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**Tidenham, Chepstow**  
**Agricultural Land Classification**  
**June 1998**

Resource Planning Team  
Bristol  
FRCA Western Region

RPT Job Number: 51/98

FRCA File No: EL14/0334B



**TIDENHAM, CHEPSTOW**  
**AGRICULTURAL LAND CLASSIFICATION SURVEY**

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## TIDENHAM, CHEPSTOW

### AGRICULTURAL LAND CLASSIFICATION SURVEY

#### INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 248 ha of land in between Tidenham and Tutshill, and between Tidenham and the River Severn. Field survey was based on 94 auger borings and 6 soil profile pits, and was completed in July 1997. During the survey 3 soils 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 the Forest of Dean District Local Plan.
3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant sections. The published regional ALC map (MAFF, 1977) shows the site at a reconnaissance scale as being all Grade 3. However, the current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and supersedes any previous ALC surveys. Grade descriptions are summarised in Appendix I.
4. Land to the south and south-west of the current site was surveyed in 1996 (ADAS, 1996). This showed large areas of Grade 2 and Subgrade 3a, with smaller mapping units of Subgrade 3b and Grade 4. These findings were taken into account during the current survey.
5. At the time of survey the land cover included permanent and ley pasture, maize and other fodder crops. Non-agricultural land included residential areas, farmsteads, woodland and copses, and land at Dayhouse Quarry.

#### SUMMARY

6. The distribution of ALC grades is shown on the accompanying 1:20 000 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 Table 1.

**Table 1: Distribution of ALC grades: Tidenham**

Grade	Area (ha)	% Surveyed Area (185 ha)
2	55	30
3a	69	37
3b	47	25
4	14	8
Other land	63	-
Total site area	248	100

7. The agricultural land on this site has been mapped in the current survey as Grade 2 (very good quality), Subgrade 3a (good quality), Subgrade 3b (moderate quality) and Grade 4 (poor quality). The key limitations to the agricultural use are workability on the Grade 2 land and wetness elsewhere. Over two thirds of the site has been mapped as best and most versatile with 30 % being Grade 2.

8. The Grade 2 land, mapped mostly to the north of the A 48, has minor a workability limitation to its agricultural use. The profiles consist of deep, well drained, loamy soils with no drought limitation. A few localised areas with moderate wetness limitations which could not be mapped at his level of survey are included in these mapping units.

9. The Subgrade 3a land tends to have a moderate wetness limitation to its agricultural use. The soils which are developed over mudstone geology have impaired drainage at depth. Some smaller areas developed over river terrace deposits have increased stone contents which restrict the amount of moisture available to crops leading to a moderate droughtiness limitation.

10. The Subgrade 3b and Grade 4 land has moderate and severe wetness limitations respectively. These areas have clay subsoils that are poorly drained and will restrict the access to the land and the choice of crops.

## CLIMATE

11. 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.

12. 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: Tidenham**

Grid Reference	ST 565 947	ST 543 950	ST 556 956
Altitude (m)	10	60	30
Accumulated Temperature (day °C)	1529	1472	1506
Average Annual Rainfall (mm)	944	986	970
Overall Climatic Grade	1	1	1
Field Capacity Days	200	207	205
Moisture deficit (mm):			
Wheat	94	84	89
Potatoes	84	72	78

13. Climatic variables also affect 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**

14. Altitude across the site ranges from 10 metres at the mouth of Sturch Pill to 65 metres at Wirewoods Green Manor, and 76 metres at Cross Hill, Tidenham. The gradients within the site are mainly level, and gently and moderately sloping with no limitation to the agricultural use. There are small areas of land that are strongly sloping to the south of Tidenham, to the north east of Lowcroft Barn, near Old Bishton and adjacent to Cumberland Wood. A small area of moderately steeply sloping land occurs to the south of Tidenham.

## **GEOLOGY AND SOILS**

15. The underlying geology of the site is shown on the published geology maps (IGS, 1978). This shows the geology to largely consists of geology from the Mercia Mudstone Group. A small area of Carboniferous Clifton Down limestone is shown on the edge of Tutshill. Estuarine alluvium is mapped along Sturch Pill and patches of river terrace deposits are shown in-between Tidenham and the River Severn. Cumberland Wood is shown to be underlain by Tea Green Marl, Cotham and Westbury Beds (Penarth Group) and Brownstones (Old Red Sandstones).

16. The soils that were found during the current survey indicate that most of the site is underlain by geology of the Mercia Mudstone Group. The outcrop of limestone near Tutshill was clearly identifiable but the river terrace deposits were not as extensive as had been expected.

17. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) and this shows them as being mainly from the Whimple 1 Association with the Denchworth Association being mapped in the southern part of the site near Cumberland Wood

18. The Whimple 1 soils are developed over the Mercia Mudstone geology. They are described as being reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging and are associated with similar well-drained soils, some over gravel. The Denchworth soils are also poorly drained being described as slowly permeable seasonally waterlogged clayey soils with similar fine loamy over clayey soils.

19. The soils found during the current survey were similar to those described as the Whimple 1 Association. Within the site most of these soils had restricted drainage but there are areas, especially to the north of the A 48 where they are well drained. The area mapped as Denchworth soils were not identified but an area of Denchworth was found further north.

## **AGRICULTURAL LAND CLASSIFICATION**

20. The distribution of ALC grades found by the current survey is shown on the accompanying 1:20 000 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**

21. The Grade 2 mapping units are mainly to the north of the A48 although there are two smaller units in-between the A48 and the railway near Day House and Severndale Farm. These areas have a minor workability limitation and Soil Pits 1, 3, 4 and 5 are representative of the mapping units. Most of the profiles have medium clay loam topsoils over reddish medium clay loam subsoils. The soils are deep and well drained being assessed as Wetness Class I (see Appendix II). Clay lower subsoils were found in places but these were permeable as shown by Soil Pits 1 and 4.

22. Although there was some evidence of gleying and therefore restricted drainage in Soil Pit 4 because it is a red soil the definitions of gleying were not met and the profile was assessed as Wetness Class I.

23. A few small areas of land which have moderate wetness limitations are included in these mapping units because they could not be individually mapped at this level of survey.

### **Subgrade 3a**

24. Land graded as Subgrade 3a is found to the south-east of Tidenham and has a moderate wetness limitation. The profiles typically comprise medium clay loam topsoils over medium clay loam upper subsoils and reddish clay lower subsoils. The lower subsoils are slowly permeable layers which develop within 5 cm of the upper boundary of the horizon. The depth to the slowly permeable layer meant that the profile was assessed as Wetness Class III. Additional borings within 20 metres of the soil pit showed that the depth to the clay lower subsoil and the slowly permeable layer is variable. Soil Pit 2 is characteristic of this mapping unit.

25. Within these mapping units there are profiles consisting of medium clay loam topsoils over medium clay loam subsoils with no slowly permeable clay in the top 80 cm of the profile. These profiles however are gleyed and were assessed as Wetness Classes II and III depending on the depth to gleying.

26. There are a few Grade 2 profiles with minor workability limitations which are included in these mapping units as they can not be mapped individually at his level of survey.

### **Subgrade 3b**

27. The land mapped as Subgrade 3b has a moderate wetness limitation. Typically the profiles have medium clay loam topsoils over either heavy clay loam or clay upper subsoils and clay lower subsoils. The reddish clay subsoils are derived from the Keuper Marl geology and although they do not show evidence of wetness they are poorly drained. These slowly permeable layers start higher up the profile than 60 cm and experience here and in the adjacent 1996 survey (ADAS, 1996) shows that they extend to below 100 cm so the profiles were assessed as Wetness Class IV. Soil pit 5 is representative of these mapping units.

28. The small mapping unit adjacent to Tutshill has a moderate drought limitation. The soils in this area comprise medium clay loam topsoils over medium clay loam subsoils and are differentiated from other profiles by their stone content. The profiles were well drained and were assessed as wetness Class I. The topsoils are relatively stone free , 3 % fine grained

sandstone by volume, whilst the subsoil contains 50 % fine grained sandstone by volume. This fractured rock overlies sandstone parent material at around 36 cm. Rooting was observed extending into the parent material to 50 cm. The relatively shallow nature of these soils and their high stone contents reduce the amount of easily available water with the moisture balances for wheat and potatoes placing the soils in Subgrade 3b.

29. The large areas of Subgrade 3b to the south of the A48 have a moderate wetness limitation. The soils comprise medium clay loam topsoils over red clay subsoils. The subsoils contain common and many ochreous mottles and are gleyed. On this basis and from observations of surface wetness the profiles were assessed as Wetness Class IV.

30. The small Subgrade 3b mapping units in the northern part of the site have restricted drainage and also have a moderate wetness limitation.

31. The small Subgrade 3b mapping units to the north of Lowcroft Barn, adjacent to Cumberland Wood and to the south of Tidenham have gradients between 7° and 11°. These gradients will restrict the safe and accurate use of some machinery therefore limiting the land to Subgrade 3b.

#### **Grade 4**

32. The main mapping unit in this grade, on the southern side of the railway, has a severe wetness limitation. The profiles typically have heavy clay loam topsoils over grey and pale coloured clay subsoils. Common and many ochreous mottling is present. The profiles are gleyed above 40 cm, some from the surface, and have slowly permeable subsoils and were therefore assessed as Wetness Class IV. A similar area of Grade 4 has also been mapped in the northern part of the site around a small pond to the south of Old Bishton.

33. The two smaller mapping units in the southern part of the site also have a severe wetness limitation. Standing surface water indicated restricted drainage that would severely limit the agricultural use of the land.

34. On the western edge of the site, near Powder House, the land has apparently been disturbed leaving boulders and some short steep slopes which cause a topographic limitation due to micro-relief.

35. The small Grade 4 mapping unit to the south of Tidenham has gradients between 11° and 18° that will restrict the safe and accurate use of some agricultural machinery.

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June 1998

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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 (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 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 (In preparation) Soil Survey Field Handbook, Revised Edition.

## 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, 1974).

#### 1. Terms used on computer database, in order of occurrence.

**GRID REF:** National 100 km grid square and 8 figure grid reference.

**USE:** Land Use at the time of survey

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

**ASPECT:** The aspect of the land.

**GRDNT:** Gradient as estimated or measured by hand-held optical clinometer.

**GLEYS, SPL:** Depth in centimetres to gleying or slowly permeable layer.

**AP (WHEAT AND POTS):** Crop-adjusted available water capacity.

**MB (WHEAT AND 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.

<b>M.REL:</b>	Microrelief limitation	<b>FLOOD:</b>	Flood risk	<b>EROSN:</b>	Soil erosion risk
<b>EXP:</b>	Exposure limitation	<b>FROST:</b>	Frost prone	<b>DIST:</b>	Disturbed land
<b>CHEM:</b>	Chemical limitation				

**LIMIT:** The main limitation to land quality: The following abbreviations are used.

<b>OC:</b>	Overall Climate	<b>AE:</b>	Aspect	<b>EX:</b>	Exposure
<b>FR:</b>	Frost Risk	<b>GR:</b>	Gradient	<b>MR:</b>	Microrelief
<b>FL:</b>	Flood Risk	<b>TX:</b>	Topsoil Texture	<b>DP:</b>	Soil Depth
<b>CH:</b>	Chemical	<b>WE:</b>	Wetness	<b>WK:</b>	Workability
<b>DR:</b>	Drought	<b>ER:</b>	Erosion Risk	<b>WD:</b>	Soil Wetness/Droughtiness
<b>ST:</b>	Topsoil Stoniness				

**TEXTURE:** Soil texture classes are denoted by the following abbreviations:-

<b>S:</b> Sand	<b>LS:</b> Loamy Sand	<b>SL:</b> Sandy Loam
<b>SZL:</b> Sandy Silt Loam	<b>CL:</b> Clay Loam	<b>ZCL:</b> Silty Clay Loam
<b>ZL:</b> Silt Loam	<b>SCL:</b> Sandy Clay Loam	<b>C:</b> Clay
<b>SC:</b> Sandy clay	<b>ZC:</b> Silty clay	<b>OL:</b> Organic Loam
<b>P:</b> Peat	<b>SP:</b> Sandy Peat	<b>LP:</b> Loamy Peat
<b>PL:</b> Peaty Loam	<b>PS:</b> Peaty Sand	<b>MZ:</b> 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:-

<b>F:</b> Fine (more than 66% of the sand less than 0.2mm)
<b>M:</b> Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C:</b> 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

<b>F:</b> faint - indistinct mottles, evident only on close inspection
<b>D:</b> distinct - mottles are readily seen
<b>P:</b> Prominent - mottling is conspicuous and one of the outstanding features of the horizon.

**PED. COL:** Ped face colour using Munsell notation.

**GLEYS:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, and 'S' will appear.

**STONE LITH:** Stone Lithology - One of the following is used.

<b>HR:</b> All hard rocks and stones	<b>SLST:</b> Soft oolitic or dolimitic limestone
<b>CH:</b> Chalk	<b>FSST:</b> Soft, fine grained sandstone
<b>ZR:</b> Soft, argillaceous, or silty rocks	<b>GH:</b> Gravel with non-porous (hard) stones
<b>MSST:</b> Soft, medium grained sandstone	<b>GS:</b> Gravel with porous (soft) stones
<b>SI:</b> 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

<b>Degree of development</b>	<b>WK:</b> Weakly developed	<b>MD:</b> Moderately developed
	<b>ST:</b> Strongly developed	
<b>Ped size</b>	<b>F:</b> Fine	<b>M:</b> Medium

	<b>C:</b> Coarse	<b>VC:</b> Very coarse
<b>Ped Shape</b>	<b>S:</b> Single grain	<b>M:</b> Massive
	<b>GR:</b> Granular	<b>AB:</b> Angular blocky
	<b>SAB:</b> Sub-angular blocky	<b>PR:</b> Prismatic
	<b>PL:</b> Platy	

**CONSIST:** Soil consistence is described using the following notation:

<b>L:</b> Loose	<b>VF:</b> Very Friable	<b>FR:</b> Friable	<b>FM:</b> Firm
<b>VM:</b> Very firm	<b>EM:</b> Extremely firm	<b>EH:</b> 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:

<b>EF:</b> Extremely fine <1mm	<b>M:</b> Medium 5-15mm
<b>VF:</b> Very fine 1-2mm>	<b>C:</b> Coarse >15mm
<b>F:</b> 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

<b>N:</b> None	<b>M:</b> Many	20-40%
<b>F:</b> Few <2%	<b>VM:</b> Very Many	>40%
<b>C:</b> Common 2-20%		

**STRUCTURE:** Ped Development \*

**WA:** Weakly adherent  
**W:** Weakly developed

**M:** Moderately developed  
**S:** Strongly developed

**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 <sup>2</sup> :		Very Fine and Fine	Medium and Coarse
<b>F:</b>	Few	1-10	1 or 2
<b>C:</b>	Common	10.25	2 - 5
<b>M:</b>	Many	25-200	>5
<b>A:</b>	Abundant	>200	

**ROOT SIZE**

<b>VF:</b>	Very fine	<1mm	<b>M:</b>	Medium	2 - 5mm
<b>F:</b>	Fine	1-2mm	<b>C:</b>	Coarse	>5mm

**HORIZON BOUNDARY DISTINCTNESS:**

<b>Sharp:</b>	<0.5cm	<b>Gradual:</b>	6 - 13cm
<b>Abrupt:</b>	0.5 - 2.5cm	<b>Diffuse:</b>	>13cm
<b>Clear:</b>	2.5 - 6cm		

**HORIZON BOUNDARY FORM:** Smooth, wavy, irregular or broken.\*

\* See Soil Survey Field Handbook (Hodgson, 1974) for details.

SITE NAME Tidenham		PROFILE NO. Pit 1 (Asp 35)	SLOPE AND ASPECT 2° West	LAND USE Maize	Av Rainfall: 970 mm ATO: 1506 day °C FC Days: 205 Climatic Grade: 1 Exposure Grade: 1	PARENT MATERIAL Mercia Mudstone Group
JOB NO. 51/98		DATE 11/6/98	GRID REFERENCE ST 5587 9560	DESCRIBED BY VR/PW		PSD SAMPLES TAKEN TS: MCL S38:Z40:C22

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	30	MCL	7.5YR44	2%(vis) HR	None	None	-	-	Moderate	Good	MF/M	-	Smooth Abrupt
2	46	MCL	05YR44	10% (vis) HR	None	None	MDMSAB	Friable	Good	Good	CF	-	Smooth Clear
3	80	C	05YR44	12%(vis)HR	None	Few fine	MDCSAB	Friable	Moderate	Good (tending to poor)	FF	-	-

Profile Gleyed From: No gleying

Slowly Permeable Horizon From: No spl

Wetness Class: 1

Wetness Grade: 2

Available Water Wheat: 139 mm

Potatoes: 117 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 50 mm

Potatoes: 39 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Workability

Remarks:

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE		Av Rainfall: 970 mm		PARENT MATERIAL				
Tidenham		Pit 2 (Asp 104)	3° South East	PGR/LEY		ATO: 1506 day °C		Mercia Mudstone Group				
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY		FC Days: 205		PSD SAMPLES TAKEN				
51/98		11/6/98	ST 5632 9489	VR/PW		Climatic Grade: 1		T/S: MCL: S25:Z54:C21				
						Exposure Grade: 1						

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	24	MCL	7.5YR43	2%>2cm (vis) 6%HR TOTAL	None	None	-	-	-	-	CF	-	Distinct, Smooth
2	44	MCL	10YR56	8%HR (vis)	10YR76 C	None	MDMSAB	Friable	Good	Good	CF	-	Abrupt Wavy
3	50	C	05YR44	0%	None	CF	MDCSAB (tending to PR)	Firm	Moderate	Good	FF	-	Clear Smooth
4	80	C	2.5YR34	0%	None	CM	Massive	Very Firm	Poor	Poor	-	-	-

Profile Gleyed From: 44 cm  
 Slowly Permeable Horizon From: 50 cm  
 Wetness Class: III  
 Wetness Grade: 3a

Available Water Wheat: 138 mm  
 Potatoes: 115 mm  
 Moisture Deficit Wheat: 89 mm  
 Potatoes: 78 mm  
 Moisture Balance Wheat: 49 mm  
 Potatoes: 37 mm  
 Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a  
 Main Limiting Factor(s): Wetness

Remarks: Additional borings within 20m of the pit showed variable depth of clay. This pit showed an SPL starting 5 cm into the clay. Ped faces in H3 and H4 were paler than the matrix and gleying was assessed on that basis



SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 970 mm	PARENT MATERIAL
Tidenham		Pit 3 (Asp 99)	5° North	Ley	ATO: 1506 day °C	
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 205	PSD SAMPLES TAKEN
57/98		17.6.98	ST 5464 9490	VR	Climatic Grade: 1	
					Exposure Grade: 1	None

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	30	MCL	7.5YR33	None	None	None	-	Friable	-	Good	MF	-	Smooth Abrupt
2	45	MCL	05YR44	8% HR (vis)* <sup>2</sup>	None	None	MDMSAB	Friable	Good	Good	CF	-	Smooth Clear
3	100	MCL	05YR54 (05YR53 ped faces)	None	VFFFO (rare)	Few* <sup>1</sup>	MDCSAB	Friable	Moderate	Good	FF	-	-

Profile Gleyed From: No gleying

Slowly Permeable Horizon From: No spl

Wetness Class: I\*<sup>3</sup>

Wetness Grade: 2

Available Water Wheat: 161 mm

Potatoes: 123 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 72 mm

Potatoes: 45 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Workability

Remarks: \*<sup>1</sup> Mn concretions in Horizon 3 are few overall, but local areas have common Mn concretions.  
\*<sup>2</sup> Occasional large stones.  
\*<sup>3</sup> Gley ped faces but only few Mn. If common Mn then WC II 3a.

SITE NAME Tidenham		PROFILE NO. Pit 4 (Asp 86)	SLOPE AND ASPECT 3° South	LAND USE Ley	Av Rainfall: 970 mm ATO: 1506 day °C FC Days: 205 Climatic Grade: 1 Exposure Grade: 1	PARENT MATERIAL Mercia Mudstone Group
JOB NO. 51/98		DATE 17/698	GRID REFERENCE ST 5547 9503	DESCRIBED BY VR		PSD SAMPLES TAKEN T/S MCL: S24; Z51; C25

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	26	MCL	0.5YR43	1% HR (visual)	None	None	-	-	-	-	M Fine	-	Abrupt Smooth
2	60	C	0.5YR34 0.5YR43	0%	Few fine ochreous	Few	MDCSAB	Firm	Moderate	Good	C Fine	-	Clear Smooth
3	80	C	2.5YR34 2.5YR43	5%HR (vis)	Few fine Ochreous	Few	MDMSAB	Firm	Good	Good	C Fine	-	-

Profile Gleyed From: No gleying	Available Water	Wheat: 124 mm	Final ALC Grade: 2
Slowly Permeable Horizon From: No spl		Potatoes: 121 mm	Main Limiting Factor(s): Wetness
Wetness Class: I	Moisture Deficit	Wheat: 89 mm	
Wetness Grade: 2		Potatoes: 78 mm	
	Moisture Balance	Wheat: 35 mm	
		Potatoes: 43 mm	
	Droughtiness Grade: 1	(Calculated to 120 cm)	Remarks: Above sandstone structure is platy. Subsoil gave appearance of being gleyed. Ped faces are paler than matrix however did not meet criteria for gleying. Below 80cm hard flaggy sandstone.

SITE NAME		PROFILE NO.		SLOPE AND ASPECT		LAND USE		Av Rainfall: 970 mm			PARENT MATERIAL		
Tidenham		Pit 5 (Asp 59)		1° North		Wheat		ATO: 1506 day °C			Mercia Mudstone Group		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 205			PSD SAMPLES TAKEN		
51/98		17/6/98		ST5518 9530		VR/PW		Climatic Grade: 1			None		
Exposure Grade: 1													
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	26	MCL	7.5YR43	None	None	None	-	-	-	-	MF	-	Abrupt Smooth
2	85	MCL	05YR44 (Grey 05YR42)	None	None	Few	MDMSAB becoming MDCAB at depth.	Friable	Good	Good	CF becoming few at 50 cm	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: No spl

Wetness Class: I

Wetness Grade: 2

Available Water Wheat: 195 mm

Potatoes: 139 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: 106 mm

Potatoes: 61mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 2

Main Limiting Factor(s): Workability

Remarks:

SITE NAME Tidenham		PROFILE NO. Pit 6 (Asp 107)	SLOPE AND ASPECT 3° East		LAND USE PGR		Av Rainfall: 970 mm ATO: 1506 day °C		PARENT MATERIAL Mercia Mudstone Group				
JOB NO. 51/98		DATE 18/6/98	GRID REFERENCE ST 5435 9475		DESCRIBED BY VR		FC Days: 205 Climatic Grade: 1 Exposure Grade: 1		PSD SAMPLES TAKEN None				

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	21	MCL	10YR43	3% FSST (vis)	None	None	-	-	-	-	Many Fine	-	Diffuse Smooth
2	36	MCL	10YR43	50%>2cm (s) FSST	None	None	MDMSAB	Friable	Good	Good	Common Few to 50	-	-

Profile Gleyed From: Not gleyed

Slowly Permeable Horizon From: No spl

Wetness Class: 1

Wetness Grade: 2

Available Water Wheat: 64 mm

Potatoes: 64 mm

Moisture Deficit Wheat: 89 mm

Potatoes: 78 mm

Moisture Balance Wheat: -25 mm

Potatoes: -14 mm

Droughtiness Grade: 3b (Calculated to 50 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Droughtiness

Remarks: Soil depth - cultivable to 36cm - 3a. Assumed 100% FSST to 50cm.