

PLYMOUTH LOCAL PLAN  
OBJECTOR SITES  
AGRICULTURAL LAND CLASSIFICATION  
REPORT OF SURVEY

Resource Planning Team  
Taunton Statutory Unit

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# PLYMOUTH LOCAL PLAN OBJECTOR SITES

## AGRICULTURAL LAND CLASSIFICATION

### REPORT OF SURVEY

#### 1. SUMMARY

The 6 sites, totalling an area of 101.3 hectares of land east of Plymouth, were graded using the Agricultural Land Classification (ALC) system in August 1993. The survey was carried out on behalf of MAFF as part of its statutory role in the preparation of the Plymouth Local Plan.

The fieldwork was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:10,000. The information is correct at this scale but any enlargement would be misleading. A total of 80 auger borings and 3 soil profile pits were examined.

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

Land of good quality (subgrade 3a) was found at Cot Hill, Elberton and Staddiscombe. These soils comprise well drained (Wetness Class I) clayey profiles with heavy clay loam topsoils which impose a workability limitation. Soils are very stony (more than 30% soft shale) below a depth of 40-60 cm.

Most of the agricultural land surveyed is of moderate quality (subgrade 3b). The high field capacity days and clay topsoil textures impose a moderately severe workability limitation. There are some moderately steep slopes also included in this grade. The small areas of very steep slopes have been graded 4.

**DISTRIBUTION OF ALC GRADES:**

**Plymouth Local Plan  
Objector Sites**

Site Name	Grade	Area (ha)	% of Survey Area	% of Agric Land
Boringdon Park East	3b	<u>7.15</u>	100%	100% (7.15 ha)
	TOTAL	7.15		
Boringdon Park West	3b	0.75	78.9	100% (0.75 ha)
	Non-Agric	0.2	21.1	
	TOTAL	<u>1.9</u>	<u>100%</u>	
Cot Hill	3a	1.1	57.9	57.9
	3b	<u>0.8</u>	<u>42.1</u>	<u>42.1</u>
	TOTAL	0.95	100%	100% (1.9 ha)
Hardwick Farm	3b	<u>21.45</u>	100%	100% (21.45 ha)
	TOTAL	21.45		
Elberton	3a	1.95	7.7	8.9
	3b	20.05	78.8	91.1
	Agric-Buildings	0.7	2.7	
	Non Agric	1.65	6.5	
	Urban	<u>1.1</u>	<u>4.3</u>	
	TOTAL	25.45	100%	100% (22 ha)
Staddiscombe	3a	6.3	14.1	14.8
	3b	32.4	72.5	76.0
	4	3.95	8.2	
	Agric Buildings	0.95	2.1	
	Non Agric	<u>1.4</u>	<u>3.1</u>	
	TOTAL	44.7	100%	100% (42.65 ha)

## 2. INTRODUCTION

The 6 site, totalling an area of 101.6 hectares of land, east of Plymouth were graded using the Agricultural Land Classification (ALC) system in August 1993. The survey was carried out on behalf of MAFF as part of its statutory role in the preparation of the Plymouth Local Plan.

The field work was carried out by ADAS (Resource Planning Team, Taunton Statutory Unit) at a scale of 1:10,000 (approximately one sample point every hectare of agricultural land). The information is correct at this scale but any enlargement would be misleading. A total of 80 auger borings and 3 soil profile pits were examined.

The published provisional 1" to the mile ALC map of the Plymouth Area (MAFF 1973) shows most of the sites to be grade 3 land with some grade 2 land at Elberton and grade 4 on the steep slopes at Staddiscombe. All the sites were in the Plymouth Study which was carried out at a scale of 1:50,000 in 1975. This indicated the land at Boringdon Park, Hardwick Farm, Cot Hill, the northern part of Staddiscombe and the three smaller areas of land at Elberton to be 3b and 3c. The southern half of Staddiscombe was graded 3a in the same survey. An area around Elberton Vineries was surveyed in 1984 at a scale of 1:5,000, and is shown in this survey as grade 2 and 3a. The recent survey supersedes all previous work having been carried out at a detailed level and using the revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988).

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 120 cm of the soil profile. A description of the grades used in the ALC System can be found in Appendix 2.

## 3. 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.

Climatic data for the site were interpolated from the Agricultural Climate Dataset (Meteorological Office 1989). The parameters used for assessing overall climatic 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 1 indicate that there is no overall climatic limitation.

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat (MDW) and potatoes (MDP) are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in Section 6.

Table 1 Climatic Interpolations Plymouth Objector Sites

Site Name Grid Reference	Boringdon Park SX 544 574	Cot Hill SX 526 561	Hardwick Farm SX 534 553	Elberton SX 534 535	Staddiscombe SX 509 518
Height (m)	55	25	85	35	85
Accumulated Temperature (day deg)	1562	1597	1528	1586	1531
Average Annual Rainfall (mm)	1189	1099	1224	1100	1079
Overall Climatic Grade	2	1	2	1	1
Field Capacity (Days)	234	219	237	218	212
Moisture Deficit, Wheat (mm)	88	95	81	95	91
Potatoes (mm)	77	86	68	85	80

#### 4. RELIEF AND LANDCOVER

##### **Boringdon Park**

Both sites at Boringdon Park slope south from a maximum height of 86 m AOD to lowest point at 42 m AOD. At the time of survey both areas were being used for grazing.

##### **Cot Hill**

This grassland site occupies a moderately steep north facing slope at an altitude of between 15 and 25 m AOD.

##### **Hardwick Farm**

The site occupies a south easterly facing slope which in the most easterly corner is moderately steep where land falls to 60 m AOD. The highest point is 112 m AOD. The land use at the time of surveying was grass leys with three fields of arable crops.

##### **Elberton**

The 5 sites at Elberton lie between 55 m AOD and 30 m AOD. The largest block of land at Elberton Vineries was used for market gardening in the west and grass land in the east of the site. The sites at Stag Lane, Arcadia Road and Brockwood Road were all grassland.

##### **Staddiscombe**

This site occupies the north and east sides of a convex shape hill. The highest point being 107 m AOD and the lowest 55 m AOD. There are some moderately steep slopes which have resulted in down grading. The gentler sloping fields were used for arable cropping whilst the rest were being used for grassland at the time of survey.

#### 5. GEOLOGY AND SOILS

The geology of all the sites is shown on the 1:50,000 scale sheet 349 Ivybridge Sheet. (Geological Survey of England and Wales 1974). The soil survey of England and Wales mapped the soils of the area in 1983, as a reconnaissance scale of 1:250,000. The details of each site is described below.

##### **Boringdon Park**

The solid geology of both sites at Boringdon Park is shown as Upper Devonian Slate and the soils are shown as Denbigh 1 Association which is described as well drained fine loamy and fine silty over rock. Some similar soils with slowly permeable subsoils and slight seasonal waterlogging, shallow soils and some bare rock locally. The recent survey indicates one soil type comprising clay topsoils over shallow stony clay subsoils.

## **Cot Hill**

The entire site is mapped as Upper Devonian Slate overlain by Powys Association soils which are described as shallow well drained loamy soils over rock. Many steep slopes with some gently sloping interfluves, and bare rock locally. The recent survey indicates one soil type comprising heavy clay loam topsoils over shallow stony silty clay loam subsoils.

## **Hardwick Farm**

Most of the site is underlain by Upper Devonian Slate. There are small areas of igneous rock (Schalsians Tufts) on the higher ground in both the north and southern parts of the site. The soils are mapped as entirely Denbigh 2 Association, described as well drained fine loamy soils over slate or slate rubble. Some fine loamy soils variably affected by groundwater. The recent survey indicates one soil type across the whole of the site comprising heavy clay loam topsoils over clay with moderately stony (silty rock) cleyey subsoils below 60-70 cm.

## **Elberton**

The sites at Stag Lane, Arcadia Road and Brockwood Road are all mapped as Middle Devonian slate. The southern edge of the site at Elberton Vineries is also slate, this lies adjacent to a broad band of igneous rock which passes through the centre of the site. The northern edge of this part of Elberton is mapped as Middle Devonian Limestone. The soils in the north of Elberton are mapped as Nordrack Association which are described as well drained fine silty over clayey soils, stoneless or with chart stones, often deep shallow silty soils over limestone in places, mainly on flat or gently sloping ground. Bare rock occurs in places on brows or steeper valley sites. The site at Brockwood Road is mapped as Transham Association and described as well defined fine loamy soils over deeply weathered rock locally. Some shallow soils - steep slopes in places. Bare rock occurs locally.

The land at Arcadia Road is mapped as Denbigh 1 soils (described above).

## **Staddiscombe**

The geology of the site is shown as Mid Devonian Slate above approximately 100 m AOD and Lower Devonian Staddon Grits and slates below this contour. The soils are mapped as Denbigh 1 Association.

## **6. AGRICULTURAL LAND CLASSIFICATION**

The distribution of ALC grades identified in the survey area is detailed in Table 2 and shown on the accompanying ALC maps. This shows there to be small areas of best and most versatile land at Cot Hill, Elberton and Staddiscombe.

**TABLE 2 DISTRIBUTION OF ALC GRADES: Plymouth Local  
Plan Objector Sites**

Site Name	Grade	Area (ha)	% of Survey Area	% of Agric Land
Boringdon Park East	3b	<u>7.15</u>	100%	100% (7.15 ha)
	TOTAL	7.15		
Boringdon Park West	3b	0.75	78.9	100% (0.75 ha)
	Non-Agric	0.2	21.1	
	TOTAL	<u>1.9</u>	<u>100%</u>	
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	Agric Buildings	0.95	2.1	
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	TOTAL	44.7	<u>100%</u>	<u>100%</u> (42.65 ha)



## **Boringdon Park**

### **Subgrade 3b**

All the agricultural land at Boringdon Park has been assessed as subgrade 3b. The heavy topsoil textures of HCL combined with high Field Capacity days (234 FCD) limits the workability of the land to 3b. There are also areas of moderately steep sloping land (8-9 degrees) particularly west of Boringdon Hill Road which limit the use of some types of agricultural machinery and lead to a grading of 3b.

## **Cot Hill**

### **Subgrade 3a**

Most of the agricultural land at Cot Hill has been graded 3a. This relates to well drained (Wetness Class I) soils with medium clay loam topsoil which impose a moderate workability limitation with 219 Field Capacity Days.

### **Subgrade 3b**

Land of this grade comprises slopes of greater than 8-11° which limit the safe operation of some types of farm machinery.

## **Hardwick Farm**

### **Subgrade 3b**

All the agricultural land has been assessed as moderate quality. The high FC days (237 days) and heavy clay loam topsoil textures impose a moderately severe workability limitation. The north east corner of the site also experiences a 3b slope limitation.

## **Elberton**

### **Subgrade 3a**

A small area of land south of Elberton Vineries has been graded 3a. Here soils are well drained Wetness Class I and II with a heavy clay loam topsoil and are limited by the workability of the soil.

### **Subgrade 3b**

The majority of the agricultural land has been graded 3b due to the clay topsoil textures which impose a moderately severe workability limitation.

## **Staddiscombe**

### **Subgrade 3a**

Two areas of land have been graded 3a. These soils are assessed as Wetness Class I which combined with heavy clay loam topsoils imposes a moderate workability limitation.

### Subgrade 3b

Most of the site has been assessed as land of moderate quality. The clay topsoils combined with high FC days impose a moderately severe workability limitation. In some areas of this subgrade there are areas which experience a moderate slope limitation.

### Grade 4

The land with slopes of between 11-18° has been graded 4 due to the severe limitation imposed on the safe use of farm machinery.

## APPENDIX 1

### REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1974) Solid and Drift edition. Sheet 349 Ivybridge 1:50,000 scale

MAFF (1973) Agricultural Land Classification Map Sheet 187 Provisional 1:63,360 scale

MAFF (1975) Plymouth Study - Unpublished Agricultural Land Classification 1:50,000

MAFF (1988) Agricultural Land Classification of England and Wales (revised guidelines and criteria for grading the quality of land) Alnwick

METEOROLOGICAL OFFICE (1989) Published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5 Soils of South West England 1:250,000 scale

## APPENDIX 2

### DESCRIPTION OF THE 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.

## 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 park land, 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.

Source: MAFF (1988) Agricultural Land Classification of England and Wales (Revised guidelines and criteria for grading the quality of agricultural land) Alnwick.

## APPENDIX 3

### DEFINITION OF SOIL WETNESS CLASSES

#### 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).