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NEW FOREST DISTRICT LOCAL PLAN
Objector Site 42
Land at Gordleton Industrial park, Upper Pennington, Hampshire
Agricultural Land Classification
ALC Map & Report

February 1997

Resource Planning Team
Eastern Region
FRCA, Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

NEW FOREST DISTRICT LOCAL PLAN
OBJECTOR SITE 42 LAND AT GORDLETON INDUSTRIAL PARK, UPPER PENNINGTON, HAMPSHIRE

INTRODUCTION

1 This summary report presents the findings of a detailed Agricultural Land Classification (ALC) survey on approximately 16 hectares of land at Gordleton Industrial Park Upper Pennington near Lymington in Hampshire The survey was carried out during February 1997

2 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

3 Prior to 1st 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 all of the agricultural land on this site was under permanent grassland having been restored to agriculture some years ago The areas shown as Other Land comprise mainly the industrial park though the two small areas to the west include a drainage pond and spoil heap

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 surveyed land are summarised in Table 1 below

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
3b	7 1	100 0	44 9
Other land	8 7	N/A	55 1
Total surveyed area	7 1	100	44 9
Total site area	15 8		100

7 The fieldwork was conducted at an average density of 1 boring per hectare A total of 8 borings and one soil inspection pit were described

8 All of the agricultural land on this site has been restored and has been classified as Subgrade 3b (moderate quality) with soil wetness as the main limitation The majority of soil profiles comprise very shallow light textured slightly flinty topsoils over poorly structured and moderately flinty clay loam and clay subsoils The poorly structured subsoils impede drainage through the profile thus causing prolonged seasonal waterlogging seed germination and root development will therefore be adversely affected There is also a topsoil resource problem on part of the land where less than 50% of the original topsoil material remains This shortage of topsoil can reduce the moisture and nutrient holding capacity of the soil as well as increase wetness and workability problems In other parts the combination of soil textures structures and stone contents reduces the amount of profile available water for crops during the drier part of the year causing a significant soil droughtiness limitation that further restricts the land to Subgrade 3b

FACTORS INFLUENCING ALC GRADE

Climate

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

10 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)

Table 2 Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SZ 296 964
Altitude	m AOD	30
Accumulated Temperature	day°C (Jan June)	1532
Average Annual Rainfall	mm	831
Field Capacity Days	days	172
Moisture Deficit Wheat	mm	109
Moisture Deficit Potatoes	mm	103
Overall climatic grade	N/A	Grade 1 Grade x

11 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 combination of rainfall and temperature at this site mean that there is no overall climatic limitation However climatic factors can interact with soil properties to influence soil wetness and droughtiness At this locality the field capacity day values are relatively high thus increasing the likelihood of soil wetness restrictions

14 Local climatic factors such as frost risk and exposure are unlikely to adversely affect agricultural land use on this site The site is climatically Grade 1

Site

15 The land on this site is flat and lies at approximately 2m below its original level due to past workings The land immediately outside the site boundary is measured at 30m AOD

16 Gradient microrelief and flooding do not affect land quality in this area

Geology and soils

17 The relevant geological sheet (BGS 1975) maps the entire site as plateau gravel

18 The most recently published soils information for this area (SSEW 1983) maps the Efford 1 soil association across all of the site These soils are described as Well drained fine loamy soils often over gravel associated with similar permeable soils variably affected by groundwater (SSEW 1983)

19 Detailed field examination revealed soils which are believed to have been disturbed They do not therefore resemble those soils described above as the Efford 1 soil association

AGRICULTURAL LAND CLASSIFICATION

20 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

21 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 III

Subgrade 3b

22 All of the agricultural land on this site has been classified as Subgrade 3b In the past the land has been disturbed and subsequently restored to agricultural use The majority of profiles now comprise shallow (5 20cm thick) slightly to moderately stony (10 20% flints by v/v) moderately well structured medium sandy loam or fine sandy silt loam topsoils over moderately stony (20 50% flint by v/v) poorly structured medium or heavy clay loam and clay subsoils Where there is more than 50% subsoil material in the topsoil the profiles cannot be graded any higher than Subgrade 3b as the nutrients and moisture holding capacity of the topsoil will be heavily depleted

23 In addition to this the profiles are also limited to Subgrade 3b on the basis of both soil drougthiness and/or soil wetness As regards the soil wetness soil inspection Pit 1 shows the subsoils to be slowly permeable from at least 25cm depth This causes a major drainage

impedance which means that these soils are waterlogged for prolonged periods The land is therefore limited to Wetness Class IV (Appendix II) as this degree of soil wetness will significantly inhibit seed germination and growth With the mixing of the top 25cm of soil material the topsoil texture generally works as a medium clay loam thus leading to a significant workability restriction This may increase the likelihood of structural damage from over trafficking by agricultural machinery and grazing livestock thus restricting the timing and flexibility of cultivations

24 Some of these profiles are also impenetrable to the soil auger from between 45-85cm depth Soil inspection Pit 1 showed that the soil resource continues to depth and does in fact become markedly less stony (2% flint) at depth However in this local climatic regime the combination of soil textures shallow topsoils structures and stone contents significantly reduces the amount of profile available water for crops therefore restricting the level and consistency of crop yields These profiles are therefore also limited to Subgrade 3b by soil droughtiness

25 Other profiles within this mapping unit are lighter in texture comprising medium sandy loam and medium clay loam topsoils over similar or lighter textured (loamy medium sand) upper subsoils The stone content ranges from 10-12 % flint in the topsoil to 30 50% in the upper subsoils The profiles then become impenetrable to the soil auger at variable depths Due to the limited extent of these profiles a soil inspection pit was not dug However it is assumed that the lower subsoils comprise gravelly deposits which in this local climatic regime reduce the amount of profile moisture for plants These profiles are further complicated by high groundwater levels during the wetter months therefore this land is equally limited to Subgrade 3b by soil droughtiness and/or soil wetness restrictions

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SOURCES OF REFERENCE

British Geological Survey (1975) Sheet *No 330 Lymington* 1 50 000 Series 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*
SSEW Harpenden.

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

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 WETNESS CLASSIFICATION

Definitions of Soil Wetness Classes

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

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

Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* (MAFF 1988)

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

APPENDIX III

SOIL DATA

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

SOIL PIT DESCRIPTION

Site Name NEW FOREST DLP SITE 42 Pit Number 1P

Grid Reference SZ29609632 Average Annual Rainfall 831 mm
Accumulated Temperature 1532 degree days
Field Capacity Level 172 days
Land Use Permanent Grass
Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 11	MSL	10YR42 00	0	5	HR	C				
11- 24	MCL	25Y 63 00	0	27	HR	C	WKVCPL	FM	P	
24-100	MCL	10YR42 52	0	33	HR	C	MDVCPL	FM	P	
100-120	C	25Y 66 00	0	2	HR	C			P	

Wetness Grade 3B Wetness Class IV
Gleying 0 cm
SPL 11 cm

Drought Grade 3B APW 089mm MBW -20 mm
APP 068mm MBP -35 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Soil Wetness/Droughtiness

SAMPLE NO	GRID REF	USE	ASPECT GRDNT	--WETNESS-- GLEY	SPL	CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SZ29709640	PGR		5	5	4	3B	082	-27	088	-15	3B			Y	WE	3B	I72 Flints
1P	SZ29609632	PGR		0	11	4	3B	089	-20	068	-35	3B			Y	WD	3B	At AB4
2	SZ29809640	RGR				4	3B	119	10	084	-19	3A			Y	WE	3B	WT 30CM
3	SZ29459632	PGR				1	1	034	-75	034	-69	4			Y	DR	3B	I25 V Flinty
4	SZ29609632	PGR		0	20	4	3A	062	-47	062	-41	3B			Y	WD	3B	I45 See 1P
5	SZ29709630	PGR		10	10	4	3B	093	-16	091	-12	3A			Y	WE	3B	I85 Wet50
6	SZ29809630	PGR			5	4	3B	093	-16	097	-6	3A			Y	WE	3B	I78 Flints
7	SZ29509620	PGR				3	2	057	-52	057	-46	4			Y	DR	3B	I50 Wet/Grav
8	SZ29609620	PGR				4	3B	069	-40	069	-34	3B			Y	WD	3B	I50 Gravel

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	0-5	msl	10YR42 00						6	1	HR	20							T/S mainly HCL
	5-45	hcl	10YR53 72	75YR58 00	C			Y	0	0	HR	20		P			Y		Disregard Gley
	45-68	scl	10YR56 00						0	0	HR	25		M					Interb d S & C
	68-72	mcl	25Y 62 00	75YR46 00	C			Y	0	0	HR	15		P					Imp Flints
1P	0-11	msl	10YR42 00	10YR46 00	C			Y	0	0	HR	5							T/S mainly MCL
	11-24	mcl	25Y 63 00	10YR58 00	C		00MN00 00	Y	0	0	HR	27	WKVCPL FM	P	Y		Y		T/S not compacted
	24-100	mcl	10YR42 52	10YR58 00	C			Y	0	0	HR	33	MDVCPL FM	P	Y		Y		WT 56CM
	100-120	c	25Y 66 00	10YR68 00	C			Y	0	0	HR	2		P	Y		Y		Disregard Gley
2	0 30	hcl	10YR42 73						8	0	HR	20							Interbedded S
	30 50	lms	10YR56 00						0	0	HR	30		M					V Wet
	50-100	lfs	10YR56 00						0	0		0		G					Assume 120/Wet
3	0-15	scl	10YR42 00						0	0	HR	10							
	15-25	scl	10YR43 00						0	0	HR	30		M					Imp Flints
4	0-20	msl	10YR42 00	10YR46 00	C			Y	0	0	HR	5							Disregard Gley
	20-35	msl	25Y 63 00	10YR58 00	C			Y	0	0	HR	20		P			Y		
	35-45	mcl	10YR42 52	10YR58 00	C			Y	0	0	HR	30		P			Y		Imp Flints
5	0-10	fszl	10YR42 00						6	0	HR	20							T/S mainly MCL
	10-50	mcl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0	HR	25		P			Y		Disregard Gley
	50-85	mcl	10YR52 00	10YR58 00	C			Y	0	0	HR	25		P			Y		V Wet
6	0-5	fsl	10YR42 00						6	0	HR	20							T/S mainly MCL
	5-65	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	15		P			Y		Disregard gley
	65-78	hcl	10YR53 00	10YR56 00	C			Y	0	0	HR	15		P			Y		Imp Flints
7	0-15	msl	10YR41 00						5	0	HR	12							
	15-45	msl	10YR43 61	10YR58 00	F				0	0	HR	35		M					Clayey Lenses
	45-50	msl	10YR42 00						0	0	HR	50		M					WT 45/150 GH
8	0-30	mcl	10YR43 00						0	0	HR	2							
	30-40	mcl	10YR41 43						0	0	HR	10		M					Compacted/Wet
	40-50	gh	10YR56 58						0	0		0		P					Sandy/V Wet