July 2026

Church Commissioners for England
Agricultural Land Classification and Soil Resources

at

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1 Introduction

1.1 Reading Agricultural Consultants Limited (RAC) is instructed by Church Commissioners for England to investigate the Agricultural Land Classification (ALC) and soil resources of land at Hey Beck Lane, Chidswell, Dewsbury, by means of a detailed survey of soil and site characteristics.

1.2 Guidance for assessing the quality of agricultural land in England and Wales is set out in the Department for Environment, Food and Rural Affairs (Defra)/Welsh Government guidelines for grading the quality of agricultural land[1], and summarised in Natural England's Technical Information Note (TIN) 049[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 in the ALC system is defined as Best and Most Versatile (BMV) agricultural land.

Strategic-scale ALC mapping

1.6 As explained in Natural England's TIN049, the whole of England and Wales was mapped from reconnaissance field surveys in the late 1960s and early 1970s, to provide a provisional series of

[1] **Welsh Government and Defra (2025).** *Joint Publication 069 - Agricultural Land Classification of England and Wales. Guidelines for grading the quality of agricultural land*.

[2] **Natural England (2012).** *Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land*, Second Edition.

maps for general strategic guidance on agricultural land quality for planners. In April 2026, Defra released an updated Predictive ALC Map[3], which was produced in collaboration with Cranfield University and takes precedence over the provisional mapping[4]. The Provisional Mapping shows the site as undifferentiated Grade 3. The Predictive ALC Map shows the site as likely to be moderate quality Subgrade 3b.

1.7 However, these maps should not be used for assessing the quality of individual sites because of limitations of scale. This is confirmed in Natural England's TIN049, and for the latest iteration of mapping, Defra and Cranfield University explain:

> *"Scale and resolution limitations mean it should only be used for strategic or indicative purposes. The Predictive ALC map is not a replacement for detailed field-based ALC surveys, especially in planning contexts."*

1.8 As noted within TIN049, a definitive ALC grading should be obtained by undertaking a detailed survey according to the published guidelines, at an observation density of one boring per hectare. This survey follows the detailed methodology set out in the ALC guidelines.

2 Site and climatic conditions

General features, land form and drainage

2.1 The site extends to approximately 7.1 hectares (ha) across five agricultural fields in arable use. The site is located south of Hey Beck Lane and east of Leeds Road, bordered on both sides by residential properties. Other agricultural land is to the south and Dum Wood is to the east.

2.2 The site slopes gradually downwards from approximately 105 m above Ordnance Datum (AOD) in the north-western corner to approximately 90 m AOD in the south-east. The slopes direct water into a valley containing a tributary of Hey Beck which flows beyond the site boundary to the east.

2.3 Drainage of the site is facilitated by the slope. There is no mapped flood risk at the site[5].

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[3] **Department for Environment, Food & Rural Affairs (2026).** Predictive Agricultural Land Classification Map for England. *https://environment.data.gov.uk/dataset/a817d96f-271d-487b-89ad-48d271f931aa*

[4] **Hannam J.A., Keay C.A., Mukherjee K., Holden A., Liyana Arachchige M. 2025.** Development of a Predictive Agricultural Land Classification Map for England: Final Report (draft). Defra Project RDE118. 28pp

[5] **GOV.uk (2026).** *Flood map for planning*. https://flood-map-for-planning.service.gov.uk

Agro-climatic conditions

2.4 Agro-climatic data for the site have been interpolated from the Meteorological Office's standard 5 km grid point data set at a representative altitude of 100 m AOD and are given in Table 1. The climate at the site is cool with moderate rainfall and moderate moisture deficits. The number of Field Capacity Days is larger than the average for lowland England (150) and is unfavourable for providing opportunities for agricultural field work. There is an overriding climatic limitation to the ALC, to Grade 2.

Table 1: Local agro-climatic conditions

Parameter	Value
Grid Reference	SE 27100 24300
Average Annual Rainfall	709 mm
Accumulated Temperatures >0°C	1,309 day°
Field Capacity Days	177 days
Average Moisture Deficit, wheat	92 mm
Average Moisture Deficit, potatoes	79 mm

Soil parent material and soil type

2.5 The bedrock mapped by the British Geological Survey[6] is the Pennine Middle Coal Measures Formation which is mostly characterised by interbedded grey mudstone, siltstone and sandstone with common coal seams. A variation within the Pennine Middle Coal Measures Formation, identified as Horbury Rock, is present in the north of the site and comprises relatively soft, fine-grained yellow and brown sandstone.

2.6 No superficial deposits are mapped at the site.

2.7 The Soil Survey of England and Wales soil association mapping[7] (1:250,000 scale) shows the Dale association present across the site. The main Dale soils are characterised by dark greyish brown clay or clay loam topsoil over strong brown then grey, slowly permeable clay subsoils. The soil profiles are typically poorly drained and seasonally waterlogged resulting in Wetness Class (WC) IV[8].

[6] **British Geological Survey (2026).** *BGS Geology Viewer*, https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/

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

[8] **Cranfield University (2026)**. The Soils Guide. Available: www.landis.org.uk.

3 Agricultural land quality

Soil survey methods

3.1 Seven soil profiles were examined using an Edelman (Dutch) auger at an observation density of one per hectare which is in accordance with the established recommendations for ALC surveys[2]. One soil pit was excavated to examine subsoil structures and stone content. The locations of observations are indicated on Figure RAC/11117/1a. At each observation point the following characteristics were assessed for each soil horizon up to a maximum of 120 cm or any impenetrable layer:

- soil texture;
- stone content;
- colour (including localised mottling);
- consistency;
- structural condition;
- free carbonate; and
- depth.

3.2 Two topsoil samples were submitted for laboratory determination of particle size distribution, pH and nutrient contents (P, K, Mg). Results are presented in Appendix 1.

3.3 Soil WC was determined from the matrix colour, presence or absence of, and depth to, greyish and ochreous gley mottling, and slowly permeable subsoil layers at least 15 cm thick, in relation to the number of Field Capacity Days at the location.

3.4 Soil droughtiness was investigated by the calculation of moisture balance equations (given in Appendix 2). Crop-adjusted Available Profile Water (AP) is estimated from texture, stoniness and depth, and then compared to a calculated moisture deficit (MD) for the standard crops wheat and potatoes. The MD is a function of potential evapotranspiration and rainfall. Grading of the land can be affected if the AP is insufficient to balance the MD and droughtiness occurs.

Agricultural land classification and site limitations

3.5 Assessment of agricultural land quality has been carried out according to the ALC guidelines[1]. Soil profiles have been described according to Hodgson[9] which is the recognised source for describing soil profiles and characteristics according to the ALC guidelines.

3.6 Agricultural land quality at the site is limited by soil wetness and workability.

3.7 The topsoil consists of clay or heavy clay loam which is very dark greyish brown (10YR3/2 in the Munsell soil colour charts[10]) and has an average depth of 22 cm. The soil structure is moderately developed, with friable, medium subangular blocky peds, with many visible roots and pores. The topsoil is slightly stony with approximately 2% stones by volume.

3.8 The upper subsoil comprises brown, or occasionally greyish brown or dark greyish brown (10YR5/3, 10YR5/2 or 10YR4/2), slowly permeable clay. The upper subsoil is firm, forming coarse angular blocky peds with few visible roots and pores. The upper subsoil is mottled with ochreous stains which are indicative of periodic soil wetness.

3.9 The lower subsoil consists of slowly permeable clay which is greyish brown or brown (10YR5/2 or 10YR5/3), mottled and gleyed. In the observation pit, the lower subsoil was shown to form firm, coarse, platy peds tending to massive, with no roots or visible pores. At Profile 2, the lower subsoil consists of black slowly permeable clay which contains many coal fragments.

3.10 Profiles are typically gleyed within 40 cm and slowly permeable within 48 cm and are therefore assessed as WC IV. With 177 FCD and heavy topsoil textures, there is a wetness and workability limitation to Grade 4. In the north of the site, the slowly permeable horizon is deeper in the profile and the soils are in WC III. With heavy topsoil textures, there is a wetness limitation to Subgrade 3b.

3.11 The areas of each ALC grade are given in Table 2, and the ALC distribution is shown in Figure RAC/11117/2a. Photographs taken at the site are given in Appendix 3.

Table 2: ALC areas

Grade	Description	Area (ha)	Area (% of agri land)
Subgrade 3b	Moderate quality	2.5	36
Grade 4	Poor quality	4.4	64
	Total agricultural	6.9	100
	Non-agricultural	0.2	-

[9] **Hodgson, J. M. (Ed.) (2022).** *Soil survey field handbook.* Technical Monograph No. 5, Cranfield.

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

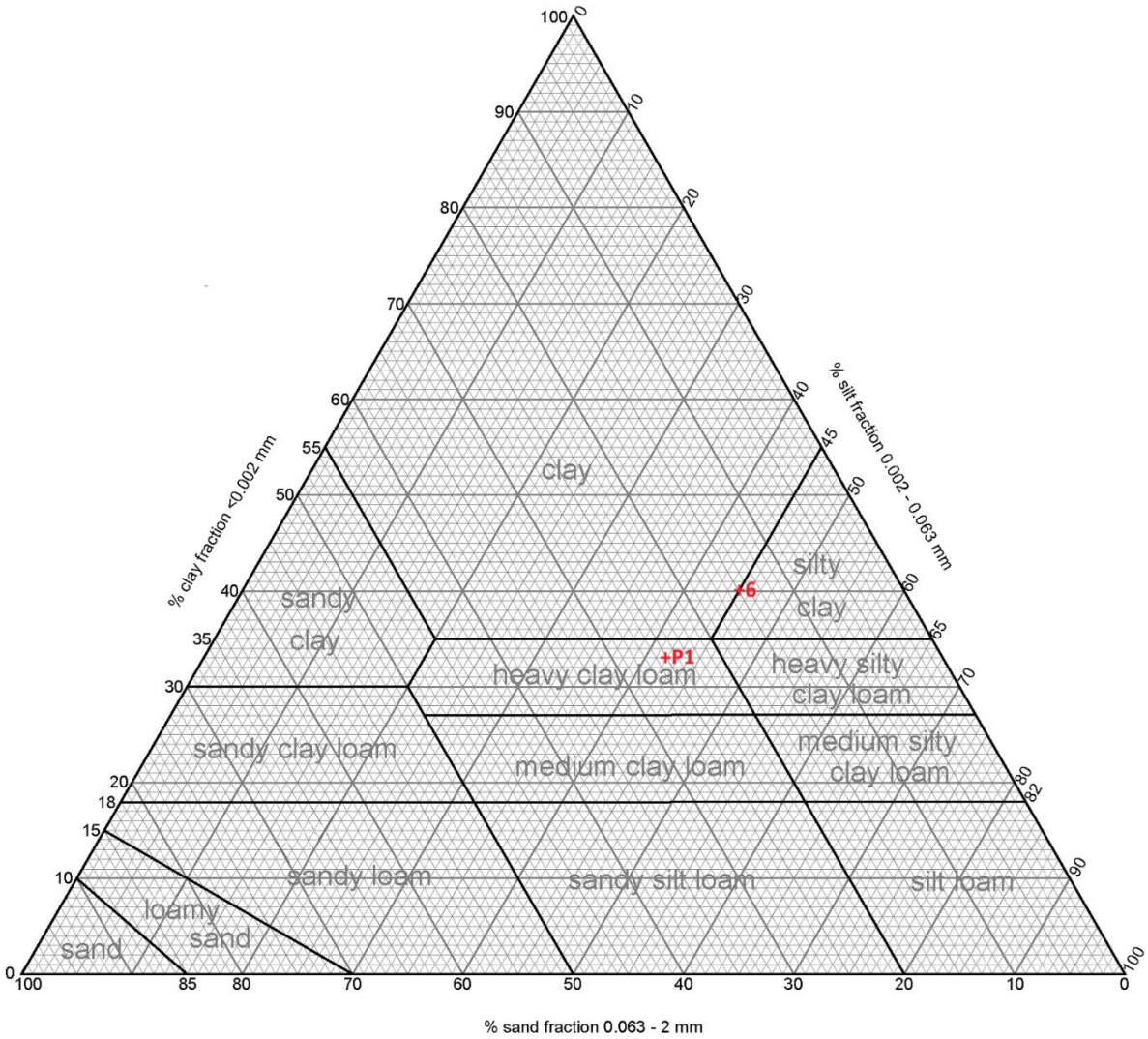
Appendix 1: Laboratory Data

Determinand	Pit 1	Profile 6 Topsoil	Units
Sand 2.00-0.063 mm	25	15	% w/w
Silt 0.063-0.002 mm	42	45	% w/w
Clay <0.002 mm	33	40	% w/w
Texture	Heavy Clay Loam	Clay/Silty Clay	

Determinand	Pit 1	Profile 6 Topsoil	Units
Soil pH	7.1	6.8	
Phosphorus (P)	11.6	21.7	mg/l (av)
Potassium (K)	149	220	mg/l (av)
Magnesium (Mg)	135	197	mg/l (av)

Determinand	Pit 1	Profile 6 Topsoil	Units
Phosphorus (P)	1	2	ADAS Index
Potassium (K)	2-	2+	ADAS Index
Magnesium (Mg)	3	4	ADAS Index

Soil Texture by Particle Size Analysis



Appendix 2: Soil Profile Summaries and Droughtiness Calculations

Wetness / workability limitations are determined according to the methodology given in Appendix 3 of the ALC guidelines,

Droughtiness calculations are made according to the methodology given in Appendix 4 of the ALC guidelines,.

Grades are shown for drought, wetness and any other soil or site factors which are relevant. The overall Grade is set by the most limiting factor and shown on the right.

Stone types		
%	TAv	EAv
hard	1	0.5
N/A		

Climate Data	
MDwheat	92
MDpotato	79
FCD	177

Wetness Class Guidelines	*II*	*III*	*IV*	*V*
SPL within 80cm, gleying within 40cm	>76cm	48-76cm	<48cm	
SPL within 80cm, gleying at 40-70cm	>63cm	<63cm		
No SPL but gleying within 40cm	coarse subsoil	*I*	other cases	*II*

hard flint & pebble

Maximum depth of auger penetration is underlined

Site No.		Depth cm		Texture	$CaCO_3$	Colour	Mottle colour	abund-ance	stone% hard	stone% N/A	Struct-ure	APwheat mm	AP potato mm	Gley	SPL	WC	Wetness grade WE	Final Grade	Limiting Factor(s)
1	T	0	20	hCL		10YR3/2			2			33	33	n	n	*IV*	4	**4**	WE
		20	40	C		10YR5/3	och	cmd	2		poor	26	26	y	y				
		40	120	C		10YR5/3	och	cmd	2		poor	61	38	y	y				
											Total	**120**	**97**						
											MD	26	16						
									Droughtiness grade (DR)			2	1						
2	T	0	20	hCL		10YR3/2			2			33	33	n	n	*IV*	4	**4**	WE
		20	40	C		10YR5/3	och	cmd	2			26	26	y	n				
		40	60	C		10YR5/3	och	cmd	2		poor	20	26	y	y				
		60	120	C		Black			2			47	16						
											Total	**126**	**100**						
											MD	32	19						
									Droughtiness grade (DR)			1	1						
3	T	0	23	hCL		10YR3/2			2			38	38	n	n	*III*	3b	**3b**	WE
		23	38	C		10YR5/3	och	cmd	2			24	24	y	n				
		38	50	C		10YR5/3	och	cmd	2			19	19	y	n				
		50	120	C		10YR5/3	och	cmd	2		poor	48	26	y	y				
											Total	**129**	**106**						
											MD	35	25						
									Droughtiness grade (DR)			1	1						

4	T	0	24	hCL	10YR3/2			2		42	42	n	n	*III*	3b	**3b**	WE
		24	48	C	10YR4/2	och	cmd	2		38	38	y	n				
		48	120	C	10YR5/2	och	cmp	2	poor	51	28	y	y				
									Total	**131**	**108**						
									MD	37	27						
								Droughtiness grade (DR)		1	1						
5	T	0	20	C	10YR3/2			2		33	33	n	n	*IV*	4	**4**	WE
		20	38	C	10YR5/3	och	cmd	2		23	23	y	n				
		38	120	C	10YR5/3	och	cmd	2	poor	63	41	y	y				
									Total	**120**	**97**						
									MD	26	16						
								Droughtiness grade (DR)		2	1						
6	T	0	25	C/ZC	10YR3/2			2		42	42	n	n	*IV*	4	**4**	WE
		25	120	C	10YR5/2	och	cmp	2	poor	80	57	y	y				
									Total	**122**	**99**						
									MD	28	18						
								Droughtiness grade (DR)		2	1						
7	T	0	20	C	10YR3/2			2		33	33	n	n	*IV*	4	**4**	WE
		20	120	C	10YR5/3	och	cmd	2	poor	86	64	y	y				
									Total	**120**	**97**						
									MD	26	16						
								Droughtiness grade (DR)		2	1						

Appendix 3: Photographs

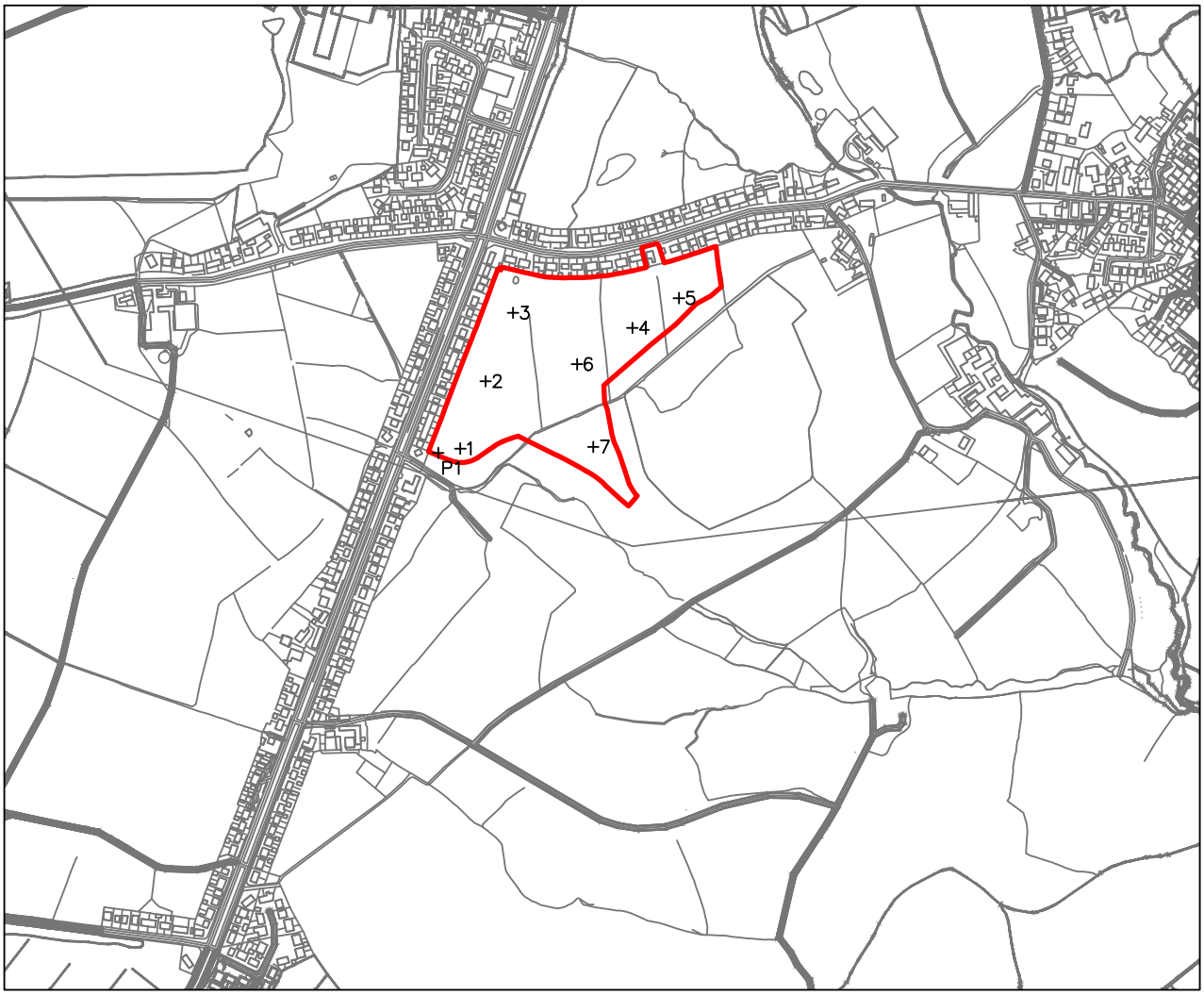
Site 1

Pit 1 face

Pit topsoil

Pit Subsoil

Profile 2



KEY

Survey boundary

+1 Observations

+P Pit

1:10,000

0 200m 400m

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	Scales 1:10,000@A4	Date 07/2026	Rev.	Comment	Date	

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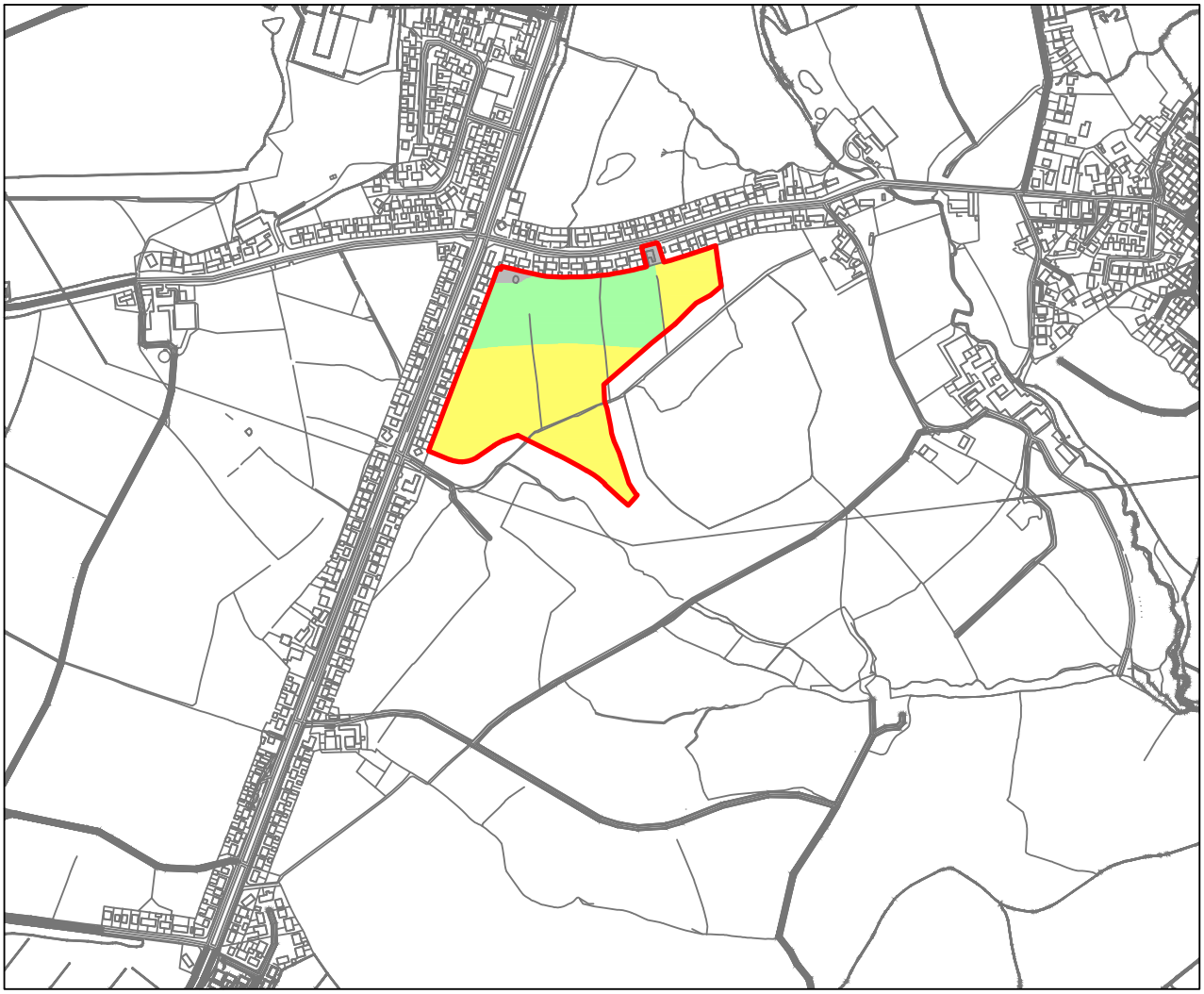

KEY			
Grade 1	*	Grade 4	
Grade 2	*	Grade 5	*
Subgrade 3a	*	Non-agricultural	
Subgrade 3b		Not present	*

1:10,000

0 200m 400m

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