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New Forest District Local Plan Objector Site 3 Land west of Ridgeway Lane, Pennington, Hants

Agricultural Land Classification ALC Map and Report

February 1997

Resource Planning Team Eastern Region FRCA Reading RPT Job Number 1508/017/97 MAFF Reference EL 15/00315 LURET Job Number 02768

#### AGRICULTURAL LAND CLASSIFICATION REPORT

# NEW FOREST DISTRICT LOCAL PLAN OBJECTOR SITE 3 LAND WEST OF RIDGEWAY LANE, PENNINGTON, HAMPSHIRE

## INTRODUCTION

- This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately eleven hectares of land to the west of Ridgeway Lane Pennington, south Hampshire The survey was carried out during February 1997
- The survey was commissioned by the Ministry of Agriculture Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with its statutory input to the New Forest District Local Plan the site is one of a number of objector sites. The results of this survey supersede any previous ALC information for this land
- Prior to 1 April 1997 the work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS After this date the work was completed by the same team as part of the Farming and Rural Conservation Agency (FRCA) Reading 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 on this site was in permanent grassland. The areas of the site shown as Other Land consist of residential dwellings and agricultural buildings.

#### **SUMMARY**

- 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
- The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3a	4 9	64 5	43 0
3b Other land	27	35 5 N/A	23 7 33 3
Total surveyed area	76	100 0	
Total site area	114		100 0

- The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land surveyed. A total of 11 borings and 2 soil pits were described
- The majority of land at this site has been classified as Subgrade 3a (good quality) Typical profiles comprise relatively deep loamy soils which overlie gravelly deposits. The interaction between these soil characteristics and the prevailing climate acts to impart a soil droughtiness limitation.
- Land in the centre of the site has been classified as Subgrade 3b (moderate quality) In the north of this mapping unit the key limitation is soil wetness. Medium textured topsoils overlie plastic clay subsoils which impede soil drainage. Elsewhere the key limitation is soil droughtiness. In comparison to land classified as Subgrade 3a gravel or gravelly deposits occur at shallower depths within the soil profile.

#### 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
- The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using the standard interpolation procedures (Met Office 1989)

Factor	Units	Values
Grid reference	N/A	SZ 318 942
Altıtude	m AOD	10
Accumulated Temperature	day°C (Jan June)	1555
Average Annual Rainfall	mm	796
Field Capacity Days	days	165
Moisture Deficit, Wheat	mm	114
Moisture Deficit, Potatoes	mm	110
Overall climatic grade	N/A	Grade 1

Table 2 Climatic and altitude data

- 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
- 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 (ATO January to June) as a measure of the relative warmth of a locality
- The combination of rainfall and accumulated temperature at this site mean that there is no overall climatic limitation. However, climatic factors do interact with soil properties to

influence soil wetness and droughtiness limitations. The soil moisture deficits at this locality are slightly above average for the south-east of England. This may increase the likelihood of soil droughtiness limitations. No local climatic factors such as exposure or frost risk, are believed to adversely affect the land quality on the site. This site is climatically Grade 1.

#### Site

15 The site lies at altitudes of between 5 and 10 m AOD. The land on the site is level to gently sloping (0-2°) and falls in a south easterly direction. Nowhere on the site do gradient or microrelief affect agricultural land quality.

## Geology and soils

- 16 The published geological information (BGS 1975) shows the entire site to be underlain by Osborne and Headon Beds. Drift deposits of plateau gravel are mapped along the western site boundary and also running north-west to south east through the centre of the site.
- The reconnaissance soil survey map (SSEW 1983) for the area shows the entire site to comprise soils of the Efford 1 Association. These soils are described as Well drained fine loamy soils often over gravel associated with similar permeable soils variably affected by groundwater (SSEW 1983). Detailed survey work typically found similar soils to those described.

#### AGRICULTURAL LAND CLASSIFICATION

- The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1 page 1
- 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 page 8

## Subgrade 3a

20 All of the land classified as Subgrade 3a (good quality) is limited by soil droughtiness Topsoils comprise non calcareous medium clay loams These overlie similarly textured heavy clay loam or sandy clay loam upper subsoils Topsoils tend to be slightly stony containing 0-2% of flints > 2 cm and 5 15% total flints by volume Upper subsoils have a similar stone content but become moderately stony (approximately 20-30% total flints) at about 50 cm depth Between 80 85 cm depth these profiles proved impenetrable to an auger because of underlying gravelly deposits From Pit 2 (see Appendix II) which represents such profiles the lower subsoils were found to comprise very stony (approximately 65% total flints) heavy clay loams passing into slightly less stony (approximately 40% total flints) medium sands These profiles are typically well drained (Wetness Class I see Appendix II) and have moderately structured subsoils The interaction between the soil characteristics (and in particular the high stone content) and the relatively high soil moisture deficits at this locality results in the amount of soil water being inadequate to fully meet crop needs in some years This may cause crops to suffer drought stress and thereby adversely affect yield potential

## Subgrade 3b

- 21 The majority of land classified as Subgrade 3b (moderate quality) is limited by significant soil droughtiness arising from relatively shallow soils overlying gravelly deposits Topsoils and upper subsoils comprise medium clay loams Topsoils are slightly stony containing 1-4% of flints larger than 2 cm and 5-15% total flints by volume Upper subsoils are moderately or very stony containing approximately 30-50% total flints gravelly nature of the subsoils all of the auger borings proved impenetrable to a soil auger between 30 and 60 cm depth Consequently Pit 1 (see Appendix II) was dug to assess subsoil conditions At approximately 34 cm depth this profile passed into gravel. Due to the high groundwater levels at the time of survey it was only possible to dig the pit to a depth of about 50 cm Roots should be able to extend further in search of available water but the exact depth of penetration below 50 cm is unknown. Assuming deep penetration these soils can be graded no higher than Grade 4 It is unclear however as to what role the water table might play throughout the growing season in providing an additional source of moisture to roots As a result the land has been placed in Subgrade 3b The soil droughtiness limitation means that this land may be subject to lower and less consistent crop yields
- A small area in the north of the Subgrade 3b mapping unit is limited by soil wetness and workability. Here plastic clay subsoils occur immediately below the topsoil. These subsoils are slowly permeable, and result in poor soil drainage conditions (Wetness Class IV). The interaction between these soil drainage characteristics and the local climate results in significant restrictions on the flexibility of cropping, stocking and cultivations.

Gillian Iles Resource Planning Team Eastern Region FRCA Reading

## **SOURCES OF REFERENCE**

British Geological Survey (1975) Sheet No 330 Lymington 1 50 000 (drift edition) BGS London

Ministry of Agriculture Fisheries and Food (1988) Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural—land

MAFF London

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

Soil Survey of England and Wales (1983) Sheet 6 Soils of South East England and accompanying legend 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	<b>CFW</b>	Conferous 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	<b>EROSN</b>	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	ΑE	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	Sılt 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

- 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

HK	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	GH	gravel with non porous (hard)
	igneous/metamorphic rock		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 ST	weakly developed strongly developed	MD	moderately developed
Ped size	<b>F</b> — <b>C</b> —	fine coarse-	<b>M</b> _	medium 
Ped shape	S GR SAB PL	sıngle graın granular sub angular blocky platy	M AB PR	massive angular blocky prismatic

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
<b>MBP</b>	moisture balance potatoes

SOIL PIT DESCRIPTION

Site Name NEW FOREST DLP - SITE 3

P1t Number 1P

Grid Reference SZ31909410 Average Annual Rainfall

796 mm

Accumulated Temperature 1555 degree days

Field Capacity Level

Land Use

165 days

Permanent Grass

Slope and Aspect

degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 21	MCL	25Y 51 00	1	5	HR					
21- 34	MCL	10YR32 00	0	30	HR		WKCSAB	FR	M	
34-120	GH	10YR53 63	0	0					P	

Wetness Class Wetness Grade 1 Gleying CTI No SPL SPL Drought Grade 4 APW MBW -53 mm 61 mm APP 58 mm MBP -52 mm

FINAL ALC GRADE 4

MAIN LIMITATION Droughtiness

## SOIL PIT DESCRIPTION

Site Name NEW FOREST DLP - SITE 3 Pit Number 2P

Grid Reference SZ31909420 Average Annual Rainfall 796 mm

Accumulated Temperature 1555 degree days

Field Capacity Level 165 days

Land Use Permanent Grass
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 34	MCL	10YR32 00	1	5	HR					
34- 50	MCL	10YR42 43	0	5	HR		MVCSAB	FR	M	
50- 74	SCL	10YR54 00	0	20	HR		MDCSAB	FR	M	
74- 83	HCL	10YR44 00	0	65	HR				M	
83-105	MS	10YR58 00	0	40	HR				M	
105-120	MS	10YR64 00	0	40	HR				M	

Wetness Grade 1 Wetness Class Gleying Cm SPL No SPL Drought Grade ЗА APW 115mm MBW 1 mm APP 107mm MBP -3 mm

FINAL ALC GRADE 3A

MAIN LIMITATION Droughtiness

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S#	MPI	.E		A:	SPECT				WETI	NESS	-₩H	EAT-	-P0	TS-	M I	REL	EROSN	FROST	CHEM	ALC	
VC	)	GRID R	EF	USE		GRDNT	GLEY	' SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EX	P DIST	LIMIT		COMMENTS
	1	SZ31859	438	PGR			0		2	2	107	-7	108	-2	3A				DR	ЗА	Imp80 see2P
	1P	SZ31909	410	PGR					1	1	61	-53	58	-52	4				DR	4	Watertable34
	2	SZ31809	430	PGR					1	1	97	-17	99	-11	3A				DR	<b>3A</b>	Imp80gravely
	<u>2</u> P	SZ31909	420	PGR					_1 _	1 _	115_	_ 1	<u>1</u> 07	3	<u>3A</u>			_	<u>D</u> R _	<u>3</u> A	
	3	SZ31909	430	PGR				065	2	2	135	21	110	0	2				WD	2	S1 gley65
_	4	SZ31709	420	PGR	SE	02	028	028	4	38	80	-34	85	-25	3B				WE	3B	Watertable25
	5	SZ31809	420	PGR	SE	01	028		2	2	70	-44	72	-38	3B				DR	3B	Imp55gravely
	6	SZ31909	420	PGR			065		1	1	103	-11	105	-5	3A				DR	3A	Imp80 see2P
	8	SZ31659	413	HRT			045	095	1	1	133	19	105	-5	2				DR	2	Deep profile
	9	SZ31809	410	HRT					1	1	98	-16	97	-13	3 <b>A</b>				DR	ЗА	Imp85gravely
	10	SZ31909	410	PGR					1	1	56	-58	56	-54	4				DR	3B	Imp40 see1P
_ 1	11	SZ31989	410	PGR					1	1	46	-68	46	-64	4				DR	4	Imp30 see1P
1	11A	SZ31999	410	PGR			30		2	2	77	-37	81	-29	3B				DR	3B	Imp60 see1P

----MOTTLES----- PED ----STONES---- STRUCT/ SUBS APLE DEPTH TEXTURE COLOUR COL ABUN CONT COL GLEY >2 >6 LITH TOT CONSIST STR POR IMP SPL CALC 0-33 10YR32 00 10YR66 00 C Υ 0 0 HR 2 mc1 33-48 10YR32 00 10YR46 00 M hc1 Υ 0 0 HR 5 48-67 75YR32 00 10YR46 00 C 0 0 HR 25 hc1 Y 67-80 - 10YR53 00 10YR68 00 C 20 scl 0 0 HR М Imp80 gravelly 0-21 25Y 51 00 1 0 HR 5 mcl 21-34 10YR32 00 O O HR 30 WKCSAB FR M mc1 34-120 gh 10YR53 63 0 0 0 Р Water table 34 0-30 10YR32 00 1 0 HR 5 mc } 30-50 10YR41 42 D D HR 20 М hc1 50-65 hc1 10YR41 42 0 0 HR 30 65-80 10YR42 46 0 0 HR 45 sc1 M Imp80 gravelly 0-34 10YR32 00 1 0 HR mc l 34-50 10YR42 43 0 0 HR 5 MVCSAB FR M mc1 50-74 10YR54 00 0 0 HR 20 MDCSAB FR M scl 74-83 hcl 10YR44 00 O O HR 65 М 83-105 ms 10YR58 00 0 0 HR 40 M 105-120 ms 40 10YR64 00 0 0 HR М 0-34 mc1 75YR32 00 0 0 HR 2 34-55 mcl 10YR32 00 0 0 HR 5 М 55-65 10YR42 00 O O HR 15 М sc l 65-85 10YR54 00 10YR68 00 C S 0 0 HR 12 Ρ hc1 S1 gleyed 85-120 sc1 10YR54 00 75YR68 00 C 0 0 HR 12 \$1 gleyed 0-28 10 mc1 25Y 21 00 2 0 HR 28-60 25Y 51 62 10YR58 00 M 00MN00 00 Y 0 0 HR Р Υ С 5 Plastic 0-28 25Y 21 00 4 0 HR 15 mcl 28-45 25Y 21 53 10YR58 00 C Y 0 0 HR 35 mc1 М 45-55 mc1 10YR42 53 10YR58 00 C Y 0 0 HR 40 Imp55 gravelly 0-33 10YR32 00 O O HR 5 mc1 33-48 hcl 10YR42 00 0 0 HR 5 48-65 mc1 10YR42 43 0 0 HR 25 м 65-80 10YR53 00 10YR58 00 C Y 0 0 HR 40 М scl Imp80 gravelly 0-28 25Y 31 00 2 0 HR 10 mc1 28-45 10YR32 00 0 0 HR 10 mc1 м 45-95 25Y 53 63 75YR58 00 M Y 0 0 HR 15 hc1 М Tending mcl 95-120 c 25Y 53 63 75YR58 00 M Y 0 0 HR 15 М 0-30 25Y 21 00 mc1 2 0 HR 15 30-50 mc1 25Y 32 00 0 0 HR 15 50-65 hc1 10YR44 42 0 0 HR 25 М 65-85 hc1 10YR44 42 10YR58 00 C S 0 0 HR 40 M Imp85 gravelly

SAMPLE	DEPTH	TEXTURE	COLOUR		OTTLES ABUN	PED COL						STRUCT/ CONSIST	SUBS STR POR IMP SPL CALC	
10	0-25 25-40	mcl mcl	25Y 21 00 10YR32 00					-		HR HR	5 50		М	Imp40 gravelly
11	0-30	mcl	25Y 21 00					2	0	HR	15			I30 Wtable20
11A	0-30 30-60	mcl	25Y 21 00 25Y 63 00	10YR58	00 C		Y	2		HR HR	15 30		м	Imp Qmsl-v wet