

DEVON COUNTY STRUCTURE PLAN: ADDITIONAL LAND ALLOCATIONS, PLYMOUTH

Vinery Lane West: Agricultural Land Classification

Report of Survey

1. Introduction

In August 1989, a detailed Agricultural Land Classification (ALC) survey was carried out over 114 hectares of land to the east of Plymouth between the A38 and A379. This single block of land is bounded to the east by Vinery Lane and to the west by Haye Road and is situated to the north of Elburton.

The survey was requested by Plymouth City Council and formed one of a number of alternative sites for future expansion of the City and incorporation into the Devon County Structure Plan.

The fieldwork was conducted by the Resource Planning Group at an approximate auger sampling density of one boring per hectare. A total of 88 borings and 3 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 its use for agriculture. The distribution of ALC grades is detailed below and illustrated on the accompanying ALC map at a scale of 1:10,000. The information is accurate at the scale shown, but any enlargement of the maps would be misleading.

Table 1: Distribution of ALC Grades

Grade	Area (ha)	% of Survey Area	% of Agricultural Area
3A	17.67	15.4	16.7
3B	69.40	60.6	65.6
4	18.66	16.3	17.7
Non Agric	1.63	1.4	100% (105.73ha)
Urban	2.57	2.2	
Agric Bldgs	4.6	4.1	
	114.53ha	100%	

2. Climate

Estimates of important climatic variables were obtained for three representative locations by interpolation from a 5 km grid database in order to assess any overall climatic limitation. The indicative parameters for assessing such a limitation 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 affecting the site. However, the climatically-driven parameter of Field Capacity Days is important in estimating the appropriate ALC grade for the soils in the survey area.

No local climatic factors were noted at the site.

Table 2: Climatic Interpolations

	1	2	3
Grid Reference	SX532542	SX546541	SX544549
Height (m)	30	50	76
Accumulated Temperature (°days)	1592	1568	1539
Average Annual Rainfall (mm)	1095	1162	1220
Field Capacity (days)	217	228	236
Moisture Deficit, Wheat (mm)	97	91	85
Moisture Deficit, Potatoes (mm)	85	78	71

3. Geology

Three main geological types are present in the survey area and their distribution has an important impact on the ALC grades that have been identified. The northern half of the site is underlain by Slate, giving rise to shallow soils with a soil depth limitation; the southern section possess deeper, free-draining soils over Limestone with soil workability as the active limitation; a north-east/south-west running band of heavy Alluvium delineates a topographic depression where soil wetness is important.

4. Agricultural Land Classification

Sub-grade 3A: two maps units have been identified in the south and west developed mainly over limestone but also picking out the deeper soils over slate. The description of the second soil pit is typical of these soils and illustrates profiles that exhibit no evidence of wetness (WCI) but are limited by soil workability because of the heavy topsoil textures (Heavy Clay Loam, HCL) for the prevailing FC values (176-225 band in the south of the site below 46 metres). The soils have good structural conditions in their clay subsoils and have adequate reserves of available water and soil rooting depth.

Sub-grade 3B: the majority of the survey area has been placed in this ALC grade. The major limitation is soil depth, mostly as a result of less than 30 cm of soil being found above the weathered layers of slate but some of the southern areas of 3B include those locations where the limestone occurs close to the surface and greatly reduces soil depth.

The majority of the soils developed over slate have HCL topsoils which further limit them to 3B (even for WCI) because much of the northern area where the slate occurs has a prevailing FCD value of greater than 225 days. Some of the deeper limestone soils have been placed in this grade because of the evidence of wetness (WCIII) but no clear evidence of slowly permeable layers (SPLs). Gradient is a limiting factor at several points throughout the site.

Grade 4: three map units of this type have been identified. The southern unit has been mapped as a result of very shallow soils over limestone. The two northern units mark out the soils developed over alluvium. These are heavy clay soils with clear evidence of wetness and shallow SPLs which place them into Westness Class IV.

Gradient is also an important factor in the north-west.

PLYMOUTH, Site 2, Vinery Lane West
Soil Pit Descriptions

Pit No 1

Topsoil: 0-16/22 cm
Heavy clay loam
10YR63; pale brown
No evidence of wetness except for few rusty roots
Approx 5% slate; 2 mm - 2 cm; visual estimate

+22 cm Very thinly bedded soft slate (shillet); >70% stone.
Difficult to assess the rooting depth into the almost
vertically bedded shillet.

Wetness Class I
3B on Soil Depth
3B on Workability (FCD => 225)

ALC Grade = 3B

Pit No 2

Topsoil: 0-20 cm
Heavy clay loam
10YR63/54
No evidence of wetness
Stone content negligible

Subsoil: Transition from Topsoil to Subsoil at 20/25 cm
Clay
10YR63/54
No evidence of wetness
Stone content negligible
Structure below 25 cm is Moderately Developed, Medium
Subangular Blocky; firm (ie good subsoil structure
conditions)
Porosity good (>0.5%, >0.5 mm)
Roots evident to depth

Pit dug to 52 cm; augering to 62 cm revealed similar subsoil conditions.
Impenetrable from 62 cm; Geology uncertain.
AP Wheat (stopping calculation early at 62 cm) = 117 mm = +20 mm
(= potential Grade 2)
Workability = 3A (for WCI, FCD 217 and HCL)

ALC Grade = 3A

Pit No 3

Soil Pit Description took the form of an examination of a recently excavated
drainage trench.

Topsoil: 0-20 cm
Clay
10YR72
Common distinct ochreous mottles
Approx 2% stone >2 cm; visual

Subsoil 1: 20-36 cm
Clay
2.5Y74
Very many prominent ochreous mottles
Moderately developed Coarse Angular Blocky
Good porosity (>0.5%, >0.5 mm), ie Non SPL

Subsoil 2: 36-90+ cm
Clay
2.5Y74
Very many prominent ochreous mottles
Moderately developed Coarse Angular Blocky (becoming
coarser and prismatic with depth)
Low porosity (< 0.5%, >0.5 mm), ie SPL
Approx 10% shillet > 2 cm; visual estimate

Soil Wetness: Gleyed < 40 cm; SPL from 36 cm; WCIV
Workability: WCIV; 225 FCD; Clay topsoil = Grade 4

ALC Grade = 4

(Note: This wet description straddles the important 225 FCD isoline. Technically, given an FCD value greater than 225, for the above soil profile, will produce an ALC Grade of 5. However, the whole of the depression has been assigned to Grade 4 in order to produce a meaningful map unit on the ground).

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