

HUNTSMAN'S QUARRY, NAUNTON, GLOUCESTER
 AGRICULTURAL LAND CLASSIFICATION AND SITE PHYSICAL CHARACTERISTICS

REPORT OF SURVEY

1. Introduction

This report describes the survey of agricultural land carried out in response to a proposal by Huntsman's Quarries Ltd to extend the operations of Huntsman's Quarry on land at Chalk Hill, Naunton, Gloucester.

The site was surveyed on 6 October 1989 by members of the Resource Planning Group (South West Region) in order to fulfill MAFF's statutory role under the Town and Country Planning (Minerals) Act, 1982, by providing a statement of the land quality and the site physical characteristics.

2. Agricultural Land Classification (ALC)

A detailed ALC survey was carried out on the 19.5 hectare site to assess the degree to which the physical characteristics of the land impose long-term limitations on its use for agriculture.

The soil was examined at 20 sites by hand auger, and a soil pit was dug and described. Topsoil was assessed by sieving at the soil pit and at one other site. The distributions of the ALC grades is shown on the ALC Map, Map 1, and their relative proportions are shown below in table 1.

Details of the auger borings are given in appendix 1, and the soil pit description is given in appendix 2. Auger boring sites and the location of the soil pit (site 15) are shown on map 2.

Table 1: Areas of Grades

Grades	Area (ha)	% of Survey Area
3a	18.6	94
3b	0.8	4
Non Agricultural	<u>0.3</u>	<u>2</u>
TOTAL	19.7	100

The site has uniform soil characteristics with the exception of a very stony patch in the North Western corner.

Climate The average annual rainfall for the site is 794 mm, and the accumulated temperature (0°) is 1263 $^{\circ}$ days. These lead to an overall climatic site limitation of grade 2.

Topography and Gradient The area is gently sloping, with gradients not exceeding 2° . Gradient is not a limiting factor.

Soil Depth Auger borings ranged from between 22 cm and 30 cm deep before the auger was stopped by stones. The soil pit revealed a very

stony layer extending to 45 cm, which was not limiting to root development. Sub-grade 3a is therefore appropriate.

Stoniness Stone content (stones > 2 cm) in the top 25 cm was measured at two sites by sieving. A stone content of 10% was measured, leading to a grade of 2. A small area (0.5 ha) in the NW corner had over 15% stones, leading to a grade of 3b.

Wetness The absence of both gley characteristics and any slowly permeable layers leads to a wetness class of 1. This, with a topsoil texture of heavy silty clay loam in combination with the climate factor of 180 field capacity days leads to a grade of 3a.

Droughtiness Moisture balance calculations lead to a grade of 3a.

The site is therefore graded as sub-grade 3a, with soil depth, wetness and droughtiness being the most limiting factors. The small area to the NW is sub-grade 3b with stoniness the most limiting factor.

3. Soil Pit Information

The pit was sited to be representative of the profiles found by augering. It revealed a very stony subsoil extending from the base of the topsoil (22-30 cm from the surface) to the top of the fractured limestone at 45 cm deep. This layer was not limiting to root development or water movement.

4. Soil Resources: Topsoil and Subsoil

"Topsoil" is defined as the organic rich surface horizon of heavy silty clay loam. It has a thickness of between 22 cm and 30 cm across the site.

"Subsoil" is defined as the non organic rich horizon of very stoney sandy clay lying below the topsoil.

The site consists of 25-30 cm of topsoil, overlying a thin layer of fractured rock and subsoil, over fractured hard rock. The thin stoney subsoil has good drainage characteristics and allows free rooting. The presence of this layer provides sufficient soil depth to grade the land as sub-grade 3a. It is therefore essential that this layer is replaced in full so that the land will be restored as sub-grade 3a. This site must be restored with a minimum of 40 cm (15") of topsoil and subsoil. On this basis, the topsoil and subsoil resources available for stripping and restoration are listed below:

	Depth	Thickness	Area (ha)	Volume (m ³)
Topsoil	0-30 cm	30 cm	19.5	58,500
Subsoil	30-40 cm	10 cm	19.5	19,500

5. Stripping Storage and Restoration Considerations

(i) The topsoil and subsoil must be stripped and stored separately.

- (ii) Stripping and replacement of soil must take place under dry conditions.
- (iii) At least 10 cm of subsoil must be replaced during restoration. If stones have been recovered from the subsoil material, additional material recovered from the deeper layers must be substituted.

APPENDIX 1

Soil Profile Descriptions

Soil Profile Descriptions: Explanatory Note

Soil texture classes are denoted by the following abbreviations:

Sand S; Loamy Sand LS Sandy Loam SL; Sand Silt Loam SZL; Silt Loam ZL;
Medium Silty Clay Loam MZCL; Medium Clay Loam MCL; Sandy Clay Loam SCL;
Heavy Silty Clay Loam HZCL; Heavy Clay Loam HCL; Sandy Clay SC;
Silty Clay ZC; Clay C

For the sand, loamy sand, sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

F fine (more than $\frac{2}{3}$ of sand less than 0.2 mm)
C coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:-

M medium (less than 27% clay); H heavy (27-35% clay)

Other possible texture classes include:

Peat P; Sandy Peat SP; Loamy Peat LP; Peaty Loam PL;
Peaty Sand PS; Marine Light Silts MZ

The prefix "Calc" is used to identify naturally calcareous soils containing more than 1% Calcium Carbonate.

For organic mineral soils, the texture of the mineral fraction is prefixed by "org".

Other notation:

st	stones (6 cm)
sst	small stones (2 cm - 6 cm)
vsst	very small stones (2 mm - 2 cm)
Mn	manganese
cdom/cfom	common distinct/feint ochreous mottles
mpom	many prominent ochreous mottles (VMPOM = very many ..)

Few = 1-5%; common = 6-15%; many = 16-35%; very many = +35%

APPENDIX 2

Soil Pit Descriptions

Soil Pit - located at auger sample point No 15

Topsoil	0-25 cm Heavy silty clay loam 7.5YR3/4 dark brown 10% stones 2-6 cm; 5% stones 2 cm
Subsoil 1	25-45 cm Sandy clay 10YR4/4 dark yellowish brown 55% stones 2-6 cm; 10% stones 2 cm
Subsoil 2	45+ cm Sandy clay 10YR4/4 dark yellowish brown 80% Fractured rock