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Canterbury District Local Plan
HBA 7, Land near Elm Court Farm.
Agricultural Land Classification
ALC Map and Report
June 1995

AGRICULTURAL LAND CLASSIFICATION, SUMMARY REPORT

CANTERBURY DISTRICT LOCAL PLAN
HBA 7: LAND NEAR ELM COURT FARM.

1. Summary

1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in the Canterbury district of Kent. The work forms part of MAFF's statutory input to the Canterbury District Local Plan.

1.2 The site comprises approximately 50 hectares of land to the north of the railway line to the south of Herne Bay in Kent. An additional area of land, totalling approximately 16 hectares, was surveyed to the west of the local plan site in order to provide information on land quality up to the boundary of a previous ALC survey. An Agricultural Land Classification (ALC) survey was carried out during June 1995. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 50 borings and four soil inspection pits were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose a long term limitation on its use for agriculture.

1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.

1.4 At the time of survey the agricultural land on the site comprised set aside land, cereals, permanent grassland and recently cultivated land. The areas mapped as urban include hard core tracks. The area marked as non-agricultural includes an earth track, and an area of woodland has also been mapped in the south-east of the site.

1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent are given in table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

Table 1 : Distribution of Grades and Subgrades for Local Plan site.

Grade	Area (ha)	% of Site	% of Agricultural Land
2	4.6	9.0	9.4
3a	31.6	62.3	64.8
3b	12.5	24.7	25.8
Urban	1.0	2.0	100% (48.7 ha.)
Non-agricultural	0.4	0.7	
Woodland	0.6	1.1	
Total area of site	50.7	100%	

1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1.7 The majority of the agricultural land on the site has been classified as Subgrade 3a, good quality land, with soil wetness as the main limitation. Profiles within this mapping unit typically comprise medium silty clay loam topsoils resting upon clay subsoils. The clay subsoils are poorly structured and slowly permeable causing a drainage impedance. soils tend to show signs of a wetness imperfection in the form of gleying from either the topsoil or upper subsoil. Therefore these profiles are assigned to Wetness Class III with a resultant classification of Subgrade 3a. Moderate quality Subgrade 3b land has been mapped on the site due to a more significant wetness limitation. Within this mapping unit, heavy silty clay loam topsoils rest upon slowly permeable clay subsoils. Similarly, these soils equate to Wetness Class III yet the existence of heavier textured topsoils means that the effects of the drainage imperfection upon agricultural use are more severe. This results in a classification of Subgrade 3b. Poorly drained wet soils can inhibit plant growth and rooting and may be more susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock.

1.8 An area of land towards the centre of the site has been classified as Grade 2, very good quality land, with soil wetness and droughtiness as the main limitations. Soil profiles typically comprise medium silty clay loam topsoils and upper subsoils overlying heavy silty clay loam lower subsoils which occasionally become lighter with depth. Profiles are commonly gleyed from below the topsoil and are assigned to Wetness Class II with a subsequent classification of Grade 2 due to this slight wetness limitation. Furthermore, the interaction between soil properties such as texture and structure and the local climatic regime, which is relatively dry in regional context, means that there is a slight restriction on the amount of profile available water for plant growth. This can affect the level and consistency of crop yields such that a classification of Grade 2 is appropriate.

2. Climate

2.1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe climatic limitations will restrict land to low grades irrespective of favourable site or soil conditions.

2.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall, as a measure of overall wetness, and accumulated temperature (degree days Jan-June), as a measure of the relative warmth of a locality.

2.3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met. Office 1989). The details are given in the table below and these show that there is no overall climatic limitation affecting the site.

2.4 However, climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations. At this locality the Field Capacity Days value is relatively low in a regional context, and therefore soil wetness problems may be diminished.

2.5 No local climatic factors such as exposure or frost risk are believed to affect the site.

Table 2 : Climatic Interpolation

Grid Reference	TR 203 677
Altitude (m)	35
Accumulated Temperature (Day °C, Jan-June)	1451
Average Annual Rainfall (mm)	583
Field Capacity (days)	119
Moisture Deficit, Wheat (mm)	127
Moisture Deficit, Potatoes (mm)	126
Overall Climatic Grade	1

3. Relief

3.1 The site slopes very gently down to the east, lying at an altitude of 30-35m.

4. Geology and Soils

4.1 The published geological map (BGS, 1974) shows the majority of the site to be underlain by Head Brickearth. An area of London Clay is mapped towards the east of the site, alongside small areas of Head Gravel.

4.2 The published Soil Survey map (SSEW, 1983) shows the soils on the site to comprise two associations. Towards the west of the site soils of the Park Gate association are mapped, these are described as 'deep stoneless silty soils variably affected by groundwater' (SSEW 1983). Towards the east of the site soils of the Wickham 4 association are mapped, these are described as 'slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey oils associated with similar clayey soils.'

4.3 Detailed field examination found the soils on the site to be silty and clayey with slowly permeable subsoils at variable depths. Soil drainage imperfections were found to be more serious towards the east of the site.

5. Agricultural Land Classification

5.1 The location of the soil observation points are shown on the attached sample point map.

Grade 2

5.2 Very good quality land has been mapped towards the central part of the site, where soils are subject to both a slight wetness and droughtiness limitation. Medium silty clay loam topsoils rest upon subsoils which tend to be of a lighter texture than elsewhere on the site. Soil inspection pit no. 4 is typical of the soils within this mapping unit. At the location of the pit, a medium silty clay loam topsoil was found to overlie a similar textured upper subsoil extending to 50 cm. A heavy silty clay loam lower subsoil was found to extend to a depth of 80cm where textures become lighter comprising a medium silty clay loam extending to 120cm. The profile shows evidence of soil wetness in the form of gleying

from the upper subsoil. Subsoils were found to be moderately structured with good porosity and, therefore, permeable. Evidence of a slight wetness imperfection means that these soils are assigned to Wetness Class II with a resultant classification of Grade 2. Furthermore, given the local climatic regime, a combination of soil textures and structures means that there is a slight restriction upon the amount of profile available water for crop growth which can affect the level and consistency of crop yields. Consequently, a classification of Grade 2 due to this slight droughtiness limitation is also appropriate.
This Grade 2 mapping unit does not match exactly with an adjacent survey (ADAS Ref: 2002/009/93), this may be attributed to the presence of the railway cutting.

Subgrade 3a

5.3 Good quality land is mapped across the majority of the site, where soils show signs of a moderate wetness limitation. Medium silty clay loam topsoils resting upon clay subsoils were observed across much of this mapping unit. However, a number of soil observations proved impenetrable to the auger below the topsoil. A subsequent soil inspection pit (Pit 1) was dug to investigate the nature of the impenetrability. This found the cause to be the relatively dry state of the soils at the time of survey. At the location of this pit, a medium silty clay loam topsoil was found to overlie a clay subsoil commencing at 26cm. A further soil inspection pit (Pit 2) dug in this mapping unit found a medium silty clay loam topsoil overlying a heavy silty clay loam upper subsoil which in turn rests upon a clay lower subsoil commencing at 45cm. At the location of both pits, profiles show signs of imperfect drainage in the form of gleying from the upper subsoil. Furthermore, the clay subsoils were found to be poorly structured with low porosity and therefore may be classified as slowly permeable causing a moderate drainage impedance. Such drainage characteristics equate the soils to Wetness Class III which, in combination with the local climatic regime and the topsoil texture, gives a resultant classification of Subgrade 3a.

Subgrade 3b

5.4 Moderate quality land has been mapped towards the east of the site, where soils are derived from the London Clay. Within this mapping unit soil profiles typically comprise heavy silty clay loam topsoils resting upon gleyed clay subsoils. The soil inspection pit dug in this mapping unit (pit no. 4) found the clay subsoil to be poorly structured with low porosity, and is consequently slowly permeable. Similarly, such drainage characteristics equate these soils to Wetness Class III. Yet the presence of a heavy silty clay loam topsoil, with a higher clay content and therefore more difficult to work, means that a classification of Subgrade 3b is appropriate. Poorly drained wet soils can inhibit plant rooting and development and may be more susceptible to structural damage through trafficking by agricultural machinery or poaching by grazing livestock.

SOURCES OF REFERENCE

British Geological Survey (1974), Sheet No. 273, Faversham, 1:50,000 Series (solid and drift edition).

MAFF (1988), Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

Meteorological Office (1989), Climatological Data for Agricultural Land Classification.

Soil Survey of England and Wales (1983), Sheet 6: Soils of South East England, 1:250,000 and accompanying legend.

APPENDIX I

DESCRIPTION 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 (eg. 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.

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

Agricultural Buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg. polythene tunnels erected for lambing) may be ignored.

Open Water

Includes lakes, ponds and rivers as map scale permits.

Land Not Surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above, eg. buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will be shown.

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

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.

Definition of Soil Wetness Classes

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.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

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

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

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 **ST** : strongly developed	**MD** : moderately developed
ped size	**F** : fine **C** : coarse	**M** : medium **VC** : very coarse
ped shape	**S** : *single grain* **GR** : granular **SAB** : sub-angular blocky **PL** : platy	**M** : *massive* **AB** : angular blocky **PR** : prismatic

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 : CANTERBURY LP HBA 7 Pit Number : 1P

Grid Reference: TR19806760 Average Annual Rainfall : 583 mm
Accumulated Temperature : 1451 degree days
Field Capacity Level : 119 days
Land Use : Set-aside
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 26	MZCL	10YR42 00	6	10	HR	F				
26-120	C	10YR53 52	0	3	HR	M	MDVCAB	VM	P	

Wetness Grade : 3A Wetness Class : III
Gleying :026 cm
SPL :026 cm

Drought Grade : 3A APW : 123mm MBW : -4 mm
APP : 100mm MBP : -26 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Soil Wetness/Droughtiness

SOIL PIT DESCRIPTION

Site Name : CANTERBURY LP HBA 7 Pit Number : 2P

Grid Reference: TR20506770 Average Annual Rainfall : 583 mm
Accumulated Temperature : 1451 degree days
Field Capacity Level : 119 days
Land Use : Ploughed
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MZCL	10YR42 00	2	4	HR	F				
28- 45	HZCL	10YR52 00	0	0		C	MDCSAB	FR	M	
45- 75	C	10YR62 00	0	0		C	WKCSAB	FM	P	
75-120	C	10YR53 63	0	0		M	MDCAB	FM	P	

Wetness Grade : 3A Wetness Class : III
Gleying :028 cm
SPL :045 cm

Drought Grade : 3A APW : 136mm MBW : 9 mm
APP : 113mm MBP : -13 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Soil Wetness/Droughtiness

SOIL PIT DESCRIPTION

Site Name : CANTERBURY LP HBA 7 Pit Number : 3P

Grid Reference: TR20506780
Average Annual Rainfall : 583 mm
Accumulated Temperature : 1451 degree days
Field Capacity Level : 119 days
Land Use : Barley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 29	HZCL	10YR42 00	2	3	HR	F				
29- 65	C	10YR62 00	0	0		M	MDCAB	FM	P	

Wetness Grade : 3B
Wetness Class : III
Gleying :029 cm
SPL :029 cm

Drought Grade :
APW : 000mm MBW : 0 mm
APP : 000mm MBP : 0 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : CANTERBURY LP HBA 7 Pit Number : 4P

Grid Reference: TR20206760 Average Annual Rainfall : 583 mm
Accumulated Temperature : 1451 degree days
Field Capacity Level : 119 days
Land Use : Ploughed
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 27	MZCL	10YR42 00	0	2	HR					.
27- 50	MZCL	10YR53 00	0	0		C	MDCSAB	FR	M	
50- 80	HZCL	10YR53 00	0	0		C	MDCSAB	FR	M	
80-120	MZCL	10YR63 00	0	0		C	MDCSAB	FR	M	

Wetness Grade : 2 Wetness Class : II
Gleying :027 cm
SPL : No SPL

Drought Grade : 2 APW : 159mm MBW : 32 mm
APP : 123mm MBP : -3 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Soil Wetness/Droughtiness

SAMPLE NO.	GRID REF	USE	ASPECT GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1P	TR19806760	SAS		026	026	3	3A	123	-4	100	-26	3A				WD	3A	
2	TR20006790	WHT		030		1	1	059	-68	059	-67	4				WE	3A	I35DRY SEE1P
2P	TR20506770	PLO		028	045	3	3A	136	9	113	-13	3A				WD	3A	
3	TR20106790	WHT		030	045	3	2	131	4	108	-18	3A				DR	3A	CLAY 48
3P	TR20506780	BAR		029	029	3	3B	000	0	000	0					WE	3B	
4	TR20206790	WHT		028	060	2	2	106	-21	111	-15	3B				DR	3A	I80
4P	TR20206760	PLO		027		2	2	159	32	123	-3	2				WD	2	
5	TR20306790	WHT		030		2	2	067	-60	067	-59	4				WE	3A	I40DRY SEE1P
6	TR19806780	SAS		000	027	3	3A	000	0	000	0					WE	3A	
7	TR19906780	SAS		000		2	2	053	-74	053	-73	4				WE	3A	I30DRY SEE1P
8	TR20006780	SAS		027	040	3	3A	000	0	000	0					WE	3A	
9	TR20106780	WHT		030		1	1	153	26	115	-11	3A				DR	3A	POTS LIM
10	TR20206780	WHT		025		2	2	099	-28	108	-18	3B				DR	3A	IMP65DRY
11	TR20306780	CER		025	025	3	3B	124	-3	101	-25	3A				WE	3B	
12	TR20406780	CER		025	025	3	3B	000	0	000	0					WE	3B	
13	TR20506780	CER		025	025	3	3B	000	0	000	0					WE	3B	
14	TR20606780	PLO		025	025	3	3B	000	0	000	0					WE	3B	
15	TR20706780	PLO		000	028	3	3B	000	0	000	0					WE	3B	
16	TR19706770	PGR		030	045	3	3A	099	-28	111	-15	3B				WE	3A	
17	TR19806770	PGR		026	026	3	3A	089	-38	099	-27	3B				WE	3A	
18	TR19906770	PGR		000		1	1	054	-73	054	-72	4				WE	3A	I30DRY SEE1P
19	TR20006770	PGR		030	065	2	2	142	15	121	-5	2				WD	2	
20	TR20106770	WHT		028	080	2	2	146	19	122	-4	2				WD	2	
21	TR20206770	CER		028	055	3	3A	138	11	115	-11	3A				WE	3A	POTS LIM
22	TR20306770	CER		030	048	3	3A	134	7	112	-14	3A				WE	3A	POTS LIM
23	TR20406770	CER		025	055	3	3A	104	-23	112	-14	3B				WE	3A	I75STDRY
24	TR20506770	PLO		030	080	2	2	000	0	000	0					WE	2	
25	TR20606770	PLO		030	050	3	3A	136	9	113	-13	3A				WD	3A	POTS LIM
26	TR20706770	PLO		030	030	3	3B	000	0	000	0					WE	3B	PLASTC30
27	TR19506760	PGR		000	029	3	3B	000	0	000	0					WE	3B	
28	TR19606760	PGR		000	029	3	3A	096	-31	108	-18	3B				WE	3A	
29	TR19706760	PGR		027	027	3	3A	128	1	104	-22	3A				WE	3A	
30	TR19806760	PGR		000		1	1	044	-83	044	-82	4				WE	3A	I25DRY SEE1P
31	TR19906760	PGR		000		1	1	067	-60	067	-59	4				WE	3A	I40DRY SEE1P
33	TR20106760	PLO		030	030	3	3A	130	3	107	-19	3A				WE	3A	
34	TR20206760	PLO		028		2	2	159	32	123	-3	2				WD	2	
35	TR20306760	PLO		029	029	3	3A	094	-33	106	-20	3B				WE	3A	
36	TR20406760	PLO		027	040	3	3A	149	22	111	-15	3A				WE	3A	
37	TR20506760	PLO		030	030	3	3B	000	0	000	0					WE	3B	
38	TR20606760	PLO		030	055	3	3B	140	13	118	-8	2				WE	3B	
39	TR20706760	PLO		025	025	3	3B	000	0	000	0					WE	3B	
40	TR20806760	WHT		000		1	1	042	-85	042	-84	4				DR	4	I25

SAMPLE NO.	GRID REF	USE	ASPECT GRDNT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M.REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
41	TR19506750	PGR	030	030		3	3A	132	5	109	-17	3A				WD	3A	
42	TR19606750	PGR	035	035		3	3A	131	4	106	-20	3A				WE	3A	
43	TR19706750	PGR	000	026		3	3B	000	0	000	0					WE	3B	
44	TR19806750	PGR	000	030		3	3B	000	0	000	0					WE	3B	
45	TR19906750	BAR	027	027		3	3A	083	-44	088	-38	3B				WE	3A	
46	TR20006750	WHT	030	030		3	3A	094	-33	106	-20	3B				WE	3A	
47	TR20106750	PLO	045	045		2	2	137	10	114	-12	3A				DR	3A	
48	TR20206750	PLO	045			1	1	160	33	124	-2	2				DR	2	
49	TR20306750	PLO	027	065		2	2	153	26	121	-5	2				WD	2	
50	TR20406750	PLO	030	030		3	3A	151	24	115	-11	3A				WE	3A	
51	TR20506750	PLO	029	080		3	3A	000	0	000	0					WE	3A	

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
1P	0-26	mzcl	10YR42 00	10YR56 00	F				6	0	HR	10						
	26-120	c	10YR53 52	10YR68 51	M			Y	0	0	HR	3	MDVCAB	VM P	Y		Y	
2	0-30	mcl	10YR43 00						1	0	HR	5						
	30-35	mcl	10YR44 00	10YR58 00	C			S	0	0	HR	5		M				
2P	0-28	mzcl	10YR42 00	10YR56 00	F				2	0	HR	4						
	28-45	hzcl	10YR52 00	10YR58 61	C			Y	0	0		0	MDCSAB	FR M				
	45-75	c	10YR62 00	10YR68 51	C		00MN00 00	Y	0	0		0	WKCSAB	FM P	Y		Y	
	75-120	c	10YR53 63	10YR68 71	M		00MN00 00	Y	0	0		0	MDCAB	FM P	Y		Y	
3	0-30	mcl	10YR43 00						0	0	HR	4						Y
	30-45	mcl	25Y 62 00	10YR58 00	M		00MN00 00	Y	0	0	HR	4		M				
	45-120	c	35Y 62 00	10YR58 61	M		00MN00 00	Y	0	0		0		P			Y	
3P	0-29	hzcl	10YR42 00	10YR56 00	F				2	0	HR	3						
	29-65	c	10YR62 00	10YR68 71	M			Y	0	0		0	MDCAB	FM P	Y		Y	
4	0-28	mcl	10YR43 00						1	0	HR	5						
	28-40	mcl	10YR53 00	10YR56 00	C			Y	0	0	HR	5		M				
	40-60	hcl	10YR52 00	10YR68 51	M			Y	0	0		0		M				
	60-80	c	10YR52 00	10YR68 51	M		00MN00 00	Y	0	0	HR	5		P			Y	
4P	0-27	mzcl	10YR42 00						0	0	HR	2						
	27-50	mzcl	10YR53 00	10YR56 00	C		00MN00 00	Y	0	0		0	MDCSAB	FR M				
	50-80	hzcl	10YR53 00	10YR58 61	C			Y	0	0		0	MDCSAB	FR M				
	80-120	mzcl	10YR63 00	10YR58 00	C		00MN00 00	Y	0	0		0	MDCSAB	FR M				
5	0-30	mcl	10YR43 00						1	0	HR	5						
	30-40	mcl	10YR53 00	10YR56 00	C		00MN00 00	Y	0	0	HR	5		M				
6	0-27	mzcl	10YR42 00	10YR58 00	C			Y	4	0	HR	6						
	27-70	c	10YR53 52	10YR68 71	M		00MN00 00	Y	0	0		0		P			Y	
7	0-30	mzcl	10YR42 00	10YR56 00	C			Y	5	0	HR	8						
8	0-27	mzcl	10YR42 43						0	0	HR	2						
	27-40	mzcl	10YR62 00	10YR68 00	C			Y	0	0		0		M				
	40-70	c	10YR53 00	10YR68 71	M			Y	0	0		0		P			Y	
9	0-30	mcl	10YR43 00						0	0	HR	4						
	30-50	mcl	10YR44 00	10YR58 00	C			S	0	0	HR	2		M				
	50-120	hcl	10YR53 00	10YR68 52	M		00MN00 00	Y	0	0		0		M				
10	0-25	mzcl	10YR43 00						0	0	HR	3						
	25-50	mcl	10YR53 00	10YR68 51	M		00MN00 00	Y	0	0	HR	4		M				
	50-65	hcl	10YR52 00	10YR68 51	M		00MN00 00	Y	0	0	HR	2		M				

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL.	GLEY	----STONES---- >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
11	0-25	hcl	10YR42 00						0	0	HR	5						
	25-60	c	10YR53 00	10YR56 51	M		00MN00 00	Y	0	0		0		P				Y
	60-120	c	10YR53 00	10YR56 51	M		00MN00 00	Y	0	0	HR	2		P				Y
12	0-25	c	10YR42 00						0	0	HR	5						
	25-60	c	10YR53 00	10YR56 51	M			Y	0	0		0		P				Y
13	0-25	c	10YR42 00						0	0	HR	5						
	25-60	c	10YR62 00	10YR68 61	M		00MN00 00	Y	0	0	HR	2		P				Y
14	0-25	hzcl	10YR42 00						2	0	HR	5						
	25-60	c	10YR62 52	10YR68 00	M			Y	0	0	HR	2		P				Y
15	0-28	hcl	10YR42 00	10YR56 00	C			Y	2	0	HR	5						
	28-60	c	10YR62 00	10YR68 00	M			Y	0	0	HR	2		P				Y
16	0-30	mzcl	10YR53 00						0	0	HR	5						
	30-45	hzcl	10YR72 00	10YR68 71	M			Y	0	0	HR	5		M				
	45-70	c	10YR62 00	10YR68 71	M			Y	0	0		0		P				Y
17	0-26	mzcl	10YR53 00						0	0	HR	5						
	26-50	c	10YR62 00	10YR68 71	C			Y	0	0	HR	5		P				Y
	50-70	c	10YR62 00	10YR68 71	M		00MN00 00	Y	0	0	HR	15		P				Y
18	0-30	mzcl	10YR54 00						5	0	HR	6						
19	0-30	mzcl	10YR53 00						0	0		0						
	30-45	mzcl	10YR72 00	10YR68 00	C			Y	0	0	HR	10		M				
	45-65	hzcl	10YR72 00	10YR68 71	C			Y	0	0		0		M				
	65-120	c	10YR62 00	10YR68 71	M			Y	0	0		0		P				Y
20	0-28	mzcl	10YR43 00						2	0	HR	5						
	28-50	mzcl	10YR53 00	10YR58 00	M			Y	0	0		0		M				
	50-80	hzcl	10YR53 00	10YR58 00	M			Y	0	0		0		M				
	80-120	c	10YR53 00	10YR58 00	M		00MN00 00	Y	0	0		0		P				Y
21	0-28	mzcl	10YR43 00						2	0	HR	5						
	28-55	hzcl	10YR63 00	10YR68 00	C			Y	0	0	HR	2		M				
	55-120	c	10YR63 00	10YR68 61	M			Y	0	0		0		P				Y
22	0-30	mzcl	10YR43 00						2	0	HR	5						
	30-48	mzcl	10YR53 00	10YR56 00	C			Y	0	0	HR	5		M				
	48-120	c	25Y 62 00	10YR68 61	M			Y	0	0	HR	2		P				Y
23	0-25	mzcl	10YR42 00						2	0	HR	5						
	25-55	hzcl	10YR52 00	75YR56 00	M			Y	0	0	HR	5		M				
	55-75	c	10YR52 53	10YR68 61	M			Y	0	0	HR	5		P				Y

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL.	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
24	0-30	mzcl	10YR42 00						3	0	HR	6						
	30-80	hzcl	10YR52 00	10YR68 00	C			Y	0	0	HR	2		M				
	80-100	c	10YR62 00	10YR68 71	M			Y	0	0		0		P			Y	
25	0-30	mzcl	10YR42 00						2	0	HR	5						
	30-50	hzcl	10YR52 00	75YR58 00	M			Y	0	0	HR	2		M				
	50-120	c	10YR53 00	10YR68 51	M			Y	0	0	HR	2		P			Y	
26	0-30	hcl	10YR42 00						2	0	HR	5						
	30-60	c	10YR53 54	10YR56 00	C			Y	0	0		0		P			Y	
27	0-29	hzcl	10YR52 00	10YR58 61	C			Y	0	0		0						
	29-70	zc	10YR72 00	10YR68 71	M			Y	0	0		0		P			Y	
28	0-29	mzcl	10YR42 00	10YR58 61	C			Y	0	0		0						
	29-70	c	10YR52 00	10YR58 61	C			Y	0	0		0		P			Y	
29	0-27	mzcl	10YR53 00						0	0		0						
	27-55	zc	10YR72 00	10YR68 71	M			Y	0	0		0		P			Y	
	55-120	c	10YR62 00	10YR68 71	M			Y	0	0		0		P			Y	
30	0-25	mzcl	10YR42 00						5	0	HR	8						
31	0-30	mzcl	10YR54 00						5	0	HR	8						
	30-40	mzcl	10YR54 00						0	0	HR	15		M				
33	0-30	mzcl	10YR43 00						1	0	HR	4						
	30-50	c	75YR53 00	75YR58 52	M		00MN00 00	Y	0	0		0		P			Y	
	50-120	c	10YR53 00	10YR56 52	M		00MN00 00	Y	0	0		0		P			Y	
34	0-28	mzcl	10YR42 00						2	0	HR	4						
	28-45	mzcl	10YR52 00	10YR58 61	C			Y	0	0		0		M				
	45-70	hzcl	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0		0		M				
	70-120	mzcl	10YR53 54	10YR58 00	C		00MN00 00	Y	0	0		0		M				
35	0-29	mzcl	10YR42 00						3	0	HR	5						
	29-70	c	10YR53 00	10YR58 61	C		00MN00 00	Y	0	0		0		P			Y	
36	0-27	mzcl	10YR42 00	10YR56 00	F				0	0	HR	2						
	27-40	hzcl	10YR53 00	10YR58 00	C			Y	0	0		0		M				
	40-70	c	10YR63 00	10YR68 71	M			Y	0	0		0		P			Y	
	70-120	hzcl	10YR54 00	10YR58 00	C			S	0	0		0		M			Y	
37	0-30	hzcl	10YR42 00						4	0	HR	6						
	30-70	c	10YR53 00	10YR58 61	C		00MN00 00	Y	0	0		0		P			Y	
38	0-30	hzcl	10YR42 00						0	0	HR	2						
	30-55	hzcl	10YR53 00	10YR58 61	C			Y	0	0		0		M				
	55-120	c	10YR62 00	10YR68 71	M			Y	0	0		0		P			Y	

				----MOTTLES-----			PED		----STONES----			STRUCT/	SUBS			
SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
39	0-25	hzcl	10YR42 00						5	0	HR	8						
	25-70	c	10YR53 00	10YR68 00	C		00MN00 00	Y	0	0		0		P			Y	
40	0-25	mzcl	10YR44 00						8	0	HR	12						
41	0-30	mzcl	10YR42 00	10YR56 00	F				0	0		0						
	30-60	c	10YR62 00	10YR68 71	M			Y	0	0	W	0		P			Y	
	60-120	c	10YR52 00	10YR58 61	M			Y	0	0		0		P			Y	
42	0-24	mzcl	10YR42 00						0	0		0						
	24-35	mzcl	10YR54 00						0	0		0		M				
	35-70	zc	10YR72 00	10YR68 71	M			Y	0	0		0		P			Y	
	70-120	c	10YR62 00	10YR68 71	M			Y	0	0		0		P			Y	
43	0-26	hzcl	10YR43 00	10YR58 61	C			Y	0	0		0						
	26-60	c	10YR62 00	10YR68 71	M			Y	0	0		0		P			Y	
44	0-30	hzcl	10YR42 00	10YR56 00	C			Y	0	0	HR	8						
	30-60	c	10YR62 00	10YR68 71	M			Y	0	0	HR	10		P			Y	
45	0-27	mzcl	10YR42 00						3	0	HR	6						
	27-60	c	10YR53 00	10YR58 00	C		00MN00 00	Y	0	0	HR	8		P			Y	
46	0-30	mzcl	10YR43 44						3	0	HR	5						
	30-70	c	10YR53 00	75YR58 00	C		00MN00 00	Y	0	0		0		P			Y	
47	0-30	mzcl	10YR43 00						0	0	HR	2						
	30-45	mzcl	10YR54 00						0	0		0		M				
	45-120	c	75YR54 00	75YR58 00	C		00MN00 00	S	0	0		0		P			Y	
48	0-30	mzcl	10YR42 00						0	0	HR	2						
	30-45	mzcl	10YR54 00	10YR56 00	F				0	0		0		M				
	45-70	mzcl	10YR64 00	10YR58 00	C			S	0	0		0		M				
	70-120	mzcl	10YR63 64	10YR68 00	C			Y	0	0		0		M				
49	0-27	mzcl	10YR42 00	10YR56 00	F				0	0	HR	2						
	27-65	hzcl	10YR52 53	10YR56 00	C			Y	0	0		0		M				
	65-85	zc	10YR53 54	10YR68 71	C			Y	0	0		0		P			Y	
	85-120	mzcl	10YR72 74	10YR68 00	C			Y	0	0		0		M			Y	
50	0-30	mzcl	10YR42 00						2	0	HR	4						
	30-50	c	10YR62 64	10YR68 00	C		00MN00 00	Y	0	0		0		P			Y	
	50-70	hzcl	10YR52 00	10YR58 61	C		00MN00 00	Y	0	0		0		M			Y	
	70-120	mzcl	10YR54 00	10YR58 00	C			S	0	0		0		M			Y	
51	0-29	hzcl	10YR42 00						3	0	HR	5						
	29-40	mzcl	10YR52 00	10YR58 61	C			Y	0	0		0		M				
	40-50	hzcl	10YR62 00	10YR68 51	C			Y	0	0		0		M				
	50-120	c	10YR62 00	10YR68 71	M		00MN00 00	Y	0	0		0		P			Y	