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## ASSESSMENT OF LAND QUALITY ON CHAT MOSS

### INTRODUCTION

Chat Moss is an area of lowland peat to the west of Manchester, comprised of: Worsley, Barton, Little Wolden, Astley, Cadishead and Bedford mosses. It has been reclaimed since the 17th century by improving drainage, adding night soil and marling, and the majority of the land is currently in agricultural use.

The Association of Greater Manchester Authorities is preparing a "mossland strategy", in part to deal with the issue of peat extraction on Chat Moss. They require detailed land quality information under the Revised ALC guidelines in order to help determine, firstly, whether the land should be subject to peat extraction and restored to nature conservation or as agricultural after use, or secondly, whether extraction should be resisted.

The RPG surveyed the total consultation area of 2,880 hectares, at a survey and final map scale of 1:25,000. 2,103 hectares (73% of Chat Moss) is currently in agricultural use. The majority of this land is underlain by reclaimed peat soils including Turbury Moor, Ridley, Altcar and Westhay series. These soils were classified as grades 1 and 2 in the 'provisional' survey, and are mainly under intensive arable and horticultural use, and are capable of producing a very wide range of crops. The remainder of the agricultural land is underlain by mineral soils, mainly in the north of Chat Moss and along the periphery of the consultation area. These soils were classified as grades 2 and 3 in the provisional survey, and are mainly under grass and cereals. The 'non-agricultural' areas of Chat Moss were shown as grade 5 in the 'provisional' survey, a category no longer thought suitable as the land has reverted to scrub with no evidence of grazing. (A breakdown of the figures for individual grades is shown in Appendix 1).

## BACKGROUND TO THE REVISED ALC OF CHAT MOSS

Much of the problem associated with grading Chat Moss is associated with the lack of quantitative evidence. The report to accompany Sheet 101, Manchester (yellow booklet) was brief in its description, and failed to provide a clear justification for grading the land as grade 1. Similarly, the few previous detailed surveys had reached quantitative decisions only on the mineral soils.

Preliminary discussions took place with the local field engineers. They suggested that Chat Moss was predominantly wetness class III (no higher than grade 2), but were unable to provide quantitative evidence to support these claims. Due to considerable variation in drain spacing and adequate outfall availability it was felt the use of dipwell observations should provide a more objective view of water levels.

A series of 32 dipwells, were placed in groups of four at strategically chosen locations in order to provide a representative view of the levels of ground water within different peat types. The dipwells were installed in December and read on a twice weekly basis from 3.1.89 until 17.4.89, from then on readings were taken once a week until 30.6.89. (A summary of the results is shown in Appendix 2).

## REVISED ALC SURVEY

Climate and site factors were non-limiting, and resources were focused on soil and interactive wetness limitations.

To determine the soil wetness the 'Revised Guidelines' (blue booklet) were used. Chat Moss falls within the FCD range 201-225. Using table 12 (page 40) 'other peat soils' fall into wetness class II-IV, correspondingly ranging from grade 1 to sub-grade 3a.

It was hoped that the use of dipwells to assess the duration of waterlogging would provide a partial solution to the question of

grading. The results of the 6 month dipwell study were as follows:-

- 4 dipwells = WC I (grade 1)
- 12 " = WC II (grade 1)
- 16 " = WC III (grade 2)

(NB. some of these results were extrapolated, due to the loss/removal of dipwells.)

There was no clear correlation between wetness class and type of peat, and the results must be regarded as inconclusive. The reasons are as follows:-

1. 60% of the dipwells were lost or destroyed during the 6 month period.
2. The dipwells were not representative of the full range of peat soils (they were installed when only 20% of the ALC survey had been carried out).
3. They were not fully representative of the wide range of cereal and horticultural crops grown on Chat Moss.
4. The results exclude the July - December period.

Thus, other factors need to be considered to help determine grade.

Land Use - Land Use was noted during survey work and the relationship with soil/or wetness limitations examined. A variation was found to exist between the west, where the land was under intensive arable and horticultural use, and the east, where a narrower range of crops (principally grass and cereals) were grown, on similar peat soils.

Local advisory officers indicated that much of the land in the east had been under horticultural crops but as these had become uneconomic to grow because of the size of holding, the tenancies

had been sold to the larger cereal growers. Thus, farm structure and economic factors were found to be responsible for the choice of land use.

Local advisory officers also indicated that the peat soils were unsuited for winter barley crops due to the presence of an acid layer within the peat which restricts root growth and hence moisture availability. However, drumminess is less of a problem in the peat soils of Chat Moss with their higher water retention capability than in similar soils in the Fens, which are also graded as 1.

Drain spacing - it was hoped this would reveal a correlation between drain spacing and the duration of waterlogging, but the results were inconclusive for the dipwell sites and elsewhere on Chat Moss there was an incomplete record of drainage (the spacing could not be identified from air photos). Furthermore, the hydraulic conductivity deteriorates 20 to 30 years after reclamation and subsequent drains have to be placed closer together. Thus, the age of the drains also needs to be known, besides their spacing and depth, which would require further survey work.

Workability - during survey work there was evidence of 'problems in removing winter-harvested vegetables', with tractors being bogged. Local evidence suggests that these problems were extremely localised and due to poor management in terms of timing of cultivation and incorrect choice of machinery.

Yields - local advisory officers provided general information which confirmed the high yields of horticultural crops, but suggested cereal yields were relatively lower as a result of frost heave, and a preference to growing spring cereals. Drumminess, whilst affecting barley, has less effect on potatoes and other vegetables, which have a shallower rooting depth.

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## CONCLUSION

The peat soils of Chat Moss are shown as Grade 1 on the 'provisional' map. They are capable of growing a very wide range of horticultural and cereal crops, with high yields for horticultural crops.

There is some anecdotal evidence, and some inconclusive dipwell data which suggest that limited areas should be downgraded, assuming wetness class III peat soils are Grade 2. However, there is no hard evidence of the inability of the land to produce flexibly or consistently.

In the absence of any hard evidence to the contrary, these soils should be shown as grade 1. This accounts for 1,252 hectares (60%) of the agricultural area of Chat Moss.

This raises the question of the need for further dipwell work to relate wetness class to ALC grade on peat soils. If the peat soils are predominantly WC III and the productive capacity is Grade 1, then some revision of the Blue Book guidelines may be necessary. Alternatively, if peat soils on Chat Moss are predominantly WC I and WC II, then this would reinforce the guidelines.

Appendix 1

Grade	Provisional Survey (hectares)	%	Revised Survey (hectares)	%	in $\Delta$ hectares	$\Delta$ in %
1	1,640	57	1,682	58	+ 42	+ 1
2	130	5	48	2	- 82	- 3
3a	} 300	10	214	12	+ 55	+ 2
3b			141			
4	-	-	18	1	+ 18	+ 1
5	550	19	-	0	- 550	- 19
Urban	30	1	77	3	+ 47	+ 2
Non-agricultural	230	8	700	24	+ 470	+16
	<u>2,880</u>	<u>100</u>	<u>2,880</u>	<u>100</u>	<u>0</u>	<u>0</u>

Appendix 2

Dipwell No	Soil Description	Wetness Class	Last reading
1	Deep peat -dry	III	1/5
2	Deep peat -dry	III	1/5
2	Peat over sand at 90cm. Moist by 80cm	III	1/5
4	Deep peat, moist throughout	III	1/5
5	Peat over Sandy Silt Loam at 90cm	III	1/5
6	Peat over Sandy Silt loam at 80cm - dry	III	30/6
7	Peat over Sandy Silt Loam at 90cm. Wet 80cm+	III	30/6
8	Peat over Sandy Loam at 60cm. Wet at 55cm	III	30/6
9	Deep peat wet by 90cm	II	30/6
10	Deep moss peat, moist by 70cm	II	30/6
11	Deep peat moist/wet by 80cm	II	30/6
12	Deep semi fibrous peat wet by 70cm	II	22/3
13	Deep peat-dry	I	1/5
14	Deep peat-dry	I	8/5
15	Deep peat moist by 60cm	I	1/5
16	Deep peat moist by 60cm	I	8/2
17	Deep peat moist throughout	II	1/5
18	Deep peat moist throughout	II	1/5
19	Deep peat moist throughout	II	1/5
20	Deep peat moist throughout	II	1/5
21	Deep peat moist by 60cm	II	1/5
22	Deep peat moist by 60cm	II	1/5
23	Deep peat moist by 60cm	II	1/5
24	*Deep peat moist by 60cm	II	1/5
25	*Deep humified peat, wet by 60cm	III	30/6
26	Deep humified peat wet by 80cm	III	30/6
27	Deep humified peat wet by 80cm	III	30/6
28	Deep humified peat wet by 80cm	III	30/6
29	30cm of Clay loam over semi fibrous peat wet 50cm +	III	30/6
30	30cm Clay loam over semi fibrous peat wet 50cm +	III	8/5
31	30cm of Clay loam over semi fibrous peat wet 50cm+	III	8/5
32	30cm of Clay loam over semi fibrous peat wet 50cm+	III	8/5

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