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MAFF Ministry of Agriculture Fisheries and Food

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Land at Tongham, Surrey
Agricultural Land Classification
ALC Map and Report
June 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

LAND AT TONGHAM, SURREY

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on 22 hectares of land in respect of an adhoc planning application for a proposed residential development at Tongham in Surrey. An Agricultural Land Classification (ALC) survey of this site was carried out in June 1995.

1.2 The Agricultural Land Classification (ALC) survey was undertaken at a detailed level of approximately one boring per hectare. A total of 25 auger borings and one soil inspection pit were assessed in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture.

1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of survey all of the agricultural land on this site was under permanent pasture with a strip of Woodland towards the south.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in Table 1 below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading. This information supersedes any previous ALC information for the site.

Table 1 : Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site
3b	22.2	99.1
Woodland	0.2	0.9
Total area of site	22.4	100%

1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 All of the agricultural land on this site has been classified as Subgrade 3b, moderate quality, on the basis of a significant soil wetness limitation. The soils are derived from the London Clay and as such generally comprise poorly drained, heavily poached, medium or heavy clay loams over slowly permeable clay subsoils. Occasional organic profiles were noted but in this climatic regime, which is relatively dry in regional terms, the agricultural land quality is not affected. Isolated patches of possibly poorer quality land also exist on the site where hydrophilic vegetation such as Juncus Spp. is present. These patches are not mapped separately, however, due to their limited extent.

2. Climate

2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (day degrees Celsius, Jan-June), as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office, 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site. However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations

2.4 No local climatic factors such as exposure or frost risk are believed to affect the site.

Table 2 : Climatic Interpolation

Grid Reference	SU 892 497
Altitude (m AOD)	75
Accumulated Temperature (day degrees, Jan-June)	1444
Average Annual Rainfall (mm)	698
Field Capacity (days)	148
Moisture Deficit, Wheat (mm)	109
Moisture Deficit, Potatoes (mm)	102
Overall Climatic Grade	1

3. Relief

3.1 The land on this site slopes very gently from approximately 73m AOD in the north to 85m AOD in the south. Nowhere on the site does altitude or relief impose limitations to agricultural land quality.

4. Geology and Soil

4.1 The relevant geological sheet (BGS, 1976) shows the majority of the site to be underlain by London Clay with a very small area of 2nd terrace river gravel in the extreme north west corner.

4.2 The published soil information (SSEW, 1983) shows the Wickham 3 soil association across the site. These soils are described as 'Slowly permeable seasonally waterlogged fine loamy over clayey and coarse loamy over clayey soils, and similar more permeable soils

with slight waterlogging. Some deep coarse loamy soils affected by groundwater. Landslips with irregular terrain locally.' (SSEW, 1983).

4.3 Detailed field survey broadly confirms the existence of soils similar to those described in paragraph 4.2.

5. Agricultural Land Classification

5.1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map.

5.2 The location of the soil observation points are shown on the attached sample point map.

5.3 **Subgrade 3b**

All of the agricultural land on this site has been assessed as Subgrade 3b (moderate quality) on the basis of a severe soil wetness limitation. Pit 1 is representative of the majority of these soil profiles which generally comprise slightly sandy medium and heavy clay loam topsoils over poorly structured, slowly permeable, clay at 25-38cm depth. Occasional heavy clay loam upper subsoils occur but the clay is usually present within 40cm thus creating a drainage restriction consistent with Wetness Class IV, Subgrade 3b. Organic topsoils and upper subsoils were recorded in a few isolated places but this does not appear to affect agricultural land quality on this site. The sporadic occurrence of hydrophilic vegetation, e.g. Juncus Spp., suggests that local patches are wetter than the surrounding land but are too limited to warrant a separate mapping unit.

SOURCES OF REFERENCE

British Geological Survey (1976), Sheet No. 285, Aldershot, 1:50,000 Scale (solid & drift edition).

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet 6, Soils of South East England, and accompanying legend.

APPENDIX I

DESCRIPTION OF THE GRADES AND SUBGRADES

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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3 : Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the level of yields. It is mainly suited to grass with occasional arable crops (eg. 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 Agricultural Land

Land with severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religous buildings, cemetries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging[1]
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years.[2]
II	The soil profile is wet within 70 cm depth for 31-90 days in most years **or**, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but only wet within 40 cm depth for 30 days in most years.
III	The soil profile is wet within 70 cm depth for 91-180 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31-90 days in most years.
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years **or**, if there is no slowly permeable layer present within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40 cm depth for 211-335 days in most years.
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

[1]The number of days specified is not necessarily a continuous period.
[2]'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents :

Soil Pits and Auger Borings

1. **TEXTURE** : soil texture classes are denoted by the following abbreviations.

S :	Sand	**LS** :	Loamy Sand	**SL** :	Sandy Loam
SZL :	Sandy Silt Loam	**CL** :	Clay Loam	**ZCL** :	Silty Clay Loam
ZL :	Silt Loam	**SCL** :	Sandy Clay Loam	**C** :	Clay
SC :	Sandy Clay	**ZC** :	Silty Clay	**OL** :	Organic Loam
P :	Peat	**SP** :	Sandy Peat	**LP** :	Loamy Peat
PL :	Peaty Loam	**PS** :	Peaty Sand	**MZ** :	Marine Light Silts

For the sand, loamy sand, sandy loam and sandy silt loam classes, the predominant size of sand fraction will be indicated by the use of the following prefixes:

F : Fine (more than 66% of the sand less than 0.2mm)
M : Medium (less than 66% fine sand and less than 33% coarse sand)
C : Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M** : Medium (<27% clay) **H** : Heavy (27-35% clay)

2. **MOTTLE COL** : Mottle colour using Munsell notation.

3. **MOTTLE ABUN** : Mottle abundance, expressed as a percentage of the matrix or surface described.

F : few <2% **C** : common 2-20% **M** : many 20-40% **VM** : very many 40% +

4. **MOTTLE CONT** : Mottle contrast

F : faint - indistinct mottles, evident only on close inspection
D : distinct - mottles are readily seen
P : prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL** : Ped face colour using Munsell notation.

6. **GLEY** : If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH** : Stone Lithology - One of the following is used.

HR :	all hard rocks and stones	**SLST** :	soft oolitic or dolimitic limestone
CH :	chalk	**FSST** :	soft, fine grained sandstone
ZR :	soft, argillaceous, or silty rocks	**GH** :	gravel with non-porous (hard) stones
MSST :	soft, medium grained sandstone	**GS** :	gravel with porous (soft) stones
SI :	soft weathered igneous/metamorphic rock		

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

SOIL PROFILE DESCRIPTIONS : EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

1. **GRID REF** : national 100 km grid square and 8 figure grid reference.

2. **USE** : Land use at the time of survey. The following abbreviations are used.

ARA : Arable	**WHT** : Wheat	**BAR** : Barley
CER : Cereals	**OAT** : Oats	**MZE** : Maize
OSR : Oilseed rape	**BEN** : Field Beans	**BRA** : Brassicae
POT : Potatoes	**SBT** : Sugar Beet	**FCD** : Fodder Crops
LIN : Linseed	**FRT** : Soft and Top Fruit	**FLW** : Fallow
PGR : Permanent Pasture	**LEY** : Ley Grass	**RGR** : Rough Grazing
SCR : Scrub	**CFW** : Coniferous Woodland	**DCW** : Deciduous Wood
HTH : Heathland	**BOG** : Bog or Marsh	**FLW** : Fallow
PLO : Ploughed	**SAS** : Set aside	**OTH** : Other
HRT : Horticultural Crops		

3. **GRDNT** : Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL** : Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)** : Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)** : Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT** : Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL : Microrelief limitation	**FLOOD** : Flood risk	**EROSN** : Soil erosion risk
EXP : Exposure limitation	**FROST** : Frost prone	**DIST** : Disturbed land
CHEM : Chemical limitation		

9. **LIMIT** : The main limitation to land quality. The following abbreviations are used.

OC : Overall Climate	**AE** : Aspect	**EX** : Exposure
FR : Frost Risk	**GR** : Gradient	**MR** : Microrelief
FL : Flood Risk	**TX** : Topsoil Texture	**DP** : Soil Depth
CH : Chemical	**WE** : Wetness	**WK** : Workability
DR : Drought	**ER** : Erosion Risk	**WD** : Soil Wetness/Droughtiness
ST : Topsoil Stoniness		

8. **STRUCT** : the degree of development, size and shape of soil peds are described using the following notation:

degree of development	**WK** : weakly developed **ST** : strongly developed	**MD** : moderately developed
ped size	**F** : fine **C** : coarse	**M** : medium **VC** : very coarse
ped shape	**S** : single grain **GR** : granular **SAB** : sub-angular blocky **PL** : platy	**M** : massive **AB** : angular blocky **PR** : prismatic

9. **CONSIST** : Soil consistence is described using the following notation:

L : loose **VF** : very friable **FR** : friable **FM** : firm **VM** : very firm
EM : extremely firm **EH** : extremely hard

10. **SUBS STR** : Subsoil structural condition recorded for the purpose of calculating profile droughtiness : **G** : good **M** : moderate **P** : poor

11. **POR** : Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP** : If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropiate horizon.

13. **SPL** : Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC** : If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations
APW : available water capacity (in mm) adjusted for wheat
APP : available water capacity (in mm) adjusted for potatoes
MBW : moisture balance, wheat
MBP : moisture balance, potatoes

SOIL PIT DESCRIPTION

Site Name : TONGHAM, SURREY Pit Number : 1P

Grid Reference: SU89204980
Average Annual Rainfall : 698 mm
Accumulated Temperature : 1444 degree days
Field Capacity Level : 148 days
Land Use : Permanent Grass
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 24	MCL	10YR31 00	0	3	HR	C				
24- 33	C	05Y 52 00	0	10	HR	M	WKCAB	FM	P	
33- 65	C	25Y 52 61	0	0		M	MDCAB	FM	P	

Wetness Grade : 3B
Wetness Class : IV
Gleying : 0 cm
SPL :024 cm

Drought Grade :
APW : mm MBW : 0 mm
APP : mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

MPLE		ASPECT			--WETNESS--		-WHEAT-		-POTS-		M.REL	EROSN	FROST	CHEM	ALC	
.	GRID REF	USE	GRDNT	GLEY SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT	COMMENTS
1	SU89005000	PGR		0 030	4	3B		0		0					WE 3B	
1P	SU89204980	PGR		0 024	4	3B		0		0					WE 3B	At boring 10
2	SU89105000	PGR		0 025	4	3B		0		0					WE 3B	
3	SU89205000	PGR		0 067	3	3A		0		0					WE 3A	Sandy
4	SU89305000	PGR		0 038	4	3B		0		0					WE 3B	
5	SU89104990	PGR		0 023	4	3B		0		0					WE 3B	
6	SU89204990	PGR		0 030	4	3B		0		0					WE 3B	
7	SU89324990	PGR		0 038	4	3B		0		0					WE 3B	
8	SU89404990	PGR		0 028	4	3B		0		0					WE 3B	
9	SU89104980	PGR		0 026	4	3B		0		0					WE 3B	
10	SU89204980	PGR		0 025	4	3B		0		0					WE 3B	
11	SU89304980	PGR		0 025	4	3B		0		0					WE 3B	
12	SU89404980	PGR		028 033	4	3B		0		0					WE 3B	Rushes
13	SU89504980	PGR		0 028	4	3B		0		0					WE 3B	
14	SU89104970	PGR		0 025	4	3B		0		0					WE 3B	
15	SU89204970	PGR		0 025	4	3B		0		0					WE 3B	
16	SU89304970	PGR		0 028	4	3B		0		0					WE 3B	
17	SU89474972	RGR		0 035	4	3B		0		0					WE 3B	
18	SU89204962	RGR		0 035	4	3B		0		0					WE 3B	
19	SU89304960	RGR		0 025	4	3B		0		0					WE 3B	Rushes
20	SU89434960	RGR		0 030	4	3B		0		0					WE 3B	
21	SU89204950	PGR		0 030	4	3B		0		0					WE 3B	
22	SU89304950	PGR		0 042	3	3A		0		0					WE 3A	Sandy
23	SU89404950	PGR		0 033	4	3B		0		0					WE 3B	Rushes
24	SU88824997	PGR		0 030	4	3B		0		0					WE 3B	
25	SU89324942	PGR		0 038	4	3B		0		0					WE 3B	Sandy

AMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-30	hcl	10YR21 31	10YR46 00	C			Y	0	0		0							
	30-70	c	25Y 61 00	10YR58 00	M			Y	0	0		0		P	Y		Y		
1P	0-24	mcl	10YR31 00	10YR46 00	C			Y	0	0	HR	3							
	24-33	c	05Y 52 00	10YR58 00	M			Y	0	0	HR	10	WKCAB	FM P	Y		Y		Slightly Sandy
	33-65	c	25Y 52 61	10YR58 00	M		25Y 53 00	Y	0	0		0	MDCAB	FM P	Y		Y		variable b'dary
2	0-25	hcl	10YR21 31	10YR46 00	C			Y	0	0	HR	2							
	25-70	c	25Y 61 00	10YR58 68	M			Y	0	0		0		P	Y		Y		Slightly sandy
3	0-28	mcl	10YR32 00	75YR58 00	C			Y	0	0	HR	1							Slightly sandy
	28-40	hcl	10YR42 00	75YR58 00	C			Y	0	0	HR	1		M					slightly sandy
	40-67	hcl	25Y 61 62	10YR58 00	C			Y	0	0		0		M					slightly sandy
	67-85	c	10YR61 62	75YR58 00	M			Y	0	0		0		P	Y		Y		
4	0-25	mcl	10YR32 00	75YR58 00	C			Y	0	0	HR	1							
	25-38	hcl	10YR42 00	75YR58 00	C			Y	0	0	HR	1		M					
	38-80	c	25Y 62 00	10YR66 00	M			Y	0	0		0		P	Y		Y		Slightly sandy
5	0-23	hcl	10YR31 00	10YR46 00	C			Y	0	0	HR	5							
	23-40	c	25Y 62 00	10YR68 00	M			Y	0	0	HR	3		P	Y		Y		
	40-70	c	25Y 51 00	75YR58 00	M			Y	0	0		0		P	Y		Y		
6	0-30	c	25Y 31 00	10YR58 00	M			Y	0	0	HR	2							
	30-70	c	25Y 52 61	10YR58 00	M			Y	0	0	HR	3		P	Y		Y		
7	0-25	mcl	10YR32 00	10YR58 00	C			Y	0	0	HR	2							
	25-38	hcl	10YR42 00	10YR68 00	C			Y	0	0		0		M					
	38-60	c	25Y 61 62	10YR58 00	M			Y	0	0		0		P	Y		Y		
8	0-28	mcl	10YR32 00	10YR58 00	C			Y	0	0	HR	2							
	28-60	c	05Y 53 61	10YR68 00	M			Y	0	0		0		P	Y		Y		Slighlty sandy
9	0-26	hcl	10YR31 00	10YR46 00	C			Y	0	0		0							
	26-80	c	25Y 61 51	10YR58 00	M			Y	0	0	HR	5		P	Y		Y		
10	0-25	hcl	10YR31 32	10YR46 00	C			Y	0	0	HR	2							
	25-40	c	25Y 52 42	10YR58 00	M			Y	0	0	HR	5		P	Y		Y		Slightly sandy
	40-70	c	25Y 52 53	10YR58 00	M			Y	0	0		0		P	Y		Y		
11	0-25	hcl	10YR31 00	10YR46 00	C			Y	0	0	HR	2							
	25-70	c	25Y 52 53	10YR58 00	M		00MN00 00	Y	0	0	HR	5		P	Y		Y		
12	0-28	omcl	10YR31 00						0	0	HR	1							organic
	28-33	ohcl	10YR32 00	10YR68 00	C			Y	0	0	HR	1		M					organic
	33-60	c	25Y 62 00	10YR66 00	C			Y	0	0	HR	1		P	Y		Y		
	60-75	c	25Y 62 00	10YR68 00	M			Y	0	0		0		P	Y		Y		

MPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
13	0-28	hcl	10YR32 31	10YR68 00	C		Y	0	0	HR	2							
	28-35	c	10YR41 00	10YR68 00	C		Y	0	0	HR	2		P	Y		Y		Slightly sandy
	35-50	c	25Y 61 62	75YR58 00	M		Y	0	0	HR	8		P	Y		Y		
14	0-25	hcl	10YR31 00	10YR46 00	C		Y	0	0	HR	2							
	25-50	c	25Y 61 63	10YR68 00	M		Y	0	0	HR	5		P	Y		Y		Slightly sandy
	50-80	c	25Y 51 00	10YR58 00	M		Y	0	0		0		P	Y		Y		
15	0-25	hcl	10YR31 00	10YR46 00	C		Y	0	0	HR	2							
	25-40	c	25Y 61 00	10YR68 58	M		Y	0	0	HR	5		P	Y		Y		Slightly sandy
	40-80	c	25Y 51 52	10YR58 00	M		Y	0	0		0		P	Y		Y		
16	0-28	hcl	10YR32 00	10YR46 00	C		Y	0	0	HR	2							
	28-50	c	25Y 61 00	10YR68 00	M		Y	0	0	HR	5		P	Y		Y		Slightly sandy
	50-80	c	25Y 52 00	10YR58 00	M		Y	0	0		0		P	Y		Y		
17	0-25	hcl	10YR41 00	10YR46 00	C		Y	0	0	HR	2							
	25-35	hcl	10YR53 00	10YR58 00	M		Y	0	0		0		M					
	35-80	c	25Y 53 51	10YR58 00	M		Y	0	0		0		P	Y		Y		
18	0-25	hcl	10YR31 00	10YR46 00	C		Y	0	0		0							
	25-35	hcl	25Y 41 00	10YR58 00	M	00MN00 00	Y	0	0		0		M					
	35-50	c	25Y 53 00	10YR58 00	M	00MN00 00	Y	0	0	HR	5		P	Y		Y		Slightly sandy
	50-80	c	25Y 52 00	10YR58 00	M		Y	0	0		0		P	Y		Y		
19	0-25	hcl	10YR32 00	10YR46 00	C		Y	0	0		0							
	25-45	c	25Y 51 00	10YR58 00	M		Y	0	0	HR	5		P	Y		Y		Slightly sandy
	45-90	c	25Y 53 00	10YR58 00	M		Y	0	0		0		P	Y		Y		
20	0-30	hcl	10YR21 00	10YR46 00	C		Y	0	0		0							
	30-70	c	25Y 53 00	10YR56 00	M	00MN00 00	Y	0	0	HR	3		P	Y		Y		
21	0-30	mcl	10YR32 00	75YR68 00	C		Y	0	0	HR	1							
	30-60	c	25Y 61 62	10YR58 00	M		Y	0	0	HR	1		P	Y		Y		Slightly sandy
22	0-30	cl	10YR32 00	75YR58 00	C		Y	0	0	HR	1							Slightly sandy
	30-42	scl	25Y 61 62	10YR66 00	C		Y	0	0	HR	1		M					Slightly sandy
	42-60	c	25Y 61 00	10YR58 00	M		Y	0	0		0		P	Y		Y		Slightly sandy
23	0-28	omcl	10YR32 00	75YR58 00	C		Y	0	0		0							organic
	28-33	ohcl	10YR42 00	75YR58 00	C		Y	0	0		0		M					organic
	33-60	c	25Y 62 63	75YR58 00	M	00MN00 00	Y	0	0		0		P	Y		Y		
24	0-30	mcl	10YR21 31	10YR46 00	C		Y	0	0	HR	2							
	30-50	c	25Y 51 00	10YR58 00	M		Y	0	0		0		P	Y		Y		
	50-80	c	25Y 51 00	10YR58 00	M		Y	0	0	HR	10		P	Y		Y		
25	0-28	mcl	10YR32 00	75YR58 00	C		Y	0	0	HR	1							Slightly sandy
	28-38	mcl	10YR42 00	75YR58 00	C		Y	0	0	HR	3		M					Slightly sandy
	38-60	c	25Y 61 62	10YR58 00	M		Y	0	0		0		P	Y		Y		Slightly sandy