A1 Horsham District Local Plan
Land West of Cowfold
South of the A272
Agricultural Land Classification
ALC Map and Report
March 1995

AGRICULTURAL LAND CLASSIFICATION REPORT

HORSHAM DISTRICT LOCAL PLAN
LAND WEST OF COWFOLD, SOUTH OF THE A272

1 Summary

1 1 ADAS was commissioned by MAFF s Land Use Planning Unit to provide information on land quality for a number of sites in the Horsham district of West Sussex This forms part of MAFF s input to the preparation of the Horsham District Local Plan

1 2 Approximately 8 hectares of land to the west of Cowfold south of the A272 in West Sussex was surveyed during March 1995 The Agricultural Land Classification (ALC) survey was undertaken at a detailed level of approximately one boring per hectare A total of 10 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 The non agricultural and urban land mapped comprises a private garden and a farm track

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

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
3b	7 3	92 4	100% (7 3 ha)
Non Agricultural	0 3	3 8	
Open water	0 3	3 8	
Urban	<0 1	<1 0	
Total area of site	7 9	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 The entire site has been classified as moderate quality Subgrade 3b due to a significant soil wetness limitation The soils are derived from Weald Clay and as such comprise poorly drained silty over clayey soils

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 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 At this locality the high average annual rainfall (in regional terms) and relatively high field capacity days increase the likelihood of soil wetness Crop adjusted soil moisture deficits are moderate in this area so the land may also be susceptible to soil droughtiness

2 4 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolations

Grid Reference	TQ 212 220	TQ 211 225
Altitude (m)	15	28
Accumulated Temperature (day degrees Jan June)	1517	1502
Average Annual Rainfall (mm)	797	803
Field Capacity (days)	169	170
Moisture Deficit Wheat (mm)	113	111
Moisture Deficit Potatoes (mm)	109	106
Overall Climatic Grade	1	1

3 Relief

3 1 The land on this site slopes gently from 30m AOD in the north to 15m AOD in a small valley towards the south In the extreme south of the site the land rises again very slightly Nowhere on the site do altitude or relief impose limitations to agricultural land quality

4 Geology and Soil

4 1 The British Geological Survey (1984 &1972) sheet 318/333 & 302 Brighton & Worthing and Horsham (Solid & Drift Editions) show the majority of the site to be underlain by Weald Clay with alluvium associated with the valley towards the south

4 2 The Soil Survey of England and Wales (1983) has mapped soils of the Wickham 1 association in the south of the site and those of the Wickham 5 association in the north The former are described as Slowly permeable seasonally waterlogged fine silty over clayey fine loamy over clayey and clayey soils (SSEW 1983) The latter are said to be similar though reddish locally and comprising Some coarse loamy soils with slowly permeable subsoils and slight seasonal waterlogging over sandstone (SSEW 1983)

4 3 Detailed field examination broadly confirmed the existence of soils similar to those described in paragraph 4 2 however all show signs of moderate soil wetness

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 classified as moderate quality Subgrade 3b The soil profiles are gleyed from the topsoil and comprise relatively stone free medium silty clay loams over heavy silty clay loams and clays A thin band of sandstone cobbles may occur at approximately 35 cm from the surface however this horizon is discontinuous and is not impenetrable to plant roots so does not adversely affect profile available water for crops Soil inspection pit 1 on the other hand showed the subsoil to be slowly permeable (from 28 cm depth) therefore significantly impeding drainage and causing a soil wetness limitation consistent with wetness class IV Subgrade 3b In this relatively moist climatic regime (in regional terms) poorly drained soils such as these can inhibit plant and root development as well as render the soils susceptible to structural damage through trafficking by agricultural machinery and poaching by livestock thereby reducing the opportunities for mechanised operations and grazing

ADAS Ref 4205/29/95
MAFF Ref EL42/130

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1972) Sheet No 302 Horsham 1 63360 Scale (solid & drift edition)

British Geological Survey (1984) Sheet No 318/333 Brighton & Worthing 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 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				

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)

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

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

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

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	WETNESS-- GLEY	SPL	CLASS	WHEAT- GRADE	AP	MB	POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	TQ21102250	PGR	S	02	0	028	4	3B		0		0					WE	3B	SPL 28
1P	TQ21102230	PGR	S	01	0	026	4	3B		0		0					WE	3B	At Boring 5
2	TQ21202250	PGR	S	02	0	028	4	3B		0		0					WE	3B	SPL 28
3	TQ21102240	PGR	S	01	0	028	4	3B		0		0					WE	3B	SPL 28
4	TQ21202240	PGR	E	03	0	028	4	3B		0		0					WE	3B	SPL 28
5	TQ21102230	PGR	S	01	0	028	4	3B		0		0					WE	3B	SPL 28
6	TQ21102220	PGR	S	01	028	028	4	3B		0		0					WE	3B	SPL 28
7	TQ21202220	PGR	S	01	0	028	4	3B		0		0					WE	3B	SPL 28
8	TQ21072225	PGR	S	01	0	028	4	3B		0		0					WE	3B	A few rushes
9	TQ21152201	PGR	E	01	0	028	4	3B		0		0					WE	3B	SPL 28
10	TQ21142192	PGR	N	03	0	028	4	3B		0		0					WE	3B	SPL 28

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES 2	STONES 6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
1	0-28	mzcl	25Y 52 00	75YR56 00	C			Y	0	0	HR	1							
	28-35	hzcl	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	35-60	c	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
1P	0-26	mzcl	25Y 52 00	75YR56 00	C			Y	0	0	HR	1							
	26-35	c	25Y 62 00	75YR56 00	C		00MN00 00	Y	0	0	MSST	5	WKCSAB FR	M	Y		Y		Some prisms
	35-45	c	05Y 63 00	75YR56 00	M		00MN00 00	Y	0	0	MSST	15	MDCPR FM	P	Y		Y		Sst bands
	45-65	c	05Y 63 00	75YR56 00	M		00MN00 00	Y	0	0	MSST	1	STCAB FM	P	Y		Y		
2	0-28	mzcl	25Y 53 00	75YR56 00	C			Y	0	0	HR	1							
	28-40	hzcl	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	40-65	c	25Y 63 00	75YR56 00	C			Y	0	0	HR	1		P	Y		Y		
3	0-28	mzcl	25Y 53 00	75YR56 00	C			Y	0	0	HR	1							
	28-50	hzcl	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	50-80	c	25Y 63 00	75YR56 00	M		00MN00 00	Y	0	0	HR	1		P	Y		Y		
4	0-28	mzcl	25Y 53 00	75YR56 00	C			Y	0	0	HR	1							
	28 40	hzcl	05Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	MSST	1		P	Y		Y		
	40 60	c	05Y 63 73	75YR56 00	M		00MN00 00	Y	0	0	HR	1		P	Y		Y		
5	0 28	mzcl	05Y 52 00	75YR58 00	C			Y	0	0	HR	1							
	28-38	hzcl	05Y 63 00	75YR58 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	38 55	c	05Y 63 00	75YR58 00	M		00MN00 00	Y	0	0	HR	1		P	Y		Y		Sandy lenses
	55 70	c	05Y 61 00	10YR58 00	M			Y	0	0		0		P	Y		Y		
6	0 28	mzcl	25Y 53 00	10YR58 00	F				0	0	HR	1							
	28 48	hzcl	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	48 65	c	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	65 90	scl	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	MSST	3		P	Y		Y		Interb d S&C
7	0 28	mzcl	05Y 52 00	75YR56 00	C			Y	0	0	HR	1							
	28 38	hzcl	05Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	38 60	zc	05Y 63 00	75YR56 00	M		00MN00 00	Y	0	0	HR	1		P	Y		Y		
8	0 28	mzcl	25Y 52 00	75YR56 00	C			Y	0	0	HR	1							
	28 40	hzcl	25Y 53 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	40 52	c	05Y 63 00	75YR56 00	M		00MN00 00	Y	0	0	MSST	5		P	Y		Y		Imp Sst see 1P
9	0-28	hzcl	25Y 63 00	10YR56 00	C			Y	0	0	HR	1							
	28 60	c	25Y 62 00	75YR56 00	M		00MN00 00	Y	0	0		0		P	Y		Y		
10	0 28	hzcl	25Y 52 00	75YR56 00	C			Y	0	0	HR	1							
	28-40	c	25Y 63 00	75YR56 00	C		00MN00 00	Y	0	0	HR	1		P	Y		Y		
	40-60	c	25Y 62 00	75YR56 00	M		00MN00 00	Y	0	0	HR	1		P	Y		Y		

SOIL PIT DESCRIPTION

Site Name HORSLP COWFOLD S OF A272 Pit Number 1P

Grid Reference TQ21102230

Average Annual Rainfall	800 mm
Accumulated Temperature	1511 degree days
Field Capacity Level	170 days
Land Use	Permanent Grass
Slope and Aspect	01 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 26	MZCL	25Y 52 00	0	1	HR	C				
26- 35	C	25Y 62 00	0	5	MSST	C	WKCSAB	FR	M	
35 45	C	05Y 63 00	0	15	MSST	M	MDCPR	FM	P	
45- 65	C	05Y 63 00	0	1	MSST	M	STCAB	FM	P	

Wetness Grade 3B

Wetness Class	IV
Gleying	0 cm
SPL	026 cm

Drought Grade

APW	mm	MBW	0 mm
APP	mm	MBP	0 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Wetness