READING AGRICULTURAL CONSULTANTS

January 2025

Harworth Group plc

Agricultural Land Quality

at

Cefn Park, Wrexham

(Reading Agricultural Consultants Project Ref: 9244)

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RAC Project Ref	Version	Author	Checked/approved	Date
9244/ALQ	V6	Sophie Webb	Alastair Field	15/01/2025

1 Introduction

1.1 Reading Agricultural Consultants Ltd (RAC) is instructed by Harworth Group plc to assess the quality of agricultural land at Cefn Park, Wrexham, which forms part of a Key Strategic Housing Site, known as KSS2 (Land East of Cefn Road, Wrexham), under Policy SP4 of the adopted Wrexham Local Development Plan 2013-2028[1].

1.2 Guidance for assessing the quality of agricultural land in England and Wales is set out in the Ministry of Agriculture, Fisheries and Food (MAFF) revised guidelines and criteria for grading the quality of agricultural land[2].

1.3 Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. The principal physical factors influencing grading are climate, site conditions and soil which, together with interactions between them, form the basis for classifying land into one of the five grades.

1.4 Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use. Grade 2 is very good quality agricultural land, with minor limitations which affect crop yield, cultivations or harvesting. Grade 3 land has moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield, and is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grade 4 land is poor quality agricultural land with severe limitations which significantly restrict the range of crops and/or level of yields. Grade 5 is very poor quality land, with very severe limitations which restrict use to permanent pasture or rough grazing.

1.5 Land which is classified as Grades 1, 2 and 3a is defined in paragraph 3.58 of Planning Policy Wales (PPW)[3] as the best and most versatile (BMV) agricultural land.

[1] **Wrexham County Borough Council (2023)**. Wrexham Local Development Plan 2013-2028, Adopted 20th December 2023. https://wrexham-consult.objective.co.uk/file/5112068

[2] **MAFF (1988).** *Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land* Agricultural Land Classification of England and Wales: Revised criteria for grading the quality of agricultural land - ALC011 (naturalengland.org.uk)

[3] **Welsh Government (2024).** *Planning Policy Wales, Edition 12.* Planning Policy Wales - Edition 12 (gov.wales)

2 Site and climatic conditions

General features, land form and drainage

2.1 The site is located to the east of Wrexham and extends to 40.27ha of mostly arable land. Non-agricultural land comprises sports pitches and an unnamed block of woodland in the west. The site is bounded to the west and north by Wrexham, and to the east and south by other agricultural land, with Llwyn Knottia Farm and buildings also to the south.

2.2 The topography at the site is level in the west to gently sloping toward the east, with altitudes falling from 80m above Ordnance Datum (AOD) in the west to around 65m AOD in the east where a valley feature begins to form. The valley directs water eastward to Redwither Brook and River Clywedog, beyond the Wrexham Industrial Estate.

Agro-climatic conditions

2.3 Agro-climatic data for the site have been interpolated from the Meteorological Office's standard 5km grid point dataset at a representative altitude of 75m AOD, and are given in Table 1. The climate at the site is moist and moderately cool. Moisture deficits are moderate. The number of Field Capacity Days (FCD) is larger than is typical for lowland areas and is slightly unfavourable for agricultural land working.

Table 1: Local agro-climatic conditions

Parameter	Value
Grid Ref	SJ 3576150775
Average Annual Rainfall	766mm
Accumulated Temperatures >0°C	1,391 day°
Field Capacity Days	176 days
Average Moisture Deficit, wheat	98mm
Average Moisture Deficit, potatoes	86mm

Soil parent material and soil type

2.4 The bedrock geology mapped by the British Geological Survey[4] is the Salop Formation, comprising reddish brown mudstone with sandstone. The sandstone may be pebbly and contain conglomerates of limestone and chert, and thin limestone beds. Across most of the site the bedrock is overlain by glaciofluvial sheet deposits of sand and gravel, locally with lenses of silt, clay or organic material. Deposits of diamicton overlie the bedrock in a small area in the west, correlating with the location of the block of woodland.

[4] **British Geological Survey (2025).** *Geology of Britain viewer*, http://mapapps.bgs.ac.uk/geologyofbritain/home.html

2.5 The Soil Survey of England and Wales soil association mapping[5] (1:250,000 scale) shows the Newport 1 association across the site. Around Wrexham, the Newport series or, where drift is loamy, Wick series of the Newport 1 association are extensive on upper slopes and hillcrests. The Newport series is characterised by sandy loam or loamy sand topsoil and becomes progressively sandier with depth. The Wick series may include sandy loam or sandy silt loam upper horizons, passing to loamy sand or sand at depth. Profiles of both series are permeable and well-drained, in Wetness Class (WC) I[6].

[5] **Soil Survey of England and Wales (1984).** *Soils of Wales* (1:250,000), Sheet 2

[6] **Rudeforth et al (1984).** *Soils and Their Use in Wales.* Soil Survey of England and Wales Bulletin 11, Harpenden

3 Agricultural land quality

Existing data

3.1 Welsh Government has published a Predictive ALC Map for Wales[7]. The map is designed on a 50m grid. Criteria including climate, slope, soil wetness, droughtiness and stone contents have been considered and used to determine the most likely limitation to agricultural land quality within each grid square. The map predicts this site to be mainly of very good quality Grade 2, described in the ALC guidelines[2] as:

> *"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."*

3.2 The predictive map is not suitable for assessing the quality of individual sites, as explained in the Welsh Government's Frequently Asked Questions on ALC [8] which states that the only way to accurately determine the agricultural grade of land is by a detailed field survey in accordance with the current ALC guidelines.

3.3 Survey data is available for the site, derived from two separate surveys:

- Agricultural Land Classification and Physical Characteristics Survey of land at Llwyn Knottia Farm, Cefn Road, Wrexham (Evaluation of Sand and Gravel Reserves), ADAS Resource Planning Group, Aberystwyth, 1989; data from this survey is available on the Natural Resources Wales website[7] and reproduced at Appendix 1; this survey classified the site other than the western fringe and eastern corner as Grade 2; and
- Erlas Park, Land east of Wrexham, Agricultural Land Classification and Soil Resources, Reading Agricultural Consultants 2015; this survey classified the western fringe of the site as a mix of Grades 2, 3a and 3b, and followed a joint site visit with Natural Resources Wales to agree survey findings; data from this survey is reproduced in Appendix 2.

[7] **Welsh Government (2019)**. *Predictive Agricultural Land Classification (ALC) Map2 for Wales* http://lle.gov.wales/map/alc2

[8] **Welsh Government (2020).** *Agricultural Land Classification, Frequently Asked Questions* https://gov.wales/sites/default/files/publications/2020-06/agricultural-land-classification-frequently-asked-questions.pdf

3.4 As the ALC is concerned with the long-term inherent physical characteristics of land and soil, rather than short-term management or use, the findings of the 1989 and 2015 surveys remain valid.

Agricultural Land Quality

3.5 In the west of the site, the soil profiles include very dark grey (10YR3/1 in the Munsell soil colour charts[9]) sandy loam topsoil. The depths range from 28cm to 38cm. Most of the subsoil across the west comprises sand. The subsoil contains increasing volumes of stone with depth, such that the average observable depth was 81cm, ranging from 31cm to 120cm. The inclusion of stone within the profiles increases the droughtiness limitation to Subgrade 3a or Subgrade 3b, depending upon the specific volumes.

3.6 The available ADAS data logs show Grade 2 quality land at the northern edge and west of the centre of the site to have dark brown (7.5YR3/2 or 7.5YR3/3) sandy loam topsoil, typically of 30cm depth.

3.7 The upper subsoil is reddish brown to brown (5YR4/4, 5YR5/6 or 7.5YR4/4) medium sandy loam or loamy medium sand. The lower subsoil is mostly strong brown (7.5YR4/6 or 7.5YR5/6) and commonly comprises medium or coarse sand. To the north and north-west of Llwyn Knottia Farm, lower subsoil horizons of sandy silt loam are also identified.

3.8 North of Llwyn Knottia Farm, the soil profiles include slightly stony, dark brown (7.5YR3/3 or 7.5YR3/4) loamy medium sand topsoil. The upper subsoil is yellowish red (5YR5.6) loamy medium sand or medium sand, and becomes progressively sandier with depth.

3.9 Due to the coarse nature of the soils, the ability of the profiles to retain water is ordinarily slightly affected, resulting a droughtiness limitation to Grade 2. In one individual profile north of Llwyn Knottia Farm there is no droughtiness limitation and the profile is Grade 1. In another profile close to Llwyn Knottia Farm, there is a higher proportion of sand throughout resulting in a droughtiness limitation to Subgrade 3a. These individual profiles have been subsumed within the surrounding Grade 2 map unit. Recalculations of the applicable moisture balances are given in Appendix 1.

3.10 The data correlate with the mapped soil type although it should be noted that no stones are recorded in the WG/ADAS available profile data. Soils of the Newport 1 association are typically

[9] **Munsell Color (2009).** *Munsell Soil Color Book*. Grand Rapids, MI, USA

slightly stony throughout, or may be moderately stony in the subsoil (where Wick series is present). The inclusion of stones may increase the severity of the droughtiness limitation (which may in turn exclude the individual Grade 1 profiles).

3.11 The results of both surveys are shown in Figure RAC/9244/1 and the areas of each grade at the site are given in Table 2.

Table 2: ALC areas

Grade	Description	Area (ha)	%
Grade 2	Very good quality	22.7	56
Subgrade 3a	Good quality	6.5	16
Subgrade 3b	Moderate quality	1.9	5
Non-agricultural		9.2	23
Total		40.3	100

Appendix 1: Welsh Government/ADAS Soil Profile Summaries

Site No.		Depth cm		Texture	$CaCO_3$	Colour	Mottle colour	abund-ance	stone% hard	stone% .	Struct-ure	APwheat mm	AP potato mm	Gley	SPL	WC	Wetness grade WE	Final Grade	Limiting Factor(s)
1	T	0	30	mSL		7.5YR3/2					-	51	50	n	n	/	1	**2**	DR
		30	50	LmS		5YR4/4						18	18	n	n				
		50	85	LmS		5YR4/4						21	18	n	n				
		85	120	cS		7.5YR4/6						14	0	n	n				
											Total	**104**	**85**						
											MB	6	-1						
											Droughtiness grade (DR)	2	2						
2	T	0	30	mSL		7.5YR3/2						51	51	n	n	/	1	**2**	DR
		30	50	mSL		7.5YR4/4						30	30	n	n				
		50	75	LmS		7.5YR4/4						15	18	n	n				
		75	90	mS		10YR7/3						8	0	n	n				
		90	121	cS		7.5YR6/4						12	0	n	n				
											Total	**116**	**99**						
											MB	18	13						
											Droughtiness grade (DR)	2	1						
4	T	0	30	mSL		7.5YR3/2						51	51	n	n	/	1	**2**	DR
		30	50	mSL		5YR4/4						30	30	n	n				
		50	65	LmS		7.5YR4/5						9	14	n	n				
		65	120	LmS		7.5YR4/6						33	5	n	n				
											Total	**123**	**99**						
											MB	25	13						
											Droughtiness grade (DR)	2	1						
5	T	0	30	mSL		7.5YR3/3						51	51	n	n	/	1	**1**	
		30	50	LmS		5YR5/6						18	18	n	n				
		50	75	fSL		5YR5/5						33	36	n	n				
		75	85	SCL		5YR5/6						10	0	n	n				
		85	95	fSZL		10YR7/3						15	0	n	n				

		95	120	mS	7.5YR4/6			13	0	n	n			
							Total	**139**	**105**					
							MB	41	19					
						Droughtiness grade (DR)		1	1					
9	T	0	25	mSL	7.5YR3/3			43	43	n	n	/	1	**2**	DR
		25	70	LmS	7.5YR4/4			35	41	n	n			
		70	80	mS	10YR5/6			5	0	n	n			
		80	90	mS	10YR6/4			5	0	n	n			
		90	120	fSZL	7.5YR5/6			45	0	n	n			
							Total	**132**	**83**					
							MB	34	-3					
						Droughtiness grade (DR)		1	2					
10	T	0	5	LmS	7.5YR3/4	5		6	6	n	n	/	1	**3a**	DR
		5	30	LmS	5YR4/6			23	23	n	n			
		30	80	mS	5YR5/6			29	28	n	n			
		80	120	mS	5YR5/6			20	0	n	n			
							Total	**78**	**57**					
							MB	-20	-29					
						Droughtiness grade (DR)		3a	3a					

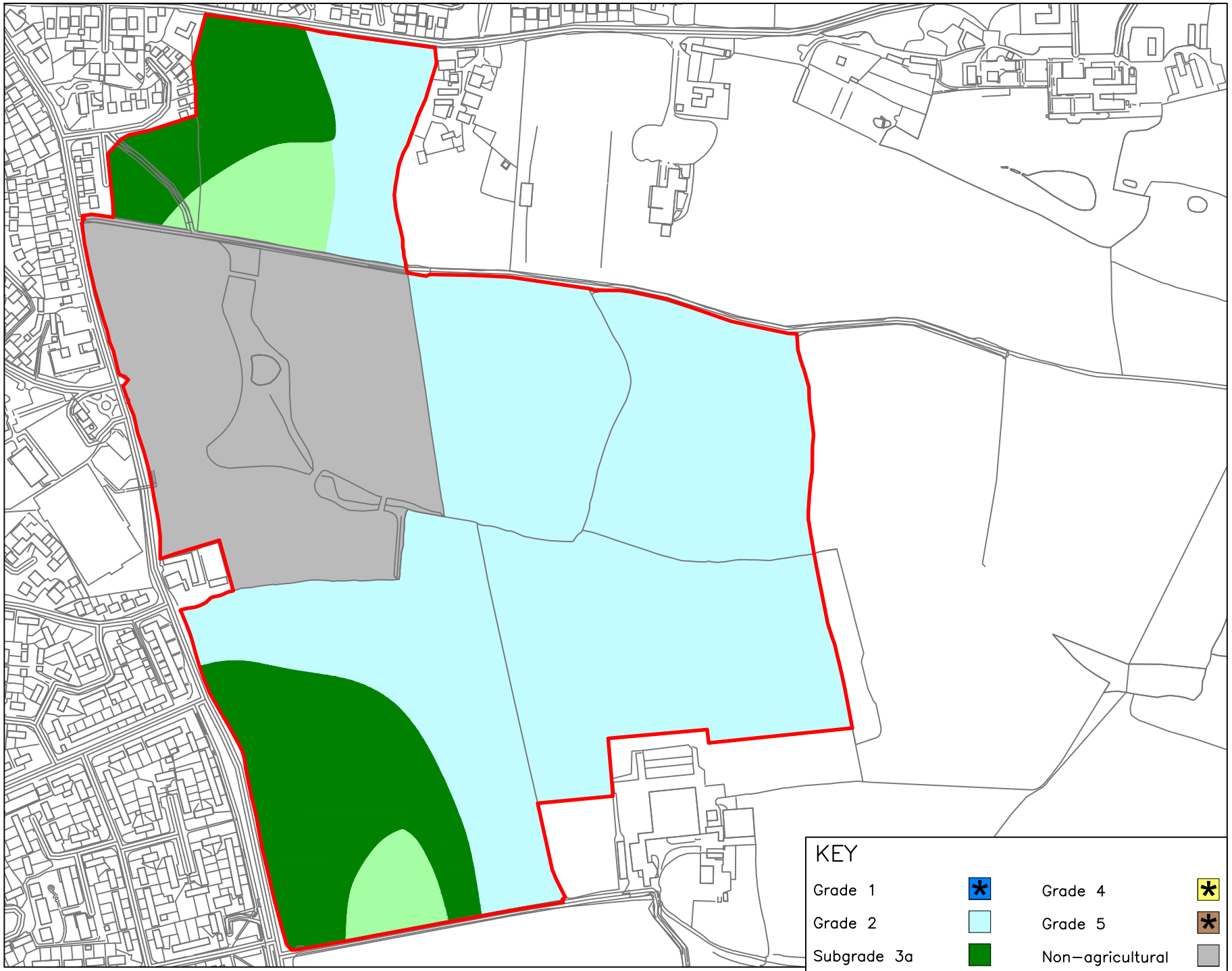
Appendix 2: RAC Soil Profile Summaries

Droughtiness calculations are made according to the methodology given in Appendix 4 of the ALC guidelines, MAFF 1988.													
The following grades represent the extent of the limitation posed by droughtiness only. Other factors will also influence the final grading.													
Values which are underlined represent the maximum observable depth. Further analysis is based upon reasonable assumption.													
		MDw=	99		MDp=	87							
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
1	0	40	cSL	10YR3/2	1	1	17	67.4	1	17	67.4	I	3a
	40	50	cS	7.5YR3/2+3/3	5	1	5	4.8	1	5	4.8		
	50	70	cS	7.5YR3/2+3/3	5	0.5	4	7.7	1	5	9.6		
	70	78	cS	7.5YR3/2+3/3	5	0.5	4	3.1					
	78	80	mS	10YR6/3	10	0.5	5	0.9					
	80	120	mS	10YR6/3	10	0.5	5	18.2					
							Total (mm) =	102.0		Total (mm) =	81.8		
							MBw=	3.0		MBp=	-5.2		
							Grade =	3a		Grade =	2		
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
2	0	30	mSL	10YR3/1	2	1	17	50.0	1	17	50.0	I	3a
	30	48	cSL	10YR4/2	2	0.5	16	28.2	0.5	16	28.2		
	48	50	cS	10YR4/2	66	0.5	5	0.4	0.5	5	0.4		
	50	70	cS	10YR4/2	66	0.5	4	3.4	0.5	5	4.1		
	70	120	cS	10YR4/2	66	0.5	4	8.5					
							Total (mm) =	90.5		Total (mm) =	82.7		
							MBw=	-8.5		MBp=	-4.3		
							Grade =	3a		Grade =	2		

						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
3/Pit 2	0	34	mSL	10YR3/1	1	1	17	57.3	1	17	57.3	I	3b
	34	50	cS	7.5YR3/2+3/3	10	1	5	7.4	1	5	7.4		
	50	60	cS	7.5YR3/2+3/3	10	0.5	4	3.7	1	5	4.6		
	60	70	cS	7.5YR3/3	66	0.5	4	1.7	1	5	2.4		
	70	120	cS	7.5YR3/3	66	0.5	4	8.5					
							Total (mm) =	78.4		Total (mm) =	71.6		
							MBw=	-20.6		MBp=	-15.4		
							Grade =	3b		Grade =	3a		
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
7	0	40	LmS	10YR3/1	1	1	13	51.5	1	13	51.5	I	3a
	40	50	mS	7.5YR4/3	2	1	7	6.9	1	7	6.9		
	50	70	mS	7.5YR4/3	2	0.5	5	9.8	1	7	13.8		
	70	75	mS	7.5YR4/3	2	0.5	5	2.5	1	7	3.4		
	75	120	mS	10YR4/3 + 4/4	2	0.5	5	22.1					
							Total (mm) =	92.8		Total (mm) =	75.6		
							MBw=	-6.2		MBp=	-11.4		
							Grade =	3a		Grade =	3a		
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
9	0	28	mSL	10YR3/1	1	1	17	47.2	1	17	47.2	I	3a
	28	50	mS	10YR4/2	1	0.5	7	15.3	0.5	7	15.3		
	50	70	mS	10YR4/3	1	0.5	5	9.9	0.5	7	13.9		
	70	75	mS	10YR5/8	1	0.5	5	2.5					
	75	120	mS	7.5YR4/4	1	0.5	5	22.3					
							Total (mm) =	97.1		Total (mm) =	76.3		
							MBw=	-1.9		MBp=	-10.7		

							Grade =	3a		Grade =	3a		
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
10	0	38	mSL	10YR3/1	1	1	17	64.0	1	17	64.0	I	2
	38	50	mS	10YR4/2	1	0.5	7	8.3	0.5	7	8.3		
	50	60	mS	10YR4/3	1	0.5	5	5.0	0.5	7	6.9		
	60	70	mS	7.5YR4/4	1	0.5	5	5.0	0.5	7	6.9		
	70	120	mS	7.5YR4/4	1	0.5	5	24.8					
							Total (mm) =	107.0		Total (mm) =	86.2		
							MBw=	8.0		MBp=	-0.8		
							Grade =	2		Grade =	2		
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
11/Pit 1	0	35	mSL	10YR3/2	1	1	17	58.9	1	17	58.9	I	2
	35	50	mS	7.5YR4/4	1	0.5	7	10.4	0.5	7	10.4		
	50	70	mS	7.5YR4/4	1	0.5	5	9.9	0.5	7	13.9		
	70	120	mS	7.5YR4/4	1	0.5	5	24.8					
							Total (mm) =	104.0		Total (mm) =	83.2		
							MBw=	5.0		MBp=	-3.8		
							Grade =	2		Grade =	2		
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
12	0	34	mSL	10YR3/1	1	1	17	57.3	1	17	57.3	I	3a
	34	50	mS	10YR4/2	0	0.5	7	11.2	0.5	7	11.2		
	50	70	mS	10YR4/2	0	0.5	5	10.0	0.5	7	14.0		
	70	120	mS	10YR4/3	0	0.5	5	25.0					
							Total (mm) =	103.5		Total (mm) =	82.5		
							MBw=	4.5		MBp=	-4.5		
							Grade =	3a		Grade =	2		
						Wheat Calculation			Potato Calculation				

Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
13	0	37	LmS	10YR3/1	1	1	13	47.7	1	13	47.7	I	3a
	37	50	mS	10YR4/2	0	0.5	7	9.1	0.5	7	9.1		
	50	70	mS	10YR4/2	0	0.5	5	10.0	0.5	7	14.0		
	70	85	mS	10YR4/3	0	0.5	5	7.5					
	85	120	mS	10YR4/4	0	0.5	5	17.5					
							Total (mm) =	91.8		Total (mm) =	70.8		
							MBw=	-7.2		MBp=	-16.2		
							Grade =	3a		Grade =	3a		
						Wheat Calculation			Potato Calculation				
Site No.	Depth (cm)		Texture	Colour	stones %	TAv or EAv (stones) %	TAv or EAv (soil) %	AP (wheat) mm	TAv (stones) %	TAv (soil) %	AP (potatoes) mm	WC	Grade
14/Pit 3	0	30	LcS	10YR3/1	8	1	11	30.6	1	11	30.6	I	3b
	30	50	cS	7.5YR4/3	15	1	5	8.8	1	5	8.8		
	50	60	cS	10YR4/3	15	0.5	4	3.5	1	5	4.4		
	60	70	cS	7.5YR4/4	25	0.5	4	3.1	1	5	4.0		
	70	100	cS	7.5YR4/4	25	0.5	4	9.4					
	100	105	C	5YR4/4	0	0.5	8	4.0					
	105	120	fS	7.5YR4/3	0	0.5	12	18.0					
							Total (mm) =	77.4		Total (mm) =	47.8		
							MBw=	-21.6		MBp=	-39.2		
							Grade =	3b		Grade =	3b		



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Rev.	Comment	Date
B	RLB	131224

Drawing title

AGRICULTURAL LAND CLASSIFICATION

Contract

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