Banbury Road Warwick

Agricultural Land Classification

December 1998

Resource Planning Team
Bristol
FRCA Western Region

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BANBURY ROAD WARWICK

AGRICULTURAL LAND CLASSIFICATION SURVEY

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AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 106 4 ha of land west of Banbury Road Warwick Field survey was based on 96 auger borings and 4 soil profile pits and was completed in December 1998 During the survey 2 samples were analysed for particle size distribution (PSD)

2 The survey was conducted by the Resource Planning Team of FRCA Western Region on behalf of MAFF in its statutory role in the preparation of Warwickshire Structure Plan

3 Information on climate geology and soils and from previous ALC surveys was considered and is presented in the relevant sections Apart from the published regional ALC map (MAFF 1977) which shows the site at a reconnaissance scale as Grade 2 in the north east part and Grade 3 elsewhere with non agricultural land along the Tach Brook the eastern fringe of the site was previously surveyed pre 1989 at a scale of 1 25 000 (ADAS pre1989) The current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) and supersedes any previous ALC survey Grade descriptions are summarised in Appendix I

4 Land to the west of the site was surveyed in 1991 (ADAS 1991) which showed mainly Subgrade 3a on droughty sandy loams Land to the north and east was surveyed in 1990 and 1997 (ADAS 1990 FRCA 1997) These surveys showed a range of soils including slightly droughty Grade 2 soils and poorly drained Subgrade 3a and 3b soils Similar soils were found during the current survey

5 At the time of survey land cover was pasture on the higher land in the south and arable elsewhere The marshy land shown in the centre of the map had been landraised and was not in agricultural use To the east of this a lake had been created The areas of woodland still remained as such

SUMMARY

6 The distribution of ALC grades is shown on the accompanying 1 10 000 scale ALC map The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas Areas are summarised in the Table 1

Table 1 Distribution of ALC grades Banbury Road Warwick

Grade	Area (ha)	% Surveyed Area (93 7 ha)
2	79 0	84 3
3a	6 0	6 4
3b	8 7	9 3
Other land	12 7	
Total site area	106 4	

7 The majority of the site has been mapped as Grade 2 with over 90% mapped as Best and Most Versatile land The soils are mainly limited by droughtiness being light textured medium sandy loams Parent red marl is encountered in parts of the site which imposes a wetness limitation the severity of which depends on the depth to the slowly permeable clay Where it is much higher in the profile a moderate wetness limitation exists and the soils are mapped as Subgrade 3a and 3b

CLIMATE

8 Estimates of climatic variables for this site were derived from the published agricultural climate dataset Climatological Data for Agricultural Land Classification (Meteorological Office 1989) using standard interpolation procedures Data for key points around the site are given in Table 2 below

9 Since the ALC grade of land is determined by the most limiting factor present overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions Parameters used for assessing overall climate are accumulated temperature a measure of relative warmth and average annual rainfall a measure of overall wetness The results shown in Table 2 indicate that there is no overall climatic limitation

Table 2 Climatic Interpolations Banbury Road Warwick

Grid Reference		SO 295 634	SO 297 626	SO 298 631
Altitude (m)		50	74	60
Accumulated Temperature (day C)		1436	1409	1425
Average Annual Rainfall (mm)		629	634	632
Overall Climatic Grade		1	1	1
Field Capacity Days		138	138	138
Moisture deficit (mm)	Wheat	108	105	107
	Potatoes	100	96	98

10 Climatic variables also affect the ALC grade through interactions with soil conditions The most important interactive variables are Field Capacity Days (FCD) which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes

which are compared with the moisture available in each profile in assessing soil droughtiness limitations These are described in later sections

RELIEF

11 Altitude ranges from 50 metres along the Tach Brook to 74 metres at Park Farm The site is dissected by the Tach Brook Only two small agricultural areas to the north of the Brook have limiting slopes The area which has been landraised has very steep slopes but these are not in agricultural use The rest of the slopes on the site are gentle and not limiting to agriculture versatility

GEOLOGY AND SOILS

12 The underlying geology of the site is shown on the published geology map (BGS 1984) The area is underlain by Triassic Mercia Mudstone There are drift deposits lying on this alluvium along the Tach Brook sand and gravel on top of the hill above Park Farm head by Asps Cottages and 4th River Terrace Deposits in the southeast northwest north of The Asps and across part of the northern section Evidence of the underlying Mudstone was found across the site with sandier material from the drift deposits being more extensive than indicated by the published map The alluvium is no longer exposed following landfilling and lake creation

13 Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1 250 000 (SSEW 1983) as a small area of Dunnington Heath in the northwest tip Whimple 3 Association across the centre of the site with Wick 1 Association elsewhere More detailed soils information is also available for the eastern fringe in the 1 25 000 scale survey of the SP36 area (SSEW 1973)

14 Dunnington Heath is described as reddish coarse and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging Whimple 3 Association is described as reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging Similar clayey soils may be found on brows with slowly permeable seasonally waterlogged fine loamy and fine silty over clayey soils on lower slopes The Wick 1 Association is described as a well drained coarse loamy and sandy soil locally over gravel Some of the soils may be affected by groundwater

15 Soils typical of the Wick 1 Association were found to be more extensive than suggested by the regional soils map however the underlying marl was often encountered within the profile in these soils Whimple 3 soils were found mainly on the eastern side of the site There was little evidence for distinguishing Dunnington Heath soils

AGRICULTURAL LAND CLASSIFICATION

16 The distribution of ALC grades found by the current survey is shown on the accompanying 1 10 000 scale map and areas are summarised in Table 1 The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas

Grade 2

17 The majority of the site has been mapped as Grade 2 very good quality agricultural land These soils have a minor droughtiness limitation imposed by the light textures and relatively high moisture deficits in the area Soil profile pit 3 describes the soils within this unit The profiles typically have medium sandy loam topsoils with 2% hard stones The subsoils are similar textures with slightly higher stone contents Sometimes lower in the profile loamy sands may be found Some profiles also had red clay deep in the profile which acts as a slowly permeable layer This clay has associated gleying above it Depending on the depth at which the clay occurs if at all the profile in this area are assessed as Wetness Class I or II (see Appendix II) In either case with medium sandy loam topsoils the soils are Grade 1 however there is an overriding droughtiness limitation which limits the soils to Grade 2 Occasional profiles had clay higher in the profile and were assessed as Wetness Class III Grade 2 There are a few borings within this unit where there is more moisture available in the profile and the profiles are Grade 1 or borderline Grade 1/2 These are scattered and cannot be mapped out as a separate unit at the scale of mapping Two PSD samples in this are confirmed the medium sandy loam topsoils even where the soils felt slightly heavier around ASP 6 Intermittently along the field edge beside Gallows Hill three borings had clay close to the surface with a moderate wetness limitation However it was not considered appropriate to map these separately at the scale of mapping

18 The southern block of Grade 2 has more variable topsoil textures with medium sandy loam medium clay loam and sandy clay loam The profiles around Asps Cottages were impenetrable to the auger at shallow depths but soil profile pit 4 showed that there was a stony layer over red clay The soils in this area are assessed as Wetness Class III Grade 2 with medium sandy loam topsoils Soil profile pit 2 also showed similar soils There are also other similar but less stony soils within this unit as described by soil profile pit 1 Some of the profiles within this unit did not encounter clay until much deeper in the profile if at all and were Wetness Class I or II For these profiles the overriding limitation was droughtiness Grade 2 Within this unit there are some scattered patches where the red clay is closer to the surface and the profiles are Subgrade 3a and 3b These could not be mapped out separately at the scale of mapping There were also some scattered Grade 1 borings which did not have any limitations

Subgrade 3a

19 Two small areas of Subgrade 3a good quality have been mapped North of The Asps a combination of heavy clay loam topsoils and Wetness Class II limit the soil to 3a In the south there was a mix of medium clay loam sandy clay loam and heavy clay loam topsoils with mainly Wetness Class III The profiles in this unit were predominantly Subgrade 3a

Subgrade 3b

20 Two areas of Subgrade 3b moderate quality land have been mapped There is a small area of 9 degree slope north of Tach Brook which has been included with the Wetness Class IV soils to the east These soils have heavy clay loam and clay topsoils which go straight onto slowly permeable red clays These soils continue on the other side of the brook in the other block of 3b land mapped The presence of slowly permeable layers in these red clays is confirmed in all the soil profile pits dug which encountered this red marl at varying depths

The profiles within these units had the red clay much higher in the profile than elsewhere on the site

Other land

21 A block of land in the centre of the site was not surveyed because it comprised woodland and an area that had been landraised that was not in agricultural use Trees had been planted beside the sub station The farm buildings and houses are the other areas of other land

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23 December 1998

REFERENCES

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APPENDIX I

DESCRIPTION OF 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 include 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 and horticultural crops can usually be grown but on some land in the 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

Grade 3 good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops timing and type of cultivation, harvesting or the level of yield Where 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 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 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 very severe limitations which restrict use to permanent pasture or rough grazing except for occasional pioneer forage crops

Source MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land MAFF Publications Alnwick

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years

Wetness Class 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 not wet within 40 cm depth for more than 30 days in most years

Wetness Class 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 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 and 90 days in most years

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or if there is no slowly permeable layer within 80 cm depth it is wet within 40 cm depth for 91 210 days in most years

Wetness Class V

The soil profile is wet within 40 cm depth for 211 335 days in most years

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years

Notes The number of days specified is not necessarily a continuous period

In most years is defined as more than 10 out of 20 years

Source Hodgson J M (Ed) (1997) Soil Survey Field Handbook Soil Survey Technical Monograph No 5 Silsoe

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report Terms used and abbreviations are set out below These conform to definitions contained in the Soil Survey Field Handbook (Hodgson 1997)

1 Terms used on computer database in order of occurrence

GRID REF National 100 km grid square and 8 figure grid reference

LAND USE At the time of survey

WHT	Wheat	**SBT**	Sugar Beet	**HTH**	Heathland
BAR	Barley	**BRA**	Brassicas	**BOG**	Bog or Marsh
OAT	Oats	**FCD**	Fodder Crops	**DCW**	Deciduous Wood
CER	Cereals	**FRT**	Soft and Top Fruit	**CFW**	Coniferous Woodland
MZE	Maize	**HRT**	Horticultural Crops	**PLO**	Ploughed
OSR	Oilseed Rape	**LEY**	Ley Grass	**FLW**	Fallow (inc Set aside)
POT	Potatoes	**PGR**	Permanent Pasture	**SAS**	Set Aside (where known)
LIN	Linseed	**RGR**	Rough Grazing	**OTH**	Other
BEN	Field Beans	**SCR**	Scrub		

GRDNT Gradient as estimated or measured by hand held optical clinometer

GLEY SPL Depth in centimetres to gleying or slowly permeable layer

AP (WHEAT/POTS) Crop adjusted available water capacity

MB (WHEAT/POTS) Moisture Balance (Crop adjusted AP crop potential MD)

DRT Best grade according to soil droughtiness

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				

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				

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)

MOTTLE COL Mottle colour using Munsell notation

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%+

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

PED COL Ped face colour using Munsell notation

GLEY If the soil horizon is gleyed a Y will appear in this column If slightly gleyed an S will appear

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 or metamorphic rock

Stone contents are given in % by volume for sizes >2cm >6cm and total stone >2mm

STRUCT The degree of development size and shape of soil peds are described using the following notation

Degree of development	**WA**	Weakly developed Adherent	**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		

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		

SUBS STR Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** Good **M** Moderate **P** Poor

POR Soil porosity If a soil horizon has poor porosity with less than 0 5% biopores >0 5mm a Y will appear in this column

IMP If the profile is impenetrable to rooting a Y will appear in this column at the appropriate horizon

SPL Slowly permeable layer If the soil horizon is slowly permeable a Y will appear in this column

CALC If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a Y will appear this column

2 Additional terms and abbreviations used mainly in soil pit descriptions

STONE ASSESSMENT

VIS	Visual	**S**	Sieve	**D**	Displacement

MOTTLE SIZE

EF	Extremely fine <1mm	**M**	Medium 5 15mm
VF	Very fine 1 2mm>	**C**	Coarse >15mm
F	Fine 2 5mm		

MOTTLE COLOUR May be described by Munsell notation or as ochreous (OM) or grey (GM)

ROOT CHANNELS In topsoil the presence of rusty root channels should also be noted

MANGANESE CONCRETIONS Assessed by volume

N	None		**M**	Many	20 40%
F	Few	<2%	**VM**	Very Many	>40%
C	Common	2 20%			

POROSITY

P	Poor	less than 0 5% biopores at least 0 5mm in diameter
G	Good	more than 0 5% biopores at least 0 5mm in diameter

ROOT ABUNDANCE

The number of roots per 100cm^2		Very Fine and Fine	Medium and Coarse
F	Few	1 10	1 or 2
C	Common	10 25	2 5
M	Many	25 200	>5
A	Abundant	>200	

ROOT SIZE

VF	Very fine	<1mm	**M**	Medium	2 5mm
F	Fine	1 2mm	**C**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS

Sharp	<0 5cm	**Gradual**	6 13cm
Abrupt	0 5 2 5cm	**Diffuse**	>13cm
Clear	2 5 6cm		

HORIZON BOUNDARY FORM Smooth wavy irregular or broken *

* See Soil Survey Field Handbook (Hodgson 1997) for details

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Banbury Road Warwick	Pit 1	1 W	Cereal Stubble	Av Rainfall 632 mm ATO 1425 day C FC Days 138 Climatic Grade 1 Exposure Grade 1	Sand & Gravel
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
96/98	2/12/98	SP 2955 6310	GMS		

Horizon No	Lowest Av Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness Size Type and Field Method	Mottling Abundance Contrast Size and Colour	Mangan Concs	Structure Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots Abundance and Size	Calcium Carbonate Content	Horizon Boundary Distinctness and form
1	25	MSL	05YR42	1/HR>2cm ( ) 2/HR>2mm ( )	None	None					FVF		Clear Smooth
2	40	SCL	05YR43	2/HR ( )	FDFO 75YR56	Few	MDCAB	Friable	Mod	Good	FVF		Gadual Smooth
3	90+	C	25YR43 (25YR54)	N	None	Common	WKCAB	Firm	Mod	Low	FVF		

Profile Gleyed From Not gleyed

Slowly Permeable Horizon From 40 cm

Wetness Class III

Wetness Grade 2

Available Water Wheat 135 mm

Potatoes 111 mm

Moisture Deficit Wheat 107 mm

Potatoes 98 mm

Moisture Balance Wheat 28 mm

Potatoes 13 mm

Droughtiness Grade 2 (Calculated to 120 cm)

Final ALC Grade 2

Main Limiting Factor(s) Wetness/Droughtiness

Remarks H3 has patches of Tea Green marl which has medium structure

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Banbury Road Warwick	Pit 2	4 N	Cereal Stubble	Av Rainfall 632 mm ATO 1425 day C FC Days 138 Climatic Grade 1 Exposure Grade 1	Triassic Mudstone
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
96/38	2/12/98	SP 2985 6310	GMS		

Horizon No	Lowest Av Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness Size Type and Field Method	Mottling Abundance Contrast Size and Colour	Mangan Concs	Structure Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots Abundance and Size	Calcium Carbonate Content	Horizon Boundary Distinctness and form
1	27	MSL	7 5YR42	1 / HR>2 cm ( ) 2 / HR>2 mm (vi)	None	None					FVF		Clear Smooth
2	50	MSL	5YR53 54	8 / HR>2 cm ( ) 33 / HR>2 mm (+d) 41 / HR t t l	CDFO 7 5YR56	Common	WKCSAB	Friable	Good	Good	CVF		Abrupt Smooth
3	80+	C	2 5YR54 (2 5YR53)	None	None	Common	WKadherant CAB	Firm	Poor	Low	CVF		

Profile Gleyed From 27 cm

Slowly Permeable Horizon From 50 cm

Wetness Class III

Wetness Grade 2

Available Water	Wheat	118 mm
	Potatoes	95 mm
Moisture Deficit	Wheat	107 mm
	Potatoes	98 mm
Moisture Balance	Wheat	11 mm
	Potatoes	3 mm

Droughtiness Grade 2 (Calculated to 120 cm)

Final ALC Grade 2

Main Limiting Factor(s) Wetness/Droughtiness

Remarks

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Banbury Road Warwick	Pit 3 (ASP 11)	1 W	Cereal	Av Rainfall 632 mm ATO 1425 day C	4th River Terrace
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY	FC Days 138 Climatic Grade 1 Exposure Grade 1	PSD SAMPLES TAKEN
96/98	15/12/98	SP 29706375	GMS/SYH		ASP16 S 67 / Z 20 / C 13 / MSL

Horizon No	Lowest Av Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness Size Type and Field Method	Mottling Abundance Contrast Size and Colour	Mangan Concs	Structure Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots Abundance and Size	Calcium Carbonate Content	Horizon Boundary Distinctness and form
1	36	MSL	10YR3/2 3/3	2 / HR (s)	None						CF+VF		Clear Smooth
2	55	MSL	7 5YR4/3	5 / > 2 cm 3 / < 2 cm 8 / HR (+d)	None	None	MDCAB	VF	Mod	Low	CVF		Clear Smooth
3	90	LMS	7 5YR 5/3 (patchy)	2 / > 2 cm 3 / < 2 m 5 / HR (+d)	c d 7 5YR 4/4 46 in bands associated with mn	Common around iron pan	MDCAB	VF	Good	Low	CVF		Abrupt Wavy
4	120	C	5YR4/4 (25YR5/4)	N	None	Common	MASS	FM	Poor	Low	FVF		

Profile Gleyed From 55 cm

Slowly Permeable Horizon From 90 cm

Wetness Class I

Wetness Grade 1

Available Water Wheat 130 mm

Potatoes 100 mm

Moisture Deficit Wheat 107 mm

Potatoes 98 mm

Moisture Balance Wheat 23 mm

Potatoes 2 mm

Droughtiness Grade 2 (Calculated to 120 cm)

Final ALC Grade 2

Main Limiting Factor(s) Droughtiness

Remarks At top of H3 some iron cementation in patches

SITE NAME	PROFILE NO	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Banbury Road	Pit 4	1 S	PGR	Av Rainfall 632 mm ATO 1425 day C FC Days 138 Climatic Grade 1 Exposure Grade 1	Sand & Gravel
JOB NO	DATE	GRID REFERENCE	DESCRIBED BY		PSD SAMPLES TAKEN
96/98	17/12/98	SP 2955 6275	GMS		

Horizon No	Lowest Av Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness Size Type and Field Method	Mottling Abundance Contrast Size and Colour	Mangan Concs	Structure Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots Abundance and Size	Calcium Carbonate Content	Horizon Boundary Distinctness and form
1	28	MSL	7 5YR42	1 / HR > 2 cm ( )	None	None					MF + VF		Clear Smooth
2	36	MSL	7 5YR42	20 / HR > 2 cm ( )	None	None	MDCSAB	Friable	Mod	Good	MF + VF		Clear Smooth
3	46	SCL	7 5YR53 63	2 / HR ( )	CDFO 7 5YR56	None	MDCAB	Friable	Mod	Good	MVF		Clear Smooth
4	60	C	2 5YR43 (5YR53)	N	None	Common	MDCAB then more massive from 60 cm	Friable	Mod	Poor	CVF		Gradual Smooth
5	80+	C	2 5YR54	N	None	Few		Firm	Poor	Poor	FVF		

Profile Gleyed From 36 cm
Slowly Permeable Horizon From 46 cm

Wetness Class III
Wetness Grade 2

Available Water Wheat 128 mm
Potatoes 107 mm

Moisture Deficit Wheat 107 mm
Potatoes 98 mm

Moisture Balance Wheat 21 mm
Potatoes 9 mm

Droughtiness Grade 2 (Calculated to 120 cm)

Final ALC Grade 2

Main Limiting Factor(s) Wetness/Droughtiness

Remarks H3 and H4 have some large worm holes but overall porosity considered low H3 + H4 have sandy element to the clay