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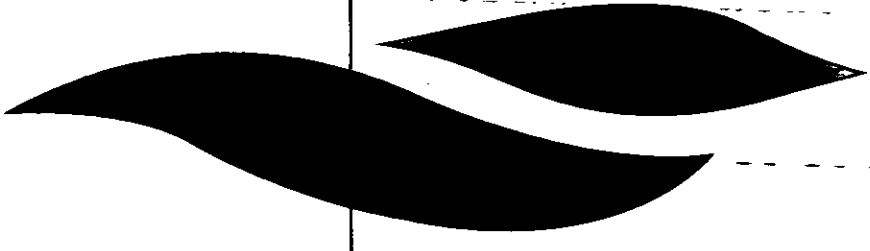

**FARMING AND RURAL CONSERVATION AGENCY**

*An Executive Agency of the Ministry of Agriculture, Fisheries and Food and the Welsh Office*

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# OXFORD CITY LOCAL PLAN
## Land south of Red Barn Farm, Woodstock Road, Oxford

**Agricultural Land Classification**
**ALC Map and Report**

**March 1998**

**Resource Planning Team**
**Eastern Region**
**FRCA Reading**

**RPT Job Number: 3302/010/98**
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# AGRICULTURAL LAND CLASSIFICATION REPORT

## OXFORD CITY LOCAL PLAN
## LAND SOUTH OF RED BARN FARM, WOODSTOCK ROAD, OXFORD

## INTRODUCTION

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of approximately 16 hectares of land on the north of Oxford, immediately south of the junction of the A34 (Oxford Ring Road) and the A44 (Woodstock Road). The survey was carried out during March 1998.

2. The work was undertaken by the Farming and Rural Conservation Agency (FRCA)[1] on behalf of the Ministry of Agriculture, Fisheries and Food (MAFF), in connection with its statutory input to a revision to the Oxford City Local Plan. This survey supersedes any previous ALC information for this land.

3. The fieldwork was conducted by members of the Resource Planning Team in the Eastern Region of FRCA. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF, 1988). A description of the ALC grades and subgrades is given in Appendix I.

4. At the time of survey, all of the agricultural land was under permanent grassland. The areas mapped as 'Other land' comprise farm buildings.

## SUMMARY

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but 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 |
|---|---|---|---|
| 3b | 15.3 | 100 | 97.5 |
| Other land | 0.4 | N/A | 2.5 |
| Total surveyed area | 15.3 | 100 | 97.5 |
| Total site area | 15.7 | - | 100 |

[1] FRCA is an executive agency of MAFF and the Welsh Office

7. The fieldwork was conducted at an average density of 1 boring per hectare of agricultural land. A total of 13 borings and 1 soil pit was described.

8. All of the agricultural land has been classified as Subgrade 3b (moderate quality) with soil wetness being the main limiting factor. Medium or heavy clay loam topsoils are underlain by poorly structured clay subsoils that significantly restrict the drainage of water through the profiles. This degree of wetness significantly reduces the flexibility of the land - there will be a limitation on the number of days when the soil is in a suitable condition to allow cultivations or grazing and there will be an impact on such things as seed germination and survival, thus affecting the quality and consistency of yields from this land.

## FACTORS INFLUENCING ALC GRADE

### Climate

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

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

11. 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.

12. 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.

**Table 2: Climatic and altitude data**

| Factor | Units | Values |
|---|---|---|
| Grid reference | N/A | SP495105 |
| Altitude | m, AOD | 65 |
| Accumulated Temperature | day°C (Jan-June) | 1438 |
| Average Annual Rainfall | mm | 696 |
| Field Capacity Days | days | 146 |
| Moisture Deficit, Wheat | mm | 110 |
| Moisture Deficit, Potatoes | mm | 103 |
| Overall climatic grade | N/A | Grade 1 |

13. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors such as exposure or frost risk are also not significant. The site is climatically Grade 1.

## Site

14. The site is flat to gently sloping, lying in the altitude range 63–72m. No site factors such as gradient, microrelief or flooding are significant.

## Geology and soils

15. The most detailed published geological information for the site (IGS, 1982) shows the whole site to be underlain by Oxford Clay.

16. The most detailed published soils information for the site (SSEW, 1983) shows the whole site to comprise soils of the Wickham 2 soil association. These soils are described as 'slowly permeable, seasonally waterlogged, fine loamy over clayey, fine silty over clayey, and clayey soils' (SSEW, 1984). The detailed fieldwork confirmed the presence of loamy over clayey soils across the whole site.

# AGRICULTURAL LAND CLASSIFICATION

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

18. The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix II.

## Subgrade 3b

19. All of the agricultural land on the site has been placed in this subgrade (moderate quality). Soils are virtually identical across the whole site, with soil wetness as the main limiting factor. Pit 1 is typical of the soils found, and describes a non-calcareous heavy clay loam topsoil overlying a clay subsoil. A mixture of heavy clay loam and medium clay loam topsoils was found across the site, but in no discernible pattern. The clay subsoils exhibit clear evidence of gleying (with distinct mottling in a 2.5Y63 or 53 matrix) and are slowly permeable, with coarse angular blocky structures and low porosity. At the time of survey (mid-March, after a relatively dry winter), the topsoils were often saturated, with standing water in places across the site, even on some gently sloping land. This degree of soil wetness places the soils in Wetness Class IV. Given the topsoil textures, the local climate and the soil drainage status, the land cannot be classified higher then Subgrade 3b.

20. The agricultural impact of this degree of soil wetness will be seen in the lower flexibility of this land. As wetness adversely affects seed germination and survival, and inhibits the development of a good root system, the quality and consistency of yields will be significantly reduced. As wetness also affects the workability of the land, there will be a significant reduction in the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock, if structural damage is to be avoided.

DE Black
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Eastern Region
FRCA Reading

## SOURCES OF REFERENCE

Institute of Geological Sciences (1982) *Sheet No. 236 Witney.*
IGS: London.

Ministry of Agriculture, Fisheries and Food (1988) *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land.*
MAFF: London.

Met. Office (1989) *Climatological Data for Agricultural Land Classification.*
Met. Office: Bracknell.

Soil Survey of England and Wales (1983) *Sheet 6 Soils of South East England.*
SSEW: Harpenden.

Soil Survey of England and Wales (1984) *Soils and their Use in South East England*
SSEW: Harpenden

## APPENDIX I

## DESCRIPTIONS OF THE 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 includes 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 or horticultural crops can usually be grown but on some land of this 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 land.

### Grade 3: Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the level of yields. It is mainly suited to grass with occasional arable crops (e.g. 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

# APPENDIX II

# SOIL DATA

Contents:

# SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

**Boring Header Information**

1. **GRID REF**: national 100 km grid square and 8 figure grid reference.

2. **USE**: Land use at the time of survey. The following abbreviations are used:

| | | | | | |
|---|---|---|---|---|---|
| **ARA:** | Arable | **WHT:** | Wheat | **BAR:** | Barley |
| **CER:** | Cereals | **OAT:** | Oats | **MZE:** | Maize |
| **OSR:** | Oilseed rape | **BEN:** | Field beans | **BRA:** | Brassicae |
| **POT:** | Potatoes | **SBT:** | Sugar beet | **FCD:** | Fodder crops |
| **LIN:** | Linseed | **FRT:** | Soft and top fruit | **FLW:** | Fallow |
| **PGR:** | Permanent pasture | **LEY:** | Ley grass | **RGR:** | Rough grazing |
| **SCR:** | Scrub | **CFW:** | Coniferous woodland | **OTH** | Other |
| **DCW:** | Deciduous woodland | **BOG:** | Bog or marsh | **SAS:** | Set-Aside |
| **HTH:** | Heathland | **HRT:** | Horticultural crops | **PLO:** | Ploughed |

3. **GRDNT**: Gradient as estimated or measured by a hand-held optical clinometer.

4. **GLEY/SPL**: Depth in centimetres (cm) to gleying and/or slowly permeable layers.

5. **AP (WHEAT/POTS)**: Crop-adjusted available water capacity.

6. **MB (WHEAT/POTS)**: Moisture Balance. (Crop adjusted AP - crop adjusted MD)

7. **DRT**: Best grade according to soil droughtiness.

8. If any of the following factors are considered significant, 'Y' will be entered in the relevant column:

| | | | | | |
|---|---|---|---|---|---|
| **MREL**: | Microrelief limitation | **FLOOD:** | Flood risk | **EROSN**: | Soil erosion risk |
| **EXP**: | Exposure limitation | **FROST**: | Frost prone | **DIST**: | Disturbed land |
| **CHEM**: | Chemical limitation | | | | |

9. **LIMIT**: The main limitation to land quality. The following abbreviations are used:

| | | | | | |
|---|---|---|---|---|---|
| **OC**: | Overall Climate | **AE**: | Aspect | **ST**: | Topsoil Stoniness |
| **FR**: | Frost Risk | **GR**: | Gradient | **MR**: | Microrelief |
| **FL**: | Flood Risk | **TX**: | Topsoil Texture | **DP**: | Soil Depth |
| **CH**: | Chemical | **WE**: | Wetness | **WK**: | Workability |
| **DR**: | Drought | **ER**: | Erosion Risk | **WD**: | Soil Wetness/Droughtiness |
| **EX**: | Exposure | | | | |

**Soil Pits and Auger Borings**

1. **TEXTURE**: soil texture classes are denoted by the following abbreviations:

| | | | | | |
|---|---|---|---|---|---|
| **S**: | Sand | **LS**: | Loamy Sand | **SL**: | Sandy Loam |
| **SZL**: | Sandy Silt Loam | **CL**: | Clay Loam | **ZCL**: | Silty Clay Loam |
| **ZL**: | Silt Loam | **SCL**: | Sandy Clay Loam | **C**: | Clay |
| **SC**: | Sandy Clay | **ZC**: | Silty Clay | **OL**: | Organic Loam |
| **P**: | Peat | **SP**: | Sandy Peat | **LP**: | Loamy Peat |
| **PL**: | Peaty Loam | **PS**: | Peaty Sand | **MZ**: | Marine Light Silts |

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

**F**: Fine (more than 66% of the sand less than 0.2mm)
**M**: Medium (less than 66% fine sand and less than 33% coarse sand)
**C**: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content:
**M:** Medium (<27% clay) **H**: Heavy (27-35% clay)

2. **MOTTLE COL**: Mottle colour using Munsell notation.

3. **MOTTLE ABUN**: Mottle abundance, expressed as a percentage of the matrix or surface described:

**F**: few <2% **C**: common 2-20% **M**: many 20-40% **VM**: very many 40% +

4. **MOTTLE CONT:** Mottle contrast:

**F**: faint - indistinct mottles, evident only on close inspection
**D**: distinct - mottles are readily seen
**P**: prominent - mottling is conspicuous and one of the outstanding features of the horizon

5. **PED. COL**: Ped face colour using Munsell notation.

6. **GLEY:** If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

7. **STONE LITH**: Stone Lithology - one of the following is used:

| | | | |
|---|---|---|---|
| **HR**: | all hard rocks and stones | **FSST**: | soft, fine grained sandstone |
| **ZR**: | soft, argillaceous, or silty rocks | **CH**: | chalk |
| **MSST**: | soft, medium grained sandstone | **GS**: | gravel with porous (soft) stones |
| **SI**: | soft weathered igneous/metamorphic rock | **GH**: | gravel with non-porous (hard) stones |

Stone contents (>2cm, >6cm and total) are given in percentages (by volume).

8. **STRUCT**: the degree of development, size and shape of soil peds are described using the following notation:

| | | | | |
|---|---|---|---|---|
| Degree of development | **WK**: | weakly developed | **MD**: | moderately developed |
| | **ST**: | strongly developed | | |
| Ped size | **F**: | fine | **M**: | medium |
| | **C**: | coarse | | |
| Ped shape | **S**: | single grain | **M**: | massive |
| | **GR**: | granular | **AB**: | angular blocky |
| | **SAB**: | sub-angular blocky | **PR**: | prismatic |
| | **PL**: | platy | | |

9. **CONSIST**: Soil consistence is described using the following notation:

| | | |
|---|---|---|
| **L**: loose | **FM**: firm | **EH**: extremely hard |
| **VF**: very friable | **VM**: very firm | |
| **FR**: friable | **EM**: extremely firm | |

10. **SUBS STR**: Subsoil structural condition recorded for the purpose of calculating profile droughtiness: **G**: good **M**: moderate **P**: poor

11. **POR**: Soil porosity. If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column.

12. **IMP**: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

13. **SPL**: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

14. **CALC**: If the soil horizon is calcareous, a 'Y' will appear in this column.

15. Other notations:

| | |
|---|---|
| **APW**: | available water capacity (in mm) adjusted for wheat |
| **APP**: | available water capacity (in mm) adjusted for potatoes |
| **MBW**: | moisture balance, wheat |
| **MBP**: | moisture balance, potatoes |

| SAMPLE NO. | GRID REF | USE | ASPECT | | GRDNT | GLEY | SPL | --WETNESS-- CLASS | GRADE | -WHEAT- AP | MB | -POTS- AP | MB | M.REL DRT | FLOOD | EROSN EXP | FROST DIST | CHEM LIMIT | ALC | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | SP494 106 | PGR | | | | 22 | 22 | 4 | 3B | 80 | -30 | 83 | -21 | | | | | WE | 3B | |
| 3 | SP493 106 | PGR | | | | 25 | 25 | 4 | 3B | 81 | -29 | 87 | -17 | | | | | WE | 3B | |
| 4 | SP494 105 | PGR | | | | 10 | 10 | 4 | 3B | 74 | -36 | 77 | -27 | | | | | WE | 3B | |
| 5 | SP496 105 | PGR | W | | 2 | 22 | 22 | 4 | 3B | 78 | -32 | 81 | -23 | | | | | WE | 3B | |
| 6 | SP492 104 | PGR | | | | 25 | 25 | 4 | 3B | 83 | -27 | 89 | -15 | | | | | WE | 3B | |
| 7 | SP493 104 | PGR | | | | 25 | 25 | 4 | 3B | 84 | -26 | 90 | -14 | | | | | WE | 3B | |
| 9 | SP495 104 | PGR | | | | 22 | 22 | 4 | 3B | 79 | -31 | 82 | -22 | | | | | WE | 3B | |
| 10 | SP496 104 | PGR | NW | | 4 | 15 | 15 | 4 | 3B | 75 | -35 | 78 | -26 | | | | | WE | 3B | |
| 11 | SP492 103 | PGR | | | | 20 | 20 | 4 | 3B | 77 | -33 | 80 | -24 | | | | | WE | 3B | |
| 12 | SP493 103 | PGR | | | | 25 | 25 | 4 | 3B | 79 | -31 | 82 | -22 | | | | | WE | 3B | |
| 13 | SP494 103 | PGR | | | | 10 | 10 | 4 | 3B | 72 | -38 | 75 | -29 | | | | | WE | 3B | |
| 14 | SP495 103 | PGR | | | | 20 | 20 | 4 | 3B | 77 | -33 | 80 | -24 | | | | | WE | 3B | |
| 15 | SP496 103 | PGR | NW | | 3 | 15 | 15 | 4 | 3B | 75 | -35 | 78 | -26 | | | | | WE | 3B | |
| 1P | SP493 104 | PGR | SE | | 1 | 25 | 32 | 4 | 3B | 86 | -24 | 92 | -12 | | | | | WE | 3B | |

| SAMPLE | DEPTH | TEXTURE | COLOUR | MOTTLES COL | MOTTLES ABUN | MOTTLES CONT | PED COL. | GLEY | STONES >2 | STONES >6 | STONES LITH | STONES TOT | STRUCT/ CONSIST | SUBS STR | SUBS POR | SUBS IMP | SUBS SPL | CALC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 0-22 | MCL | 10YR42 | | | | | | 0 | 0 | | 0 | | | | | | |
| | 22-55 | C | 25Y 64 | 000C00 | C | | | Y | 0 | 0 | | 0 | | | P | | Y | |
| 3 | 0-25 | C | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 25-60 | C | 25Y 63 | 000C00 | C | | | Y | 0 | 0 | | 0 | | | P | | Y | |
| 4 | 0-10 | MCL | 10YR42 | | | | | | 0 | 0 | | 0 | | | | | | |
| | 10-55 | C | 25Y 63 | 000C00 | C | | | Y | 0 | 0 | | 0 | | | P | | Y | |
| 5 | 0-22 | HCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 22-55 | C | 25Y 63 | 000C00 | C | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 6 | 0-25 | HCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 25-60 | C | 25Y 53 | 000C00 | C | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 7 | 0-25 | HCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 25-60 | C | 25Y 63 | 000C00 | C | | | Y | 0 | 0 | | 0 | | | P | | Y | |
| 9 | 0-22 | MCL | 10YR52 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 22-55 | C | 10YR53 | 000C00 | C | | | Y | 0 | 0 | | 0 | | | P | | Y | |
| 10 | 0-15 | MCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 15-55 | C | 25Y 63 | 000C00 | C | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 11 | 0-20 | MCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 20-55 | C | 25Y 63 | 000C00 | M | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 12 | 0-25 | MCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 25-55 | C | 25Y 53 | 000C00 | C | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 13 | 0-10 | MCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 10-55 | C | 25Y 53 | 000C00 | M | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 14 | 0-20 | MCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 20-55 | C | 25Y 53 | 000C00 | C | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 15 | 0-15 | MCL | 10YR42 | | | | | | 0 | 0 | HR | 2 | | | | | | |
| | 15-55 | C | 10YR53 | 000C00 | C | | | Y | 0 | 0 | HR | 2 | | | P | | Y | |
| 1P | 0-25 | HCL | 10YR42 | | | | | | 0 | 0 | HR | 1 | | | | | | N |
| | 25-32 | C | 25Y 53 | 10YR56 | C | | | Y | 0 | 0 | HR | 1 | | | M | | | N |
| | 32-60 | C | 25Y 53 | 10YR56 | C | | | Y | 0 | 0 | HR | 1 | MCAB | FM | P | Y | Y | N |