

**LAND AT
ST NICHOLAS**

**AGRICULTURAL LAND
CONSIDERATIONS**

November 2014





**LAND AT
ST NICHOLAS**

**AGRICULTURAL LAND
CONSIDERATIONS**

November 2014

COPYRIGHT

The contents of this document must not be copied in whole or in part without the written consent of Kernon Countryside Consultants.

Authorised By APK 11/14

*Greenacres Barn, Stoke Common Lane, Purton Stoke, Swindon SN5 4LL
T: 01793 771333 Email: info@kernon.co.uk Website: www.kernon.co.uk*

*Directors - **Tony Kernon** BSc(Hons), MRAC, MRICS, FBIAC **Sarah Kernon**
Chartered Surveyors- **Verity Drewett** BSc(Hons), MRICS, MBIAC, **Sara Compton** BA (Hons), MSc, MRICS, MBIAC
Julia Norman BSc(Hons), MRICS*

1 INTRODUCTION

- 1.1 Development of a site of approximately 3.7 ha on the edge of St Nicholas is proposed.
- 1.2 This report considers the agricultural land quality of the site and the implications of that in terms of policy in Planning Policy Wales, 6th Edition.

2 THE SITE

- 2.1 The site comprises agricultural land on the northeast edge of the village, as shown below.

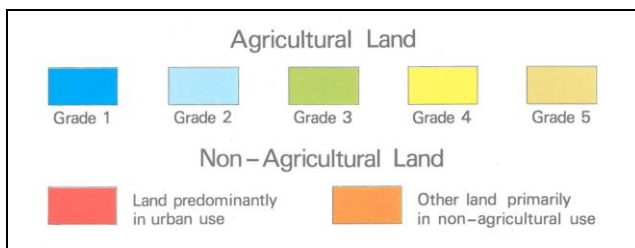
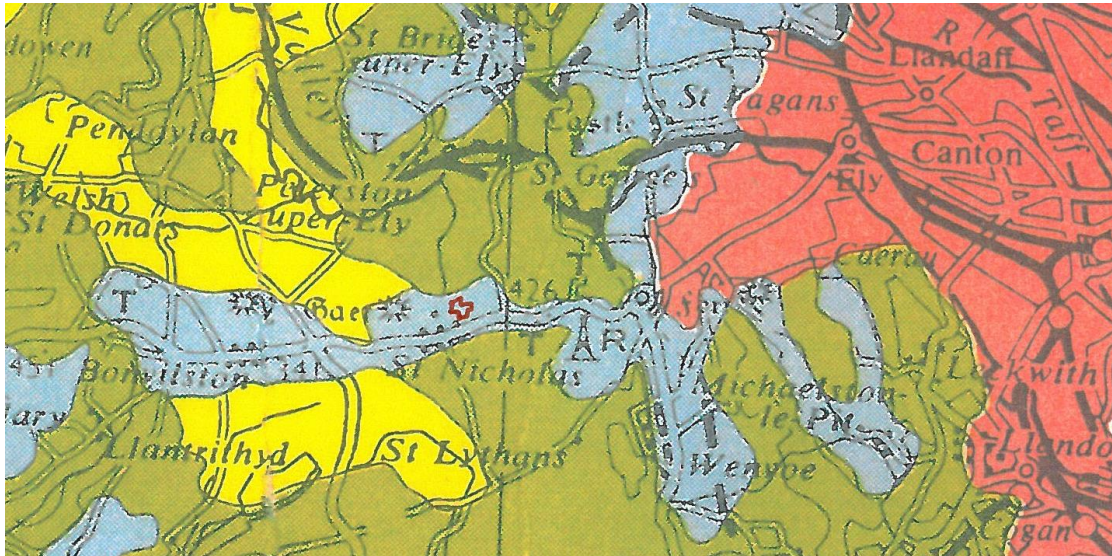
Insert 1: The Site



3 LAND QUALITY

3.1 The land quality is shown on the 1:250,000 provisional MAFF Agricultural Land Classification sheets as comprising Grade 2 land, with land beyond the northern margins shown as undifferentiated Grade 3. The site is indicated below.

Insert 2: Extract MAFF Provisional ALC (not to scale)



3.2 Provisional ALC maps are not sufficiently accurate to determine the grade for an individual site. Accordingly we carried out a detailed ALC survey using a soil auger and spade, using the MAFF Revised Guidelines for ALC.

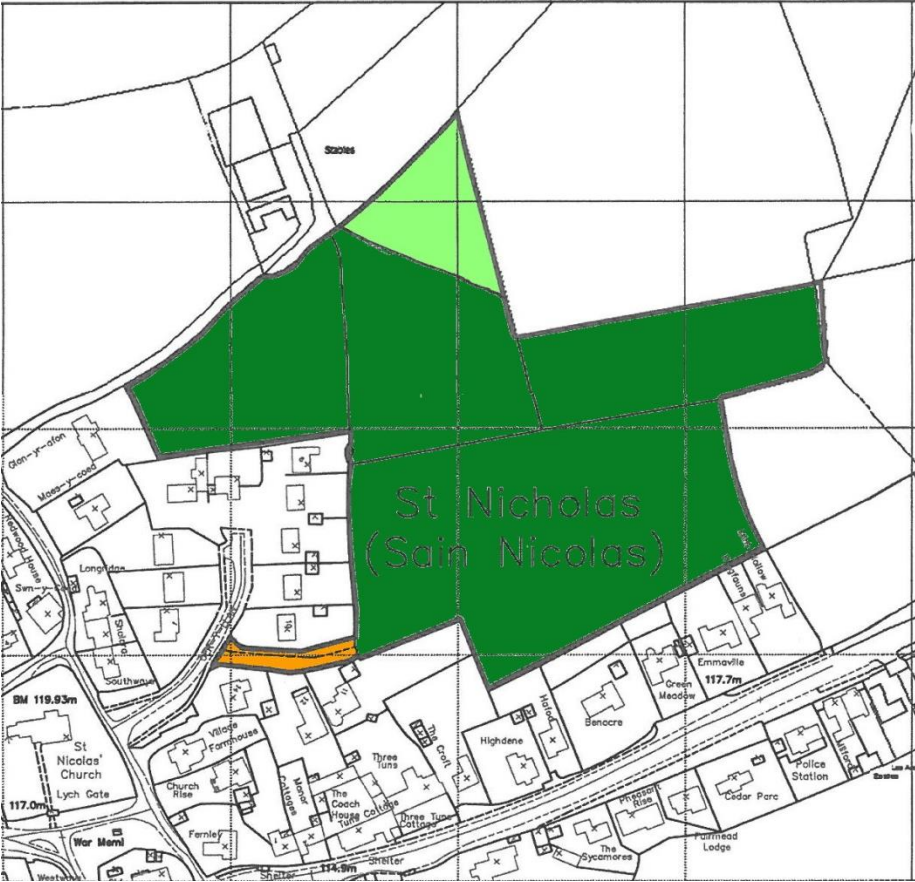
3.3 The results are set out in **Appendix KCC1**. We have identified the site to comprise a mixture of Subgrades 3a and 3b, in the following proportions.

Table 1: ALC Results

ALC Grade	Area (ha)	Proportion (%)
Subgrade 3a good quality	3.2	86.5
Subgrade 3b moderate quality	0.3	8.1
Non-agricultural	0.2	5.4
Total	3.7	100.0

3.4 The distribution is shown on the plan below, which is an extract from the ALC plan in **Appendix KCC1**.

Insert 3: Extract from ALC Plan



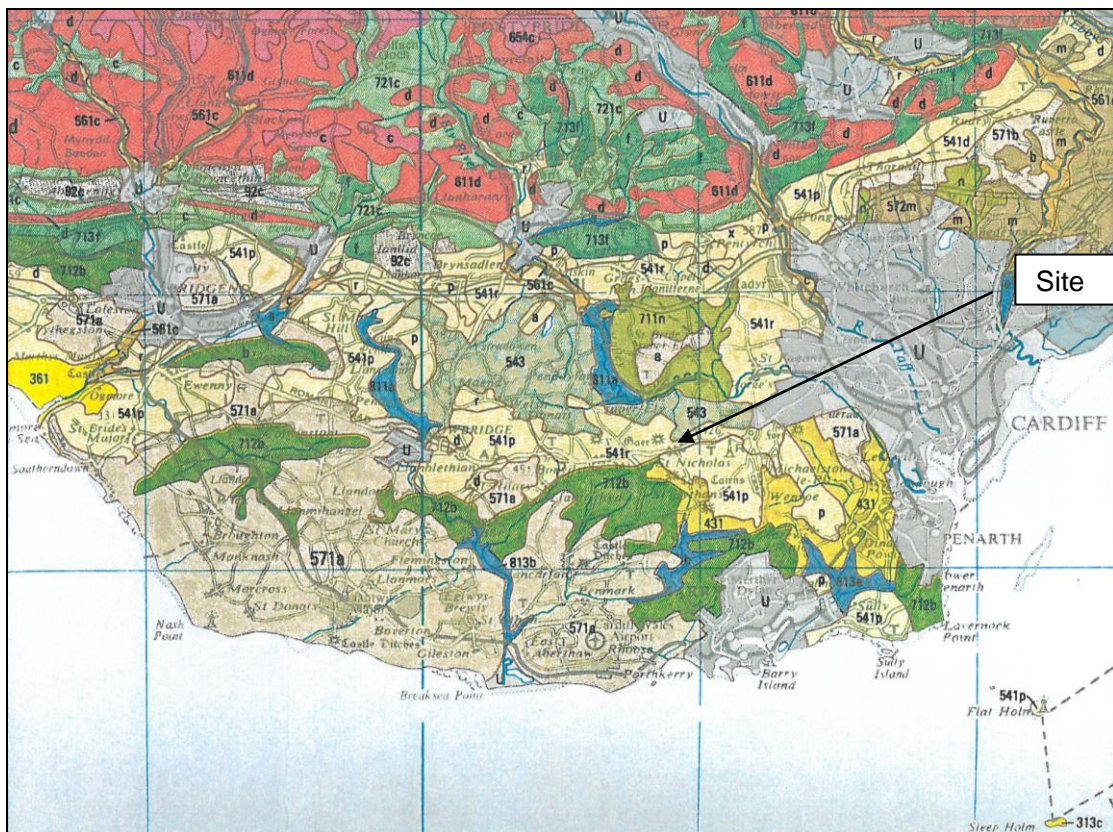
4 POLICY

- 4.1 Policy in Planning Policy Wales, 7th Edition (July 2014), paragraph 4.10.1, states that the best and most versatile agricultural land, that graded as 1, 2 or 3a, is a finite resource and should be conserved for the future. Considerable weight should be given to protecting such land from development.
- 4.2 Development of such land should only take place if there is an overriding need for the development and either previously developed land or land in lower agricultural grades is not available or lower grade land has a recognised environmental value.
- 4.3 If land in grades 1, 2 or 3a does need to be developed and there is a choice between sites of a different grade, development should be directed to land of the lowest grade.
- 4.4 Further guidance is available in TAN 6 (2010). Section 6.2 sets out the potential impacts including:
- limitations due to the proximity of development (6.2.5);
 - land loss and fragmentation (6.2.6);
 - use of buildings and fixed equipment (6.2.7);
 - irrigation and water supplies (6.2.8);
 - effects on drainage systems (6.2.9).
- 4.5 Annex B of TAN 6 sets out the arrangements for consultation with the Welsh Government, but those only apply where more than 20 ha of best and most versatile agricultural land is involved. In this case no more than 3.2 ha is involved, far below the consultation threshold.

5 ASSESSMENT

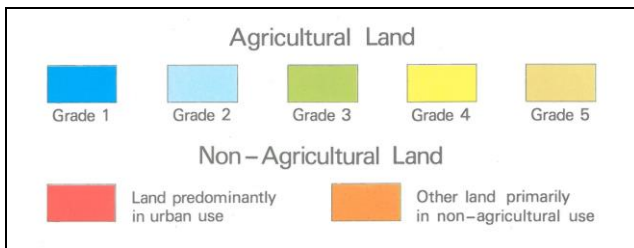
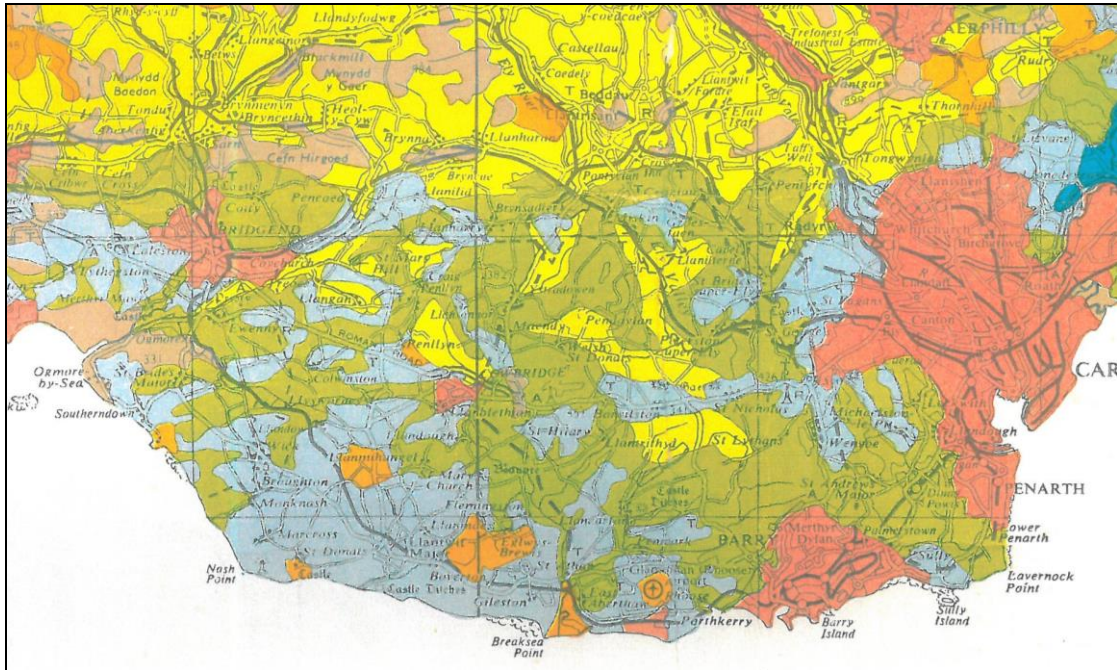
- 5.1 The site comprises a mixture, but is predominantly Subgrade 3a and therefore best and most versatile agricultural land.
- 5.2 The site is shown as Grade 2 on the published provisional ALC plans. As shown on Insert 2 above, all the land around St Nicholas and Bonvilston is also shown as of Grade 2 quality. Detailed survey reveals the site to comprise mostly Subgrade 3a with a small area of Subgrade 3b.
- 5.3 Soils in the area comprise generally well drained soils, with the land quality often determined by the proportion of clay in the topsoil. Much of the area between Cardiff and Cowbridge is a mixture of Subgrades 3a and 3b, depending upon clay content.
- 5.4 The extract from the National Soils Map below shows that around St Nicholas soils are shown as of the 541r Wick 1 and 541p Malham 2 associations, both deep well drained coarse loamy and sandy (Wick 1) or stoneless silty soils over limestone (Malham 2). There is no indication that around these settlements there is any likelihood of land of a lower quality being found.

Insert 4: Extract from National Soils Map



- 5.5 Taking a wider look, much of the land across the Vale of Glamorgan is shown as Grade 2 and undifferentiated Grade 3. We know from numerous surveys across the area that Grade 2 and Subgrade 3a (in particular) are widespread.

Insert 5: Wider “Provisional” ALC Map Extract



- 5.6 In this case the fields are small and are adjacent to a settlement where there can be limitations for their use due to the proximity of other development. There are no other significant agricultural effects such as on the use of buildings as identified in TAN 6.
- 5.7 In the context of the settlement, and in the wider context, Subgrade 3a and 3b land (as found on this site) is common.
- 5.8 Therefore if there is a choice between sites, Subgrade 3a is likely to comprise the lowest grade available in the area.

APPENDIX KCC1
Agricultural Land Classification

1 INTRODUCTION

- 1.1 This report sets out the findings of a detailed Agricultural Land Classification (ALC) survey of a site of approximately 3.7 hectares on the north-eastern edge of St Nicholas, Vale of Glamorgan.

2 METHODOLOGY

- 2.1 The work has been carried out by a Chartered Scientist and Member of the Institute of Professional Soil Scientists (IPSS). The IPSS is the chartered and professional body of the British Society of Soil Science (BSSS). In addition, this ALC survey has been carried out by a soil scientist who meets the requirements of the IPSS Professional Competency Scheme for ALC.
- 2.2 This assessment is based upon the findings of a study of published information on climate, geology and soil in combination with a soil investigation carried out in accordance with the Ministry of Agriculture, Fisheries and Food (MAFF) ¹ '*Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land*', October, 1988 (henceforth referred to as the 'the ALC Guidelines').
- 2.3 The ALC system 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 ALC system divides agricultural land into five grades (Grade 1 '*Excellent*' to Grade 5 '*Very Poor*'), with Grade 3 subdivided into Subgrade 3a '*Good*' and Subgrade 3b '*Moderate*'. Agricultural land classified as Grade 1, 2 and Subgrade 3a falls in the '*best and most versatile*' category in Paragraph 112 and Annex 2 of the National Planning Policy Framework (NPPF) of March 2012.
- 2.4 A detailed ALC survey was completed on the 19th May 2014. The detailed survey involved examination of the soil's physical properties at six locations located on a 100m by 100m grid. The auger locations of the detailed soil survey are shown on **Plan KCC1**.
- 2.5 A sample of topsoil was collected at auger locations 1, 2 and 4 and all three samples were sent to an accredited laboratory for particle size analysis, i.e. the proportions of sand, silt and clay. This is to determine the definitive texture class of the topsoil, especially with regard to distinguishing between medium clay loams (i.e. <27% clay), heavy clay loams (27% to 35% clay) and clays (>35% clay).

¹ The Ministry of Agriculture, Fisheries and Food (MAFF) was incorporated within the Department for Environment, Food and Rural Affairs (Defra) in June 2001

- 2.6 The sample locations were located using a hand-held Garmin E-Trec Geographic Information System (GIS) to enable the sample locations to be relocated for verification, if necessary.
- 2.7 The soil profile was examined at each sample location to a maximum depth of approximately 1.2 m by hand with the use of a 5 cm diameter Dutch (Edleman) soil auger.
- 2.8 The soil profile at each sample location was described using the ‘*Soil Survey Field Handbook: Describing and Sampling Soil Profiles*’ (Ed. J.M. Hodgson, Cranfield University, 1997). Each soil profile was ascribed a grade following the ALC Guidelines.

3 AGRICULTURAL LAND CLASSIFICATION

- 3.1 As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:
- climate;
 - site;
 - soil; and
 - interactive limitations.
- 3.2 These factors are considered in turn below.

Climate

- 3.3 Interpolated climate data relevant to the determination of the ALC grade of land at the Site is given in Table 1 below.

Table 1: ALC Climate Data for National Grid Reference ST 092 745

Climate Parameter	Data
Average Altitude (m)	118
Accumulated Temperature above 0°C (January – June)	1425
Average Annual Rainfall (mm)	1223
Field Capacity Days (FCD)	242
Moisture Deficit (mm) Wheat	67
Moisture Deficit (mm) Potatoes	50

- 3.4 With reference to Figure 1 ‘*Grade according to climate*’ on page 6 of the ALC Guidelines, the quality of agricultural land at the Site slightly limited by climate to Grade 2. As a result, agricultural land at the Site can be graded no higher than Grade 2 in the absence of any other limiting factor (ie site and/or soil).

3.5 Due to the average annual rainfall, agricultural land at the Site is predicted to be at field capacity (i.e. near saturation point) for 242 days per year, mainly over the late autumn, winter and early spring. This will, in an interaction with topsoil texture, cause an 'interactive limitation' to agricultural land quality at the Site - namely soil wetness (see below).

Site

3.6 The Site is located approximately 7 km to the north of Barry, Vale of Glamorgan. It is centred on National Grid Reference ST 092 745 and is bordered by the village of St Nicholas to the south west. The Site measures approximately 3.7 ha in area and comprises three agricultural fields which were under grass at the time of the survey. Farm buildings border the Site to the north west with agricultural land surrounding to the north and east. The location and boundary of the Site is shown on Figure 1.

3.7 With regard to the ALC Guidelines, agricultural land quality can be limited by one or more of three main site factors as follows:

- gradient;
- micro-relief (i.e. complex change in slope angle over short distances); and
- risk of flooding.

Gradient and Micro-Relief

3.8 The Site is located on a relatively flat gradient with all of the Site at an elevation of approximately 119m Above Ordnance Datum (AOD). Gradient is not considered to be a limiting factor to agricultural land quality at the Site.

3.9 Micro-relief, i.e. complex changes in slope angle and direction over short distances, does not affect the quality of the agricultural land at the Site.

Risk of Flooding

3.10 From an Environment Agency (EA) Flood Risk Map², the Site is not predicted to be at risk of flooding by rivers or the sea. Overall, the risk of flooding is not known to be limiting to agricultural land quality in terms of Table 2 '*Grade according to flood risk in summer*' and Table 3 '*Grade according to flood risk in winter*' of the ALC Guidelines.

² Environment Agency Flood Risk Map. Available online http://maps.environment-agency.gov.uk/wiyby/wiybyController?value=CF5+6SY&submit.x=0&submit.y=0&submit=Search%09&lang=_e&ep=map&topic=floodmap&layerGroups=default&scale=9&textonly=off Last viewed 23rd June 2014

Soil

Geology/Soil Parent Material

- 3.11 British Geological Survey (BGS) information available online has been utilised to identify the Bedrock underlying the Site and to determine whether or not the bedrock is covered by any Superficial (Drift) Deposits³. This provides information on soil forming materials at the Site.
- 3.12 The Site is underlain by bedrock geology described by the BGS (1:50,000) as Limestone of the Friars Point Limestone Formation and Dolomitised Limestone and Dolomite of the Friars Point Limestone Formation.
- 3.13 The BGS Superficial Deposit map (1:50,000) indicates that the bedrock at all of the Site is covered by superficial (drift) deposits described as Diamicton Till.

Published Information on Soil

- 3.14 Provisional information for soils at the Site was gathered from the Soil Survey of England and Wales (SSEW) soil map of Wales (Sheet 2) at a scale of 1:250,000 and accompanying Bulletin No. 11 '*Soils and their Use in Wales*' (C. C. Rudeforth *et al*, Harpenden, 1984). The information provided indicates that agricultural land at the Site is covered by soil grouped in the Wick 1 Association with soils of the Malham 2 Association to the south and Arrow Association soils to the north. The main physical characteristics of these soils are summarised below.
- 3.15 The Wick 1 Association occurs widely throughout Northern England, the Midlands and Wales but is not extensive in Eastern and South West England. Deep well drained (Wetness Class I) coarse loamy typical brown earths, Wick series, are intermixed with gleyic brown earths of the Arrow Series, and typical brown sands of the Newport Series. A typical profile in the Wick Series comprises of dark brown, slightly stony sandy loam or sandy silt loam over brownish yellow, slightly or moderately stony sand or loamy sand.
- 3.16 The Malham 2 Association is mapped where a variable thickness of silty Aeolian drift overlies limestone in the Peak District of Derbyshire and Staffordshire and in the Vale of Glamorgan. Malham soils are shallow or moderately deep fine silty soils with a characteristic brown unmottled subsoil over hard limestone. A typical profile comprises of dark brown, stoneless silty clay loam topsoil over brown, stoneless or slightly stony silty clay loam over limestone at approximately 70cm. the soils are porous and are underlain by fractured and well jointed limestone which ensures good drainage (Wetness Class I).

³ British Geological Survey 'Geology of Britain Viewer'. Available online @ <http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html> Last viewed 23rd June 2014.

3.17 Developed in glaciofluvial and river terrace deposits, the Arrow Association is composed predominantly of coarse loamy soils of which Arrow series, gleyic brown earths, and Quorndon series, cambic gley soils, cover more than half the land. Because of the variable nature of the underlying drift and differences in soil water regime, coarse loamy Wick, Hall and Rockland soils occur locally and sandy Newport, Ollerton and Blackwood soils are also found. A typical profile consists of a dark brown, stoneless or slightly stony sandy loam over a dark yellowish brown, slightly stony sandy loam with a brown, mottled, slightly stony sandy loam or loamy sand lower subsoil. The profiles are usually Wetness Class II or III but can be Wetness Class I where drainage has been implemented.

Soil Survey

3.18 From the detailed soil survey carried out on the 19th May 2014, it was determined that the soil across the Site consists of dark brown (Munsell colour 10YR 3/3), very slightly stony, non-calcareous medium clay loam topsoil over a dark brown (Munsell colour 10YR 3/3), very slightly stony, sandy clay loamy. At approximately 45cm depth the profiles consist of a brown (Munsell colour 10YR 4/4), slightly stony (10% stones) sandy clay loam which becomes slightly stonier at depth (15% stones).

3.19 The soil profiles are well drained and show no signs of mottling and are described as Wetness Class I as a result. The soil profile at auger location 1 showed signs of mottling within 70cm and has been placed in Wetness Class I as a result. Auger location 1 was mottled in the subsoil and was placed in Wetness Class II as a result.

3.20 In order to substantiate topsoil texture determined during the ALC survey by hand-texturing, three samples of topsoil were collected over the Site (i.e. Auger Locations 9, 18 and 42). The topsoil samples were sent to an accredited laboratory for analysis of particle size distribution (PSD), based on the British Standard Institution particle size grades. The certificate of analysis is provided as **Appendix A**. The findings of the PSD analysis are shown in Table 2 below:

Table 2: Topsoil Texture (re Table 10, ALC Guidelines)

Topsoil Sample Location (See Plan KCC 1)	% sand 0.063-2.0 mm	% silt 0.002-0.063 mm	% clay <0.002 mm	ALC Soil Texture Class
1	44	36	20	Medium Clay Loam
2	38	43	19	Medium Clay Loam
4	40	41	19	Medium Clay Loam

Interactive Limitations

- 3.21 From the published above, together with the findings of the detailed soil survey, it has been determined that the quality of agricultural land at the Site is limited by soil wetness.

Soil Wetness

- 3.22 From the ALC Guidelines, a soil wetness limitation exists where '*the soil water regime adversely affects plant growth or imposes restrictions on cultivations or grazing by livestock*'. The ALC grade according to soil wetness is shown in Table 3 below (based on Table 6 'Grade According to Soil Wetness – Mineral Soils' in the ALC Guidelines):

Table 3: Predicted ALC Grade According to Soil Wetness

ALC Grade According to Soil Wetness (re Table 6 of the MAFF ALC Guidelines)		
Wetness Class	Texture of the Top 25 cm	>225 Field Capacity Days
I	Medium Clay Loam* , Sandy Clay Loam	3a
	Heavy Silty Clay Loam**, Heavy Clay Loam**	3b
	Clay, Silty Clay	3b
II	Medium Clay Loam* , Sandy Clay Loam	3b
	Heavy Silty Clay Loam**, Heavy Clay Loam**	3b
	Clay, Silty Clay	3b

Key * <27% clay; and ** >27% clay

- 3.23 Therefore, soil profiles at the Site which have medium clay loam topsoil and are well drained (Wetness Class I) are limited by soil wetness to Subgrade 3a in this climate area (>225 field capacity days).
- 3.24 Soil profiles at the Site which have medium clay loam topsoil and experience slight seasonal waterlogging (Wetness Class II) are limited by soil wetness to Subgrade 3b.

Provisional ALC

- 3.25 Provisional ALC data (pre-1988) shows that the majority of agricultural land at the Site is Grade 2, with the northern margins of the site shown as ALC Grade 3. There is a small area of ALC Grade 4 land to the north-west of the site. The low resolution of the data means that the boundary between grades should be treated as somewhat indeterminate. There is no detailed (post 1988) ALC data available for the Site⁴, or land near the Site.

⁴ MAGIC.gov.uk. Last viewed 23rd June 2014

ALC Grading at the Site

Subgrade 3a

- 3.26 The detailed ALC survey has determined that the majority of the Site is covered by medium clay loam soils, which are well drained (Wetness Class I). In conjunction with the 242 field capacity days at the Site, the land is limited by soil wetness to Subgrade 3a.

Subgrade 3b

- 3.27 Auger location 1 was also found to comprise of a medium clay loam topsoil but the mottling present caused the profile to be placed in Wetness Class II. This causes the agricultural land to be limited to Subgrade 3b due to a soil wetness limitation.

Non-Agricultural

- 3.28 A small road to the south west of the Site has been graded as non-agricultural.
- 3.29 The area and proportion of agricultural land in each ALC grade has been measured from an ALC map given as **Plan KCC2**. The findings are reported in Table 4 below.

Table 4: Agricultural Land Classification – Land at St Nicholas, Vale of Glamorgan

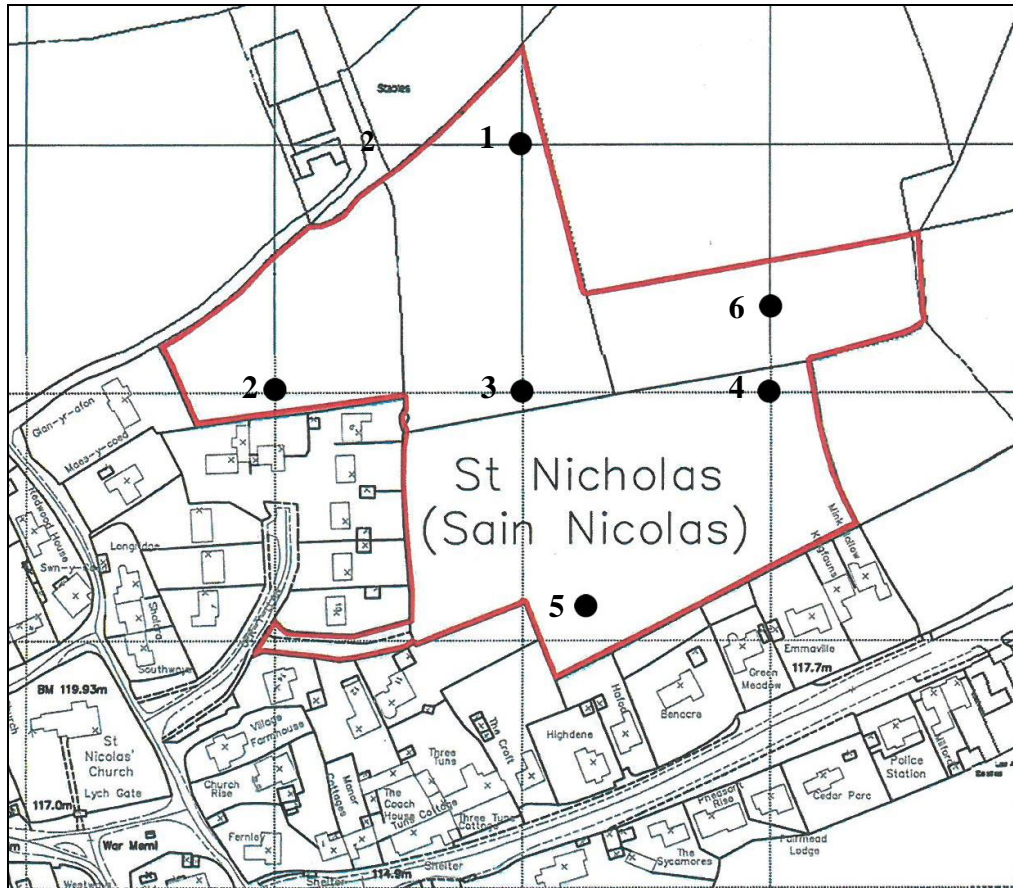
ALC Grade	Area (Ha)	Area (% of Total Site)
Grade 1 (Excellent)	0	0
Grade 2 (Very Good)	0	0
Subgrade 3a (Good)	3.2	86.5
Subgrade 3b (Moderate)	0.3	8.1
Grade 4 (Poor)	0	0
Grade 5 (Very Poor)	0	0
Other / Non-agricultural	0.2	5.4
Total	3.7	100.0

Appendix A
Particle Size Analysis Results



ANALYTICAL REPORT										
Report Number	34714-14	N717	ROB ASKEW	Client	C268 ST NICHOLAS					
Date Received	23-MAY-2014		RW ASKEW		VALE OF GLAMORGAN					
Date Reported	30-MAY-2014		THE OLD STABLES							
Project	SOILS		UPEXE							
Reference	C268 ST NICHOLAS		EXETER							
Order Number			DEVON EX5 5ND							
Laboratory Reference		SOIL254224	SOIL254225	SOIL254226						
Sample Reference		A1	A2	A4						
Determinand	Unit	SOIL	SOIL	SOIL						
Sand 2.00-0.063mm	% w/w	44	38	40						
Silt 0.063-0.002mm	% w/w	36	43	41						
Clay <0.002mm	% w/w	20	19	19						
Textural Class **		1	1	1						
Notes										
Analysis Notes	The sample submitted was of adequate size to complete all analysis requested. The results as reported relate only to the item(s) submitted for testing. The results are presented on a dry matter basis unless otherwise stipulated. This test report shall not be reproduced, except in full, without the written approval of the laboratory.									
Document Control										
Reported by	<p>Darren Whitbread Natural Resource Management, a trading division of Cawood Scientific Ltd. Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS Tel: 01344 886338 Fax: 01344 890972 email: enquires@nrm.uk.com</p>									

Plan KCC1
Auger Locations



KEY

● Auger / Pit Sample Location

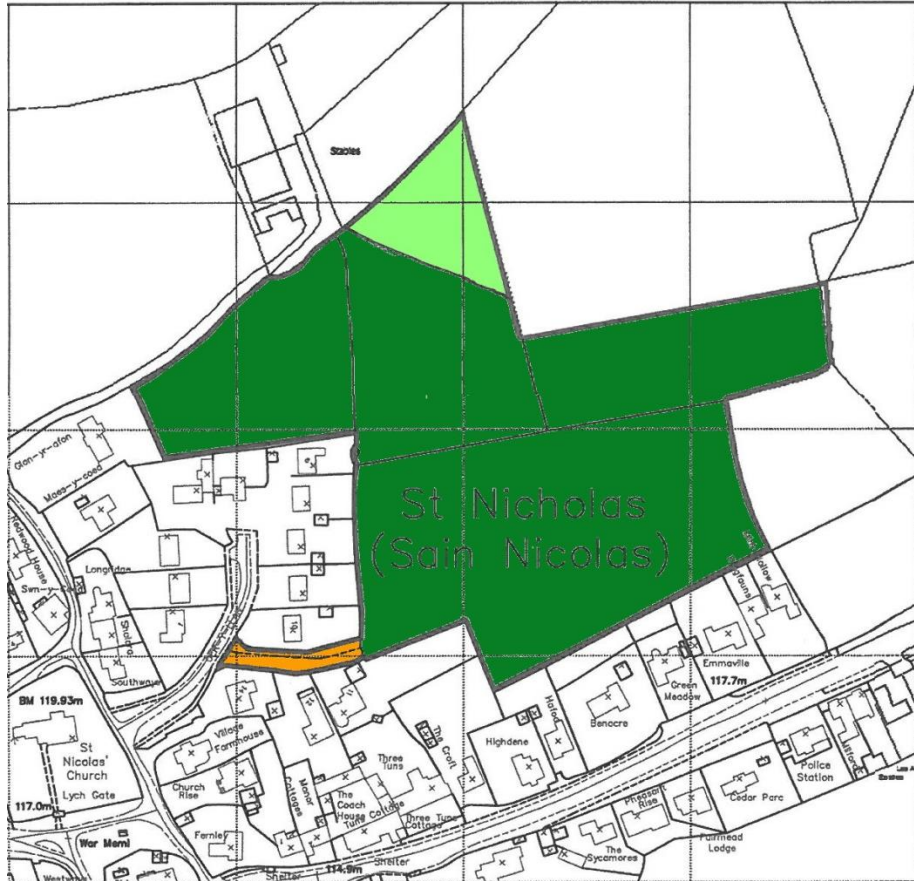
PLAN	KCC 1		
TITLE	Auger Points – Agricultural Land Classification		
SITE	Land at St Nicholas		
CLIENT	Redrow Homes Ltd		
NUMBER	KCC1756/01 06/14 jn		
DATE	June 2014	SCALE	NTS









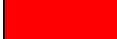
KERNON COUNTRYSIDE CONSULTANTS LIMITED
GREENACRES BARN, STOKE COMMON LANE, PURTON STOKE,
SWINDON, WILTSHIRE, SN5 4LL

Tel 01793 771333 Email: info@kernon.co.uk

This plan is reproduced from the Ordnance Survey under copyright licence 100015226.

Plan KCC2
ALC Results



KEY	Ha	%	PLAN	KCC2		
	Grade 1		TITLE	Agricultural Land Classification		
	Grade 2		SITE	Land at St Nicholas		
	Grade 3a	3.2	86.5	CLIENT	Redrow Homes Ltd	
	Grade 3b	0.3	8.1	NUMBER	KCC1756/02 06/14 jn	
	Grade 4		DATE	June 2014	SCALE	NTS
	Grade 5			<p align="center">KERNON COUNTRYSIDE CONSULTANTS LTD GREENACRES BARN, PURTON STOKE, SWINDON, WILTSHIRE SN5 4LL Tel 01793 771 333 Email: info@kernon.co.uk This plan is reproduced from the Ordnance Survey under copyright license 100015226</p>		
	Non-agricultural	0.2	5.4			
	Urban					
	Not surveyed					



Greenacres Barn, Stoke Common Lane, Purton Stoke, Swindon, Wiltshire SN5 4LL
Telephone: 01793 771333 • Email: info@kernon.co.uk • Website: www.kernon.co.uk

