



Our Ref: 6307jb-1
Your Ref:

22 May 2014

Keyford Land Owners
c/o Charles Bishop Limited
Langley House
24 Hendford
Yeovil
BA20 1TG

Dear Sirs,

RE: LAND AT KEYFORD

Reading Agricultural Consultants has been involved with the possible development of land at Keyford since 2003 when we were instructed to undertake an agricultural land classification (ALC) and agricultural impact assessment (AIA) of potential development at the site.

The site had previously been surveyed - at a semi-detailed level - by MAFF in 1996 and that survey determined that the land was all Grade 1 (see **Appendix 1**).

We (RAC) attended the site in 2003 and undertook a detailed examination of the site and provided a report that determined that whilst the physical characteristics of the soil were in agreement with the MAFF findings, there was a very real risk of erosion that limited the effective use of the land. Our survey concluded that the most appropriate grading of the land was Grade 2 (see **Appendix 2**).

In support of this erosion risk assertion RAC produced a briefing paper outlining the key issues (see **Appendix 3**). This document considered the appropriateness of the Grade 1 listing in the context of whether the land was really:

'Land with no or very minor limitations to agricultural use.'

This was based on guidance provided in the MAFF (1988) guidance on assessing agricultural land classification which noted:

"Soil erosion is mainly caused by wind or water action, although the wastage of peat can also be regarded as a form of erosion. The incidence of erosion is determined by interactions between weather, soil type and condition, topography and the amount and type of vegetative cover. It is also strongly influenced by land management practices. In agricultural terms, the problem is most significant in the arable lowlands".

And the report concluded:

"The land at Keyford is certainly not Grade 1. Erosion risk alone is considered sufficient to preclude farming to a Grade 1 potential, by restricting the choice of crops, their performance, and by imposing limitations on the way land work is carried out.

The combined effect of inherently weak topsoil structure, overall erosion risk and local droughtiness limitations is certainly sufficient to downgrade the land from Grade 1 to Grade 2.

This judgment would be applied to the same degree, or to a greater degree, elsewhere in the locality if, for example, slopes were greater and the landform more undulating than applies at this site”.

The issue of soil erosion risk became more prominent during the 2000s and in 2005 Defra published a document entitled “*Controlling Soil Erosion*” which opened with the following paragraphs:

“The management of agricultural land

Soil erosion is caused by the action of water, wind, grazing animals and human activity.

It can affect the profitability of farm businesses, damage the environment and cause a public nuisance.

Erosion has increased in recent years. Problems can occur almost anywhere but the main lowland areas at risk are shown on the map opposite. Problems are likely to increase if cropping and rainfall patterns alter due to climate change.

Action now can protect the long-term productivity of your most valuable asset – your soil.”

Thus the erosion risk topic that RAC referred to in 2003 was not new, having been referred to in the 1988 guidance, but was - by 2005 - more fully acknowledged as a very real risk for agricultural land.

At Keyford the climate, topography and nature of the soil militate towards a risk of soil erosion and in order to provide empirical data to prove that the land is NOT of Grade 1 quality Reading Agricultural Consultants commissioned a second opinion from *Askew Land & Soil Limited*. This company, based in the West Country is another specialist soils’ company, managed by Rob Askew, described in his response as a Chartered Scientist and a past President of the Institute of Professional Soil Scientists (IPSS) - the professional body of the British Society of Soil Science (BSSS); thus eminently well qualified to examine the issue.

Mr Askew’s report is appended at **Appendix 4** and it agrees with the 2003 RAC conclusion that the versatility of the land at Keyford is constrained by gradient. Within his report Mr Askew applies a new methodology developed published by Defra in 2005 that assesses erosion risk according to:

- soil texture; and,
- steepness of slope.

Based on the generally fine sandy loam/light silty topsoils found across the site Mr Askew has determined:

“Due to the Very High to High Risk of soil erosion in the northwest and southwest of the Site, and the Moderate Risk of soil erosion in the large field in the east, this agricultural land is not suitable for certain ‘susceptible land uses’, as set out in Defra’s guidance on Controlling Soil Erosion (2005), and this limits its versatility.

The Defra guidance on ‘Controlling Soil Erosion’ provides guidance on ‘Farm and Crop Planning’, which sets out ‘highly susceptible land uses’, including late sown winter cereals, potatoes, sugar beet, and forage maize, for example, that should be avoided on Very High and High Risk areas, unless certain precautions, such as additional hedge planting, etc, are carried out.

Therefore, whilst the risk of soil erosion at this Site could theoretically be reduced through appropriate farm management, the agricultural land cannot be regarded as ‘land with no or very minor limitations to agricultural use’ (i.e. the definition of Grade 1 give in the current ALC Guidelines).

Rather, by following Defra’s guidance on Farm and Crop Planning to minimize the risk of soil erosion, the agricultural land at Keyford, Yeovil, is more appropriately classified as Grade 2 land overall, i.e. land with minor limitations which affect crop yield, cultivations or harvesting - and in that regard I agree with the findings of the 2003 RAC report.”

And, he agrees with the RAC report of 2003.

Part of the site is not even best and most versatile agricultural land and is Subgrade 3b, due to gradient - and this should have been mapped by MAFF in 1996.

For the remainder, no-one disagrees that the land is capable of producing agricultural crops; but it cannot accurately be described as Grade 1 agricultural land described as “*with no or very minor limitations to agricultural use*”. In a small area it is definitely lower quality Subgrade 3b, but across the rest it is either Subgrade 3a or Grade 2.

Although Mr Askew makes reference to the 1988 MAFF guidelines for ALC assessment, he does not make reference to “pattern limitation” - where a land manager has to take account of variable conditions across a field - and manage the field with reference to the least limiting factor. The MAFF guidance states:

“A degree of variability in physical characteristics within a discrete area is to be expected. If the area includes a small proportion of land of different quality, the variability can be considered as a function of the mapping scale. Thus, small, discrete areas of a different ALC grade may be identified on large scale maps, whereas on smaller scale maps it may only be feasible to show the predominant grade. However, where soil and site conditions vary significantly and repeatedly over short distances and impose a practical constraint on cropping and land management a 'pattern' limitation is said to exist. This variability becomes a significant limitation if, for example, soils of the same grade but of contrasting texture occur as an extensive patchwork thus complicating soil management and cropping decisions or resulting in uneven crop growth, maturation or quality. Similarly, a form of pattern limitation may arise where soil depth is highly variable or microrelief restricts the use of machinery. Because many different combinations of characteristics can occur no specific guidelines are given for pattern limitations. The effect on grading is judged according to the severity of the limitations imposed by the pattern on cropping and management, and is mapped where permitted by the scale of the survey”.

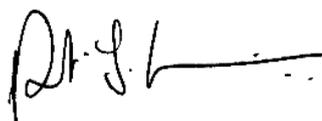
In this instance, erosion risk and gradient have been identified as factors that limit cropping and the land manager needs have regard as to the capability of farming the steepest land, as well as the flat land, in the same rotation.

In reality, the land at Keyford is - and has, for the many years - been farmed with regard to the gradient limitation - to somewhere between Grade 2 and Subgrade 3b. It has been farmed with continuous arable crops; not vegetables - and this reflects its effective ALC.

If you need either me or Mr Askew to attend the EiP in June, we would be pleased to assist the Inspector.

I trust this assists in clarifying matters.

Yours sincerely



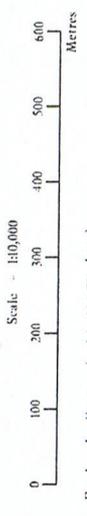
Peter Williams

APPENDIX 1

Agricultural Land Classification

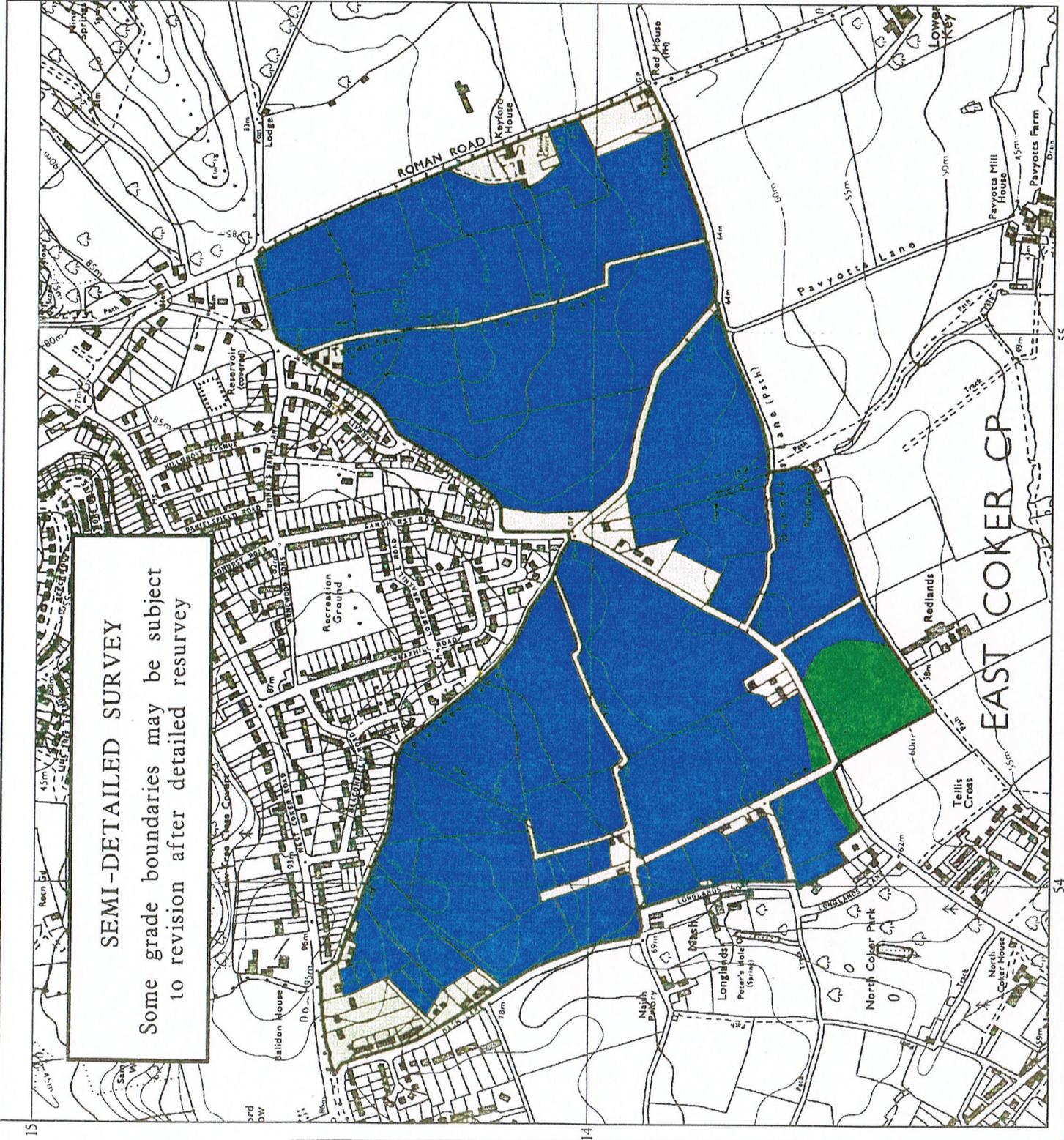
Nash Yeovil

Legend		Quality	Area (ha)
Grade 1		Excellent	89.9
Grade 2		Very Good	0.0
Grade 3a		Good	3.8
Grade 3b		Moderate	0.0
Grade 4		Poor	0.0
Grade 5		Very Poor	0.0
		Agricultural land not surveyed	0.0
		Other land	13.2
		Boundary of survey area	
Total agricultural land area			93.7
Total survey area			106.9
* Not present within survey area			



Further details contained in MAFF (1988) Agricultural Land Classification of England and Wales - Revised guidelines and criteria for grading the quality of agricultural land. MAFF (Publications), London S199 711.
 The information is accurate at base map scale but any enlargement would be misleading.
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SEMI-DETAILED SURVEY
 Some grade boundaries may be subject to revision after detailed resurvey

APPENDIX 2

Land at Keyford
Yeovil
Somerset

Agricultural Land Classification
and the
Soil Resource

October 2003

For: RPS
Planning, Transport and Environment
Milford House
260 Lichfield Road
Sutton Coldfield
West Midlands
B74 2UH

On behalf of: Charles Bishop Ltd

1. SITE AND CLIMATIC CHARACTERISTICS

1.1 General features and landform

The site lies to the south of Yeovil, Somerset.

The total area surveyed extends to about 38.2 ha of mainly agricultural land (36.4 ha) in arable cultivation and setaside, with three fields to the north and east under grass used for grazing horses at the time of survey. The remaining land (1.8 ha) comprises sections of roads and lanes, woodland, housing and gardens.

The site is bounded to the north by Apple Pie Lane and the grounds of St Margaret's Hospice; to the south by other agricultural land; to the east by Dorchester Road, Keyford House, other agricultural land, housing and gardens and to the west by East Coker Road, Lower East Coker Road, housing and gardens.

The land form across the site is mainly gently sloping, with the higher ground to the north which lies at an altitude of about 83 m aOD and the lower ground to the south at about 65 m aOD. Locally in the west, a small area of land is moderately sloping.

Surface form is mainly smooth to gently undulating.

1.2 Soil parent materials and natural drainage

The most extensive soil parent material across the site is the weathering products of the soft yellowish fine sandstone of the upper Yeovil Sands. To the west and south, soil profiles typically comprise brownish, coarse silty upper layers over yellowish, coarse silty lower layers. Most of the soils are deep; however, locally across the centre and south-west, soils are moderately deep over soft sandstone.

To the east and south-east on slightly lower lying ground, soils are developed in coarse silty colluvium which has eroded from the surrounding higher ground over time. Soil profiles are similar to those described above but are generally deep and soft sandstone does not occur within soil profile depth.

Natural drainage of both these soil types is mainly by relatively free vertical percolation down through the soil profiles layers. The presence of soft sandstone within 1.2 m depth may impede vertical percolation somewhat.

1.3 Climatic factors

Climatic factors affecting land quality, especially by their interactions with soil factors, are set out below. These have been interpolated from the Meteorological Office's standard 5 km grid point data set for the representative location **ST 550141** at **76 m aOD**.

Average annual rainfall (AAR): 848 mm

Accumulated temperature >0°C (AT0): 1489 day°

Field Capacity Days (FCD): 180 days

Moisture deficit - winter wheat (MDw): 100 mm

Moisture deficit - potatoes (MDp): 92 mm

The local climate is warm and moist. The number of FCD is well above the national average for lowland England (150 days). The combination of AAR and AT0 is not limiting, the moderately large AAR is the basis for only moderate "key" crop-adjusted moisture deficits.

2. AGRICULTURAL LAND QUALITY AND MAIN SOIL CHARACTERISTICS

2.1 Soil survey methods

Forty-three soil profiles were examined on a grid basis using an Edelman (Dutch) auger and spade at the approximate locations shown on Plan RAC 1, giving an observation density on the agricultural land of about 1.2 per ha. Soil profile characteristics were also examined in more detail in two soil pits (at or close to the locations of selected observation points): these are also shown on Plan RAC 1.

At each observation point the following characteristics were assessed for each main soil horizon to a depth of 1.2 m or to soft sandstone whichever was the shallower: texture; significant stoniness; colours (including gley mottle colours indicating seasonal wetness), density, degree of fissuring and macroporosity (together indicating structural conditions, permeability and rooting opportunities); free calcium carbonate; organic matter content and thickness.

Soil Wetness Class (WC) was inferred from the presence or absence of, and depth to, greyish and ochreous gley mottling and/or poorly permeable subsoil layers at least 150 mm thick.

2.2 Agricultural Land Classification (ALC) and main limitations

Soil, site and climatic constraints were evaluated mainly by reference to MAFF's 1988 revised ALC guidelines and criteria.

Overall the most extensive limitation across the site is the risk of soil erosion by surface water. The topsoils have a high proportion of fine sand and are inherently weakly structured. They are susceptible to surface capping, slaking and plough pans also easily develop. Under the right conditions (heavy rainfall, especially when falling on already-saturated ground) the risk of damaging soil erosion occurring on this site is high to very high, despite the relatively subdued landform. It therefore imposes a significant long-term physical limitation on the land's agricultural use and versatility. The presence of colluvial soils on the lower ground (with poorly-differentiated soil horizons below the cultivated topsoil) is evidence for the historical occurrence of mass soil movement.

The risk of erosion constrains the land with deeper soils, which would otherwise be grade 1, to grade 2.

Droughtiness, due to reduced soil moisture holding capacity, is an additional limitation across the centre of the site where soil profiles are moderately thick over soft sandstone.

2.3 Brief description of the land grade

Grade 2

Soil profiles typically comprise dark brown, stoneless to very slightly stony, fine sandy loam or fine sandy silt loam topsoils over yellowish brown, stoneless to very

slightly stony, fine sandy loam or fine sandy silt loam upper subsoils over yellowish, stoneless to very slightly stony, fine sandy loam or loamy fine sand lower subsoils. Locally, across the centre of the site, soil profiles are similar, but soft sandstone occurs between about 600 mm and 1.2 m depth.

Both these soil types are well drained (WC 1), but are constrained extensively by a soil erosion limitation, and in places where soft sandstone occurs within 1.2 m depth, by an additional droughtiness limitation.

4. SOIL RESOURCE

4.1 Introduction

The objective is to categorise the different soil materials according to their compatible - or contrasting - properties. This is to assist optimum recovery of the more valuable parts of the soil resource so that the potential for beneficial re-use can be realised.

The primary separation is between topsoil and subsoil. Secondary separations are also made in the subsoil, mainly on the basis of depth over soft sandstone.

4.2 Topsoil Types (Plan RAC 3)

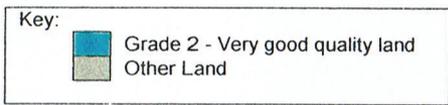
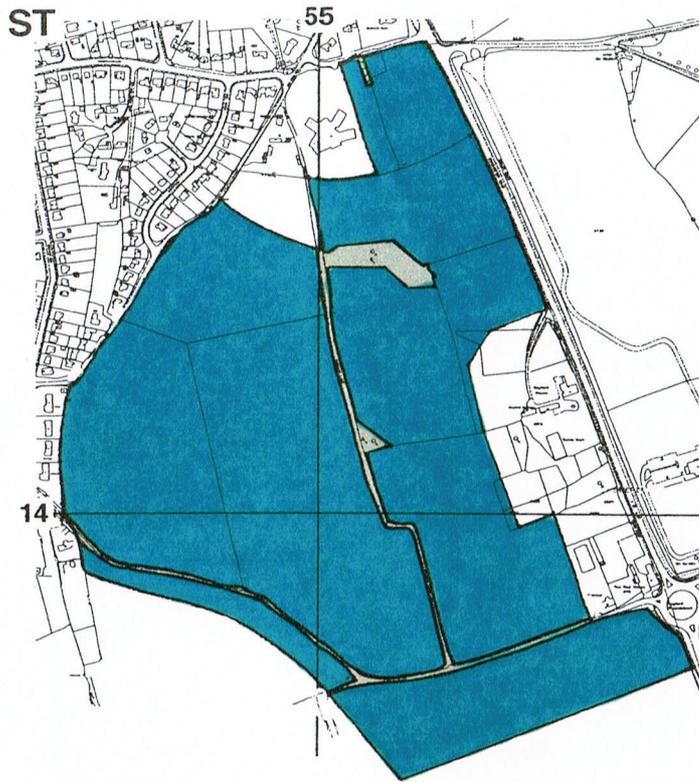
One main topsoil type, **Type A**, has been identified which typically comprises dark brown, stoneless to very slightly stony, fine sandy loam or fine sandy silt loam and is about 280-300 mm thick.

4.3 Subsoil Types (Plan RAC 4)

Two main subsoil types, **Types A and B**, have been identified which are separated on the basis of differing depth over soft sandstone.

Type A typically comprises yellowish brown, stoneless, fine sandy loam or fine sandy silt loam upper subsoils, about 300-320 mm thick; over yellowish, stoneless, fine sandy loam or loamy fine sand lower subsoils, about 580-620 mm.

Type B is similar to **Type A** described above, but soft sandstone occurs between 600 mm and 1.2 m.



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Date: 25/09/03 Job Number: RAC 3022

Plan RAC 2: Agricultural Land
Classification (ALC)

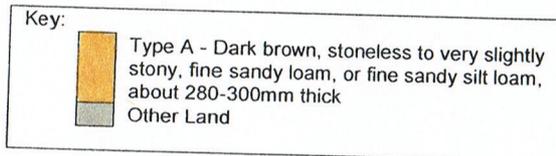
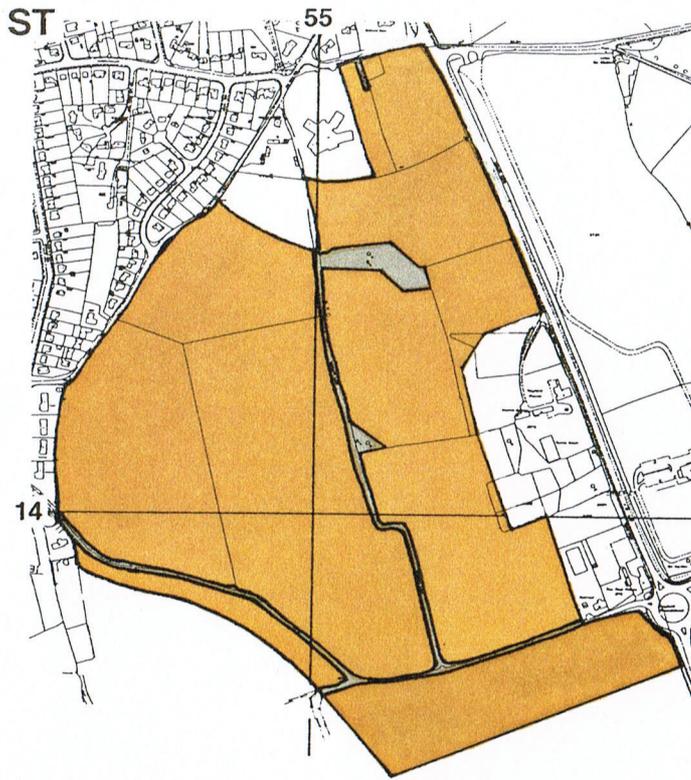
For: RPS
On Behalf of: Charles Bishop Ltd

Site: Land at Keyford,
Yeovil,
Somerset

Reading
Agricultural
Consultants



Races Farm, Aston Street, Aston Tirrold, Didcot, Oxon.
OX11 9DJ Tel: (01235) 851515 Fax: (01235) 851511



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Date: 25/09/03 Job Number: RAC 3022

Plan RAC 3: Topsoil Types

For: RPS
On Behalf of: Charles Bishop Ltd

Site: Land at Keyford,
Yeovil,
Somerset

**Reading
Agricultural
Consultants**



Races Farm, Aston Street, Aston Tirrold, Didcot, Oxon.
OX11 9DJ Tel: (01235) 851515 Fax: (01235) 851511



Key:	
	Type A - Yellowish brown, stoneless, fine sandy loam or fine sandy silt loam upper subsoils, about 300-320mm thick; over yellowish, stoneless, fine sandy loam or loamy fine sand lower subsoils, about 580-620mm thick
	Type B - As Type A subsoil described above, but soft sandstone occurs between 600mm and 1.2m depth
	Other Land

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Date: 25/09/03 Job Number: RAC 3022

Plan RAC 4: Subsoil Types

For: RPS
On Behalf of: Charles Bishop Ltd

Site: Land at Keyford,
Yeovil,
Somerset

**Reading
Agricultural
Consultants**



Races Farm, Aston Street, Aston Tirrold, Didcot, Oxon.
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APPENDIX 3

READING AGRICULTURAL CONSULTANTS

Land at Keyford, Yeovil, Somerset

Grade 1 vs Grade 2

The MAFF (October 1988) 'Revised guidelines and criteria for grading the quality of agricultural land' describe Grade 1 land (excellent quality agricultural land) as, '*Land with no or very minor limitations to agricultural use.*'

We do not consider this site to have no or very minor limitations. In our opinion there are three significant limitations affecting the quality of the land; inherently weak topsoil structure, an overall erosion risk and locally a droughtiness limitation. The first two are strongly related. Erosion risk is the main downgrading factor. The individual effect of the other two of these three limitations is considered to be slight at this site, but together the three are considered to amount to significantly more than a 'very minor' constraint. Therefore a Grade 2 classification is more appropriate.

Grade 2 land (very good quality agricultural land) is described in the MAFF revised guidelines as, '*Land with minor limitations which affect crop yield, cultivations or harvesting.*'

1. Inherently weak topsoil structure

The topsoils across the land at Keyford have a high proportion (77-88% of total particles) of fine sand (about 65-70%) and silt (about 12-18%). The organic matter content (3-3.5%) is relatively low. This combination gives an inherently weak structure-forming potential. They are thus susceptible to surface capping, slaking and plough pans also easily develop.

The effects of capping and slaking under rain impact in this generally slightly sloping land are to inhibit seedling emergence; up-root some seedlings and bury others. These effects are adverse to crop performance.

2. Erosion risk

The inherently weak topsoil structure is one of several potential triggers for erosion to take place and a significant factor to consider in assessing the overall risk of it happening at particular sites.

The MAFF revised guidelines do not give detailed criteria for classifying land according to erosion risk. However it does advise the following, '*The effects of soil erosion on land quality may be expressed in two ways. Firstly, erosion may have directly affected physical characteristics by, for example, reducing soil depth or creating steep sided gullies which inhibit the use of machinery. Such problems are taken into account by using the standard assessments of soil depth, droughtiness, gradient and microrelief. The second, rare circumstance is when soils especially prone to erosion may be downgraded because the risk of erosion constrains management to a degree which significantly reduces the range of crops which can be grown or markedly raises production costs. In nearly all cases where such a significant management problem occurs, erosion will tend to be a secondary factor*

accompanying other, more critical limitations such as slope or droughtiness. It is our opinion that the latter, so-called rare circumstance (which is now recognised by most authorities to be much more widespread than previously thought), applies at this site.

A scientific paper written by R. Evans in Soil Use and Management (September 1990) – ‘Soils at risk of accelerated erosion in England and Wales’ – places each of the soil associations of the National Soil Map of England and Wales into five categories of erosion risk. The soil map shows the land at Keyford as South Petherton Association, which is categorised as generally ‘at high risk of accelerated erosion’ ie. *‘Erosion generally affects more than 5% of fields per year, and median and mean volumes eroded are likely to be greater than those in the smaller risk categories....’*

The Soil Survey of England and Wales semi-detailed soil map (1987) – Sheet ST41/51 (Yeovil) shows two main soil series on site: South Petherton and Yeovil. The Soil Survey Record No. 111 – Soils in Somerset 1 – which accompanies the soil map, in Chapter 3 under the section discussing soil erosion, at Table 11 ranks the susceptibility of local soils to erosion. South Petherton and Yeovil series are both ranked as high risk and the eroded phases of South Petherton series as very high risk. The presence of eroded soils within the Keyford site shows that erosion has been active in the past, often associated with complex slopes that shed water easily. However, a local, detailed study (Colborne and Staines 1985 – cited by R. Evans) has shown that severe erosion can occur on slopes of as little as 2° under intensive arable use. The study shows that many gently-sloping fields are susceptible to soil erosion, particularly fields of winter cereals, and especially where the slopes are long but not straight – as is widely the case at the Keyford site.

MAFF (now DEFRA) have carried out a semi-detailed survey (Nash, Yeovil Ref. 75/95), in January 1996, of an area which includes the land at Keyford. MAFF graded the whole of the Keyford site as Grade 1 which is described as land having no limitation to its agricultural use. Erosion risk was not discussed in this report.

Other extensive areas of Grade 1 land have been mapped by MAFF, on similar soil types to those at Keyford, to the south of Yeovil (Yeovil West Ref 73/97 and Barwick Ref 74/97) also on a semi-detailed basis. Unlike the Nash survey both accompanying reports consider the effects of erosion risk. Paragraph 13 of the Yeovil West report states that, *‘The Yeovil Sands deposits have a consistent particle size distribution within the range of fine sand and coarse silt. This makes the soil susceptible to water erosion which causes considerable difficulties in other areas. Although there is some evidence of slight sheet erosion within the arable fields at this site, there is little evidence of erosion causing any difficulty although the lanes in the south of site are considerably sunken below field level. In terms of ALC, the risk of erosion is considered to be slight and not limiting. Any significant erosion limitation is confined to land with an overriding primary limitation due to gradient.’*

Although there was no evidence of actual erosion on the site, at the time of RAC’s survey (September 2003), it is the risk of erosion occurring, rather than the actuality, that is the constraining factor.

The three key physical factors that determine erosion risk are:

- Land use
- Soil type
- Landform

Land use

Erosion is likely to occur on arable land where a wide range of crops is, or could be (in the case of Grade 1 land) grown. Land under sugar beet, potatoes, field vegetables and bush fruit – all row crops with bare ground exposed between rows – is particularly at risk. The orientation of rows and headlands (across the slope is better, but headlands of across the slope rows will be up and down the slope) is also a significant risk factor.

Soil type

The soil types at the Keyford site are recognised as particularly at risk of water erosion on account of their inherently weak structure, as earlier noted.

Landform

Undulating terrain is the most vulnerable. Convexities and valleys are trigger points for erosion. Steepness of slope is not of overriding importance, but the presence of a convexity is. The western-most field is the most undulating on site, with several different slope directions. Other fields are less undulating and have relatively long slopes orientated with the preferred efficient cultivation direction. Although long straight slopes are considered generally to be at least risk of erosion (all other things being equal) it is the case that the slopes in fields on the Keyford site are not straight and also have upslope convexities.

The effects of these key factors on agricultural operations over the fields at Keyford are to constrain efficient field cultivation; reduce the choice of crops; and adversely affect their performance, if erosion is to be avoided – or the risk of occurrence be reduced to an acceptable level.

Under poor seasonal weather conditions (heavy rainfall, especially when falling on already-saturated ground) the risk of damaging soil erosion occurring on this site, if it is cropped inappropriately, is high, despite the relatively subdued landform. Erosion risk therefore imposes a significant long-term physical limitation on the land's agricultural use and versatility. The presence of colluvial soils on the lower ground (with poorly-differentiated soil horizons below the cultivated topsoil) is evidence for the historical occurrence of mass soil movement. The risk of erosion alone constrains the land with deeper soils (which would otherwise be Grade 1) to Grade 2.

MAFF, when making their assessment, do not appear to have taken full account of the potential for erosion to occur – particularly if the land were farmed to a Grade 1 potential.

3. Droughtiness

A slight droughtiness limitation affects a small number of soil profiles in patches across the centre of the site, where soft sandstone occurs at about 600 mm depth. The proportion of the site affected is about 10%. MAFF's semi-detailed surveys would not have picked this up to the extent that RAC's detailed survey did, thus causing an underestimation of the effect of that limitation.

Conclusion

The land at Keyford is certainly not Grade 1. Erosion risk alone is considered sufficient to preclude farming to a Grade 1 potential, by restricting the choice of crops, their performance, and by imposing limitations on the way land work is carried out.

The combined effect of inherently weak topsoil structure, overall erosion risk and local droughtiness limitations is certainly sufficient to downgrade the land from Grade 1 to Grade 2.

This judgment would be applied to the same degree, or to a greater degree, elsewhere in the locality if, for example, slopes were greater and the landform more undulating than applies at this site.

APPENDIX 4



21st May 2014

For the attention of Peter Williams

Reading Agricultural Consultants
Long Toll
Woodcote
READING
RG8 ORR

Our Ref: RWA/C268 Land at Keyford, Yeovil, Somerset

Dear Mr Williams,

RE: SOIL EROSION RISK ASSESSMENT AND AGRICULTURAL LAND QUALITY AT KEYFORD, YEOVIL, SOMERSET

I write further to your request to act on behalf of

Keyford Land owners
c/o Charles Bishop Limited
Langley House
24 Hendford
Yeovil
BA20 1TG

And to provide you with the findings of a soil erosion risk assessment that I have carried out in connection with agricultural land at Keyford, Yeovil, Somerset ('the Site'), and the implications that this has on the agricultural land classification (ALC) of the Site.

Suitability for Appointment

In terms of my cv, I am a Chartered Scientist and Past President of the Institute of Professional Soil Scientists (IPSS) the professional body of the British Society of Soil Science (BSSS). I have over twenty-five years of relevant experience in environmental research and consultancy and have recently acted as agricultural advisor on a number of major projects across the UK, including an assessment of agricultural land quality in a 100m-wide corridor either side of the M11 (J6/M25 – J8) as part of an Environmental Impact Assessment of a proposed expansion of Stansted Airport. I am also currently the Topic Lead for Agriculture, Forestry and Soil on HS2 Phase 1 (Country North – Warwickshire and Staffordshire).

Background

This soil erosion risk assessment has been carried out following the guidance published by the Department for Environment, Food and Rural Affairs (Defra) in '*Controlling soil erosion*' (2005) and specifically the methodology set out in Chapter 2 '*Field Guide for an Erosion Risk Assessment for Farmers and Consultants*'¹.

¹ Defra (2005) Chapter 2 '*Field Guide for an Erosion Risk Assessment for Farmers and Consultants*' in '*Controlling Soil Erosion*', Noble House, London. Available online @ <http://adlib.everysite.co.uk/adlib/defra/content.aspx?doc=110531&id=110532>. Last viewed 21 May 2014

Information on soil and agricultural land quality at the Site has been derived by a combination of a desktop study and a site visit on Friday 16th May, 2014.

The desktop study has utilised the following information:

- (i) Ministry of Agriculture, Fisheries and Food. South Somerset Local Plan, Nash, Yeovil (1996). *Agricultural Land Classification*;
- (ii) Reading Agricultural Consultants (2003). Land at Keyford, Yeovil, Somerset. *Agricultural Land Classification and the Soil Resource*;
- (iii) Reading Agricultural Consultants (2003). Land at Keyford, Yeovil, Somerset. *Grade 1 vs Grade 2*.

During my site investigation on 16th May I examined the soil profile with the use of a hand held soil auger to a depth of 120cm at three locations (National Grid Reference locations (i) ST5490014190, (ii) ST5490014300, and (iii) ST5480014100). This enabled me to familiarise myself with soil profiles (including the determination of topsoil texture class by hand-texturing) and the topographical characteristics (relief) of the Site. It also enabled me to examine and assess the accuracy of the findings of the MAFF and RAC ALC surveys.

I have also been provided with the findings of a Topographical Survey carried out by others on behalf of Charles Bishop Limited. These data have been utilised by an experienced Computer Aided Design (CAD) Technician to assess the gradient of slopes across the Site and to produce a map of the Soil Erosion Risk Assessment Categories (see **Figure 1** attached).

Soil Erosion Risk Assessment – Water Erosion

The Defra Soil Erosion Risk Assessment¹ states that runoff and erosion risk will depend on:

- soil texture; and,
- steepness of slope;

and are used to produce the following risk assessment matrix:

Table 1: Defra Soil Erosion (Water Erosion) Risk Assessment Categories

Soil Textures	Steep slopes >7°	Moderate slopes 3° - 7°	Gentle slopes 2° - 3°	Level ground <2°
Sandy and light silty soils	Very high	High	Moderate	Lower
Medium and calcareous soils	High	Moderate	Lower	Lower
Heavy soils	Lower	Lower	Lower	Lower

Defra then describe the *Erosion Risk Categories* as:

- **Very High** rills are likely to form in most years and gullies may develop in very wet periods.
- **High** rills are likely to develop in most seasons during wet periods.
- **Moderate** sediment may be seen running to roads, ditches or watercourses and rills may develop in some seasons during very wet periods.
- **Lower** sediment rarely seen to move but polluting runoff may enter ditches or watercourses.

Soil Erosion Risk Assessment at Keyford

It is clear from the MAFF ALC at Nash (including land at Keyford) ALC plan; the various RAC ALC reports and my own hand-texturing that the topsoil texture across the whole site at Keyford is fine sandy loam or sandy silty loam. (I have retained three soil samples laboratory analysis of Particle Size Determination (PSD), should this soil texture findings ever be in doubt).

Table 1 above, assesses soil erosion risk based on topsoil texture and gradient.

Having established that the topsoil texture is fine sandy loam/light silty topsoils Figure 1 then calculates the location and extent of agricultural land which falls into each Erosion Risk Category, as follows:

- Very High (Red) this category accounts for 1% of the site and as the gradient exceeds 7° the grading can be no better than Subgrade 3b
- High (Orange) this category accounts for approximately 15% of the Site and are located mainly on steep to moderate slopes along the north-west boundary of the Site;
- Moderate (Yellow) this category accounts for 49% of the Site and is spread in pockets over the whole Site, but mainly at the tops of the gentle slope in the large field in the east; and
- Lower (Green) this category accounts for 35% of the Site and is spread in pockets over the whole Site.

Thus, there is variability of erosion risk over the whole site, but with some of the site definitively NOT in Grade 1.

In assessing erosion risk, the Defra risk assessment states that

'...for assessment purposes large fields might be subdivided if slope, soils or topography differ significantly, but for the whole field assessment the worst case scenario should be mapped...'

In this case, I consider that:

- (i) the fields in the northwest and southwest (under grassland at the time of survey in May 2014) fall predominantly in the Very High Risk to High Risk Category (i.e. worst case scenario); and
- (ii) the large field in the east (cultivated and sown at the time of survey – assumed to be arable crop) falls predominantly in the Moderate Risk Category (i.e. worst case scenario).

Conclusion

Due to the Very High to High Risk of soil erosion in the northwest and southwest of the Site, and the Moderate Risk of soil erosion in the large field in the east, this agricultural land is not suitable for certain '*susceptible land uses*', as set out in Defra's guidance on Controlling Soil Erosion (2005), and this limits its versatility.

The Defra guidance on Controlling Soil Erosion¹ provides guidance on '*Farm and Crop Planning*', which sets out '*highly susceptible land uses*', including late sown winter cereals, potatoes, sugar beet, and forage maize, for example, that should be avoided on Very High and High Risk areas, unless certain precautions, such as additional hedge planting, etc, are carried out.

Therefore, whilst the risk of soil erosion at this Site could theoretically be reduced through appropriate farm management, the agricultural land cannot be regarded as '*land with no or very minor limitations to agricultural use*' (i.e. the definition of Grade 1 give in the current ALC Guidelines).

Rather, by following Defra's guidance on *Farm and Crop Planning* to minimize the risk of soil erosion, the agricultural land at Keyford, Yeovil, is more appropriately classified as Grade 2 land overall, i.e. *land with minor limitations which affect crop yield, cultivations or harvesting* - and in that regard I agree with the findings of the 2003 RAC report.

It should be noted that the 1996 MAFF ALC grading of the land at and around Keyford was a semi-detailed survey, and expressly stated²

'some grade boundaries may be subject to revision after detailed survey'.

Likewise, the Defra guidance on *Controlling Soil Erosion* was published in 2005 (i.e. after the MAFF ALC survey). Therefore, the soil erosion risk assessment set out in this letter provides the most current assessment of the erosion limitation to agricultural land quality at the Site utilising Defra best practice.

I trust that this erosion risk assessment and assessment of the erosion limitation to agricultural land quality at the Site provides you with all of the information that you require, but please do not hesitate to contact me if you require any further assistance.

Yours sincerely

A handwritten signature in dark ink, appearing to read 'Rob Askew', with a horizontal line underneath the name.

Rob Askew BSc (Hons) MSc MISoilSci CSci

² MAFF ALC Map of Nash, Yeovil (Ref. 75/95 at a scale of 1:10,000)



- Site boundary
- Very high risk (i.e. sandy soils on steep slopes $>7^\circ$)
- High risk (i.e. sandy soils on moderate slopes 3° to 7°)
- Moderate risk (i.e. sandy soils on gentle slopes 2° to 3°)
- Lower risk (i.e. sandy soils on level ground $<2^\circ$)



Soil Erosion Risk Assessment

(Based on Department for Environment, Food and Rural Affairs (2005), Chapter 2 'Field Guide for an Erosion Risk Assessment for Farmers and Consultants' in 'Controlling Soil Erosion'. London)

Project Name

Land at Keyford, Yeovil, Somerset

Client

Keyford land owners

Project No	Dwg. No	Date
C268	01	21/05/14

Scale	Drawn By
1:5,000 at A4L	RWA

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