

TIVERTON EAST
AGRICULTURAL LAND CLASSIFICATION SURVEY

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TIVERTON EAST

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 1078 ha of land at Tiverton. Field survey was based on 408 auger borings and 19 soil profile pits, and was completed in December 1996.
2. The survey was conducted by the Resource Planning Team of ADAS Taunton Statutory Group on behalf of MAFF Land Use Planning Unit in its statutory role in the preparation of Mid Devon Local Plan.
3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant section. Apart from the published regional ALC map (MAFF 1977), which shows the site at a reconnaissance scale as mainly Grade 1 with other lower grades, the only part of the site which had been surveyed previously was the route of the North Devon Link Road which was surveyed at a scale of 1:25 000 (ADAS 1984).
4. Within the current survey area a total of 116 ha in six separate sites have been surveyed previously at detailed intensity in connection with the Tiverton Local Plan at that time (ADAS 1991). This survey shows mainly Grade 2 and both this and the current survey can be combined into a composite map with only minor modification. Although the 1984 survey for the North Devon Link Road shows a similar pattern of grades to the current survey, the two cannot be totally reconciled, partly because the current survey was conducted at lower intensity but more particularly because the 1984 survey used the previous guidelines for ALC criteria which have now been superseded, particularly in relation to the assessment of wetness and droughtiness. The current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988) and grade descriptions are summarised in Appendix I.
5. At the time of survey land cover was mainly grass and cereals for mixed dairy farming with maize for silage and a small area of potatoes. The only horticultural unit was Abbots Hood Fruit Farm at Halberton. Other non-agricultural land which was not surveyed included the golf course, industrial and residential land, roads and the canal and small areas of woodland and wetland.

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 the Table 1.

Table 1: Distribution of ALC grades: Tiverton East

Grade	Area (ha)	% Surveyed Area (707 ha)
1	252	36
2	171	24
3a	115	16
3b	140	20
4	25	3
5	4	1
Other land	214	
Total site area	921	

7. 76 % of the area was found to be best and most versatile. This was mainly Grade 1, red soils with no significant limitation although otherwise similar soils on the same deposits were found to be medium clay loam with a lower sand content in the topsoil and are therefore classified as Grade 2 with a minor limitation due to workability. Other good quality soils, mainly on the lower slopes, show a moderate limitation mainly due to wetness and are classified as Subgrade 3a.

8. Soils on the lower lying land frequently show a more serious moderate limitation due to wetness and are mapped mainly as Subgrade 3b. However, these mapping units also contain scattered borings of other grades, particularly Grade 4 with a severe wetness limitation. Where such observations occur consistently in a distinct area, this is shown as a Grade 4 mapping unit. Throughout the area there are several scattered short banks with stronger slopes which are shown as Subgrade 3b with a more serious moderate limitation due to gradient, but small areas of Grades 4 and 5 due to gradient are found only on the hills north of Halberton.

CLIMATE

9. 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.

10. 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 over most of the area there is no overall climatic limitation but in two isolated small areas, one near Chettiscombe and the other above Sellake there is an overall climatic limitation which limits the land to Grade 2.

11. 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.

Table 2: Climatic Interpolations: Tiverton East

Grid Reference	SS 971132	SS 985147	ST 007139
Altitude (m)	75	107	135
Accumulated Temperature (day °C)	1505	1467	1435
Average Annual Rainfall (mm)	1022	1043	1043
Overall Climatic Grade	1	1	2
Field Capacity Days	210	212	210
Moisture deficit (mm):			
Wheat	89	85	83
Potatoes	78	73	69

12. Although exposure and frost risk may cause a limitation in local areas around the site, they are not considered to be the primary limitation at any point.

RELIEF

13. Altitude ranges from 70 metres at Cowley Moor to 135 metres above Halberton with mainly level to moderate slopes which are not limiting. However, there are isolated short banks with strong slopes which are shown mainly as Subgrade 3b. The only moderately steep and steep slopes are found in small areas on the hills above Halberton. These are shown as Grades 4 and 5.

14. A risk of flooding is identified from local knowledge in the valley of the River Lowman from Bradford Farm to Little Gornhay. This is reported to affect perhaps one field on each side of the river, mainly in winter and flooding to a depth of several inches can be expected around six times a year, with each event lasting for a matter of hours rather than days. Although this seems to fit with the ALC restriction to Subgrade 3a, it is locally considered that such land is not suitable for cropping to cereals and in this survey it has therefore been restricted to Subgrade 3b. This affects several observations which otherwise would have been Subgrade 3a on soil characteristics.

GEOLOGY AND SOILS

15. The underlying geology of the site is shown on the published geology map (IGS, 1974) as Lower Sandstone, breccia and conglomerate with alluvium and river gravels. The river gravel deposits are shown in scattered areas on the higher ground on either side of the River Lowman valley. The current survey found little distinction between the deposits of Lower Sandstone and those of breccia and conglomerate, although if anything the Lower Sandstone tended to medium clay loam topsoil textures while the others were more gritty. The deposits shown as breccia and conglomerate were found to be mainly breccia but were not particularly stony and only in two isolated hilltop situations was a droughtiness limitation due to stone content noted, even to Grade 2 level.

16. Soils were mapped by the Soil Survey of England and Wales at a reconnaissance scale of 1:250 000 (SSEW, 1983) as mainly Bromsgrove, Crediton and Newnham associations with Hollington association developed on alluvial deposits on the valley of the River Lowman.

17. Bromsgrove association is described as well-drained reddish coarse loamy soils mainly over soft sandstone, deep in places and associated with fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Crediton association is described as well-drained gritty reddish loamy soils over breccia, locally less stony and with steep slopes in places. Newnham association is described as well-drained reddish coarse and fine loamy soils over gravel, locally deep. Hollington association is described as deep stoneless reddish fine silty and clayey soils variably affected by groundwater, found on flat land with a risk of flooding.

18. The published description and distribution was almost entirely substantiated by the current survey. The Crediton association soils were found to be consistently well-drained but the Bromsgrove association, as indicated in the description above, was found to be more variable and displayed a wider range of ALC grades based on topsoil texture and wetness characteristics.

AGRICULTURAL LAND CLASSIFICATION

19. 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 1

20. Soils shown as Grade 1 are all Wetness Class I, strong red or brown red soils found on the higher ground on Lower Sandstone and breccia deposits. Topsoil textures, many of which were confirmed by laboratory analysis, are mainly medium sandy loam with some fine sandy silt loam. The sandy loams, particularly on the gritty breccia deposits, were firm to texture by hand and appeared to take a slight polish, giving the impression of a sandy clay loam or even heavy clay loam texture but this was consistently dispelled by particle size distribution analysis. In practice, workability would be assisted by the grit and small stone content which is generally present, particularly on the breccia.

21. Two small areas were down-graded and shown as Grade 2 because of a minor droughtiness limitation due to apparent stone content, but generally the climatic conditions of this site make moderately stony profiles relatively resistant to a droughtiness limitation. This is illustrated by Pits 15 and 16 which remain droughtiness Grade 1 despite a considerable stone content which was assessed by sieving and displacement. In particular, Pit 15 was sited in a position reported to be especially gravelly and droughty although the droughtiness calculation based on measured stone content would not substantiate this.

Grade 2

22. Grade 2 soils on this site show minor limitations from a variety of causes. Two small areas on the highest ground, one near Chettiscombe and one near Sellake, have an overall climatic limitation limiting them to Grade 2, despite soil profiles otherwise similar to those described above for Grade 1. These are illustrated by Pits 6 and 17.

23. In the previous survey of sites within the current survey area (ADAS 1991), workability was found to be the main limitation due to medium clay loam topsoil textures. The current survey found this less general and mainly confined to areas around the previous survey sites. Perhaps the best illustration is provided by Pit 13 where medium clay loam topsoil is found at Wetness Class I, which is similar to the large block of Grade 2 on the north side of Craze Lowman.

24. The scattered blocks of Grade 2 in the south of the survey area lie in places found to show a slight wetness limitation, typically with fine sandy silt loam topsoil at Wetness Class II with gleying present in the lower subsoil or perhaps a slowly permeable layer evident just above 80 cm. Such profiles are illustrated by Pit 12.

Subgrade 3a

25. Extensive areas of Subgrade 3a with a moderate limitation due to wetness are found through the north and particularly in the south of the survey area. Typically these have a medium clay loam topsoil at Wetness Class II, most frequently due to gleying in the lower subsoil. Such conditions are illustrated by Pits 5 and 11.

26. Smaller areas of Subgrade 3a with a moderate limitation due to droughtiness were found developed on the patches of river gravel. This is illustrated by Pits 2 and 10 which although Wetness Class I with medium clay loam topsoils were found to have a stone content ranging from 25 to 30% in the topsoil to around 60% in the lower subsoil. Although stone contents of medium or larger stones at both these pits were only around 4 or 5%, the topsoil content of medium and large stones was assessed at Pit 3 as 11% indicating an additional limitation to Subgrade 3a due to topsoil stoniness. However, this is considered to apply only to a limited area around this pit.

Subgrade 3b

27. The extensive areas of land shown as Subgrade 3b are limited most often by wetness mainly due to the presence of a slowly permeable horizon in the subsoil which on this site gives Subgrade 3b with heavy clay loam topsoil at Wetness Class III or medium clay loam topsoil at Wetness Class IV. These are illustrated by Pits 7 and 19 respectively. However, by the nature of slowly permeable layers which vary in depth and porosity, the Subgrade 3b mapping unit contains other observations of Subgrade 3a and Grade 4. Fields adjacent to the River Lowman are also considered to be subject to a risk of flooding equivalent to Subgrade 3b as described earlier in this report.

28. Small isolated areas of short strong slopes are found scattered through the survey area and are shown mainly as Subgrade 3b.

Grade 4

29. Several areas of Grade 4 are shown where several observations indicate a severe wetness limitation, although isolated borings occur in other mapping units. These are mainly Wetness Class IV with heavy silty clay loam topsoil textures as illustrated by Pits 1 and 8 although the small areas of marshland to the west and south of Pool Anthony Farm are considerably wetter than this, at least in parts, and the wettest areas have been fenced to exclude stock as they are unfit for grazing.

30. One small area of moderately steep slopes is shown to the north of Halberton.

Grade 5

31. Another steeply sloping bowl of land north of Halberton is shown as Grade 5 due to a very severe gradient limitation.

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January 1997

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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 (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.

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

<u>Degree of development</u>	WK: Weakly developed	MD: Moderately developed
	ST: Strongly developed	
<u>Ped size</u>	F: Fine	M: Medium
	C: Coarse	VC: Very coarse
<u>Ped Shape</u>	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%		

STRUCTURE: Ped Development *

WA: Weakly adherent	M: Moderately developed
W: Weakly 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 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, 1974) for details.

SITE NAME Tiverton East		PROFILE NO. Pit 1 (Nr ASP 67)	SLOPE AND ASPECT 1° S	LAND USE PGR	Av Rainfall: 1043 mm ATO: 1467 day °C	PARENT MATERIAL Alluvium
JOB NO. 34.96		DATE 31.10.96	GRID REFERENCE SS 9891 1437	DESCRIBED BY PB	FC Days: 212 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN TS 0-25cm ZC/C (S17: Z46: C37%)

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	20	HZCL	05YR53	0	0	0	-	-	-	-	MF, VF	-	Grad smooth
2	38	C	7.5YR63	0	CDFO 7.5YR58	0	MC, MSAB	Fr	M	G	CVF	-	Clear smooth
3	59	C	10YR63	0	MDMO 10YR58	0	MCP _r	F _m	P	P(low)	FVF	-	Ab smooth
4	80+	C	10YR63	30%HR(VIS)	MDMO 10YR58	C	Too stony	F _m	(P)	(G)	FVF	-	

Profile Gleyed From: 20 cm
 Depth to Slowly Permeable Horizon: 38 - 59 cm
 Wetness Class: IV/II
 Wetness Grade: 4

Available Water Wheat: 118 mm
 Potatoes: 102 mm
 Moisture Deficit Wheat: 84 mm
 Potatoes: 71 mm
 Moisture Balance Wheat: +34 mm
 Potatoes: +31 mm
 Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 4 /3b
 Main Limiting Factor(s): We
 Remarks: H3 borderline porosity

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1043 mm	PARENT MATERIAL	
Tiverton East		Pit 2 (ASP 44)	1° S	FLW	ATO: 1467 day °C	River gravel	
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 212	PSD SAMPLES TAKEN	
34.96		01.11.96	SS9621451	PB	Climatic Grade: 1	TS 0-25 cm MCL (S41: Z38: 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	20	MCL	05YR43	4% > 2cm 21% < 2cm 25% HR (S+D)	0	0	-	-	-	-	CF, VF	-	Clear smooth
2	48	HCL	5YR44	15% > 2cm 30% > 2cm 45% HR(S+D)	0	0	MCSAB	Fr	M	G	CF, VF	-	Ab wavy
3	92+	C	5YR56	30% > 2cm 31% < 2cm 61% HR (S+D)	0	0	Too stony	-	(M)	(G)*	FVF*	-	

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: -
Wetness Class: I
Wetness Grade: 2

Available Water Wheat: 79 mm
Potatoes: 68 mm
Moisture Deficit Wheat: 84 mm
Potatoes: 71 mm
Moisture Balance Wheat: -5 mm
Potatoes: -3 mm
Droughtiness Grade: 3a (Calculated to 120cm)

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

Remarks: H3 tightly packed, roots very few.

SITE NAME Tiverton East		PROFILE NO. Pit 3 (ASP 45)	SLOPE AND ASPECT 2° S	LAND USE CER	Av Rainfall: 1043 mm ATO: 1467 day °C	PARENT MATERIAL River gravel
JOB NO. 34.96		DATE 1.11.96	GRID REFERENCE SS98761451	DESCRIBED BY PB	FC Days: 212 Climatic Grade: 1 Exposure Grade: 1	PSD SAMPLES TAKEN -

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
TS	20	MCL		11% >2cm (sieved)									

Profile Gleyed From: 20

Depth to Slowly Permeable Horizon: -

Wetness Class: III/IV

Wetness Grade: 3a/b

Available Water Wheat: mm

Potatoes: mm

Moisture Deficit Wheat: mm

Potatoes: mm

Moisture Balance Wheat: mm

Potatoes: mm

Droughtiness Grade: (Calculated to 120cm)

Final ALC Grade: 3a

Main Limiting Factor(s): St, Dr (see Pit 2)

Remarks: Average of 2 assessments. Otherwise similar to Pit 2.

SITE NAME Tiverton East		PROFILE NO. Pit 4 (ASP 59)	SLOPE AND ASPECT 3° W	LAND USE Maize	Av Rainfall: 1043 mm ATO: 1467 day °C FC Days: 212 Climatic Grade: 1 Exposure Grade: 1	PARENT MATERIAL Lower Sandstone
JOB NO. 34.96		DATE 5.11.96	GRID REFERENCE SS97781438	DESCRIBED BY PB		PSD SAMPLES TAKEN TS 0-25 cm MSL (S61: Z25 : C 14%)

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	20	MSL	5YR44	5% HR (VIS)	0	0	-	-	-	-	CM,F	-	Clear smooth
2	48	MCL	5YR44	5% HR (VIS)	0	0	WCSAB	Fr	M	G	FM,F	-	Grad smooth
3	100	MSL (LMS)	2.5YR46	0	0	0	WCAB	Fr	M	G	FF	-	Ab smooth
4	120	C	2.5YR44	0	FDMG (2.5YR64)	F	-	Fm	(M)	-	-	-	

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: -
Wetness Class: I
Wetness Grade: 1

Available Water Wheat: 149 mm
Potatoes: 108 mm
Moisture Deficit Wheat: 84 mm
Potatoes: 71 mm
Moisture Balance Wheat: +65 mm
Potatoes: +37 mm
Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 1
Main Limiting Factor(s):

Remarks: Pit dug to 100cm, augered to 120cm.

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1022 mm	PARENT MATERIAL	
Tiverton East		Pit 5 (ASP 134)	1° N	Ley	ATO: 1505 day °C	River gravel/Alluvium	
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 210	PSD SAMPLES TAKEN	
34.96		6.11.96	SS98501395	PB	Climatic Grade: 1	TS 0-25 cm MCL/HCL (S30: Z44: C26%)	
					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	25	MCL	5YR44	3% HR (Vis)	0	0	-	-	-	-	MF, VF	-	Ab smooth
2	39	HCL	5YR46	3% HR (Vis)	0	F	MCSAB	Fr	M	G	CF, VF	-	Clear wavy
3	51	C	5YR54	1% HR (Vis)	FFFG 5YR63	C	WCSAB	Fm	P	G	CF, VF	-	Ab wavy
4	56	C	5YR64, 54	50% HR (Vis)	CDFG, 0 7.5YR63, 56	M	WCSAB	Fr	M	P(G)	FVF	-	Clear wavy
5	85+	C	5YR64, 54	50% HR (Vis)	CFFG, 0 7.5YR63, 56	C	WCSAB	Fr	M	P(G)	FVF	-	

Profile Gleyed From: 51 cm
Depth to Slowly Permeable Horizon: -
Wetness Class: II
Wetness Grade: 3a

Available Water Wheat: 110 mm
Potatoes: 97 mm
Moisture Deficit Wheat: 84 mm
Potatoes: 71 mm
Moisture Balance Wheat: +26 mm
Potatoes: +26 mm
Droughtiness Grade: 2 (Calculated to 120cm)

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

Remarks:

SITE NAME Tiverton East		PROFILE NO. Pit 6 (ASP 12/3)	SLOPE AND ASPECT 4° S	LAND USE Plo	Av Rainfall: 1043 mm ATO: 1467 day °C	PARENT MATERIAL Breccia and conglomerate	
JOB NO. 34.96		DATE 7.11.96	GRID REFERENCE SS97001470	DESCRIBED BY PB	FC Days: 212 Climatic Grade: 2 Exposure Grade: 1	PSD SAMPLES TAKEN TS 0-25 cm MSL/SCL (S54: Z29: C17%)	

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	20	MSL	5YR44	1% < 2cm 16% > 2cm 17% HR (S+D)	0	0	-	-	-	-	CF	-	Clear smooth
2	55	HCL	2.5YR 34	1% > 2cm 18% < 2cm 19% HR (S+D)	0	0	MCSAB	Fr	M	G	FF	-	Diffuse smooth
3	102+	MSL/ SCL*	2.5YR 44	1% > 2cm 27% < 2cm 28% HR (S+D)	0	0	WCAB	Fr	M	G	-	-	

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: -
Wetness Class: I
Wetness Grade: 1

Available Water Wheat: 124 mm
Potatoes: 91 mm
Moisture Deficit Wheat: 84 mm
Potatoes: 71 mm
Moisture Balance Wheat: +40mm
Potatoes: +20 mm
Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 2
Main Limiting Factor(s): Climate
Remarks: H3 variable texture

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1022 mm	PARENT MATERIAL	
Tiverton East		Pit 7 (ASP 93)	1° S	CER	ATO: 1505 day °C	River gravel	
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 210	PSD SAMPLES TAKEN	
34.96		8.11.96	SS96671411	PB	Climatic Grade: 1	TS 0-25 cm HCL (S23: Z46 : C31%)	
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	29	HCL	7.5YR43,53	5% HR (vis)	0	0	-	-	-	-	CF	-	Ab smooth
2	37	C	7.5YR 63	5% HR (vis)	CDFO 7.5YR 58	0	WCSAB	Fr	M	G	CF	-	Ab smooth
3	58	C	5YR 54	30% HR (Vis)	FDFO 7.5YR 58	C	MCSAB	Fr	M	G	CF	-	Clear smooth
4	80	C	5YR 54 (5YR64)	40% HR (Vis)	CDMO 5YR 58	F	WCSAB	Fr	M	G	FF	-	Grad wavy
5	90+	C	5YR 53	50% HR (Vis)	CDMO 7.5YR 58	F	Too stony	- Fm	(P)	P	FF	- - -	-

Profile Gleyed From: 29-37 and from 58cm

Depth to Slowly Permeable Horizon: 80 cm

Wetness Class: III

Wetness Grade: 3b

Available Water Wheat: 107 mm

Potatoes: 98 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 71 mm

Moisture Balance Wheat: +23 mm

Potatoes: +27 mm

Droughtiness Grade: 2 (Calculated to 120cm)

Final ALC Grade: 3b

Main Limiting Factor(s): We

Remarks:

SITE NAME		PROFILE NO.	SLOPE AND ASPECT		LAND USE		Av Rainfall: 1022 mm		PARENT MATERIAL			
Tiverton East		Pit 8 (ASP 51/30)	1° S		PGR		ATO: 1505 day °C		Alluvium			
JOB NO.		DATE	GRID REFERENCE		DESCRIBED BY		FC Days: 210		PSD SAMPLES TAKEN			
34.96		8.11.96	SS96661444		PB		Climatic Grade: 1		TS 0-22cm HZCL/HCL (S19: Z51: C30%)			
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	22	HZCL	7.5YR 53	1% HR (Vis)	0	0	-	-	-	-	MF, VF	-	Clear smooth
2	28	C	10YR 62	0	CDFO 10YR58	F	MCSAB	Fm	M	G	MVF	-	Clear smooth
3	50+	C	10YR 63	20% HR (Vis)	ADMO 10YR 58	F	WAd CSAB	Fm	P	P	CVF	-	

Profile Gleyed From: 22 cm Depth to Slowly Permeable Horizon: 28 cm Wetness Class: IV Wetness Grade: 4	Available Water Moisture Deficit Moisture Balance Droughtiness Grade: (Calculated to cm)	Wheat: Potatoes: Wheat: Potatoes: Wheat: Potatoes:	Final ALC Grade: 4 Main Limiting Factor(s): We Remarks:
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SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1022 mm	PARENT MATERIAL	
Tiverton East		Pit 9 (ASP 192)	5° N	PGR	ATO: 1505 day °C	Lower Sandstone	
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 210	PSD SAMPLES TAKEN	
34.96		14.11.96	SS98761378	PB	Climatic Grade: 1	TS 0-25 cm FSZL/MCL (S42: Z41: C17%)	
					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	FSZL	05YR44	5% HR (Vis)	0	0	-	-	-	-	MF, VF	-	Clear smooth
2	46	MSL	2.5YR 44	8% HR (Vis)	0	0	MCSAB	Fr	M	G	MVF	-	Grad smooth
3	102+	SC/SCL	2.5YR 36	1% HR (Vis)	0	0	WVCP1	Fr	P	G	FVF	-	

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: -
Wetness Class: I
Wetness Grade: 1

Available Water Wheat: 142 mm
Potatoes: 113 mm
Moisture Deficit Wheat: 84 mm
Potatoes: 71 mm
Moisture Balance Wheat: +58 mm
Potatoes: +42 mm
Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 1
Main Limiting Factor(s):

Remarks:

SITE NAME Tiverton East		PROFILE NO. Pit 10 (ASP 358)	SLOPE AND ASPECT 2° W	LAND USE Maize	Av Rainfall: 1020 mm ATO: 1454 day °C FC Days: 207 Climatic Grade: 1 Exposure Grade: 1	PARENT MATERIAL River gravel
JOB NO. 34.96		DATE 14.11.96	GRID REFERENCE SS98201283	DESCRIBED BY PB		PSD SAMPLES TAKEN TS 0-25 cm MCL (S41: Z38: C21%)

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	23	MCL	5YR44	5% > 2cm 26% < 2cm 31% HR (S+D)	0	0	-	-	-	-	CF, VF	-	Clear smooth
2	50	C	5YR46	15% > 2cm 35% < 2cm 50% HR (S+D)	0	0	Too stony	Fr	(M)	G	CF, VF	-	Clear smooth
3	100+	C	5YR56	20% > 2cm 40% < 2cm 60% HR (S+D)	0	0	Too stony	Fm	(M)	G*	FVF	-	

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: --
Wetness Class: I
Wetness Grade: 2

Available Water Wheat: 77 mm
Potatoes: 66 mm
Moisture Deficit Wheat: 84 mm
Potatoes: 71 mm
Moisture Balance Wheat: -7 mm
Potatoes: -5 mm
Droughtiness Grade: 3a (Calculated to 120cm)

Final ALC Grade: 3a
Main Limiting Factor(s): Dr
Remarks: H3 slightly compact.

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1020 mm	PARENT MATERIAL
Tiverton East		Pit 11 (ASP 527)	5° N	Ley	ATO: 1454 day °C	Lower Sandstone
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 207	PSD SAMPLES TAKEN
34.96		15.11.96	SS98771160	PB	Climatic Grade: 1	TS 0-25 cm MCL/FSZL (S 39: Z42: C19%)
					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	5YR43/75YR54	0	0	0	-	-	-	-	MF, VF	-	Clear smooth
2	44	HCL	75YR64	2% HR (Vis)	FFF0 75YR 58	0	WCSAB	Fr	M	G	CF, VF	-	Clear smooth
3	58	SCL	7.5YR64	30% HR (Vis)	CDFO, G 7.5YR58, 74	F	WC, FSAB	Fr	M	G	CVF	-	Clear smooth
4	90+	C	5YR54 (5YR63)	20% HR (Vis)	CDFO 7.5YR58	C	WFSAB	Fr	G	P	FVF/O	-	

Profile Gleyed From: 44 cm

Depth to Slowly Permeable Horizon: -

Wetness Class: II

Wetness Grade: 3a

Available Water Wheat: 162 mm

Potatoes: 111 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 71 mm

Moisture Balance Wheat: +78 mm

Potatoes: +40 mm

Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 3a

Main Limiting Factor(s): We

Remarks:

SITE NAME		PROFILE NO.	SLOPE AND ASPECT		LAND USE		Av Rainfall: 1022 mm		PARENT MATERIAL			
Tiverton East		Pit 12 (ASP 386)	1° S		Ley		ATO: 1505 day °C		Lower Sandstone			
JOB NO.		DATE	GRID REFERENCE		DESCRIBED BY		FC Days: 210		PSD SAMPLES TAKEN			
34.96		18.11.96	SS99051271		PB		Climatic Grade: 1		TS 0-25 cm FSZL/MCL (S45: Z39: C16%)			
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	31	FSZL	7.5YR43	0	0	0	-	-	-	-	MF, VF	-	Grad smooth
2	45	SCL	10YR73/ 7.5YR42	0	FDFO 5YR58	F	WCSAB	Fr	M	G	CVF	-	Clear smooth
3	63	SCL	7.5YR64	0	CDFO 7.5YR58	C	WMAB	Fr	M	G	FVF	-	Grad smooth
4	87+	SC	2.5YR46 (7.5YR64)	0	CDMO 5YR58	0	WCP _r	Fr	M	G(Low)	FVF	-	

Profile Gleyed From: 45 cm

Depth to Slowly Permeable Horizon: -

Wetness Class: II

Wetness Grade: 2

Available Water Wheat: 166 mm

Potatoes: 126 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 71 mm

Moisture Balance Wheat: +82 mm

Potatoes: +55 mm

Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 2

Main Limiting Factor(s): We

Remarks: H2 effectively gleyed but does not meet ALC definition. H4 porosity low: borderline SPL

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1022 mm	PARENT MATERIAL
Tiverton East		Pit 13 (ASP 312)	2° S	Ley	ATO: 1505 day °C	Lower Sandstone
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 210	PSD SAMPLES TAKEN
34.96		19.11.96	SS99201313	PB	Climatic Grade: 1	TS 0-25 cm MCL/FSZL (S40: Z41: C19%)
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	20	MCL	5YR46	1%HR (Vis)	0	0	-	-	-	-	MF, VF	-	None apparent
2	40	HCL	5YR46	1%HR (Vis)	0	0	MMSAB	Fr	G	G	MF, VF	-	Clear smooth
3	100+	C	2.5YR46	5%HR (Vis)	FFM Pale 5YR64	0	WCAB	Fr	M	G	FVF	-	

Profile Gleyed From: -
Depth to Slowly Permeable Horizon: -
Wetness Class: I
Wetness Grade: 2

Available Water Wheat: 146 mm
Potatoes: 123 mm
Moisture Deficit Wheat: 84 mm
Potatoes: 71 mm
Moisture Balance Wheat: +62 mm
Potatoes: +52 mm
Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 2
Main Limiting Factor(s): Wk

Remarks:

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1020 mm	PARENT MATERIAL
Tiverton East		Pit 14 (ASP 509/523)	3° E	FCD/CER	ATO: 1454 day °C	Lower Sandstone
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 207	PSD SAMPLES TAKEN
34.96		22.11.96	SS99551180	PB	Climatic Grade: 1	TS 0-25 cm FSZL/MCL (S48: Z35: C17%)
					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	20	FSZL	2.5YR44	5% HR (Vis)	0	0	-	-	-	-	MF, VF	-	Clear smooth
2	38	HCL	2.5YR44	5% HR (Vis)	0	0	MCSAB	Fr	M	G	CF, VF	-	Clear smooth
3	80	C	2.5YR44	1%HR (Vis)	0	0	WCP _r Br to CSAB	Fr	M	G	FVF	-	Clear smooth
4	100+	SC	10R44	1%HR (Vis)	0	0	WMAB	Fr	M	P	FVF	-	

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: 80cm

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 152 mm

Potatoes: 120 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 71 mm

Moisture Balance Wheat: +68 mm

Potatoes: +49 mm

Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks:

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1020 mm	PARENT MATERIAL
Tiverton East		Pit 15 (ASP 393)	3° N	Ley	ATO: 1454 day °C	Conglomerate
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 207	PSD SAMPLES TAKEN
34.96		22.11.96	ST00041272	PB	Climatic Grade: 1	TS 0-25 cm MSL (S61: Z23: C16%)
					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	40	MSL	5YR44	1% > 2cm 17% < 2cm 18% HR (S+D)	0	0	-	-	-	-	MVF	-	Clear smooth
2	70	SCL*	5YR46	1% > 2cm 27% < 0cm 28% HR (S+D)	0	0	WMSAB	VFr	G	G	CVF	-	Grad smooth
3	105+	SCL	2.5YR44	1% > 2cm 25% < 2cm 26% HR (S+D)	0	F*	WVCPL	VFr	M	P(low)	FVF	-	

Profile Gleyed From: -

Depth to Slowly Permeable Horizon: -

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 128 mm

Potatoes: 98 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 71 mm

Moisture Balance Wheat: +40 mm

Potatoes: +27 mm

Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks: H3 Mn also in diffuse darker patches.
H2, H3 difficult to texture because of high % grit.



SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1043 mm	PARENT MATERIAL
Tiverton East		Pit 16 (ASP 174/175)	6° SW	FCD	ATO: 1467 day °C	Conglomerate
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 212	PSD SAMPLES TAKEN
34.96		26.11.96	ST00241382	PB	Climatic Grade: 1	TS 0-25cm MSL (S57: Z28: C15%)
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	28	MSL	2.5YR43	2% > 2cm 13% < 2cm 15% HR (S+D)	0	0	-	-	-	-	MF, VF	-	Clear smooth
2	50	HCL	2.5YR43	1% > 2cm 26% < 2cm 27% HR (S+D)	0	0	MC, FSAB	Fr	M	G	CVF	-	Clear smooth
3	110+	C/SC	2.5YR44	0% > 2cm 22% < 2cm 22% HR (S+D)	0	0	WCSAB	Fr	M	G	FVF	-	

Profile Gleyed From: -	Available Water	Wheat: 111 mm	Final ALC Grade: 1
Depth to Slowly Permeable Horizon: -		Potatoes: 92 mm	Main Limiting Factor(s): - - - -
Wetness Class: I	Moisture Deficit	Wheat: 84 mm	Remarks:
Wetness Grade: 1		Potatoes: 71 mm	
	Moisture Balance	Wheat: +27 mm	
		Potatoes: +21 mm	
	Droughtiness Grade: 1	(Calculated to 120cm)	

SITE NAME		PROFILE NO.		SLOPE AND ASPECT		LAND USE		Av Rainfall: 1043 mm		PARENT MATERIAL		
Tiverton East		Pit 17 (ASP 148/176)		4° N		Ley		ATO: 1435 day °C		Conglomerate		
JOB NO.		DATE		GRID REFERENCE		DESCRIBED BY		FC Days: 210		PSD SAMPLES TAKEN		
34.96		26.11.96		ST00471387		PB		Climatic Grade: 2		TS 0-25cm MSL (S63: Z21: C16%)		
Exposure Grade: -												

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	MSL	2.5YR44	15% HR (Vis)	0	0	-	-	-	-	MF, VF	-	Clear smooth
2	65	HCL	2.5YR44	25% HR (Vis)	0	0	MC FSAB	Fr	M	G	CVF	-	Grad smooth
3	100+	SC	2.5YR43	10% HR (Vis)	0	0	WCSAB	Fr	M	G	FVF	-	

Profile Gleyed From: -	Available Water	Wheat: 129 mm	Final ALC Grade: 2
Depth to Slowly Permeable Horizon: -		Potatoes: 93 mm	Main Limiting Factor(s): Climate -
Wetness Class: I	Moisture Deficit	Wheat: 84 mm	
Wetness Grade: 1		Potatoes: 71 mm	
	Moisture Balance	Wheat: +45 mm	
		Potatoes: +22 mm	
	Droughtiness Grade: 1	(Calculated to 120cm)	Remarks:

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1030 mm	PARENT MATERIAL
Tiverton East		Pit 18 (ASP 288/317)	3° N	Cereal Stubble	ATO: 1460 day °C	Conglomerate (fine)
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 210	PSD SAMPLES TAKEN
34.96		3.12.96	SS 9990 1320	PB/GMS	Climatic Grade: 1	TS 0-25 cm MSL (S55: Z29: C16%)
					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	20	MSL	2.5YR43	10% HR Total (VIS)	None	None	-	-	-	Good	CFVF	-	Clear smooth
2	50	HCL	2.5YR34	5% HR (VIS)	None	None	MCSAB	Friable	M	Good	CFVF	-	Diffuse smooth
3	66	HCL	2.5YR46	5% HR (VIS)	None	None	MCSAB	Friable	M	Good	CFVF	-	Clear smooth
4	100+	SCL	10R46	10%HR(VIS)	None	None	WCSAB	Friable	M	Good	CVF	-	

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 140 mm

Potatoes: 1106 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 71 mm

Moisture Balance Wheat: +56 mm

Potatoes: +35 mm

Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks: H4 is gritty

SITE NAME		PROFILE NO.	SLOPE AND ASPECT	LAND USE	Av Rainfall: 1022 mm	PARENT MATERIAL
Tiverton East		Pit 19 (ASP 76E)	1° S	PGR	ATO: 1505 day °C	Alluvium
JOB NO.		DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 210	PSD SAMPLES TAKEN
34.96		3.12.96	SS 9710 1417	GMS/PB	Climatic Grade: 1	TS 0-25cm MCL/HCL (S31: Z43: C26%)
					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	12	MCL	10YR42	None	None	None	-	-	-	-	MVF	-	Clear smooth
2	35	HCL	7.5YR63	None	CDMO 7.5YR46	None	WCSAB	Friable	M	Good	CVF	-	Clear smooth
3	45	C	10YR42	None	FDFO 7.5YR58	None	WCSAB	Friable	M	Good	CVF	-	Abrupt smooth
4	50	C	7.5YR72	< 1% HR (VIS)	CDMO 7.5YR56	None	WCSAB	Friable	M	Good	FVF	-	Gradual smooth
5	85+	C	5YR64 (7.5YR64)	5% HR (VIS)	CDMO 5YR58	None	WCPPr	Friable	M	Just Poor (low)	FVF	-	-

Profile Gleyed From: 12cm

Depth to Slowly Permeable Horizon: 50 cm min (see notes)

Wetness Class: IV/III

Wetness Grade: 3b

Available Water Wheat: 136 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 84 mm

Potatoes: 71 mm

Moisture Balance Wheat: +52 mm

Potatoes: +42 mm

Droughtiness Grade: 1 (Calculated to 120cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Wetness

Remarks: TS 0-25 PSD+ M/HCL
Boundary between H4 and H5 is gradual so H5 SPL does not necessarily begin at 50cm therefore borderline WCIII. SPL is also borderline so could be WC III if no SPL.
Grade probably 3b