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WHALESBOROUGH FARM, MARHAMCHURCH, BUDE
AGRICULTURAL LAND CLASSIFICATION
Report of survey

1. INTRODUCTION

Over one hundred hectares of land at Whalesborough Farm, Marhamchurch were graded under the Agricultural Land Classification (ALC) System in May 1992. The survey was carried out for MAFF as part of its statutory role in response to an ad hoc planning application made to North Cornwall District Council.

The fieldwork was carried out by ADAS's Resource Planning Team (Wessex Region) at a scale of 1:10,000 (approximately one sample point every hectare). The information is correct at the scale shown but any enlargement would be misleading. This survey supercedes the previous survey of this area at 1" being at a more detailed level and carried out under the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1989). A total of 76 borings and 5 soil pits were examined.

The ALC provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120cm of the soil profile. A description of the grades used in the ALC System can be found in the appendix.

The distribution of ALC grades identified in the survey area is detailed below and illustrated on the accompanying map.

Table 1 Distribution of ALC grades: Whalesborough Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
3A	14.8	14.6	14.7
3B	78.6	77.4	77.8
4	7.6	7.5	7.5
Non agric	0.5	0.5	100% (101 ha)
TOTAL	101.5	100%	

2. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to lower grades despite other favourable conditions.

To assess any overall climatic limitation, estimates of important climatic variables were obtained for the site by interpolation from the 5km grid Met Office/Maff Database (Met Office/MAFF/SSLRC 1989). The parameters used for assessing climate are accumulated temperature, (a measure of the relative warmth of a locality) and average annual rainfall, (a measure of overall wetness). The results shown in Table 2 reveal that there is no overall climatic limitation however there is an important climatic boundary across the survey area. At 20m the Field Capacity Days (FCD) are at 175. This value is critical in grading land according to a workability limitation. FCD is a meterological parameter which estimates the duration of the period when the soil moisture deficit is zero, that is when rainfall exceeds evapotranspiration. The FCD level and topsoil texture affect the soils workability. Thus below 20m a medium clay loam topsoil in wetness class I may qualify for grade 1 but, above 20m, and hence over 175 FCD, it can be no better than grade 2.

Across the whole survey area exposure was noted. The exposure risk was assessed by an ADAS Horticultural Advisor and the results of his assessment are included in this report. Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat (MDW) and potatoes (MDP) are also shown. This data is used in assessing the soil wetness and droughtiness limitations referred to in Section 5.

Table 2 Climatic Interpolations: Whalesborough Farm

Grid Reference	SS214035	SS213035	SS201034
Height (m)	15	25	60
Accumulated Temperature (days)	1594	1583	1543
Average Annual Rainfall (mm)	848	858	886
Overall Climatic Grade	1	1	1
Field Capacity (Days)	175	177	181
Moisture Deficit, Wheat (mm)	105	104	97
Potatoes (mm)	97	95	88

3. RELIEF

The survey area sits high on the cliffs above Widemouth Bay. The land slopes away to the south east and northeast. The highest land is in the north west at 60m and the lowest is

in the east at 15m. There are some locally limiting slopes in the east of the survey area sloping to the south.

4. GEOLOGY AND SOILS

The survey area is underlain by sandstones of the Bude formation as shown on BGS sheet no. 322 and 323.

The soils vary slightly across the survey area. The majority of the soils are medium clay loam topsoils becoming heavier with depth. There is a small area in the west of the survey area which has heavier topsoils which are heavy clay loams. Some parts of the area are stoney but the volume did not exceed 15% in soil description pits dug. Soils across much of the area show evidence of restricted drainage. The extent of this wetness problem varies across the site as described in Section 5.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades identified in the survey area is detailed in Section 1 and shown on the accompanying ALC map. The information is correct at the scale shown but any enlargement would be misleading.

Subgrade 3a

Although much of the survey area has soils which could be Grades 2 and 3a in themselves the area of 3a is limited to the north east part of the survey area. Here the risk associated with exposure is considered to be less than elsewhere on the site. This area is over the crest and so slightly protected from the west and southwesterly winds. The evidence of wind pruning on boundary vegetation is less marked here. However there is evidence of exposure from the east and northeast on this side. The extent of the exposure downgrades the land to Subgrade 3a. Two types of soil exist in this area. The small block of 3a in the north has well drained, very slightly stoney soils. The medium clay loam topsoils change to heavy clay loam subsoils from around 30cm. The soils qualify for Wetness Class I and would be grade 2 if there was no exposure limitation. The rest of the soils in the 3a area show evidence of wetness and are more stoney. The medium clay loam topsoils give way to heavy clay loams and then clays by 60cm. The upper subsoil is gleyed from 30cm and a slowly permeable layer exists from 57cm in a soil pit dug in this area. These soils fall into Wetness Class III and so are classified as subgrade 3a for the local FCD level. This wetness limitation is equal to the limitation imposed by exposure risk and so the soils are classified as subgrade 3a.

Subgrade3b

The majority of the survey area has been classified as subgrade 3b. This area on the seaward side of the crest, has been downgraded on the basis of exposure. This part of the site is very open to west and southwesterly winds. Horticultural advice suggests that only a narrow range of crops can be grown such as cereals and grass. The area is too exposed for horticultural crops and early potatoes. Boundary vegetation show evidence of severe wind pruning. There is an area of 3b on the north east side of the crest. These soils are downgraded on the basis of wetness. The wetness is more severe than that described in the 3a area. These soils also exist in parts of the more exposed area. These profiles have medium clay loam topsoils which become heavier with depth. Gleying exists before 40cm and a slowly permeable layer is present before 49cm which places the soils into Wetness Class IV. These soils can therefore be graded no higher than subgrade 3b.
Soils described under subgrade 3a also are found in the 3b area, but the exposure limitation downgrades them from grades 2 and 3a to 3b.

Grade 4

There is a small area of grade 4 land in the west of the survey area. Here the topsoils are heavier than elsewhere in the survey area. The soils also show evidence of wetness similar to that described for the wet 3b soils. However because these soils have a heavier topsoil texture they are more difficult to work and so are downgraded to grade 4.

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 an 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 moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Descriptions of other land categories used on ALC maps

Urban

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

Non-agricultural

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

Agricultural buildings

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

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

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

SOIL PIT DESCRIPTION

Site Name : **WHALESBOROUGH FARM** Pit Number : 1P

Grid Reference: SS20150310

Average Annual Rainfall : 886 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 181 days
Land Use : Ley
Slope and Aspect : 05 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 23	HCL	10YR43 00	4	4		
23- 40	C	10YR64 00	0	15	M	MCSAB
40- 65	C	10YR51 58	0	5	A	MDCPR

Wetness Grade : 4

Wetnesss Class : IV
Gleying :023 cm
SPL :040 cm

Drought Grade : 3A

APW : 087mm MBW : -17 mm
APP : 095mm MBP : 0 mm

FINAL ALC GRADE : 4
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : **WHALESBOROUGH FARM** Pit Number : 2P

Grid Reference: SS20520357

Average Annual Rainfall : 886 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 181 days
Land Use : Ley
Slope and Aspect : 03 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 32	MCL	10YR44 00	0	1		
32- 90	HCL	10YR44 00	0	1		MDCSAB

Wetness Grade : 2

Wetnesss Class : I
Gleying :000 cm
SPL : No SPL

Drought Grade : 2

APW : 125mm MBW : 21 mm
APP : 117mm MBP : 22 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Exposure

SOIL PIT DESCRIPTION

Site Name : **WHALESBOROUGH FARM** Pit Number : **3P**

Grid Reference: SS21170342

Average Annual Rainfall : 886 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 181 days
Land Use : Arable
Slope and Aspect : 04 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 31	MCL	10YR44 00	0	0		
31- 57	HCL	25 Y64 00	0	2	M	MCSAB
57- 70	C	10YR52 00	0	10	M	WCSAB

Wetness Grade : 3A

Wetnesss Class : III
Gleying :031 cm
SPL :057 cm

Drought Grade : 3A

APW : 101mm MBW : -3 mm
APP : 112mm MBP : 17 mm

FINAL ALC GRADE : 3A
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : **WHALESBOROUGH FARM** Pit Number : **4P**

Grid Reference: SS20960297

Average Annual Rainfall : 886 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 181 days
Land Use : Ley
Slope and Aspect : degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 30	MCL	10YR44 00	0	0	F	
30- 45	C	25 Y64 00	0	0	M	SDCPR
45- 70	C	10YR62 00	0	10	M	WCSAB

Wetness Grade : 3B

Wetnesss Class : IV
Gleying :030 cm
SPL :030 cm

Drought Grade : 3A

APW : 093mm MBW : -11 mm
APP : 104mm MBP : 9 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Wetness

SOIL PIT DESCRIPTION

Site Name : **WHALESBOROUGH FARM** Pit Number : **5P**

Grid Reference: SS20870324

Average Annual Rainfall : 886 mm
Accumulated Temperature : 1543 degree days
Field Capacity Level : 181 days
Land Use : Cereals
Slope and Aspect : 04 degrees N

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MCL	10YR44 00	1	1		
25- 44	MSZL	10YR53 00	0	2	C	WCSAB
44- 65	MSZL	10YR52 00	0	0	C	MCSAB
65- 85	HCL	25 Y64 00	0	0	C	MCP

Wetness Grade : 3A

Wetnesss Class : II
Gleying :025 cm
SPL : No SPL

Drought Grade : 2

APW : 127mm MBW : 23 mm
APP : 124mm MBP : 29 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Exposure