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**ARUN DISTRICT LOCAL PLAN-OBJECTOR SITES
Land At Yapton, West Sussex
(Including Objector Sites 10293 (viii & ix) and 10127)**

**Agricultural Land Classification
ALC Map and Report**

July 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT
ARUN DISTRICT LOCAL PLAN - OBJECTOR SITES
LAND AT YAPTON, WEST SUSSEX,
INCLUDING OBJECTOR SITES 10293 (viii and ix) AND 10127.

INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 16.1 ha of land to the north of Yapton, between Littlehampton and Bognor Regis in West Sussex. The survey was carried out during July 1998.
2. The survey was undertaken by the Farming and Rural Conservation Agency (FRCA)¹ on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to the Arun District Local Plan. The survey covers three objector sites, numbers 10293 (viii and ix) and 10127. In order to provide a context for appraising the current objector sites further, adjacent land was also surveyed. This survey supersedes any previous ALC information for this land.
3. The work was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.
4. At the time of survey the agricultural land was in permanent grass to the west of North End Road and predominantly wheat to the east of North End Road with a small area of grass. In addition, an area of newly planted trees to the east of the nursery has also been graded. The areas mapped as 'Other land' include scrub, dwellings and glasshouses with hardstandings.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading.
6. The area and proportions of the ALC grades and subgrades on the objector sites and all of the surveyed land are summarised in Tables 1 to 4 inclusive.
7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total, 16 borings and one soil pit were described.
8. The agricultural land within the survey area has been classified as Grade 2 (very good quality). The principal limitation to land quality is soil droughtiness.

¹ FRCA is an executive agency of MAFF and the Welsh Office

Table 1: Area of grades - Objector Site 10293 (viii)

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	0.5	100	25.0
Other land	1.5	-	75.0
Total surveyed area	0.5	100	25.0
Total site area	2.0	-	100

Table 2: Area of grades and other land - Objector Site 10293 (ix)

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	1.5	100	93.8
Other land	0.1	-	6.2
Total surveyed area	1.5	100	93.8
Total site area	1.6	-	100

Table 3: Area of grades - Objector Site 10127

Grade/Other land	Area (hectares)	% site area
2	1.2	100
Total site area	1.2	100

Table 4: Area of grades and other land - Land at Yapton

Grade/Other land	Area (hectares)	% surveyed area	% site area
2	14.1	100	87.6
Other land	2.0	-	12.4
Total surveyed area	14.1	100	87.6
Total site area	16.1	-	100

9. Across the surveyed area the soils comprise virtually stone free medium silt topsoils overlying similar subsoils. In the prevailing local climate these soils give rise to land that is slightly restricted in terms of the amount of moisture available for crop growth. This area therefore has a minor soil droughtiness limitation which can adversely affect crop yields, especially in drier years. However the land is still very versatile and a wide range of crops can be successfully grown.

FACTORS INFLUENCING ALC GRADE

Climate

10. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

11. The key climatic variables used for grading this site are given in Table 5 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met. Office, 1989).

Table 5: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	SU 979 038	SU 981 038
Altitude	m, AOD	5	5
Accumulated Temperature	day°C (Jan-June)	1542	1542
Average Annual Rainfall	mm	754	754
Field Capacity Days	days	155	155
Moisture Deficit, Wheat	mm	119	120
Moisture Deficit, Potatoes	mm	117	117
Overall climatic grade	N/A	Grade 1	Grade 1

12. 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.

13. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (AT0, January to June), as a measure of the relative warmth of a locality.

14. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. The site is not believed to be either frost-prone or to suffer from exposure. As such, the site may be considered as being climatically Grade 1. However, climatic factors do interact with soil properties to influence soil wetness and soil droughtiness, the latter being dominant here due to the prevalent high moisture deficits.

Site

15. The survey area lies at approximately 5m AOD. The land is flat overall and therefore there are no gradients present which are significant in terms of the overall land classification. Other restrictions such as adverse microrelief do not affect the survey area.

Geology and soils

16. The most detailed published geological information for this area (BGS, 1972) shows the survey area to be underlain by brickearth drift deposits.

17. The most detailed published soils information covering the area (SSGB, 1967) shows the site to comprise soils from a the Hamble series in its deep phase. These soils are described as a well drained deep brown earth developed in silty drift. Soils of this nature were found throughout the site.

AGRICULTURAL LAND CLASSIFICATION

18. The details of the classification of the survey area are shown on the attached ALC map and the area statistics of each grade are given in Table 3.

19. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II.

Grade 2

20. Land of very good quality has been mapped over all the land surveyed in this area. The principal limitation to land quality is soil droughtiness. The soils are characterised by the pit observation, 1P (see Appendix II).

21. The single soil type encountered at this site comprises a medium silty clay loam topsoil which according to laboratory analysis of particle size was bordering a silt loam texture. This passes to a similar upper subsoil which overlies a medium or heavy silty clay loam lower subsoil to 120cm. The soils are virtually stone free with a maximum of 3% flints by volume recorded in the topsoil. Some of the profiles showed a slight indication of wetness in the lower subsoil due to fluctuating groundwater. This was evidenced by some ochreous mottling and manganiferous concretions from approximately 60cm in some locations. These were not significant in the classification as the profiles were all porous and permeable and as such assigned to Wetness Class I. However, the combination of these soil factors in the prevailing local climate, which is characterised by high moisture deficits, results in a slight soil droughtiness limitation. This means that there may be insufficient moisture available in the soil profile for crops to realise their full potential, especially in drier years. This can have an adverse effect on the level and consistency of yields and leads to a Grade 2 classification being appropriate.

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SOURCES OF REFERENCE

British Geological Survey (1972) *Sheet No. 317. Chichester, 1:63,360, Drift Edition.*
BGS: London.

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MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of Great Britain (1967) *Bulletin No. 3, Soils of the West Sussex Coastal Plain and accompanying maps (Sheets SU90, Bognor Regis, 1:25,000 scale).*
SSGB: Harpenden

Soil Survey of England and Wales (1983) *Sheet 6, Soils of South-East England, 1:250,000.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW: Harpenden

APPENDIX I

DESCRIPTIONS 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 (e.g. 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.

APPENDIX II

SOIL DATA

Contents:

Sample location map

Soil abbreviations - explanatory note

Soil pit descriptions

Soil boring descriptions (boring and horizon levels)

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	OTH: Other
DCW: Deciduous woodland	BOG: Bog or marsh	SAS: Set-Aside
HTH: Heathland	HRT: Horticultural crops	PLO: Ploughed

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	ST: Topsoil Stoniness
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
EX: Exposure		

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. **GLEYS:** 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	FSST:	soft, fine grained sandstone
ZR:	soft, argillaceous, or silty rocks	CH:	chalk
MSST:	soft, medium grained sandstone	GS:	gravel with porous (soft) stones
SI:	soft weathered igneous/metamorphic rock	GH:	gravel with non-porous (hard) stones

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

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 appropriate 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	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS	
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB						DRT
1	SU97800400	PGR			1	1	160	41	124	7	2			DR	2	SL GLEY 60+
2	SU97900400	PGR	65		1	1	160	41	124	7	2			DR	2	
3	SU97820408	PGR			1	1	159	40	123	6	2			DR	2	SL GLEY 75-90
4	SU97800374	PGR			1	1	161	42	125	8	2			DR	2	
5	SU98000390	WHT	60		1	1	159	40	123	6	2			DR	2	
6	SU98100390	WHT	70		1	1	160	41	124	7	2			DR	2	
7	SU98200390	WHT	90		1	1	160	41	124	7	2			DR	2	
8	SU97600380	WHT	55		1	1	151	32	123	6	2			DR	2	
9	SU97700380	PGR			1	1	161	42	125	8	2			DR	2	
10	SU97800380	PGR			1	1	161	42	125	8	2			DR	2	SLGL65+ PITLOC
11	SU97910384	WHT	80		1	1	161	42	125	8	2			DR	2	
12	SU98000380	WHT			1	1	160	41	124	7	2			DR	2	
13	SU98100380	WHT			1	1	161	42	125	8	2			DR	2	SL GLEY 75+
14	SU98030369	OTH			1	1	161	42	124	7	2			DR	2	SL GLEY 65+
15	SU98140373	WHT	90		1	1	160	41	124	7	2			DR	2	SL GLEY 75-90
16	SU98170363	WHT			1	1	158	39	122	5	2			DR	2	
1P	SU97800380	PGR			1	1	159	40	123	6	2			DR	2	PIT 95 AUG 120

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL.	----STONES----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR		POR
1	0-27	MZCL	10YR43	10YR56	66	F	D		0	0	0					ROOT MOTS/BDR ZL
	27-60	MZCL	10YR44						0	0	0			M		
	60-120	HZCL	10YR54	10YR56	C	F	FEW MN	S	0	0	0			M	SLIGHTLY GLEYED	
2	0-25	MZCL	10YR43	10YR56	F	F			0	0	0					ROOT MOTTLES
	25-65	MZCL	10YR44						0	0	0			M		
	65-120	HZCL	10YR53 54	10YR56	C	F	FEW MN	Y	0	0	0			M		
3	0-30	MZCL	10YR42	10YR56	F	D			0	0	HR	2				ROOT MOTTLES
	30-50	MZCL	10YR43						0	0	HR	2		M		
	50-75	MZCL	10YR43	10YR56	F	F			0	0	0			M		
	75-90	MZCL	10YR44	10YR56	C	F			S	0	0	0		M	SLIGHTLY GLEYED	
	90-120	HZCL	10YR54 63	10YR56	C	D			Y	0	0	0		M		
4	0-30	MZCL	10YR42 43						0	0	0					BORDER MZCL-ZL
	30-55	MZCL	10YR43						0	0	0			M		
	55-120	MZCL	10YR44 54	10YR56	F	F	FEW MN		0	0	0			M	MOTS COM 100+	
5	0-30	MZCL	10YR42						0	0	HR	3				
	30-60	MZCL	10YR53 54	10YR56	F	F	FEW MN		0	0	0			M		
	60-120	HZCL	10YR53 54	10YR56	C	F	FEW MN	Y	0	0	0			M	BORDER ZC 100+	
6	0-28	MZCL	10YR42 43						0	0	HR	2				PSD=MZCL-ZL BRDR
	28-70	MZCL	10YR44 54						0	0	0			M	BORDER MZCL-ZL	
	70-120	MZCL	10YR54 53	10YR56	C	F	FEW MN	Y	0	0	0			M		
7	0-28	MZCL	10YR43						0	0	HR	2				BORDER MZCL-ZL
	28-55	MZCL	10YR44				FEW MN		0	0	0			M		
	55-75	MZCL	10YR44 54	10YR56	F	D	FEW MN		0	0	0			M		
	75-90	HZCL	10YR44 54	10YR56	F	F	FEW MN		0	0	0			M		
	90-120	HZCL	10YR53 54	10YR56	C	D	COM MN	Y	0	0	0			M		
8	0-28	MZCL	10YR43						0	0	HR	2				BORDER MZCL-ZL
	28-55	MZCL	10YR54	10YR56	F	F	FEW MN		0	0	0			M		
	55-95	HZCL	10YR53 54	10YR56	C	D			Y	0	0	HR	2	M		
	95-120	ZC	10YR53	10YR56	M	D	FEW MN	Y	0	0	0			M		
9	0-32	MZCL	10YR43	10YR56	F	D			0	0	0					ROOT MOTS/BDR ZL
	32-60	MZCL	10YR44 54						0	0	0			M		
	60-120	MZCL	10YR54						0	0	0			M	FFOM 100+	
10	0-33	MZCL	10YR43	10YR56	F	F			0	0	0					PIT LOC/ROOTMOTS
	33-65	MZCL	10YR44						0	0	0			M		
	65-120	HZCL	10YR44 54	10YR58	C	F	FEW MN		0	0	HR	2		M	SLIGHTLY GLEYED	
11	0-28	MZCL	10YR42 43						0	0	0					BORDER MZCL-ZL
	28-40	MZCL	10YR43						0	0	0			M	BORDER MZCL-ZL	
	40-80	MZCL	10YR53 54	10YR56	F	F			0	0	0			M		
	80-120	HZCL	10YR53 54	10YR56	C	F	FEW MN	Y	0	0	0			M		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL.	----STONES-----			STRUCT/ CONSIST	SUBS			CALC	
				COL	ABUN	CONT		GLEY >2	>6	LITH TOT		STR	POR	IMP		SPL
12	0-30	MZCL	10YR43					0	0	HR	1				BORDER MZCL-ZL	
	30-95	MZCL	10YR44 54			FEW MN		0	0		0		M			
	95-120	MZCL	10YR53 54 10YR56	F	F	FEW MN		0	0		0		M			
13	0-34	MZCL	10YR43					0	0	HR	2				BORDER MZCL-ZL	
	34-75	MZCL	10YR44					0	0		0		M			
	75-120	HZCL	10YR44 54 10YR56	C	F	FEW MN	S	0	0		0		M		SLIGHTLY GLEYED	
14	0-32	MZCL	10YR43 44					0	0	HR	2					
	32-65	MZCL	10YR44 54					0	0		0		M			
	65-120	HZCL	10YR44 54 10YR56	C	F	FEW MN	S	0	0	HR	1		M		SLIGHTLY GLEYED	
15	0-30	MZCL	10YR42					0	0	HR	2				BORDER MZCL-ZL	
	30-50	MZCL	10YR43 44					0	0		0		M			
	50-75	MZCL	10YR44					0	0		0		M			
	75-90	MZCL	10YR44 46 10YR56	C	F		S	0	0		0		M		SLIGHTLY GLEYED	
	90-120	HZCL	10YR54 53 10YR56	C	F	FEW MN	Y	0	0		0		M			
16	0-22	MZCL	10YR42 43					0	0	HR	2					
	22-60	MZCL	10YR54					0	0	HR	1		M			
	60-120	HZCL	10YR54 53 10YR56	F	F	FEW MN		0	0		0		M			
1P	0-27	MZCL	10YR42 43 10YR56	F	F			0	0	HR	1				PSD=MZCL-ZL BRDR	
	27-78	MZCL	10YR54			10YR54		0	0	HR	1	MDCSAB	FR	M	N	PSD=MZCL-ZL BRDR
	78-120	HZCL	10YR54 44 10YR56	C	D	10YR54	S	0	0		0	MDCAB	FR	M	N	SL GLEY/PSD=HZCL