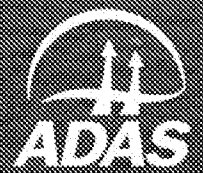


Land at Hook Lane, Westergate



Agricultural Land Classification

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Quality Assurance

Author (s)	Checked

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1 Executive Summary

The Agricultural Land Classification of approximately 0.9 ha of land at Hook Lane, Westergate was assessed by RSK ADAS Ltd (ADAS) in December 2017. The land was surveyed to provide information on the Agricultural Land Classification of the site, for Whitgift Estates Ltd.

The land is under grass and a number of buildings of block and timber construction are present on the site. There are also several mounds of brick and rubble present on the site.

The site is classified as Grade 2 (very good quality agricultural land) and non- agricultural land which would require remedial management to be returned to agriculture. A pond is mapped as open water.

2 Introduction

ADAS was instructed by Whitgift Estates Ltd to undertake an Agricultural Land Classification (ALC) on an area of land lying about 7 miles to the east of Chichester and west of the A29 road at Hook Lane, Westergate. The site lies west of Hook Lane and is part of the residential property known as Barnside. The original field gate and entrance remain with a separate entrance to Barnside. The southern boundary of the site adjoins an area with a glasshouse and nursery and the western boundary is formed by a ditch and partial tree and hedge line adjoining farmland. The northern boundary is formed by fencing and a brick wall and track boundary between the site and Barnside. The eastern boundary is formed by Hook Lane.

The land was classified using the system outlined in the Ministry of Agriculture, Fisheries and Food (MAFF now Defra) publication: 'Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land' (October 1988).

3 Methodology

3.1 Fieldwork

A desk study of soils and climatic information was undertaken using reference material held by ADAS and documents relating to the planning application to Arun District Council (AL/8/16/OUT). Fieldwork was undertaken to study soil and site limitations.

Three auger borings were examined to determine the quality of the sample points (**Appendix 1**) and the findings are given in **Appendix 2**. One soil pit was dug to examine the subsoil characteristics. Fieldwork was undertaken with a hand held 50mm diameter "Dutch" auger to a depth of 1.2m where possible. Where auger penetration to 120cm was not possible the profile depth has been extended to 120cm using nearby profile information to enable soil droughtiness calculations to be made.

The fieldwork was carried out on 29th December 2017.

3.2 The Agricultural Land Classification System

The Agricultural Land Classification System (ALC) provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The limitations can operate in one or more of four principal ways.

They may affect:

- the range of crops which can be grown
- the level of yield
- the consistency of yield
- the cost of obtaining the crop

The classification system gives considerable weight to flexibility of cropping, whether actual or potential, but the ability of some land to produce consistently high yields of a somewhat narrower range of crops is also taken into account.

The principal physical factors influencing agricultural production are climate, site (including relief) and soil. By assessing these factors, it is possible to assign land into one of five land classification grades, Grade 1 land being the highest quality and Grade 5 the lowest quality land. Grade 3 is sub-divided into Subgrades 3a and 3b, to identify good quality agricultural land from moderate quality land (see **Appendix 4** for a description of the grades used in the ALC system). By considering site specific climate, site and soil factors the land can be classified into 1 of 5 agricultural grades or certain non-agricultural grades.

4 Geology, Soils and Present Land Use

4.1 Geology

The geology map¹ shows that much of the area is underlain by clay, sand and silt of the London Clay Formation, a sedimentary deposit laid down 48-56 million years ago in the Palaeogene Period. The area is covered by superficial deposits of River Terrace Deposits consisting of sand, silt and clay.

4.2 Soils

The soils are mapped on the soil map² of the area as Park Gate Association, a deep stoneless silty soil affected by seasonally high groundwater. Park Gate soils are described as seasonally waterlogged (Wetness Class 3 or 4) and with satisfactory outfalls the soils can be well drained or occasionally waterlogged (Wetness Class 2). A typical profile is described as having a stoneless brown silty clay loam topsoil over a subsoil of brown stoneless silty clay loam.

4.3 Present Land Use

The land was under grass and is described in the Ecological Report to support the planning application as 'improved amenity grassland'. The grass is managed and mown with a ride on mower. The land is not farmed by the current owner.

There are 6 buildings or sheds covering approximately 461 m² of the site.

Four of the buildings appeared to be used as either a workshop or for machinery storage or household storage. The buildings appear to be redundant as agricultural buildings. Information received from the owner show the presence of 6 other buildings in 1963, which were not present at the time of the site visit. The footprint of these buildings is reported as being approximately 730m². There are several distinct mounds within the survey area, which have either dense bramble growth or shrub vegetation, with either soil mixed with bricks and rubble or bricks close to the surface assumed to be from the demolished buildings.

5 Previous Land Classification Surveys

The Provisional Agricultural Land Classification Map³ shows the survey site within an area mapped as Grade 2 land. This map is for strategic purposes only and is not sufficiently accurate for the assessment of individual fields. There are no detailed ALC surveys mapped on the Magic website⁴ nor are there any known previous detailed surveys of the land. A field lying 100m to the east of site is mapped as ALC Grade 2 on the Magic website.

6 Results

The sections below illustrate the main considerations and limitations to the grading of the land.

6.1 Climate

The site climatic variables have been interpolated from grid point data surrounding the site, as follows:

Table 1: Climatic Variables

Grid Reference (mid-point of site)	4934 1047
Altitude (m)	10
Accumulated Temperature (day °C)	1537
Average Annual Rainfall (mm)	771
Overall Climatic Grade	1
Field Capacity Days	157
Moisture deficit (mm): Wheat	117
Moisture deficit (mm): Potatoes	114

There is no overall climatic limitation to the agricultural use of the land at the survey site.

6.2 Site Limitations

Gradient: The survey area is generally level at an altitude of around 10m A.O.D (Above Ordnance Datum). Gradient is not a limiting factor in classifying the land.

Flooding: there is no known flood risk at the survey site.

6.3 Soil and Interactive Limitations

The soil profiles show signs of seasonal wetness in the form of pale soil colours and mottling above 40cm depth. There is no slowly permeable layer starting within 80cm depth and the profiles are placed in Wetness Class 2.

The combination of the topsoil texture, the Wetness Class and Field Capacity Day figure of 157 influence the ALC grade.

Soil droughtiness is a limitation at the site. The combination of the available water in the profile, which is influenced by soil texture and structure, and the moisture deficit give a resultant moisture balance which influences the ALC grade.

The main factors affecting agricultural land quality are:

- Soil texture and wetness class, which mainly affect the ALC grade due to a wetness limitation.
- Soil texture, which mainly affects the ALC grade due to a droughtiness limitation.

6.4 Land Quality

A brief description of the findings is given below.

6.4.1 Grade 1

No land has been placed in this grade.

6.4.2 Grade 2

The profile has a stoneless medium silty clay loam texture to depths of between 20 cm and 39 cm overlying an upper subsoil of medium silty clay loam and a lower subsoil texture of heavy silty clay loam. The subsoils are gleyed and mottled.

The profiles are placed in Wetness Class 2 and in combination with a Field Capacity Days figure of 157 and a medium silty clay loam topsoil the land is classified as Grade 2.

Near the location of a former building at auger boring 3 penetration with a hand held auger was prevented at the first attempt due to the presence of brick/rubble close to the surface. A short distance away full auger penetration was possible.

6.4.3 Grade 3, Subgrade 3a

No land has been placed in this grade.

6.4.4 Grade 3, Subgrade 3b

No land has been placed in this grade.

6.4.5 Grade 4

No land has been placed in this grade.

6.4.6 Grade 5

No land has been placed in this grade.

6.4.7 Non-agricultural land

Parts of the survey site are classified as non-agricultural land, which is described as 'soft' uses where most of the land could be returned relatively easily to agriculture.

Within the survey site there are mounds of brick, glass fragments and rubble covered by scrub or dense bramble (approximate grid references 493425 104635, 493361 104640, 493341 104630). It is not known whether the ground under these mounds has been disturbed or the brick and rubble has been placed on similar soils to those found in other parts of the survey site.

There are building structures within the survey site and areas where buildings are now demolished. The construction of the demolished buildings is not known. During the site visit close to the former location of one of the buildings hand held auger penetration was stopped by the likely presence of buried bricks.

Parts of the survey site are classified as non-agricultural land because of the presence of mounds of brick and rubble and the potential to encounter brick from demolished buildings, which would require further assessment and remedial action to return the whole survey site to agriculture.

6.4.8 Open Water

There is a pond in the south west corner of the site which discharges towards the south.

6.5 Summary of Land Quality in the Survey Area

Table 2: Agricultural Land Classification Measurements

Grade	Area (ha)	% of Total Area
1	-	-
2	0.48	50.52
3a	-	-
3b	-	-
4	-	-
5	-	-
Non-agricultural	0.44	46.31
Open water	0.03	3.17
Total	0.95	100

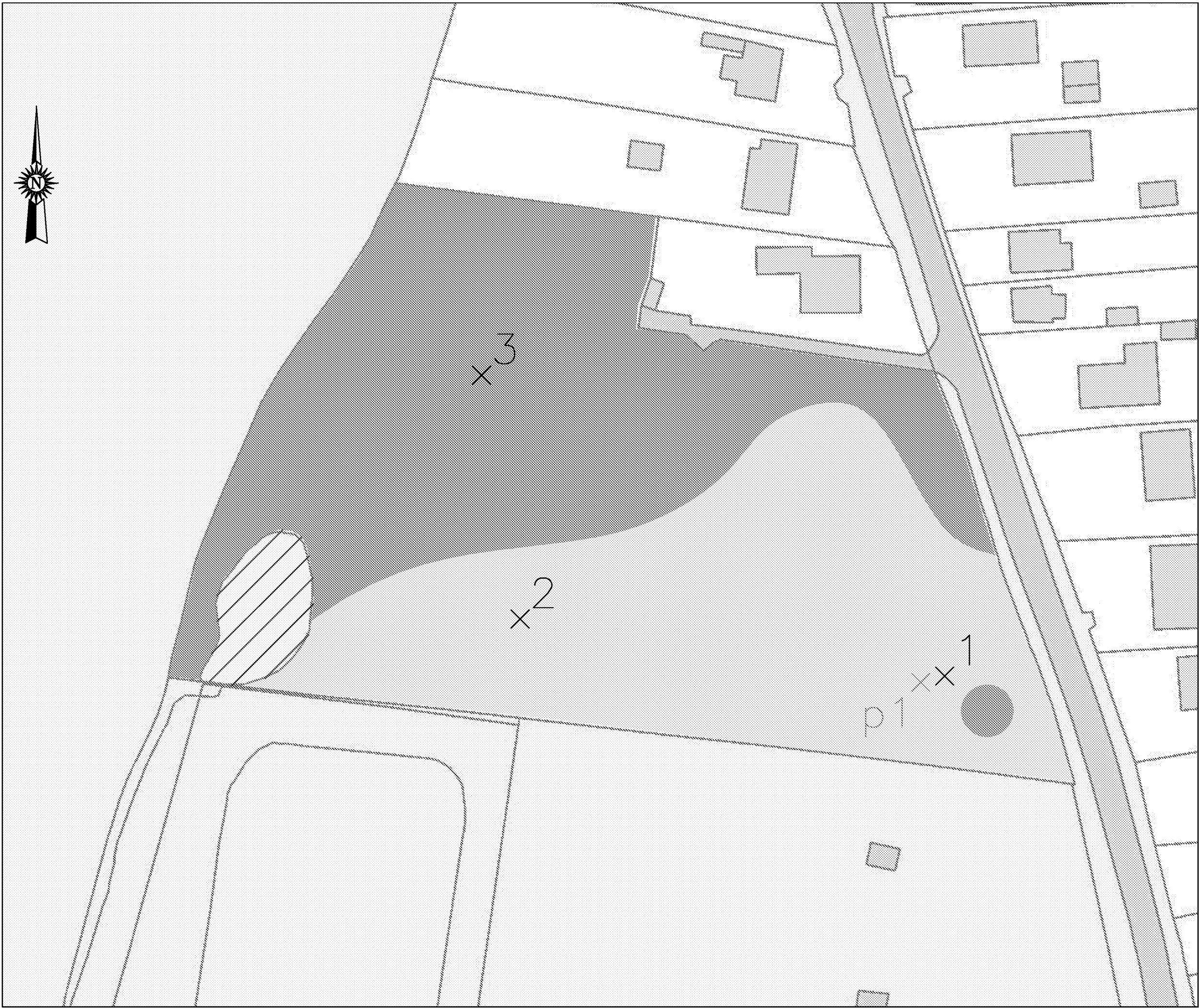
7 Conclusions

- There are no recorded existing detailed ALC maps of the site.
- The Regional ALC map (scale 1:250,000) shows the site within an area of Grade 2.
- The agricultural land is limited by soil wetness and soil droughtiness to Grade 2 land.
- Part of the site is occupied by buildings and mounds of brick and rubble, which would require remedial action to return the land to agricultural use; this area is mapped as non-agricultural land. A pond is mapped as open water.
- The land is currently not in agricultural use, but could be used for agriculture.
- If the land is developed surplus soil should be kept on site or used to restore other sites which are short of soil, to preserve the soil and retain soil functions such as water and carbon storage.

Appendix 1

Agricultural Land Classification Map and Location Plan

(See following page)



AGRICULTURAL LAND CLASSIFICATION

x 1-3 Auger Location
 \ p1 Pit Location

- Grade 1
- Grade 2
- Grade 3a
- Grade 3b
- Grade 4
- Grade 5
- Land predominantly in urban use.
- Other land primarily in non-agricultural use
- Open water

3.1.2018	DI	RM		A	AGRICULTURAL LAND CLASSIFICATION
DATE	DRAWN	CHKD	REVD	ISSUE	

Land at Hook Lane, Westergate
 AGRICULTURAL LAND CLASSIFICATION

SCALE	Plan Not To Scale	MASTER SIZE	A3
DRAWING NO.	PE-KH11/ALC 01	ISSUE	A

CLIENT:
 WHITGIFT ESTATES LTD



Appendix 2: Soil Profile Descriptions

Pit 1		Soil				
	Depth to horizon base (cm)	Texture	Colour	Mottling	Structure	Porosity (biopores >0.5mm dia)
Topsoil	30	MZCL	10YR 4/2(dark grayish brown)	Ochreous (10YR5/8), common, root mottling	n/a	n/a
Subsoil 1	50	MZCL	10YR 5/2 (grayish brown)	Ochreous, common	Moderately developed medium angular blocky Friable	>0.5%
Subsoil 2	80	HZCL	10YR 6/4 5/4 (light yellowish brown)	Ochreous, many	Moderately developed coarse platy breaking into coarse angular blocky Firm	>0.5%
Subsoil 3						
Gleyed at: 30			SPL at: >80			
Wetness Class : 2			Wetness grade : 2			
AP Wheat:133mm			MB +16mm			
AP Potatoes:115mm			MB +1mm Droughtiness grade: 2			
Main limitation: soil wetness and droughtiness			ALC Grade 2			

Auger Boring 1		Soil			
	Depth to horizon base (cm)	Texture	Colour	Mottling	% Stone content
Topsoil 1	20	MZCL(medium silty clay loam)	10YR4/2(dark grayish brown)	Root mottling, common distinct, ochreous	0
Topsoil 2	39	MZCL	10YR4/2	No mottles	0
Subsoil 1	60	MZCL	10YR5/4 6/4 (yellowish brown/light yellowish brown)	Common ochreous (10YR5/8) mottles	0
Subsoil 2	110	HZCL(heavy silty clay loam)	10YR6/4(light yellowish brown)	Many distinct ochreous (10YR5/8) mottles	0
Gleyed at:20cm			SPL at: >80cm		
Wetness Class : 2			Wetness grade : 2		
AP Wheat:136mm			MB +19mm		
AP Potatoes:118mm			MB +4mm	Droughtiness grade: 2	
Main limitation: soil wetness and droughtiness			ALC Grade 2		

Auger Boring 2		Soil			
	Depth to horizon base (cm)	Texture	Colour	Mottling	% Stone content
Topsoil	29	MZCL	10YR4/2 (dark grayish brown)		0
Subsoil 1	50	MZCL	10YR6/2(light brownish gray)	Common distinct ochreous mottles	0
Subsoil 2	80	HZCL	10YR6/2	Common distinct ochreous mottles	0
Subsoil 3			Note: wet at 30cm		
Gleyed at:20cm			SPL at: >80cm		
Wetness Class : 2			Wetness grade : 2		
AP Wheat:136mm			MB +19mm		
AP Potatoes:118mm			MB +4mm	Droughtiness grade: 2	
Main limitation: soil wetness and droughtiness			ALC Grade 2		

Auger Boring 3		Soil			
	Depth to horizon base (cm)	Texture	Colour	Mottling	% Stone content
Topsoil 1	10	MZCL	10YR4/2 (dark grayish brown)	Root mottling, common distinct, ochreous	0
Topsoil 2	30	MZCL	10YR5/2 (grayish brown)	No mottles	0
Subsoil 1	40	MZCL	10YR5/2	Common distinct ochreous mottles	0
Subsoil 2	55	HZCL	10YR6/2 (light brownish gray)	Common distinct ochreous mottles	0
Subsoil 3	80	HZCL/C(heavy silty clay loam/clay)	10YR6/1 (gray)	Many distinct ochreous mottles	0
Gleyed at:30cm			SPL at: >80cm		
Wetness Class : 2			Wetness grade : 2		
AP Wheat:125mm			MB +8mm		
AP Potatoes:129mm			MB +15mm Droughtiness grade: 2		
Main limitation: soil wetness and droughtiness			ALC Grade 2		

Appendix 3: Photographs



Soil pit at auger boring location 1



Photograph looking westwards from Hook Lane with pond and mound



Photograph of mound and buildings



Photograph of mound and northwards to Barnside

Appendix 4: Description of the Grades and Sub-grades

The ALC grades and Sub-grades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to the land's physical characteristics, for which the cut-offs are described in Section 3 of Ministry of Agriculture, Fisheries and Food (MAFF now Defra) publication: 'Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land' (October 1988). The most productive and flexible land falls into Grades 1, 2 and Sub-grade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is either of moderate quality (Sub-grade 3b) or poor quality (Grade 4). Although less significant on a national scale, such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 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 on Grade 1 land.

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.

Sub-grade 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.

Sub-grade 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 (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 agriculture 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.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including golf courses, private parkland, public open spaces, sports fields, allotments and soft-unsurfaced areas on airport/airfields.

Open water

Includes lakes, ponds and river as map scale permits.

Appendix 5: References

- 1) British Geological Society: [REDACTED]
- 2) Soils and their use in South East England Cranfield Soil and Agrifood Institute
- 3) London and South East Region Agricultural Land Classification map 1:250 00 Series
Natural England
- 4) [REDACTED] MagicMap. [REDACTED]