	88	74	60.2	38.0	1	1
58	0 - 35	Dk Br	MSL	-	-	8	8			1		2	I	1	2	2	DR
	35 - 40	Dk Br	MSL	o	no	8				1		Droughtiness Calculation					
	40 - 50	V Dk Gr Br	MSL	o	no	10				1	Stopped on stones	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	20.9	20.0	2	1
59	0 - 24	V Dk Gr Br	SCL	-	-	5				1		1	IV	3b		3b	WE,DR
	24 - 38	V Dk Gr	SCL	xxxx	yes	20				1		Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
60	0 - 38	Dk Br	MCL	-	-	5	5			1	Stopped on stones	2	(III)	(3a)		(3a)	(WE)

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	-88.0	-74.0	4	4
61	0 - 35	Br	MCL	-	-	0						2	III	3a	1	3a	WE
	35 - 40	Rd Br	MCL	o	no	0						Droughtiness Calculation					
	40 - 58	Rd Br	C	xxx	yes	0						MDW	MDP	MBW	MBP	Grade W	Grade P
	58 - 90	Rd Br	C	xxx	yes	0						88	74	47.5	38.5	1	1
62	0 - 35	Dk Br	MCL	-	-	0						2	III	3a		3a	WE
	35 - 45	Rd Br	MCL	xx	no	0					FMCs	Droughtiness Calculation					
	45 - 50	Rd Br	HCL-C	xxx	yes	0					Stopped too firm	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
63	0 - 35	Dk Br	MCL	-	-	0						2	III	3a	1	3a	WE
	35 - 48	Br	HCL	xx	no	0						Droughtiness Calculation					
	48 - 80	Br	C	xxx	yes	0						MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	47.4	38.4	1	1
64	0 - 39	Dk Br	MCL	-	-	0						2	III	3a	1	3a	WE
	39 - 45	Dk Br	HCL	o	no	0						Droughtiness Calculation					
	45 - 100	Rd Br	C	xxx	yes	0						MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	50.3	41.3	1	1
65	0 - 28	V Dk Gr Br	S/MCL	-	-	3				1		1	III	3a	1	3a	WE
	28 - 42	Br	SCL	o	no	3				1		Droughtiness Calculation					
	42 - 60	Pi Gr	HCL	xxx	yes	3				1		MDW	MDP	MBW	MBP	Grade W	Grade P
	60 - 85	Rd Gr + Rd Br	C	xxx	yes	3				1		88	74	41.1	31.7	1	1
66	0 - 35	Dk Br	MCL	-	-	5	5			1		2	(III)	(3a)	(1)	(3a)	(WE)
	35 - 40	Dk Br	MCL	o	no	5				1		Droughtiness Calculation					
	40 - 50	Dk Rd Br	MCL	o	no	5				1	Stopped on stones	MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				

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Soil Profile											Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
67	0 - 30	Dk Br	MCL	-	-		5	5		1		2	(I)	(2)	(1)	(2)	(WE)
	30 - 40	Dk Br	MCL	o	no		10			1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
68	0 - 30	Dk Br	MSL	-	-		5			1		2	IV	3b		3b	WE
	30 - 45	V Dk Gr	MSL	xxxx	no		10			1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
69	0 - 38	Dk Br	MCL	-	-		0					2	III	3a	1	3a	WE
	38 - 45	Br	HCL	o	no		0					Droughtiness Calculation					
	45 - 80	Rd Br	C	xxx	yes		0					MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	50.6	41.6	1	1
70	0 - 35	Dk Br	MCL	-	-		0					2	III	3a	1	3a	WE
	35 - 45	Rd Br	HCL	o	no		0					Droughtiness Calculation					
	45 - 80	Rd Br	C	xxx	yes		0					MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	51.8	42.8	1	1
71	0 - 40	Dk Br	MCL	-	-		5	5		1		2	(III)	(3a)		(3a)	(WE)
	40 - 42	Rd Br	MCL	o	no		10			1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
72	0 - 30	Dk Br	MCL		-		5	5		1		2	III	3a	1	3a	WE
	30 - 40	Br	MCL	xx	no		3			1		Droughtiness Calculation					
	40 - 60	Rd Br	MCL	xxx	no		5			1		MDW	MDP	MBW	MBP	Grade W	Grade P
	60 - 80	Rd Br	HCL	xxx	yes		5			1		88	74	48.3	39.4	1	1
73	0 - 40	Dk Br	SCL	-	-		5			1		2	(II)	(3a)	1	(3a)	WE
	40 - 60	Br	SCL	o	no		5			1	Stopped on stones	Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	49.2	40.4	1	1

Appendix 4: Survey Details

Soil Profile										Agricultural Land Classification					
Auger	Depth (cm)	Colour	Texture	Mottling	SPL	$CaCO_3$	Stones (%) Total	>2cm	>6cm	Litho'	Notes	(°)	W C	WE grade	DR grade	Overall grade	Limit(s)
74	0 - 30	Dk Br	MSL	-	-		10			1	Stopped on stones	2	(IV)	3b		3b	WE
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				
75	0 - 38	Dk Br	HCL	-	-		0					5	IV	4	1	4	WE
	38 - 50	Br	C	xxx	yes		0					Droughtiness Calculation					
	50 - 90	Rd Br	C	xxx	yes		0					MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74	45.0	36.0	1	1
76	0 - 38	Dk Br	MCL	-	-		0					2	III	3a	1	3a	WE
	38 - 40	Br	MCL	o	no		0					Droughtiness Calculation					
	40 - 45	Br	HCL	xx	no		0					MDW	MDP	MBW	MBP	Grade W	Grade P
	45 - 90	Rd Br	C	xxx	yes		0					88	74	48.1	39.1	1	1
77	non-agricultural - not surveyed																
												Droughtiness Calculation					
												MDW	MDP	MBW	MBP	Grade W	Grade P
												88	74				

Key to Survey Notes:

Colour	Texture	Mottling	$CaCO_3$
Bk - black **Br** - brown(ish) **Bu** – blue(ish) **Dk** - dark **Du** - dusky **Gn** - green(ish) **Gr** - grey(ish) **Li** - light **Ol** - olive **Pi** - pink(ish) **Pl** - pale **Rd** - red(dish) **St** - strong **V** - very **Wk** - weak **Yl** - yellow(ish)	**C** - clay **ZC** - silty clay **SC** - sandy clay **CL** - clay loam (H-heavy, M-medium) **ZCL** - silty clay loam (H-heavy, M-medium) **SCL** - sandy clay loam **SZL** - sandy silt loam (F-fine, M-medium, C-coarse) **ZL** - silt loam **SL** - sandy loam (F-fine, M-medium, C-coarse) **LS** - loamy sand (F-fine, M-medium, C-coarse) **S** - sand (F-fine, M-medium, C-coarse) **Org** - organic (S-sand, L-loam, C-clay) **Pty** - peaty (S-sand, L-loam) **Pt** - peat (S-sandy, L-loamy, H-humified, SF-semi-fibrous, F-fibrous) **R** - bedrock	**o** – unmottled soil; **x** – a few (<2%) *ochreous* mottles; **xx** –common (2-20%) to many (20-40%) *ochreous* mottles OR *greyish* or *pale* soil, typically with a few *ochreous* mottles; **xxx** – *greyish* or *pale* colours dominant in matrix and/or ped faces and common to very many (>40%) *ochreous* mottles OR if *reddish* colours are dominant in the matrix, > 2% *greyish*, *brownish* or *ochreous* mottles or ferri-manganiferous concentrations, and dominantly *pale* coloured ped faces (**gleyed horizon**); **xxxx** – dominantly grey soil, often with some *ochreous* mottles (**gleyed horizon**). '*greyish*', '*pale*' '*brownish*', '*ochreous*' and '*reddish*' colours are assessed in the field using a Munsell Soil Colour Book and defined according to Appendix 3 of the ALC Guidelines.	**non** - non-calcareous **v sl ca** - very slightly calcareous **sl ca** - slightly calcareous **ca** - calcareous **v ca** - very calcareous **Stone lithology** **1** - all hard rocks or stones **2** - soft, medium or coarse grained sandstones **3** - soft 'weathered' igneous or metamorphic rocks or stones **4** - soft oolitic or dolomitic limestones **5** - soft fine grained sandstones **6** - soft, argillaceous or silty rocks or stones **7** - chalk or chalk stones **8** - gravel with non-porous stones **9** - gravel with porous stones

SPL	Notes
yes - a slowly permeable layer. **borderline** - a borderline slowly permeable layer**. no** - not a slowly permeable layer.	**FMCs** – ferri-manganiferous concentrations

Principal Limitation(s) to Agriculture				
CL - climate	**DE** - depth	**DR** - droughtiness	**ER** - erosion	**FL** - flooding
GR - gradient	**MR** - microrelief	**ST** - stoniness	**TX** - texture	**WE** - wetness

Droughtiness Calculation

MDW - moisture deficit wheat (mm); **MDP** - moisture deficit potatoes (mm); **MBW** - moisture balance wheat (mm); **MBP** - moisture balance potatoes (mm); **Grade W** - droughtiness grade for wheat; **Grade P** - droughtiness grade for potatoes.

ANALYTICAL REPORT

Report Number	**52089-21**	**W195**	**MARTIN WORSLEY**	**Client**	**MARTIN WORSLEY**
Date Received	**11-MAY-2021**		**ADAS GLEADTHORPE**		
Date Reported	**20-MAY-2021**		**MEDEN VALE**		
Project	**SOIL**		**MANSFIELD**		
Reference	**MARTIN WORSLEY**		**NOTTINGHAMSHIRE**		
Order Number			**NG20 9PD**		

Laboratory Reference		**SOIL514607**	**SOIL514608**
Sample Reference		**1010760 40**	**1010760 58**
Determinand	**Unit**	**SOIL**	**SOIL**
Sand 2.00-0.063mm	% w/w	50	69
Silt 0.063-0.002mm	% w/w	32	19
Clay <0.002mm	% w/w	18	12
Textural Class **		MCL/SZL/SL/SCL	SL

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

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

Reported by

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ANALYTICAL REPORT

Report Number	**60965-21**	**W195**	**MARTIN WORSLEY**	**Client**	**RUTHIN ROAD**
Date Received	**28-JUL-2021**		**ADAS GLEADTHORPE**		**WREXHAM**
Date Reported	**03-AUG-2021**		**MEDEN VALE**		**1010760**
Project	**1010760 SOIL 16-07-2021**		**MANSFIELD**		**SOIL 16-07-21**
Reference	**RUTHIN ROAD WREXHAM**		**NOTTINGHAMSHIRE**		
Order Number	**P69101MW2007**		**NG20 9PD**		

Laboratory Reference		**SOIL520941**	**SOIL520942**	**SOIL520943**	**SOIL520944**	**SOIL520945**	**SOIL520946**				
Sample Reference		**9**	**18**	**22**	**32**	**46A**	**65**				
Determinand	**Unit**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**				
Sand 2.00-0.063mm	% w/w	45	55	43	48	64	50				
Silt 0.063-0.002mm	% w/w	37	29	36	32	19	31				
Clay <0.002mm	% w/w	18	16	21	20	17	19				
Textural Class **		MCL/SZL	SL	MCL	MCL	SL	SCL/MCL				

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.

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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.