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Bracknell Forest Local Plan
Site SAN/18 : Land at Lower Church Road, Sandhurst
Agricultural Land Classification
ALC Map and Report
November 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

BRACKNELL FOREST LOCAL PLAN
SITE SAN/18 : LAND AT LOWER CHURCH ROAD, SANDHURST

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality on a number of sites in the Bracknell district of Berkshire. The work forms part of MAFF's statutory input to the preparation of the Bracknell Forest Local Plan.

1.2 Site SAN/18 comprises 7.2 hectares of land at Lower Church Road, Sandhurst, Berkshire. An Agricultural Land Classification (ALC) survey was carried out during November 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 7 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 a long term limitation on its use for agriculture.

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

1.4 At the time of survey the land use on the site was permanent grazing, with an area of non-agricultural land to the south.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in the table 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
2	1.6	22.2	24.2
3b	5.0	69.5	75.8
Non-agricultural	0.6	8.3	100.0 (6.6 ha)
Total area of site	7.2	100.0	

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 Grade 2 land (very good quality) experiences a minor soil droughtiness limitation related to the presence of sandy subsoil horizons. The area of Subgrade 3b (moderate quality) is a variable map unit with a mixture of droughty soils, areas of steep slopes and soils with a significant soil wetness limitation.

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 (degree days 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 frost risk or exposure are believed to affect the site.

Table 2 : Climatic Interpolation

Grid Reference	SU825621
Altitude (m)	67
Accumulated Temperature (degree days, Jan-June)	1449
Average Annual Rainfall (mm)	672
Field Capacity (days)	144
Moisture Deficit, Wheat (mm)	112
Moisture Deficit, Potatoes (mm)	106
Overall Climatic Grade	1

3. Relief

3.1 The majority of the site is level to moderately sloping (0-6°) where neither relief or gradient affect agricultural land quality. A small area to the north west of the site has a slope of 8° causing a significant limitation to the agricultural potential of the site. The site lies at an altitude of 60-75m AOD.

4. Geology and Soil

4.1 The published geological sheet for the site, Sheet 269 Windsor (BGS, 1978, 1:50,000) shows the majority of the site to be mapped as Bracklesham Beds, with some alluvium along the north west edge.

4.2 The published soils information for the area, Sheet 6 (SSEW, 1983) shows the north and east part of the site to be mapped as soils of the Holidays Hill association. These are described as 'naturally very acid sandy over clayey and loamy over clayey soils, locally with humose or peaty surface horizons, slowly permeable subsoils and slight seasonal waterlogging. Some very acid well drained sandy soils, and some deep sandy soils, affected by groundwater, with humose surface horizons'. (SSEW, 1983). The south east of the site is shown as the Swanwick association,' deep permeable coarse loamy and sandy soils, some with peaty surface horizons, affected by groundwater,' (SSEW, 1983).

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.

Grade 2

5.3 Very good quality land is found to the east of the site. Soil profiles typically comprise medium sandy loam topsoils containing 1-2% hard stones, over similar ungleyed stoneless upper subsoils in turn over stoneless, gleyed, permeable, moderately structured clay with sand subsoils. Soils are well drained, falling into Wetness Class I. The combination of sandy subsoil textures and the climatic factors at this locality causes a slight restriction in profile available water reserves for adequate crop growth and land is limited to Grade 2.

Subgrade 3b

5.4 The remaining agricultural land is of moderate quality. These soils are subject to droughtiness restrictions. These profiles consist of loamy medium sand topsoils, with approximately 8% total hard stones over similar stoneless upper subsoils in turn over stoneless medium sand to 90 cm depth. Subsoils below these consist of medium sand to 120 cm with approximately 40% hard stones. These soils have a good structure and are well drained, falling into Wetness Class I. Soil Pit 1 is typical of these profiles. Stone content and light sandy subsoil textures in combination with local climatic factors imparts a significant restriction on profile available water reserves limiting these profiles to Subgrade 3b by droughtiness restrictions. Individual borings of better quality land do occur in this map unit but, given the variation, have not been mapped separately.

5.5 The remaining agricultural land is affected by wetness and slope restrictions and lies to the north of the site. Soil profiles consist of stoneless medium clay loam topsoils over poorly structured, gleyed slowly permeable, stoneless, clay subsoils. Soils are poorly drained falling into Wetness Class IV due to the presence of slowly permeable layers of clay at or above 35 cm depth. These soils are limited by significant wetness and workability restrictions. Land directly adjacent to the stream is affected by groundwater problems showing standing water and juncus vegetation at the time of survey, with an adjacent area of steep gradients.

ADAS Ref: 0201/264/94
MAFF Ref: EL02/388

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1978) Sheet No. 269, Windsor, 1:50,000 scale.

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, 1:250,000 scale 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 **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 : BRACKNELL.LP.SITE SAN 18 Pit Number : 1P

Grid Reference: SU82406200 Average Annual Rainfall : 672 mm
Accumulated Temperature : 1449 degree days
Field Capacity Level : 141 days
Land Use : Permanent Grass
Slope and Aspect : 02 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 36	LMS	10YR42 00	4	8	HR					
36- 49	LMS	10YR54 00	0	6	HR		MDCAB	FR	G	
49- 94	MS	10YR53 64	0	0		C	MDCSAB	FR	G	
94-120	MS	75YR56 00	0	40	HR			FR	G	

Wetness Grade : 1 Wetness Class : I
Gleying :049 cm
SPL : No SPL

Drought Grade : 3B APW : 080mm MBW : -32 mm
APP : 067mm MBP : -39 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness

SAMPLE NO.	GRID REF	ASPECT USE		GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SU82506220	PGR	N	05	035	035	4	3B		0		0					WE	3B	
1P	SU82406200	PGR	SE	02	049		1	1	080	-32	067	-39	3B				DR	3B	
2	SU82606220	PGR	N	01	040	060	3	2		0		0					WE	2	
3	SU82406220	PGR	W	06			1	1	082	-30	066	-40	3B				DR	3B	
4	SU82506210	PGR	N	02	050	105	1	1	086	-26	065	-41	3B				DR	3B	
5	SU82606210	PGR	N	01	040		1	1	149	37	109	3	2				DR	2	
6	SU82406200	PGR	SE	02			1	1	106	-6	090	-16	3A				DR	3A	
7	SU82506200	PGR	SE	04	030	045	3	2	102	-10	100	-6	3A				DR	3A	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
1	0-20	mcl	10YR33 00						0	0	HR	1						
	20-35	mcl	10YR44 00						0	0		0		M				
	35-70	c	10YR51 00	75YR56 00	C			Y	0	0		0		P			Y	
1P	0-36	lms	10YR42 00						4	0	HR	8						
	36-49	lms	10YR54 00						0	0	HR	6	MDCAB	FR	G			
	49-94	ms	10YR53 64	10YR58 00	C			Y	0	0		0	MDCSAB	FR	G			
	94-120	ms	75YR56 00					Y	0	0	HR	40		FR	G			
2	0-25	msl	10YR33 00						0	0	HR	2						
	25-40	msl	10YR44 00						0	0		0		M				
	40-60	mcl	25Y 56 00	75YR56 00	C			Y	0	0		0		M				
	60-120	c	25Y 56 00	10YR58 00	C			Y	0	0		0		P			Y	
3	0-30	lms	10YR42 00						0	0	HR	5						
	30-50	lms	10YR52 00						0	0	HR	5		G				
	50-120	ms	10YR54 00						0	0	HR	5		G				
4	0-25	lms	10YR32 00						0	0	HR	2						
	25-50	lms	10YR33 00						0	0	HR	8		G				
	50-105	ms	10YR52 00	75YR56 00	C			Y	0	0	HR	3		G				
	105-120	c	25Y 56 00	10YR58 00	C			Y	0	0		0		P			Y	
5	0-25	msl	10YR33 00						0	0	HR	2						
	25-40	msl	10YR44 00						0	0		0		M				
	40-120	scl	25Y 56 00	75YR56 00	C			Y	0	0		0		M				
6	0-25	msl	10YR42 00						0	0	HR	5						
	25-40	msl	10YR43 00						0	0	HR	5		M				
	40-75	lms	10YR54 00						0	0	HR	2		G				
	75-95	ms	10YR56 00						0	0		0		G				
	95-120	ms	10YR58 00						0	0	HR	10		G				
7	0-30	msl	10YR42 00						0	0	HR	10						
	30-45	msl	10YR42 00	10YR56 00	C			Y	0	0	HR	5		M				
	45-70	c	25Y 53 00	75YR56 00	C			Y	0	0	HR	2		P			Y	
	70-80	ms	25Y 53 00	75YR56 00	C			Y	0	0	HR	10		G				
	80-120	ms	25Y 53 00	75YR56 00	C			Y	0	0	HR	40		G				