NEW COWPER FARM
ASPATRIA

Agricultural Land Classification &
Statement of Site Physical Characteristics
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AGRICULTURAL LAND CLASSIFICATION & STATEMENT OF SITE PHYSICAL CHARACTERISTICS NEW COWPER FARM, ASPATRIA

INTRODUCTION

1. This report presents the findings of a detailed mineral site survey on 16.4 hectares of land. The results of this survey supersede any previous ALC information for this land. The land is located to the north west of New Cowper which is situated 3 miles to the north of Aspatria. The survey was in connection with a consultation from Cumbria County Council relating to sand extraction proposals for this site.

2. The survey was undertaken on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF) in October 1998 by the Resource Planning Team of the Farming and Rural Conservation Agency (FRCA)- Northern region of FRCA.

3. The land has been graded in accordance with the publication "Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land" (MAFF 1988) .

4. At the time of survey the agricultural land on this site was under grass, with scattered scrub on the slopes in the south and west of the site.

SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10000 with an average auger boring density of 1 per hectare. The ALC map is only accurate at this base map scale and any enlargement would be misleading.

6. The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1.

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% surveyed area	% site area
1	-	-	-
2	-	-	-
3a	8.7	53	53
3b	2.0	12	12
4	1.7	11	10
5	3.9	24	24
Agricultural land not surveyed	-	N/A	-
Other land	0.1	N/A	1
Total surveyed area	16.3	100	-
Total site area	16.4	-	100

7. The agricultural land on this site has been classified as Subgrade 3a (good quality), Subgrade 3b (moderate quality), Grade 4 (poor quality) and Grade 5 (very poor quality). The key limitations to the agricultural use of this land include gradient, soil wetness and soil droughtiness.

8. The area of good quality land is located on the higher land in the east of the site. The soils have either a sandy loam or loamy sand topsoil overlying loamy sand and sand subsoils to depth.

9. The area of moderate quality land is mapped in the northern part of the site. The soils are similar to those described in paragraph 8, but are found on strongly sloping land.

10. The area of poor quality land is mapped in the north of the site. The soils have either an organic sandy silt loam topsoil over peaty material or a sandy loam topsoil over loamy sand and sand. The sandy soils are found on moderately steeply sloping land.

11. The area of very poor quality land is mapped in the south and west of the site. The soils have a peaty topsoil texture over waterlogged peaty material with occasional lenses of sand. Some of the land within this grade is also found on the adjacent steeply sloping land.

FACTORS INFLUENCING ALC GRADE

Climate

12. Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics.

13. The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using standard interpolation procedures (Meteorological Office, 1989).

Table 2: Climatic and altitude data

Factor	Units	Values	
Grid reference	N/A	NY 119 455	NY 118 454
Altitude	m, AOD	30	20
Accumulated Temperature	day°C (Jan-June)	1362	1373
Average Annual Rainfall	mm	951	944
Field Capacity Days	days	228	227
Moisture Deficit, Wheat	mm	70	71
Moisture Deficit, Potatoes	mm	53	55
Overall climatic grade	N/A	Grade 2	Grade 2

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

15. The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR), as a measure of overall wetness, and accumulated temperature (ATO, January to June), as a measure of the relative warmth of a locality.

16. The combination of rainfall and temperature at this site means that there is an overall climatic limitation of Grade 2.

Site

17. The site lies at an altitude of 15 to 33 metres AOD. The land sharply rises from the low lying area in the south west of the site adjacent to Chapel Moss towards the north east where the site adjoins the existing mineral workings.

18. The three site factors of gradient, microrelief and flooding are considered when classifying the land.

19. The higher and lower areas of the site are separated by a south west facing scarp slope which has gradients of between 7° and 25°. These gradients limit the agricultural quality of the land to Subgrade 3b, Grade 4 and Grade 5.

20. These factors do not impose any limitations on the agricultural use of this land.

Geology and Soils

21. The solid geology of the area is comprised of St Bees Sandstone. This is overlain with deposits of peat on the lower lying land and glacial sands and gravel associated with a delta terrace on the higher ground - British Geological Survey (1975 & 1977).

22. The soils the have developed on this geology are either of a peaty texture or a sandy loam texture over loamy sand and sand.

Agricultural Land Classification

23. The details of the classification of the site are shown on the enclosed ALC map and the area statistics of each grade are given in Table 1, page 1.

Grade 3a

24. Land of good quality occupies 8.7 hectares (53%) of the site area and is found as a single unit on the higher plateau area to the north and east of the site.

25. The soil has either a sandy loam or a loamy sand texture over loamy sand and sand to depth with common to many stones within the profile. The moisture balance places these soils in Subgrade 3a. There are isolated auger borings of Grade 2 quality within this unit which cannot be shown separately at this scale of mapping.

26. The main limitation to the agricultural use of this land is soil droughtiness.

Subgrade 3b

27. Land of moderate quality occupies 2.0 hectares (12%) of the site area and is found as a single unit in the northern part of the site.

28. The soil is similar in textures and stone content to that described in paragraph 25, with occasional lenses of peaty and clay loam material. However, these soils are found on strongly sloping land of between 7° and 11° which limits the agricultural quality of the land to Subgrade 3b.

29. The main limitation to the agricultural use of this land is gradient.

Grade 4

30. Land of poor quality occupies 1.7 hectares (10%) of the site area and extends across the north of the site.

31. In the southern two thirds of this unit the soil has an organic sandy silt loam topsoil texture overlying waterlogged subsoils of sandy loam, organic clay loam and peaty textures. In this climatic zone (>225 Field Capacity Days) gleyed organic mineral topsoils over waterlogged subsoils are placed in Wetness Class V.

32. The northern third of this unit is similar in texture and stone content to that described in paragraph 25. However, these soils are found on moderately steeply sloping land of between 12° and 15° which limits the agricultural quality of the land to Grade 4.

33. The main limitations to the agricultural use of this land are soil wetness and gradient.

Grade 5

34. Land of very poor quality occupies 3.9 hectares (24%) of the site area and is found in the south and west of the site.

35. The land which adjoins Chapel Moss has a peaty topsoil texture over waterlogged peaty material with occasional lenses of sand. In this climatic zone (>225 Field Capacity Days) such soils are placed in Wetness Class V.

36. On the steeply sloping land (18°-25°) of the scarp which separates the low lying area from the upper plateau, gradient limits the agricultural quality of the land to Grade 5. In the south east corner of this unit these soils are found on slopes of between 11° and 15° (Grade 4) which cannot be shown separately at this scale of mapping.

37. The main limitations to the agricultural use of this land are soil wetness and gradient.

Other Land

38. Other land occupies 0.1 hectares (1%) of the site area and includes a barn and associated hard standing.

SOIL UNITS

39. From the auger boring and pit information obtained by the detailed mineral survey two soil units can be identified. The location and extent of the soil units are shown on the accompanying soil resource map. The soil units are not necessarily intended to be used for soil stripping but are illustrative of the soil resources available for restoration. The depths and volumes quoted should be treated with caution due to the natural variability of the soils on this site.

Soil Unit 1

40. Soil Unit 1 occupies 13.9 hectares (85%) of the site area.

41. The soil has either a sandy loam or a loamy sand topsoil texture to a depth of between 25 and 35cm, overlying loamy sand and sand to between 48 and 70cm, onto medium and coarse sand to depths greater than 120cm. The topsoils are slightly stony, with subsoils being slightly to moderately stony.

42. Table 3 describes a typical profile for Soil Unit 1.

Table 3: Soil Unit 1 - Profile description of Soil Unit 1

Horizon	Depth (cms)	Description
Topsoil	0-28	Medium sandy loam, dark brown (10YR 3/3), slightly stony, moderately developed medium to coarse subangular blocky structure, friable consistence, many roots.
Upper Subsoil	28-48	Medium sand, reddish brown (5YR 4/4), slightly stony, moderately developed medium angular blocky structure, very friable consistence, porous, common roots.
Lower Subsoil	48-120	Coarse sand, reddish brown to yellowish red (5YR 4/4 & 4/6), moderately stony, weakly developed medium angular blocky structure, firm consistence, porous, common roots.

Soil Unit 2

43. Soil Unit 2 occupies 2.5 hectares (15%) of the site area.

44. The soil has either an organic sandy silt loam or a peaty topsoil texture to a depth of between 20 and 40cm, overlying peaty material to depths greater than 120cm. Occasional lenses of sand occur within the soil profile. These soils are very slightly stony.

45. Table 4 describes a typical profile for Soil Unit 2.

Table 4: Profile description for Soil Unit 2

Horizon	Depth (cms)	Description
Topsoil	0-25	Peaty loam, black (75YR 25/1), very slightly stony, friable consistence, many roots.
Subsoil	25-120	Semi fibrous peat, dark reddish brown (5YR 25/2), waterlogged.

Available Soil Resources

46. Table 5 summarises the available soil resources. As stated above, the depths and volumes quoted should be treated with caution due to the natural variability of the soils on this site.

Table 5: Available Soil Resources

Soil Unit	Horizon	Texture[1]	Depth (cms)	Area (ha)	Volume (m^3)	Notes
1	Topsoil	MSL	0-28	13.9	38 920	Some LMS topsoils
1	Upper Subsoil	MS	28-48	13.9	27 800	Some LMS, LCS
1	Lower Subsoil	CS	48-120	13.9	100 080	
2	Topsoil	PL	0-25	2.5	6 250	Some OMSZL
2	Subsoil	P	25-120	2.5	23 750	Waterlogged

[1]All horizons are variable in the size of the sand fraction.

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SOURCES OF REFERENCE

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