8FCs 4319 20/91

CARADON COASTAL RURAL AREAS LOCAL PLAN: AGRICULTURAL LAND CLASSIFICATION

REPORT OF SURVEY

1. INTRODUCTION

In June 1991 a detailed Agricultural Land Classification (ALC) was carried out around the villages of Lanreath, Widegates, Pelynt and Millbrook in South East Cornwall. The work was requested as part of MAFF's statutory input to the preparation of the Caradon Coastal Rural Areas Local Plan by Caradon District Council.

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. An envelope survey was carried out around the four villages in an attempt to ascertain if one particular edge of the urban area contained poorer quality land than the surrounding sections and to evaluate the impact of the Local Plan proposals on local land quality and the national agricultural interest. A total of 148 hectares was surveyed.

The distribution of the grades and sub-grades is shown on the attached maps at a scale of 1:10,000. The information is accurate at this scale, but any enlargement would be misleading. Sub-grade 3A is the predominant grade around the urban areas. Only Millbrook has a significant amount of poorer quality land (Sub-grade 3B and Grade 4) adjacent to the built-up area. Soil workability is the main factor limiting these areas to no better than 3A.

2. CLIMATE

The climatic criteria are considered first when classifying land. Climate may be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions.

Estimates of local climate were made for representative locations at each of the four sites by interpolation from a MAFF/Met Office 5 km grid dataset. The two parameters used in an assessment of an overall climatic limitation are accumulated temperature (a measure of the relative warmth of a locality) and average annual rainfall (a measure of overall wetness). Together, these values show that for Millbrook there is no climatic limitation; for Lanreath and Pelynt the area can be graded no better than Grade 2; for Widegates part of the site is limited to Grade 2, part is limited to Sub-grade 3A. Details of the climatic interpolations are given below for the relevant settlements.

3. Agricultural Land Classification

3.1 Lanreath

Grade	Area (ha)	% of Survey Area
3A	10.0	81.3
Urban	1.3	10.6
Non-Agric	1.0	8.1
	12.3	100%

Ten borings and one soil pit were described around the northern fringes of the village, and the whole of the agricultural area has been classified as Sub-grade 3A (10 hectares). The pit revealed a typical soil profile of medium clay loam topsoil overlying an upper subsoil of similar texture and a well drained, well structured lower subsoil of heavy clay loam. The soils are drought free and have been downgraded on the basis of poor workability. The topsoil textures in combination with the prevailing climate (241 field capacity days) restrict the number of days in the spring and autumn when the soils may be cultivated, trafficked by machinery or grazed by livestock without causing structural damage.

Climatic Interpolation, Lanreath

Grid Reference	SX180572
Altitude (m)	140
Average Annual Rainfall (mm)	1255
Accumulated Temperature (° days)	1473
Field Capacity (days)	241
Moisture Deficit, Wheat (mm)	69
Moisture Deficit, Potatoes (mm)	53
Overall Climatic Grade	2

3.2 Wideqates

Grade	Area (ha)	% of Survey Area	% of Agricultural Area
3A	19.9	67.3	81.3
3B	4.0	13.5	16.3
4	0.6	2.0	2.4
Non Agric	0.8	2.7	100% (24.5 ha)
Urban	4.3	14.5	
	29.6 ha	100%	

18 borings and 1 soil pit were examined on this site. The whole of the urban edge is surrounded by Sub-grade 3A land with similar soils to those described at Lanreath with soil workability as the most limiting factor. Land above approximately 100 m is also climatically limited to 3A.

Two areas of Sub-grade 3B and a small area of Grade 4 land have been identified where slopes are locally limiting.

Climatic Interpolations, Widegates

Grid Reference	SX290580	SX284577	SX286580
Altitude (m)	170	140	160
Average Annual Rainfall (mm)	1275	1240	1268
Accumulated Temperature (° days)	1436	1470	1447
Field Capacity (days)	245	240	244
Moisture Deficit, Wheat (mm)	63	69	65
Moisture Deficit, Potatoes (mm)	45	52	47
Overall Climatic Grade	3A	2	3A/2

3.3 Pelynt

Grade	Area (ha)	% of Survey Area	% of Agricultural Area
3A	34.3	60.5	68.5
3B	15.4	27.2	30.7
4	0.4	0.7	0.8
Non Agric	5.4	9.5	100% (50.1 ha)
Urban	1.2	2.1	
	56.7 ha	100%	

A total of 49 borings and 1 soil pit was examined in this area. The pit revealed similar soils to those mapped at Lanreath, with soil workability as the key limitation leading to Sub-grade 3A as the predominant grade. Lower subsoils of clay are present but show no evidence of profile wetness.

An area of poorer Sub-grade 3B land has been identified on the southern fringe where topsoil textures are heavier (heavy clay loams) and some of the profiles show evidence of wetness associated with local springs. This area therefore experiences a more significant workability limitation than the surrounding 3A land.

Minor areas of Sub-grade 3B and Grade 4 land have been mapped on the western edge where gradients are locally limiting.

Climatic Interpolations, Pelynt

Grid Reference	SX200550	SX206555
Altitude (m)	114	150
Average Annual Rainfall (mm)	1228	1260
Accumulated Temperature (° days)	1503	1462
Field Capacity (days)	237	242
Moisture Deficit, Wheat (mm)	74	68
Moisture Deficit, Potatoes (mm)	59	51
Overall Climatic Grade	2	2

3.4 Millbrook

Grade	Area (ha)	% of Survey Area	% of Agricultural Area
3A	17.9	36.5	40.6
3B	15.6	31.8	35.4
4	10.6	21.6	24.0
Non Agric	3.9	7.9	100% (44.1 ha)
Urban	1.1	2.2	
	49.1 ha	100%	

The area was partially surveyed in 1982 at a scale of 1:10,000 using MAFF's Original ALC system. The current survey involved 22 auger borings and 1 soil pit which confirmed the earlier grades.

Sub-grade 3A

The soils mapped as Sub-grade 3A experience a workability limitation. There is no evidence of wetness so the soils qualify for Wetness Class I. The soils have heavy clay loam topsoils which, combined with the prevailing FCD of 217, limit the soils to Sub-grade 3A. The FCD level means that access onto the soil for cultivations and grazing without causing structural damage to the soil is limited to a short period in the driest part of the year.

Sub-grade 3B

The areas of Sub-grade 3B to the west of St Johns Road pose limitations to the type of machinery that can be used because of the adverse gradients and so are downgraded to Sub-grade 3B.

The Sub-grade 3B area to the east of St Johns Road experiences a slight wetness limitation. There is evidence of gleying from the surface caused by inadequate drainage throughout the year; there are no slowly permeable layers causing serious impediment to drainage. The soils fall into Wetness Class III and, with heavy clay loam topsoils, are classified as Sub-grade 3B.

Grade 4

Some of the land west of St Johns Road has steeper gradients and is more restrictive on safe machinery use. These are downgraded to Grade 4.

Climatic Interpolations, Millbrook

Grid Reference	SX425527	SX421524
Altitude (m)	10	80
Average Annual Rainfall (mm)	1040	1121
Accumulated Temperature (° days)	1617	1538
Field Capacity (days)	205	217
Moisture Deficit, Wheat (mm)	97	85
Moisture Deficit, Potatoes (mm)	89	72
Overall Climatic Grade	1	1

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: golf courses, 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.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 1255	PARENT MATERIAL
Lanreath, Cornwall	1			ATO :- 1473	
CCRALP	DATE	GRID REFERENCE	Temp Grass	FC Days :- 241	Slate
	July 1991	SX 179573		Climatic grade:- 2	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
Topsoil	0-29	10YR44	MCL	1% ZR	-								
Sub 1	29-55	10YR44	MCL	2% ZR	-	Moderate CSAB	+0.5%	Moderate	Friable				
Sub 2	55-80+	10YR64	HCL	5% ZR	-	Moderate MSAB	+0.5%	Good	Friable				

Depth to Slowly Permeable Horizon :- No SPL
Not gleyed

Wetness Class :- I

Wetness Grade :- 3A

RPG23/WJC

Available Water Wheat :-
Potatoes :-

Moisture Deficit Wheat :-
Potatoes :-

Moisture Balance Wheat :- +55 mm (to 80 cm)
Potatoes :- +70 mm

Droughtiness Grade :- 1

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Workability

Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Widegates, Cornwall	1	4° SW		Av Rainfall :- 1240	
CCRALP	DATE	GRID REFERENCE	Permanent Grass	ATO :- 1470	Slate
	July 1991			FC Days :- 240	
				Climatic grade:- 2	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
Topsoil	0-30	10YR43	MCL	5% HR (<2 cm)									
Sub 1	30-46	10YR56	HCL	10% ZR	-	Weak MSAB	+0.5%	Moderate	Friable				
Sub 2	46-80+	10YR66	HCL	10% ZR	-			Moderate					

Depth to Slowly Permeable Horizon :- No SPL
Not gleyed

Wetness Class :- I

Wetness Grade :- 3A

RPG23/WJC

Available Water Wheat :-
Potatoes :-

Moisture Deficit Wheat :-
Potatoes :-

Moisture Balance Wheat :- +41 mm (to 80 cm)
Potatoes :- +60 mm

Droughtiness Grade :- 1

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Workability

Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Pelynt, Cornwall CCRALP	1	4° SW	Barley	Av Rainfall :- ATO :- FC Days :- Climatic grade:-	
	DATE July 1991	GRID REFERENCE			

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
Topsoil	0-28	10YR44	MCL	2% ZR									
Sub 1	28-60	10YR44	HCL	40% ZR Visual, sieve				Moderate					
Sub 2	60-70	10YR43	C	60% ZR Visual, sieve				Moderate					

Depth to Slowly Permeable Horizon :- No SPL
Not gleyed

Wetness Class :- I

Wetness Grade :- 3A

RPG23/WJC

Available Water Wheat :-
Potatoes :-

Moisture Deficit Wheat :-
Potatoes :-

Moisture Balance Wheat :- +24 mm (to 70 cm)
Potatoes :- +51 mm

Droughtiness Grade :- Not limiting

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Workability

Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Millbrook, Cornwall	1	2° SW		Av Rainfall :- 1040	
CCRALP	DATE	GRID REFERENCE	Temporary Grass	ATO :- 1617	Slate
	July 1991			FC Days :- 205	
				Climatic grade:- 1	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
Topsoil	0-28	10YR43	HCL	2% >2 cm 2% 2 m-2 cm ZR									
Sub 1	28-58	7.5YR44	C	20% ZR		Weak MSAB	+0.5%	Good	Friable				
Sub 2	58-70	10YR43	C	50% ZR			+0.5%	Moderate					

Depth to Slowly Permeable Horizon :- No SPL
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Potatoes :-

Moisture Deficit Wheat :-
Potatoes :-

Moisture Balance Wheat :-
Potatoes :-

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Remarks :-

RPG23/WJC

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lanreath, Cornwall CCRALP	1 DATE July 1991	GRID REFERENCE SX 179573	Temp Grass	Av Rainfall :- 1255 ATO :- 1473 FC Days :- 241 Climatic grade:- 2	Slate

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
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RPG23/WJC

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Potatoes :-

Moisture Deficit Wheat :-
Potatoes :-

Moisture Balance Wheat :- +55 mm (to 80 cm)
Potatoes :- +70 mm

Droughtiness Grade :- 1

Final ALC Grade :- 3A

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Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 1240	PARENT MATERIAL
	1	4° SW		ATO :- 1470	
Widegates, Cornwall				FC Days :- 240	Slate
CCRALP	DATE	GRID REFERENCE	Permanent Grass	Climatic grade:- 2	
	July 1991				

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
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Sub 1	30-46	10YR56	HCL	10% ZR	-	Weak MSAB	+0.5%	Moderate	Friable				
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Available Water Wheat :-
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Moisture Balance Wheat :- +41 mm (to 80 cm)
Potatoes :- +60 mm

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Final ALC Grade :- 3A

Main Limiting Factor(s) :- Workability

Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Pelynt, Cornwall CCRALP	1 DATE July 1991	4° SW GRID REFERENCE	Barley	Av Rainfall :- ATO :- FC Days :- Climatic grade:-	

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
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Sub 1	28-60	10YR44	HCL	40% ZR Visual, sieve				Moderate					
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Wetness Class :- I

Wetness Grade :- 3A

RPG23/WJC

Available Water Wheat :-
Potatoes :-

Moisture Deficit Wheat :-
Potatoes :-

Moisture Balance Wheat :- +24 mm (to 70 cm)
Potatoes :- +51 mm

Droughtiness Grade :- Not limiting

Final ALC Grade :- 3A

Main Limiting Factor(s) :- Workability

Remarks :-

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Millbrook, Cornwall CCRALP	1 DATE July 1991	2° SW GRID REFERENCE	Temporary Grass	Av Rainfall :- 1040 ATO :- 1617 FC Days :- 205 Climatic grade:- 1	Slate

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
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Sub 1	28-58	7.5YR44	C	20% ZR		Weak MSAB	+0.5%	Good	Friable				
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Wetness Class :- I

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RPG23/WJC

Available Water Wheat :-
Potatoes :-

Moisture Deficit Wheat :-
Potatoes :-

Moisture Balance Wheat :-
Potatoes :-

Droughtiness Grade :- Not limiting

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Remarks :-