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**KENT MINERALS LOCAL PLAN REVIEW
Land at Hempstead House, Sittingbourne**

**Agricultural Land Classification
ALC Map and Report**

October 1998

**Resource Planning Team
Eastern Region
FRCA Reading**

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AGRICULTURAL LAND CLASSIFICATION REPORT

KENT MINERALS LOCAL PLAN REVIEW LAND AT HEMPSTEAD HOUSE, SITTINGBOURNE

INTRODUCTION

- 1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 7.9 ha of land at Hempstead House near Sittingbourne. The survey was carried out during October 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 Kent Minerals Local Plan Review. The 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 field adjacent to the A2 London Road was in permanent grassland whilst the remainder of the land was sown to oil seed rape.

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)	% site area
1	7.8	98.7
3b	0.1	1.3
Total site area	7.9	100

- 7 The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. In total 10 borings and one soil pit were described.
- 8 The agricultural land at this site has been classified as Grade 1 (excellent quality) and Subgrade 3b (moderate quality). Where a limitation exists it is one of steep gradient.

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

- 9 The land classified as Grade 1 covers the greater part of the site. Soils in this area comprise deep well drained medium and light silty textured topsoils and subsoils and are either stoneless or very slightly stony. Given the local climate the reserves of soil available water are high enough to meet crop needs throughout the growing season in most years. As a result this land has no or very minor limitations to agricultural use and is suitable for a very wide range of agricultural or horticultural crops.
- 10 Subgrade 3b land is mapped in a small area along the northern boundary of the site where the land slopes down to the main road at a gradient of 9°. This gradient is sufficient to limit the type of agricultural machinery which can be safely and efficiently operated and therefore to place the land in Subgrade 3b.

FACTORS INFLUENCING ALC GRADE

Climate

- 11 Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.
- 12 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).
- 13 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.

Table 2 Climatic and altitude data

Factor	Units	Values	
		TQ 934 630	TQ 934 628
Grid reference	N/A		
Altitude	m AOD	15	20
Accumulated Temperature	day°C (Jan June)	1482	1477
Average Annual Rainfall	mm	629	635
Field Capacity Days	days	125	126
Moisture Deficit Wheat	mm	119	118
Moisture Deficit Potatoes	mm	115	114
Overall climatic grade	N/A	Grade 1	Grade 1

- 14 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.
- 15 The combination of rainfall and temperature at this site means that there is no overall climatic limitation and in addition the site does not suffer from exposure or frost risk. As such the site may be considered as being climatically Grade 1.

Site

- 16 The survey area lies between approximately 15m and 20m AOD and the greater part of the site is level to gently sloping. In a small area along the northern boundary of the site gradients of 9° limit the land to Subgrade 3b. Nowhere on the site does microrelief adversely affect agricultural land quality.

Geology and soils

- 17 The most detailed published geological information for this area (BGS 1977) maps the site as Thanet Beds overlain by Head Brickearth.
- 18 The most recent published soils information covering the area (SSEW 1983) shows the site to comprise soils of the Hamble 1 Association. These soils are described as Deep well drained often stoneless fine silty soils. Some similar soils affected by groundwater and some fine loamy soils with slowly permeable sub soils and slight seasonal waterlogging. Some shallower soils over chalk. Slight risk of water erosion (SSEW 1983). These soils are similarly described in Soils of Kent (SSEW 1980). The survey found soils of this general type to be represented throughout the site.

AGRICULTURAL LAND CLASSIFICATION

- 19 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 1.
- 20 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 1

- 21 Land classified as Grade 1 excellent quality occurs over the greater part of the site. This land has no or very minor limitations to agricultural use. Profiles comprise non calcareous medium silty clay loam and silt loam topsoils which overlie similarly textured upper subsoils and medium silty clay loam lower subsoils. Topsoils are stoneless or very slightly stony containing 0-3% flints by volume. Subsoils were mostly stone free. Profiles are permeable and well drained (Wetness Class I) and the subsoils are moderately structured. The profiles are typified by soil pit 1 (see Appendix II).
- 22 The combination of light or medium silty topsoil textures in the prevailing climate means that this land has no or very minor restrictions on the flexibility of cropping, stocking and cultivations. In addition the silt content of the soils means that these profiles have high reserves of soil available water to support a wide range of agricultural or horticultural crops throughout the growing season in most years. Consequently Grade 1 is appropriate. Two observations within the mapping unit were of slightly poorer quality due to either topsoil removal or an increased stone content in the subsoil. These observations were however too few in number and too scattered to be mapped separately.

Subgrade 3b

- 23 Land of moderate quality has been mapped on the northern boundary of the site where the land slopes down to the main road. The principal limitation is gradient.
- 24 This area slopes towards the road with a gradient of 9°. This is sufficient to limit the land to Subgrade 3b on the basis of a gradient limitation. Within this small area such gradients will limit the safe and efficient use of agricultural machinery.
- 25 Soils in this area typically comprise well drained profiles (Wetness Class I) having a non calcareous silt loam topsoil overlying silt loam and medium silty clay loam. The soils are stoneless.

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SOURCES OF REFERENCE

British Geological Survey (1977) *Sheet No 272 Chatham 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 (1980) *Soils of Kent Soil Survey Bulletin No 9*
SSEW Harpenden

Soil Survey of England and Wales (1983) *Sheet 6 Soils of South East England 1 250 000*
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 most 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 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
HHT	Heathland	HRT	Horticultural crops	PIO	Ploughed

3 **GRDNT** Gradient as estimated or measured by a hand held optical clinometer

4 **CLLY/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:

MREI	Microrelief limitation	FLOOD	Flood risk	EROSN	Soil erosion risk
EXP	Exposure limitation	FROST	Frost problem	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	CR	Gradient	MR	Microrelief
FL	Flood Risk	TX	Topsoil Texture	DP	Soil Depth
CH	Chemical	WI	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
ZI	Silt Loam	SCI	Sandy Clay Loam	C	Clay
SC	Sandy Clay	ZC	Silty Clay	OL	Organic Loam
P	Peat	SP	Sandy Peat	LI	Loamy Silt
PL	Peaty Loam	LS	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 COI** 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	FSS1	soft, fine grained sandstone
ZR	soft, argillaceous or silty rocks	CH	chalk
MSST	soft, medium grained sandstone	CS	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

I loose	FM firm	HH	very hard
VF very friable	VM very firm		
FR friable	FM extremely firm		

10 **SUBS STR** Subsoil structural condition recorded for the purpose of calculating profile droughtiness C good M moderate P poor

11 **POR** Soil porosity. If a soil horizon has less than 0.5 biopores 0.5 mm in diameter Y will appear in this column

12 **IMP** If the profile is impermeable to rooting Y will appear in this column at the appropriate horizon

13 **SPI** Slowly permeable layer. If the soil horizon is slowly permeable a Y will appear in this column

14 **CAI C** If the soil horizon is calcareous, a Y will appear in this column

15 Other notations

APW	available water capacity (in mm) adjusted for heat
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	FROST	CHEM	ALC	COMMENTS	
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP		DIST
1	TQ93406300	PGR				1	1	160	42	124	10	1			1	
2	TQ93306290	OSR				1	1	162	44	126	12	1			1	
3	TQ93406290	OSR				1	1	170	52	134	20	1			1	1P LOCATION
4	TQ93506290	OSR				1	1	181	63	145	31	1			1	
5	TQ93206280	OSR				1	1	162	44	126	12	1			1	
6	TQ93306280	OSR				1	1	183	65	147	33	1			1	
7	TQ93406280	OSR				1	1	172	54	137	23	1			1	
8	TQ93426273	OSR				1	1	87	-31	87	-27	38	DR	38	I45 DRGD2T0120	
9	TQ93526298	PGR	N	9		1	1	185	67	149	35	1	GR	38		
10	TQ93576291	PGR				1	1	159	41	123	9	2	DR	2		
1P	TQ93406290	OSR	N	1		1	1	181	63	145	31	1			1	PIT 80 AUG 120

-----MOTTLES----- PED --- STONES----- STRUCT/ SUBS
 COL ABUN CONT COL GLEY >2 >6 LITH TOT CONSIST STR POR IMP SPL CALC

SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
1	0-25	MZCL	10YR42					0	0		0							
	25-70	MZCL	10YR43					0	0		0				M			
	70-120	MZCL	10YR53					0	0		0				M			
2	0-35	MZCL	10YR42					0	0		0							
	35-120	MZCL	10YR53					0	0		0				M			
3	0-34	MZCL	10YR42					0	0		0							1P LOCATION
	34-50	ZL	10YR54					0	0		0				M			
	50-120	MZCL	75YR54					0	0		0				M			
4	0-28	ZL	10YR42					0	0		0							
	28-46	ZL	10YR53					0	0		0				M			
	46-120	MZCL	10YR54					0	0		0				M			
5	0-34	MZCL	10YR42					0	0		0							
	34-120	HZCL	10YR54					0	0		0				M			
6	0-33	ZL	10YR42					0	0		0							
	33-50	ZL	10YR54					0	0		0				M			
	50-120	MZCL	10YR56					0	0		0				M			
7	0-35	ZL	10YR42					0	0	HR	3							
	35-50	MZCL	10YR43					0	0	HR	2				M			
	50-120	MZCL	10YR56					0	0	HR	2				M			
8	0-30	ZL	10YR42					1	0	HR	5							
	30-40	MZCL	10YR44					0	0	HR	10				M			
	40-45	MZCL	10YR44					0	0	HR	35				M			IMP FLINTS 45
9	0-29	ZL	10YR42					0	0		0							GRADIENT LIMIT
	29-55	ZL	10YR43					0	0		0				M			
	55-120	MZCL	75YR54					0	0		0				M			
10	0-30	MZCL	10YR31					0	0	HR	3							
	30-45	MZCL	10YR43					0	0	CH	5				M			Y
	45-100	MZCL	10YR44.54					0	0		0				M			
	100-120	MZCL	10YR66					0	0		0				M			
1P	0-33	ZL	10YR42					0	0	HR	2	WKCSAB	FR					PIT @ BORING 3
	33-49	ZL	10YR44					0	0		0	MDCAB	FR M					
	49-120	MZCL	10YR54					0	0		0	MDVCAB	FR M					PIT 80 AUG 120