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Swale Borough Local Plan
Objector Site Fav 9,
Land at Waterham,
near Faversham

Agricultural Land Classification
November 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

SWALE BOROUGH LOCAL PLAN OBJECTOR SITE FAV 9, LAND AT WATERHAM, NEAR FAVERSHAM, KENT

Introduction

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 9.2 ha of land to the north east of the village of Waterham, near Faversham, Kent. The survey was carried out during November 1996.

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 the Swale Borough Local Plan. This survey supersedes any previous ALC surveys on this land.

3 The work was conducted under sub-contracting arrangements by NA Duncan and Associates, and was supervised by the Resource Planning Team in the Guildford Statutory Group in ADAS. 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 whole of the site was in permanent grass with the exception of a small area at the southern end which was occupied by an old barn and heaps of sand covered with weeds.

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.

Table 1 Area of grades and other land

Grade/Other land	Area (hectares)	% Total site area	% Surveyed Area
3b	8.8	95.7	100.0
Other land	0.4	4.3	
Total surveyed area	8.8		100.0
Total site area	9.2	100.0	

7 The fieldwork was conducted at an average density of 1 boring per hectare. A total of 9 borings were described which were backed up by data from one soil inspection pit.

8 All the agricultural land on the site has been mapped as Subgrade 3b moderate quality land. The soils on the site are clays with impeded drainage and therefore the land suffers from a moderately severe wetness and workability limitation.

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	TR 084 628
Altitude	m AOD	15
Accumulated Temperature	day°C (Jan June)	1479
Average Annual Rainfall	mm	595
Field Capacity Days	days	121
Moisture Deficit, Wheat	mm	127
Moisture Deficit, Potatoes	mm	125

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.

12 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.

13 Climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. The combination of rainfall and accumulated temperature at this site mean that the area is relatively dry and warm and that the field capacity days are below the average for the south-east of England. This decreases the likelihood of soil wetness limitations. No local climatic factors such as exposure and frost risk, are believed to adversely affect the land quality on the site. This site is climatically Grade 1.

Site

14 The site lies immediately to the south and slightly higher than the coastal marsh area. It is relatively flat and lies at an altitude of 15 m AOD. Nowhere on the site does gradient or micro-relief impose any limitation on the agricultural use of the area.

Geology and soils

15 The published geological information for the area (BGS, 1974) shows the whole site to be underlain by Eocene London Clay.

16 There is no detailed soil survey map for the area but the reconnaissance soil map (SSEW 1983) shows the whole site to comprise soils of the Windsor association. These soils are described as slowly permeable seasonally waterlogged clayey soils mostly with brown subsoils. Some fine loamy over clayey and fine silty over clayey soils and locally on slopes clayey soils with only slight seasonal waterlogging (SSEW 1983).

Agricultural Land Classification

17 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.

18 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

19 All the agricultural land on the site has been mapped as Subgrade 3b land, moderate quality because of significant soil wetness and workability limitations. Topsoils comprise grey brown clays with common rusty root mottles. These overlie strongly mottled greyish brown clay subsoils which are poorly structured and slowly permeable. In some profiles (see Pit 1), a permeable clay upper subsoil may occur. The lower subsoils typically become browner with less distinct ochreous mottling. The shallow depth to the slowly permeable subsoils and the very dry local climate means that these profiles are assigned to Wetness Class III (see Appendix II). The interaction between the soil drainage status and the heavy textured topsoils is partially offset by the dry prevailing climate such that Subgrade 3b is appropriate. This land has a significant wetness and workability limitation, restricting the versatility of the land principally in terms of the timing of cultivations and stocking if structural damage to the soils is to be avoided.

N A Duncan
for the Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1974) *Sheet No 273 Faversham*
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 1 250 000 and accompanying legend.*
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 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

Sample location map

Soil abbreviations - Explanatory Note

Soil Pit Descriptions

Soil boring descriptions (boring and horizon levels)

Database Printout - Horizon Level Information

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 **GLEYSPL** 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 **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	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 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

SOIL PIT DESCRIPTION

Site Name SWALE BOROUGH LP FAV 9 Pit Number 1P

Grid Reference TR08106320
 Average Annual Rainfall 595 mm
 Accumulated Temperature 1479 degree days
 Field Capacity Level 121 days
 Land Use Permanent Grass
 Slope and Aspect 02 degrees NW

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	C	75YR42 00	0	1	HR	C				
27- 40	C	10YR53 00	0	0		M	STCSAB	FM	M	
40- 75	C	10YR62 52	0	0		M	MDCPR	FM	P	
75-120	C	10YR44 54	0	0		C	MDCPR	FM	P	

Wetness Grade 3B
 Wetness Class III
 Gleying 027 cm
 SPL 040 cm

Drought Grade 3A
 APW 128mm MBW 1 mm
 APP 105mm MBP -20 mm

FINAL ALC GRADE 3B
 MAIN LIMITATION Wetness

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	TR08206330	PGR N	01	030 030	3	3B	125	-2	102	-23	3A			WE	3B	
1P	TR08106320	PGR NW	02	027 040	3	3B	128	1	105	-20	3A			WE	3B	
2	TR08106320	PGR NW	02	027 027	3	3B	125	-2	102	-23	3A			WE	3B	
3	TR08206320	PGR N	01	027 027	3	3B	125	-2	102	-23	3A			WE	3B	
4	TR08306320	PGR N	01	027 027	3	3B	123	-4	100	-25	3A			WE	3B	
5	TR08106310	PGR N	01	027 027	3	3B	124	-3	101	-24	3A			WE	3B	
6	TR08206310	PGR		027	3	3B	132	5	109	-16	3A			WE	3B	S1 gleyed 27
7	TR08306310	PGR N	01	027 027	3	3B	124	-3	101	-24	3A			WE	3B	
8	TR08006300	PGR W	01	028 028	3	3B	125	-2	102	-23	3A			WE	3B	
9	TR08006290	PGR SW	01	027 027	3	3B	125	-2	102	-23	3A			WE	3B	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED	----STONES----			STRUCT/	SUBS			SPL	CALC		
				COL	ABUN	CONT		COL	GLE	>2		>6	LITH	TOT			CONSIST	STR
1	0-30	c	75YR43 00						0	0	HR	2						
	30-60	c	10YR53 52 10YR56 00 C					Y	0	0		0		P	Y	Y		
	60-120	c	75YR44 00 75YR55 00 C					S	0	0		0		P	Y	Y	s1 gleyed	
1P	0-27	c	75YR42 00 05YR46 56 C						0	0	HR	1					root motts	
	27-40	c	10YR53 00 10YR56 00 M					Y	0	0		0	STCSAB	FM	M			
	40-75	c	10YR62 52 10YR56 00 M				10YR62	00	Y	0	0	0	MDCPR	FM	P	Y	Y	
	75-120	c	10YR44 54 10YR55 00 C					S	0	0		0	MDCPR	FM	P	Y	Y	s1 gleyed
2	0-27	c	75YR42 00 75YR46 00 C						0	0		0					root motts	
	27-75	c	10YR53 00 75YR56 00 M					Y	0	0		0		P	Y	Y		
	75-120	c	10YR54 00 10YR56 00 C						0	0		0		P	Y	Y	s1 gleyed	
3	0-27	c	75YR42 00 75YR46 00 C						0	0		0					root motts	
	27-70	c	10YR52 00 75YR56 00 M					Y	0	0		0		P	Y	Y		
	70-120	c	75YR44 00 75YR46 00 F						0	0		0		P	Y	Y		
4	0-27	c	75YR43 00 05YR46 00 C						0	0	HR	2					root motts	
	27-90	c	10YR53 00 10YR56 00 C					Y	0	0	HR	1		P	Y	Y		
	90-120	c	10YR44 00 10YR55 00 C					S	0	0		0		P	Y	Y	Y	s1 gleyed
5	0-27	c	10YR43 00 10YR46 00 C						0	0	HR	2					root motts	
	27-65	c	25Y 52 00 10YR56 00 M					Y	0	0		0		P	Y	Y		
	65-120	c	10YR44 00 10YR56 00 F						0	0		0		P	Y	Y		
6	0-27	c	10YR42 00 05YR46 00 M						0	0		0					root motts	
	27-50	c	75YR44 00 75YR56 00 C					S	0	0		0		M		Y	s1 gleyed	
	50-120	c	10YR45 00						0	0		0		P		Y		
7	0-27	c	10YR42 00 05YR46 00 M						0	0	HR	2					root motts	
	27-65	c	10YR52 00 10YR56 00 M					Y	0	0		0		P	Y	Y		
	65-120	c	10YR53 00 10YR55 00 C					Y	0	0		0		P	Y	Y		
8	0-28	c	75YR43 00 05YR46 00 F						0	0		0					root motts	
	28-75	c	25Y 63 62 75YR56 00 M					Y	0	0		0		P	Y	Y		
	75-120	c	75YR44 00 75YR56 00 F						0	0		0		P	Y	Y		
9	0-27	c	10YR43 00 05YR46 00 C						0	0		0					root motts	
	27-80	c	25Y 62 00 75YR68 00 M					Y	0	0		0		P	Y	Y		
	80-120	c	75YR44 00 75YR56 00 F				00MN00	00	0	0		0		P	Y	Y		