

***AGRICULTURAL LAND CLASSIFICATION***

**Elgin Energy**

**Western Package  
Thorpe Estate**



**Our Ref: SES/EE/TE/1#1**

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***AGRICULTURAL LAND CLASSIFICATION***

**Western Package  
Thorpe Estate**

A report prepared on behalf of *Soil Environment Services* by:



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## **INFORMATION SOURCES**

## 1. INTRODUCTION

An Agricultural Land Classification (ALC)<sup>1,2</sup> has been carried out on 158.5 ha of land located on the west of Thorpe Estate, Tamworth (Drawing ALC/1). The site is centred on OS Grid Ref. 424281, 308931.

Agricultural land is classified into the following grades according to the 1988 guidelines<sup>1</sup> and the 1996 draft guidelines<sup>2</sup>:

Grade	Description
1	<b>Excellent quality agricultural land</b> with no or very minor limitations to agricultural use.
2	<b>Very good quality agricultural land</b> with minor limitations which affect crop yield, cultivation or harvesting.
3a	<b>Good quality agricultural land</b> capable of producing moderate to high yields of a narrow range of arable crops or moderate yields of a wider range of crops.
3b	<b>Moderate quality agricultural land</b> capable of producing moderate yields of a narrow range of crops or lower yields of a wider range of crops.
4	<b>Poor quality agricultural land</b> with severe limitations which significantly restrict the range of crops and/or level of yields.
5	<b>Very poor quality agricultural land</b> with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

The survey was conducted on the 20<sup>th</sup> and 21<sup>st</sup> May 2019 and classifies the land into one or more of the above grades.

On the survey date the site was in a rapeseed oil crop and grass or wheat crop with a number of fields currently recently ploughed.

### Statement of competence

The survey was undertaken by Rebecca Jordan BSc MSc, an Environmental Consultant who is a member of BSSS with 3 years ALC survey experience and has attended the *Agricultural Land Classification: England and Wales Training Event* (November 2018) and the *Introduction to Soil Classification Training Event* (June 2016) organised by BSSS. The report was checked by Dr Robin Davies who has been a member of the BSSS for over 30 years, the IPSS since it was formed in 1991 and has been undertaking ALC surveys for 25 years.

## 2. METHODOLOGY

The classification includes an initial desktop investigation to examine previously mapped soil types and to note the drift and solid geology. This included consultation from:

*Soil Survey of England and Wales 1:250 000<sup>4</sup>*  
*British Geological Survey 1:50 000 solid and drift map<sup>8</sup>*

The field survey consisted of pit excavations to examine soil profiles on a 100 m grid (1 per hectare) using standard soil survey methods<sup>2</sup>. This data was used to map the principal soil types for determining the ALC. The soil removed during augering and pit excavations was examined in accordance with:

*Soil Survey Field Handbook<sup>2</sup>*  
*Describing and Sampling Soil Profiles*  
*Soil Survey of England and Wales, Technical Monograph No. 5, 1976*

*Soil Classification for Soil Survey<sup>9</sup>*  
*Monographs on Soil Survey*  
*Butler, B E (1980) Clarendon Press, Oxford*

Climatological data<sup>3</sup> was used to determine the overriding site limitation and for interaction with soil parameters (Appendix A). The above information was cross referenced with geological surveys<sup>8</sup>, previous soil surveys<sup>10</sup> and the national 1:250 000 series ALC survey<sup>4</sup> relevant for this site to substantiate the findings. The ALC grade was then determined for this site and for the current survey and is detailed in Drawing ALC/1.

Particle size analysis was undertaken on samples collected on the site in accordance with Soil Survey Laboratory Methods<sup>11</sup>.

### 3. BASELINE CONDITIONS

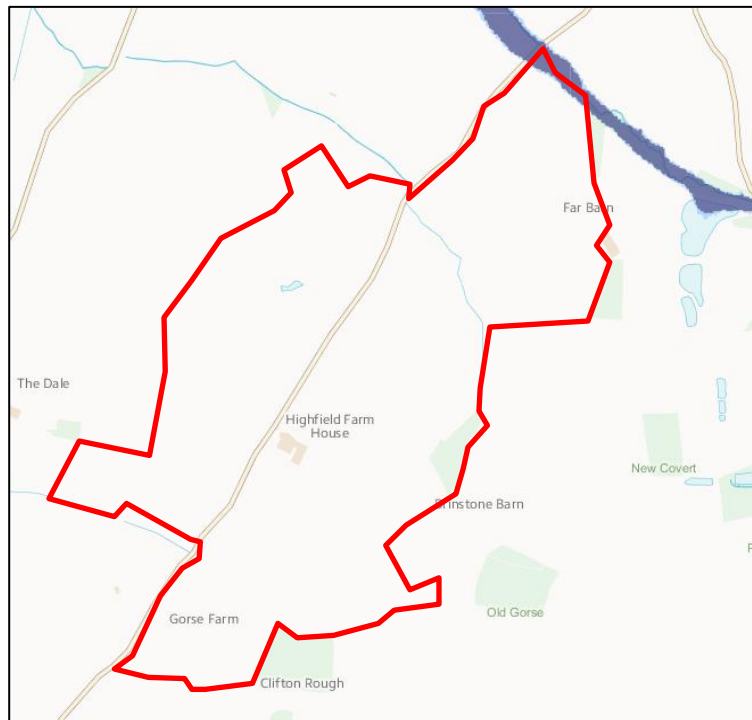
#### 3.1. Climate and flooding

The climatological data (Table 1a) indicates slightly above average temperature, average rainfall and an average number of field capacity days for the region.

<b>Table 1a</b>		
<b>Climatological information<sup>4</sup></b>		
<b>Factor</b>	<b>Units</b>	<b>Value</b>
Altitude AOD	m	85
Accumulated temperature	day°C (Jan-June)	1377.0
Average Annual Rainfall	mm	643.7
Field Capacity Days	days	139.3
Moisture Deficit Wheat	mm	105.2
Moisture Deficit Potatoes	mm	95.7

The majority of the site is mapped within a non flood risk area<sup>8</sup>. The north eastern boundary is mapped within a Flood Zone 2 and 3 flood risk area<sup>8</sup>.

Environment Agency Risk of Flooding from Rivers and Sea Map (1:10,000 scale, 2018)



For the purpose of this report, the terms used by the Environment Agency to categorise flood risk have been changed to match terms used by MAFF. This is to allow an agricultural classification grade to be determined for the site based on flood risk. The classifications have been found to correspond as follows:

- Environment Agency Zone 3a High Probability – MAFF Frequent
- Environment Agency Zone 3b Functional Floodplain – MAFF Frequent
- Environment Agency Zone 2 Medium Probability – MAFF Occasional
- Environment Agency Zone 1 Low Probability – MAFF Rare to Very Rare

The total site area affected by the Zone 3 High Probability flooding is approximately 0.3 ha (Table 1b).

**Table 1b. ALC Grade according to flood risk**

**WINTER Mid November to mid March**

ALC Grade	Frequency	Duration	Approx. Area affected (m <sup>2</sup> )
1	rare	short	
2	rare	medium	
2	occasional	short	
3a	rare	long	
3a	occasional	medium	
3a	frequent	short	
3b	occasional	long	
3b	frequent	medium	3,000.00
4	frequent	long	

**SUMMER Mid March to mid November**

ALC Grade	Frequency	Duration	Approx. Area affected (m <sup>2</sup> )
1	very rare	short	NA
2	rare	short	NA
3a	very rare	medium or long	NA
3a	rare	medium	NA
3a	occasional	short	NA
3b	rare	long	NA
3b	occasional	medium	NA
4	occasional	long	NA
4	frequent	short or medium	NA
5	frequent	long	NA

MAFF Frequency definitions	
very rare	< 1 in 15 year
rare	1 in 10 -14 year
occasional	1 in 3 - 9 year
frequent	> 1 in 3 year

Duration definitions	
short	<48 hrs
medium	2 to 4 days
long	> 4 days

## 3.2. Soils, geology and topography

### 3.2.1. Soils

The site has previously been mapped as having soils of the *Whimple 3, Salop and Brockhurst 2 Associations*<sup>5,6</sup>.

This survey identified the site soils to be the same as the previously mapped soils. Three general soil types were noted for the purposes of ALC grading. Some variation in depth occurred across the site.

This study has identified the soils to be:

1. Silty clay loams over silty clay to depth
2. Clay loam over clay with prismatic and massive structure to depth
3. Clay loam over clay with angular blocky structure to depth

### 3.2.2. Geology<sup>9</sup>

#### Superficial Geology

Majority of the site

*None recorded*

North east of the site

**1:50 000 scale superficial deposits description:** *Alluvium - Clay, Silt, Sand And Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U).*

North and west of the site

**1:50 000 scale superficial deposits description:** *Head - Diamicton. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by subaerial slopes (U).*

South of the site

**1:50 000 scale superficial deposits description:** *Glaciofluvial Deposits, Mid Pleistocene - Sand And Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by ice age conditions (UGF).*



## **Bedrock Geology**

*1:50 000 scale bedrock geology description: Gunthorpe Member - Mudstone. Sedimentary Bedrock formed approximately 237 to 247 million years ago in the Triassic Period. Local environment previously dominated by hot deserts.*

### **3.2.3. Topography**

The site has a slight slope with a gradient of 5° or less and hence gradient will not limit the ALC Grade across the site. Drains and streams present along field boundaries with gradients of 4-7° are classified as non-agricultural for the purposes of this survey.

## 4. FIELDWORK RESULTS

### 4.1. Descriptions of soil types

This study has identified the soils to be:

1. Silty clay loams over silty clay to depth
2. Clay loam over clay with prismatic and massive structure to depth
3. Clay loam over clay with angular blocky structure to depth

A summary of the features of the soil types are listed in Table 2 and locations are shown within Drawing ALC/1.

<b>Table 2. Soil Type descriptions</b>			
Profile	Soil types		
Description	Type 1	Type 2	Type 3
Horizon 1 (topsoil)	0-35 cm Dark yellowish brown (10YR 4/4) slightly stony medium silty clay loam, no mottles; friable weak medium subangular blocky structure.	0-35 cm Dark greyish brown (10YR 4/2) slightly stony medium clay loam, no mottles; friable weak fine subangular blocky structure.	0-35 cm Dark greyish brown (10YR 4/2) very slightly stony medium clay loam, no mottles; firm weak medium subangular blocky structure.
Horizon 2 (subsoil 1)	35-120 cm Reddish brown (5YR 4/3) slightly to moderately stony silty clay, few fine ochreous mottles; firm moderate coarse angular blocky structure.	35-100 cm Reddish brown (5YR 4/3) stoneless clay, many medium ochreous and greyish mottles; firm moderate medium prismatic structure.	35-60 cm Light brownish grey (2.5Y 6/2) stoneless clay, many medium ochreous mottles; firm weak medium angular blocky structure.
Horizon 3 (subsoil 2)		100-120 cm Reddish grey (5YR 5/2) stoneless clay, many medium greyish mottles; firm moderate massive structure.	60-120 cm Reddish brown (5YR 5/4) stoneless clay, many medium greyish mottles; firm moderate coarse angular blocky structure.
Soil types: Type 1 soil – 9, 16-18, 20, 29-32, 39-44, 53-60, 68-77, 80-108, 113-119, 125-132, 134-146, 150, 152-156 and 158 Type 2 soil – 1-4, 6-8, 12-15, 25-28, 36-38, 49-52, 64-67, 109-112, 120-124, 133, 147-149, 151, 157 and 159-172 Type 3 soil – 5, 10, 11, 19, 21-24, 32a-35, 45-48, 61-63, 78 and 79			
Notes: Variations in depth and stoniness of Type 1 topsoil and subsoil were noted across the site.			

## 4.2. Field study photographs

**Photo 1. Boring location 68– Profile of Soil Type 1**



NB Photographs of auger borings are included for an illustration of horizons, to verify profile depth and provide an indication of colour but are not intended to verify any structure.

**Photo 2. Pit 96 - Profile of Soil Type 1**



**Photo 3. Subsoil 1 of Soil Type 1**

**Photo 4. Boring location 28 – Profile of Soil Type 2**



NB Photographs of auger borings are included for an illustration of horizons, to verify profile depth and provide an indication of colour but are not intended to verify any structure.

**Photo 5. Pit 162 - Profile of Soil Type 2**



**Photo 6. Subsoil 1 of Soil Type 2**



**Photo 7. Boring location 47 – Profile of Soil Type 3**



NB Photographs of auger borings are included for an illustration of horizons, to verify profile depth and provide an indication of colour but are not intended to verify any structure.

**Photo 8. Pit 21 - Profile of Soil Type 3**



**Photo 9. Subsoil 1 of Soil Type 3**



### 4.3. In-field wetness class assessment

An in-field wetness assessment was conducted for the soil types mapped on site (Table 3).

<b>Table 3. In-field Wetness Class Assessment</b>					
<b>Soil Type</b>	<b>Feature</b>	<b>Parameters</b>	<b>Findings</b>	<b>WC</b>	
1	Site conditions	Undisturbed/ disturbed	Undisturbed	IV	
		FCD	139.3		
	Potential Slowly Permeable Layer (SPL)	Horizon depth (cm)	35-120		
		Texture	ZC		
		Structure	FMCAB		
		Biopores > 0.5 mm (%)	<0.5		
		Evidence of wetness	Mottles		
	Potential Gleyed Horizon	Matrix colour	5YR 4/3		
		Ped faces colour	Pale – 5YR 5/3		
		Mottles	Ochreous – 5YR 4/6		
		Depth to gleying (cm)	35		
	<b>Figure reference in ALC guidelines – 7</b>				
	2	Site conditions	Undisturbed/ disturbed		Undisturbed
FCD			139.3		
Potential Slowly Permeable Layer (SPL)		Horizon depth (cm)	35-100		
		Texture	C		
		Structure	FMMP		
		Biopores > 0.5 mm (%)	<0.5		
		Evidence of wetness	Mottles		
Potential Gleyed Horizon		Matrix colour	5YR 4/3		
		Ped faces colour	Greyish – 5YR 5/2		
		Mottles	Ochreous – 5YR 5/6 Greyish – 7.5YR 5/1		
		Depth to gleying (cm)	35		
<b>Figure reference in ALC guidelines – 7</b>					
<p><b>Key</b></p> <p>FCD – Field Capacity Days ZC – Silty Clay C – Clay</p> <p>WC – Wetness Class FMCAB – Firm Moderate Coarse Angular Blocky FMMP – Firm Moderate Medium Prismatic</p> <p><b>Notes:</b></p>					

<b>Table 3. In-field Wetness Class Assessment</b>					
<b>Soil Type</b>	<b>Feature</b>	<b>Parameters</b>	<b>Findings</b>	<b>WC</b>	
3	Site conditions	Undisturbed/ disturbed	Undisturbed	IV	
		FCD	139.3		
	Potential Slowly Permeable Layer (SPL)	Horizon depth (cm)	35-60		
		Texture	C		
		Structure	FWMAB		
		Biopores > 0.5 mm (%)	<0.5		
		Evidence of wetness	Mottles		
	Potential Gleyed Horizon	Matrix colour	Greyish – 2.5Y 6/2		
		Ped faces colour	Greyish – 2.5Y 6/2		
		Mottles	Ochreous – 10YR 6/6		
		Depth to gleying (cm)	35		
	<b>Figure reference in ALC guidelines – 7</b>				
	<p><b>Key</b>            FCD – Field Capacity Days            C – Clay            WC – Wetness Class            FWMAB – Firm Weak Medium Angular Blocky</p> <p><b>Notes:</b></p>				

## 5. AGRICULTURAL LAND CLASSIFICATION

### 5.1. National 1:250 000 map grading

Grading on the MAFF (1983) 1: 250 000 map<sup>7</sup> indicated the site was mapped as **ALC Grades 2 and 3**.

### 5.2. Current grading

This survey has resulted in an Agricultural Land Classification of the following grades:

<b>Grade</b>	<b>Area</b>		<b>Limitation</b>
1			
2			
3a			
3b	85.7	54%	Type 1 Soils – Wetness Limitation
	51.2	32%	Type 2 Soils – Wetness Limitation
	15.5	10%	Type 3 Soils – Wetness Limitation
4			
5			
Non-agricultural	6.1	4%	Road, Highfield Farm House and ponds, drains and streams on field boundaries
Total	158.5 ha	100%	

#### ***Type 1 soils – Wetness Limitation***

The combination of the topsoil texture (medium silty clay loam), Wetness Class (IV) and the number of Field Capacity Days (139.3) results in **ALC Grade 3b** for Type 1 soils.

#### ***Type 2 soils – Wetness Limitation***

The combination of the topsoil texture (medium clay loam), Wetness Class (IV) and the number of Field Capacity Days (139.3) results in **ALC Grade 3b** for Type 2 soils.

#### ***Type 3 soils – Wetness Limitation***

The combination of the topsoil texture (medium clay loam), Wetness Class (IV) and the number of Field Capacity Days (139.3) results in **ALC Grade 3b** for Type 3 soils.



# **DRAWING ALC/1**

**Soil Types and Boring and Pit Locations**

# Soil Environment Services

## Key

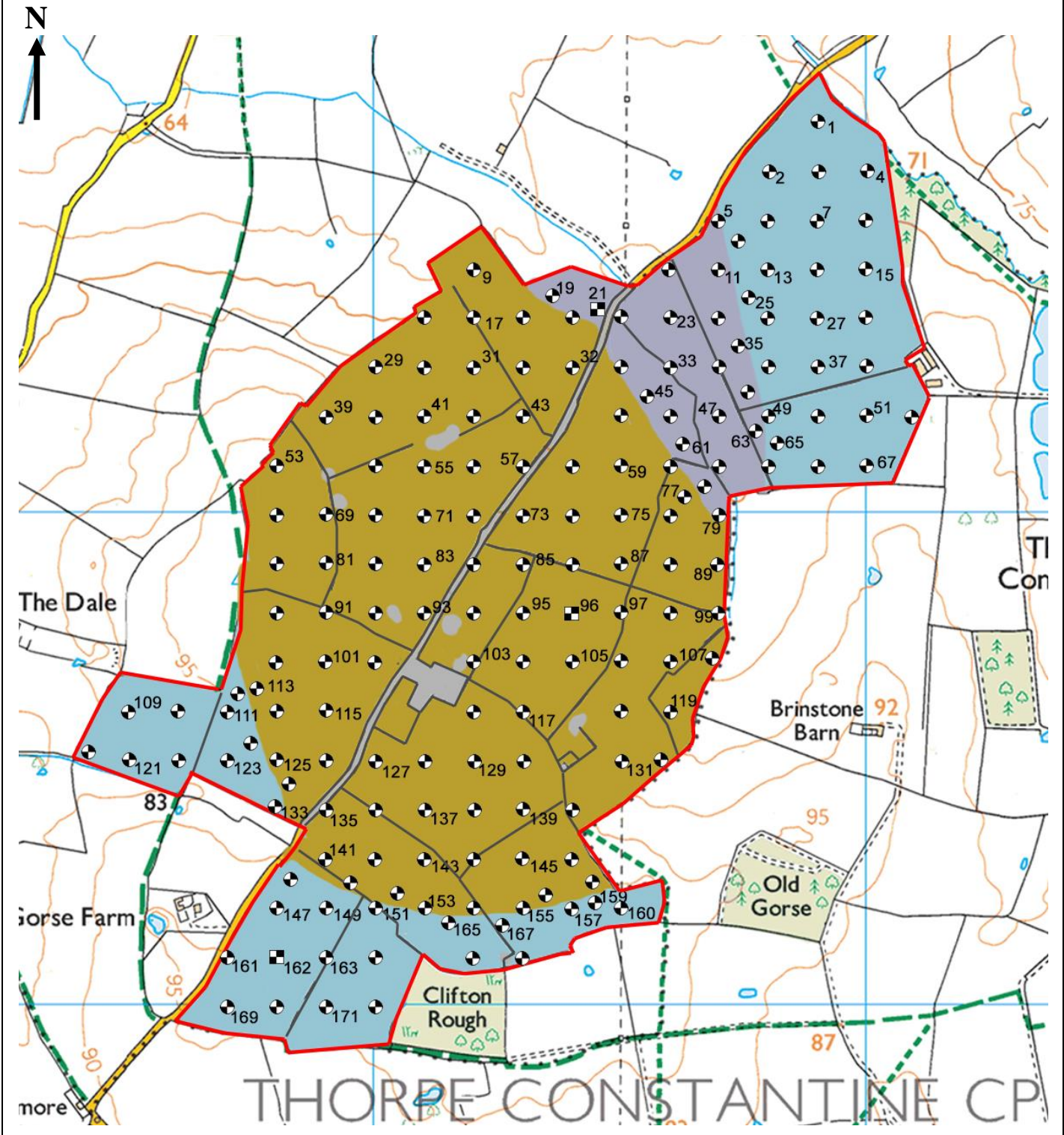
- Type 1 Soils
- Type 2 Soils
- Type 3 Soils
- Non Agricultural
- Pit Location
- Boring Location

Drawing Title: Soil Types

Drawing No.: ALC/1

Scale: 1: 12473

Date: 21/05/2019



# **DRAWING ALC/2**

**ALC Grade**

**Key**

- Moderate quality- 3b
- Non Agricultural
- Boring Location
- Pit Location

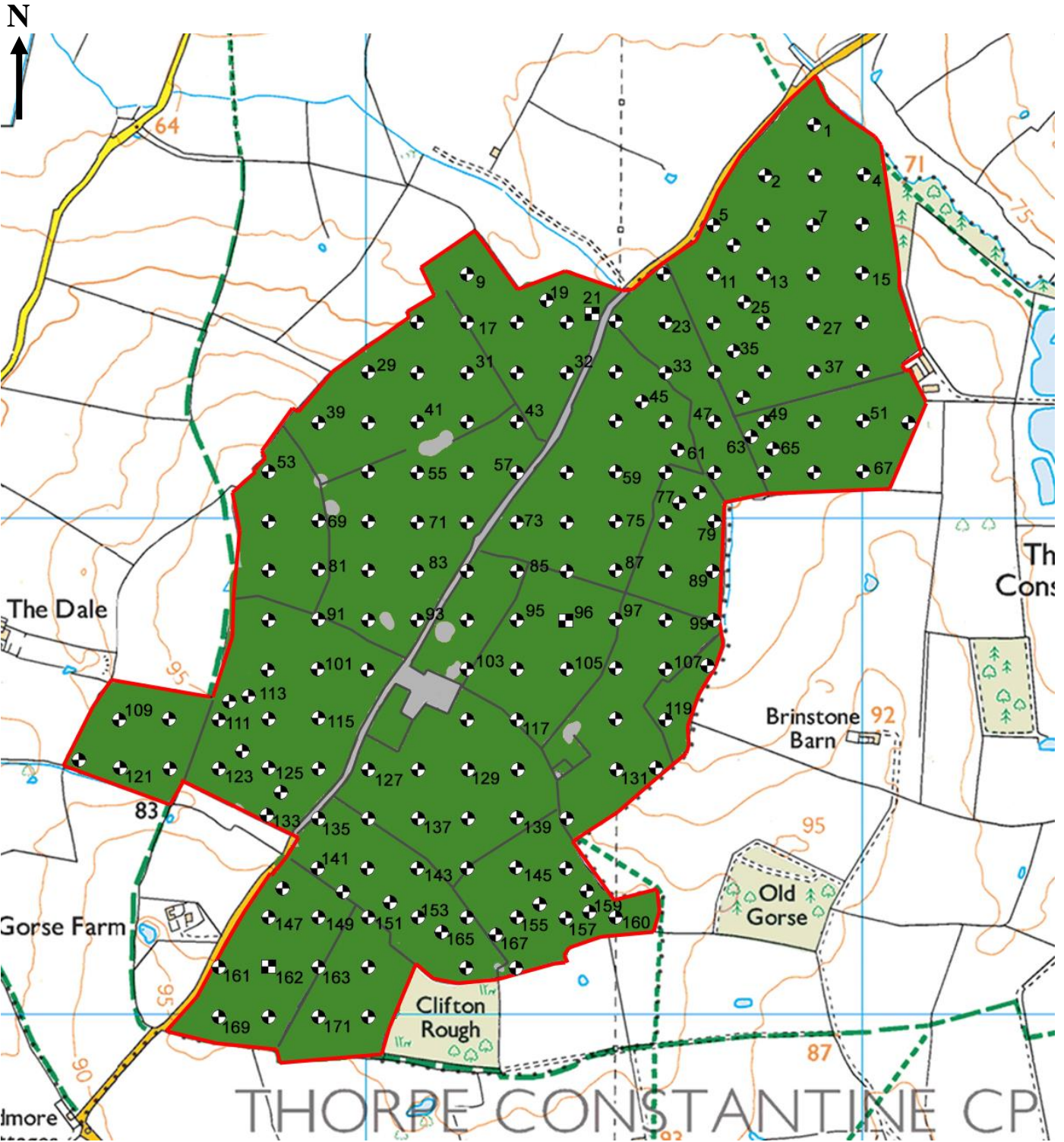
# Soil Environment Services

Drawing Title: Soil Types

Drawing No.: ALC/1

Scale: 1: 12473

Date: 21/05/2019



# **APPENDIX A**

**Climatological data for**  
*Agricultural Land Classification*



## Droughtiness (moisture balance) determination for each soil type and restored profile

Moisture availability data for each texture from MAFF ALC Guidelines 1988

Moisture Balance (MB) = AP - MD for wheat and potatoes (adjusted for stones)

	Horizon	Type 1		Type 2		Type 3			
		texture	water	texture	water	texture	water		
TAvt - Topsoil water available (mm)		ZCL	17.20	CL	16.30	CL	17.15		
LTt - Topsoil thickness (cm)		0	35.00	0	35.00	0	35.00		
TAVs - Subsoil total available	1	ZC	10.68	C	13.00	C	13.00		
	2	0	0.00	C	13.00	C	13.00		
	3	0	0.00	0	0.00	0	0.00		
EAVs -	1	ZC	6.22	C	7.00	C	7.00		
Subsoil (SS) easily available	2	0	0.00	C	7.00	C	7.00		
	3	0	0.00	0	0.00	0	0.00		
LT50 -	1	ZC	15.00	C	15.00	C	15.00		
Thickness ss layers to 50cm	2	0	0.00	C	0.00	C	0.00		
	3	0	0.00	0	0.00	0	0.00		
LT120 -	1	ZC	70.00	C	50.00	C	10.00		
Thickness ss layers 50 to 120cm	2	0	0.00	C	20.00	C	60.00		
	3	0	0.00	0	0.00	0	0.00		
LT0 -	1	ZC	35.00	C	35.00	C	25.00		
Thickness ss layers to 70cm	2	0	0.00	C	0.00	C	10.00		
	3	0	0.00	0	0.00	0	0.00		
Total profile thickness for soil type cm		0	120		120	0	120		

### SOIL Droughtiness (moisture balance) results

#### Type 1

#### Grade

Results

AP wheat =

119.8

Moisture balance wheat =

14.5 2

AP potatoes =

97.6

Moisture balance potatoes =

1.8 2

#### Type 2

Results

AP wheat =

125.6

Moisture balance wheat =

20.3 2

AP potatoes =

102.6

Moisture balance potatoes =

6.8 2

#### Type 3

Results

AP wheat =

128.5

Moisture balance wheat =

23.3 2

AP potatoes =

105.5

Moisture balance potatoes =

9.8 2

### Notes

ALC Grade	Moisture Balance Limits	
	wheat	potatoes
1	30	10
2	5	-10
3a	-20	-30
3b	-50	-55
4	<-50	<-55

# **APPENDIX B**

## **Site Survey Field Notes**



## ALC Survey Profile Data Sheet

Site: Western Package, Thorpe Estate

Pit no.	Topsoil						Subsoil 1						Subsoil 2					
	Depth (cm)	Texture	Colour (Munsell)	Stoniness (%)	Mottles	Structure	Depth (cm)	Texture	Colour (Munsell)	Stoniness (%)	Mottles	Structure	Depth (cm)	Texture	Colour (Munsell)	Stoniness (%)	Mottles	Structure
1	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
2	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
3	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
4	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMG	FMM
5	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
6	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
7	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
8	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMG	FMM
9	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
10	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
11	0-37	CL	10YR 4/2	4	No	FWMSAB	37-55	C	2.5Y 6/2	2	MMO	FWMAB	55-120	C	5YR 5/4	0	MMOG	FMCAB
12	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
13	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
14	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
15	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMG	FMM
16	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
17	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
18	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
19	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
20	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
21	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
22	0-37	CL	10YR 4/2	4	No	FWMSAB	37-55	C	2.5Y 6/2	2	MMO	FWMAB	55-120	C	5YR 5/4	0	MMOG	FMCAB
23	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
24	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
25	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
26	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM
27	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM
28	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMG	FMM
29	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						

30	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
31	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
31a	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
32	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
32a	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
33	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMOG	FMCAB
34	0-35	CL	10YR 4/2	5	No	FWMSAB	35-65	C	2.5Y 6/2	0	MMO	FWMAB	35-120	C	5YR 5/4	0	MMG	FMCAB
35	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
36	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
37	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM
38	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMG	FMM
39	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
40	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
41	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
42	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
43	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
44	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
45	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
46	0-32	CL	10YR 4/2	4	No	FWMSAB	32-55	C	2.5Y 6/2	2	MMO	FWMAB	55-120	C	5YR 5/4	0	MMOG	FMCAB
47	0-37	CL	10YR 4/2	4	No	FWMSAB	37-55	C	2.5Y 6/2	2	MMO	FWMAB	55-120	C	5YR 5/4	0	MMOG	FMCAB
48	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
49	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
50	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
51	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
52	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
53	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
54	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
55	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
56	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
57	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
58	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
59	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						

60	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
61	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
62	0-35	CL	10YR 4/2	5	No	FWMSAB	35-60	C	2.5Y 6/2	0	MMO	FWMAB	60-120	C	5YR 5/4	0	MMG	FMCAB
63	0-37	CL	10YR 4/2	4	No	FWMSAB	37-55	C	2.5Y 6/2	2	MMO	FWMAB	55-120	C	5YR 5/4	0	MMOG	FMCAB
64	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM
65	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMG	FMM
66	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
67	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMG	FMM
68	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
69	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
70	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
71	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
72	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
73	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
74	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
75	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
76	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
77	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
78	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
79	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
80	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
81	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
82	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
83	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
84	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
85	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
86	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
87	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
88	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
89	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
90	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
91	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						

92	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
93	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
94	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
95	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
96	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
97	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
98	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
99	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
100	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
101	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
102	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
103	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
104	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
105	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
106	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
107	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
108	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
109	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
110	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
111	0-40	CL	10YR 4/2	12	No	FrWFSAB	40-100	C	5YR 4/3	3	MMOG	FMMP	100-120	C	5YR 5/2	2	MMOG	FMM
112	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
113	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
114	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
115	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
116	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
117	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
118	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
119	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
120	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
121	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM
122	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM
123	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM

124	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM
125	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
126	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
127	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
128	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
129	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
130	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
131	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
132	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
133	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM
134	0-30	ZCL	10YR 4/4	10	No	FrWMSAB	30-120	ZC	5YR 4/3	20	FFO	FMCAB						
135	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
136	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
137	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
138	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
139	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
140	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
141	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
142	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
143	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
144	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
145	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
146	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
147	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM
148	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM
149	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM
150	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
151	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM
152	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
153	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FMCAB						
154	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						
155	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FMCAB						

156	0-38	ZCL	10YR 4/4	10	No	FrWMSAB	38-120	ZC	5YR 4/3	15	FFG	FM CAB							
157	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	
158	0-35	ZCL	10YR 4/4	10	No	FrWMSAB	35-120	ZC	5YR 4/3	15	FFO	FM CAB							
159	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	
160	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	
161	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	
162	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM	
163	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM	
164	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	
165	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMOG	FMM	
166	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	
167	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMOG	FMM	
168	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM	
169	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	
170	0-38	CL	10YR 4/2	10	No	FrWFSAB	38-88	C	5YR 4/3	0	MMOG	FMMP	88-120	C	5YR 5/2	0	MMG	FMM	
171	0-33	CL	10YR 4/2	10	No	FrWFSAB	33-90	C	5YR 4/3	0	MMOG	FMMP	90-120	C	5YR 5/2	0	MMOG	FMM	
172	0-35	CL	10YR 4/2	10	No	FrWFSAB	35-100	C	5YR 4/3	0	MMOG	FMMP	100-120	C	5YR 5/2	0	MMG	FMM	

Key:

CL - Clay Loam  
ZCL - Silty Clay Loam  
C - Clay  
ZC - Silty Clay  
No - No Mottles

FFO - Few Fine Ochreous  
MMOG - Many Medium Ochreous and Greyish  
MMG - Many Medium Greyish  
MMO - Many Medium Ochreous  
FrWMSAB - Friable Weak Medium Subangular Blocky

FrWFSAB - Friable Weak Fine Subangular Blocky  
FWMSAB - Firm Weak Medium Subangular Blocky  
FMCAB - Firm Moderate Coarse Angular Blocky  
FMMP - Firm Moderate Medium Prismatic  
FWMAB - Firm Weak Medium Angular Blocky  
FMM - Firm Moderate Massive

## INFORMATION SOURCES

1. *Agricultural Land Classification of England and Wales*. Guidance and criteria for grading the quality of agricultural land. MAFF. 1988.
2. *Agricultural Land Classification of England and Wales*. Guidance and criteria for grading the quality of agricultural land. Second Revision MAFF. DRAFT May 1996.
3. *Soil Survey Field Handbook*. Technical Monograph No.5. Soil Survey of England and Wales.1976.
4. *Climatological Data for Agricultural Land Classification*, The Met. Office 1989
5. *Soil Map of England and Wales: 1:250 000*. Soil Survey of England and Wales, Harpenden.
6. *Soils and Their Use in Midland and Western England*. Soil Survey of England and Wales, Harpenden.
7. *Agricultural Land Classification Map 1:250 000*. MAFF 1983.
8. *Risk of Flooding from Rivers and Sea: 1:15 000*. Environment Agency
9. *Geology of Britain Viewer*. Reproduced with the permission of the British Geological Survey ©NERC. All rights Reserved
10. *Butler, B E. Soil Classification for Soil Survey Monographs on Soil Survey (1980)*  
Clarendon Press, Oxford
11. *Soil Survey Laboratory Methods B.W. Avery and C.L. Bascomb, Harpenden (1982)*