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Perry Way
Frampton-on-Severn
Agricultural Land Classification
and Site Physical Characteristics

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PERRY WAY, FRAMPTON-ON-SEVERN

AGRICULTURAL LAND CLASSIFICATION
AND
SITE PHYSICAL CHARACTERISTICS

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AGRICULTURAL LAND CLASSIFICATION SURVEY AND SITE PHYSICAL CHARACTERISTICS

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in response to an ad hoc planning application to the Gloucestershire County Council to extract clay and gravel from a site on Perry Way. The fieldwork was completed in December 1995 at a scale of 1:10,000.

Data on climate, soils, geology and from previous Agricultural Land Classification (ALC) Surveys was used and is presented in the report. The distribution of grades is shown on the accompanying ALC map and summarised below. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Perry Way, Frampton-on-Severn

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (2.7ha)
1	1.7	63.0	63.0
4	1.0	37.0	37.0
TOTAL	2.7	100.0	100.0

Almost two-thirds of the site was mapped as Grade 1 land with no limitation to its agricultural use. The profiles in this mapping unit consist of deep, well drained, stoneless medium clay loams and medium sandy loams over sandy clay loams. The area of land mapped as Grade 4 has a severe drought limitation. This is because the original topsoil and upper subsoil horizons were removed during past gravel extraction and no restoration work has been undertaken. Subsequently the profiles typically have a thin medium clay loam topsoil over stony (58% hard rock by volume) medium sandy loam and medium sand subsoils.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in December 1995 at Perry Way, Frampton-on-Severn. The fieldwork covering 2.7 ha of land was conducted by ADAS at a scale of 1:10,000 with approximately one boring per hectare of agricultural land. A total of four auger borings were examined and two soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1970) shows the grades of the site at a reconnaissance scale to be Grade 2.

The recent survey supersedes this map having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide 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.

2. 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 a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall climate 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 there is no overall climatic limitation.

Table 1: Climatic Interpolations: Perry Way, Frampton-on-Severn

Grid Reference		SO 759 075
Altitude (m)		15
Accumulated Temperature (day °)		1513
Average Annual Rainfall (mm)		758
Overall Climatic Grade		1
Field Capacity Days		167
Moisture deficit (mm):	Wheat	104
	Potatoes	97

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

3. RELIEF AND LANDCOVER

The site occupies one field on the north side of Perry Way near Frampton-on-Severn. The site has an altitude of 15 m above ordnance datum (AOD) and is relatively level except for a break of slope which follows the 15 m contour. The lower land, in the western corner of the field, was previously worked for gravel extraction but has not had any restoration work. At the time of survey the field was under permanent pasture.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published geology map (Institute of Geological Sciences 1975). This shows that the site is underlain by lower lias clay with areas of gravel deposits from the River Frome.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 as being from the Badsey 1 Association. These are described as being well drained calcareous and non-calcareous fine loamy soils over gravel, with similar but shallower soils affected by groundwater.

The soils found during the recent survey generally had medium clay loam and medium sandy loam topsoils over sandy clay loam upper subsoils and medium sand lower subsoils. The topsoil and upper subsoil were only very slightly stony with between 1% and 5% hard rocks by volume. The lower subsoil had a much higher stone content of 58% hard rocks by volume. The topsoil and upper subsoil had been removed to a large extent from the western quarter of the site.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 2: Distribution of ALC grades: Perry Way

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (2.7ha)
1	1.7	63.0	63.0
4	1.0	37.0	37.0
TOTAL	2.7	100.0	100.0

Grade 1

The land mapped as Grade 1 has no limitation to its agricultural use. It consists of deep, well drained medium clay loam and sandy loam topsoils over sandy clay loam subsoils. The profiles were assessed as Wetness Class 1 (see Appendix 3). There are negligible stone contents in these horizons although the lower subsoil of medium sand, which starts at 110 cm, has a stone content of 58% hard rocks by volume.

Grade 4

The land mapped as Grade 4 has a severe drought limitation. The profiles have a thin topsoil of medium clay loam with a stone content of 13% hard rocks by volume. Below this are upper and lower subsoils, of medium clay loam and medium sand respectively, with stone contents of 58% hard rocks by volume. In this mapping unit the top of the profile has been removed leaving the current profile to be assessed as Wetness Class III due to the proximity of the water table.

6. SOIL RESOURCES

The areas defined can be found on the accompanying Soil Resources map.

"Topsoil" is defined as the rich organic surface horizon. Across the site two different soil map units were identified. Map Unit I has a medium clay loam or medium sandy loam topsoil with a low stone content of less than 1% hard rocks by volume. The structure of this friable topsoil was seen to be moderately developed coarse sub-angular blocky. The topsoil of Map Unit II is a very thin layer of medium clay loam with 13% hard rocks by volume. The structure was moderately developed coarse sub-angular blocky with a friable consistency.

Topsoil resources of 4,250 m^3 and 1,000m^3 for Map Units I and II respectively are shown in Table 3. The total topsoil resource of the whole site is 5,250m^3.

"Subsoil" is defined as the less organic lower horizons. The upper subsoil of Map Unit I is a sandy clay loam with a low stone content of less than 1% hard rocks by volume. It has a friable moderate coarse angular and sub-angular blocky structure. The lower subsoil of Map Unit I and the upper and lower subsoil of Map Unit II are very similar. They consist of medium sand with a single grain structure and patches of medium sandy loam with a friable moderate coarse sub-angular blocky structure. All of these horizons have stone contents of 58% hard rocks by volume.

The total subsoil resource for the whole site is 27,320m^3, which is shown in Table 3.

Table 3: Soil Resources

Map Unit	Depth (cm)	Area (ha)	Soils	Volume (m^3)
I	0-24	1.7	MCL, MSL	4,080
	24-110	1.7	SCL	14,620
	110-120	1.7	MS	1,700
II	0-10	1.0	MCL	1,000
	10-36	1.0	MSL	2,600
	36-120	1.0	MS	8,400
			Total Soil Resource	32,400

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APPENDIX 1

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1975) Solid and Drift Edition, Sheet 234, Gloucester, 1:50,000

MAFF (1970) Agricultural Land Classification Map, Sheet 156, Provisional 1:63,360 scale.

MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of agricultural land), Alnwick.

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification.

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

APPENDIX 2

DESCRIPTION OF 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 landcover types, eg buildings in large grounds, and where 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).