

Development of national significance in the renewable energy sector

Agricultural Assessment

Penderi Solar Farm,
Land at Blaenhiraeth Farm,
Langennech, Llanelli, SA14 8PX

Articles 8 & 9 of Developments of National Significance
(Procedure) (Wales) Order 2016



**PROPOSED SOLAR FARM
AT
BLAENHIRAETH FARM / PENDERI,
LLANGENNECH, LLANELLI**

AGRICULTURAL ASSESSMENT

July 2019

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1 INTRODUCTION

- 1.1 This Agricultural Assessment considers the effects of a proposed solar farm on agricultural land at Blaenhiraeth Farm / Penderi, Llangennech, near Llanelli.
- 1.2 The site is located approximately 3.8 km to the north of Llangennech and 1 km to the west of the A476 and is split into northern and southern areas by a wood and a stream that runs from the north-west to the south-east in a valley bottom. Agricultural land rises on either side of the valley. Blaenhiraeth Farm is situated in the south of the site with agricultural land surrounding. An outlying range of agricultural buildings is located at Penderi in the northern area.
- 1.3 Solar arrays are proposed in three blocks across the site, collectively extending to approximately 96 ha. All land is currently in agricultural use.
- 1.4 This Assessment:
- i. considers the effects of the proposed solar farm on the national resource of agricultural land;
 - ii. considers the effects of the proposed solar farm on the occupying farm business and adjoining agricultural land; and
 - iii. assesses the proposals in light of national and local planning policy relating to farm diversification and the protection of agricultural land.
- 1.5 A desk-based assessment of agricultural land quality was undertaken in 2014 this showed that land within the solar areas cannot be graded any higher than Subgrade 3b due to a direct climate limitation. These findings have subsequently been verified by the publication of the Welsh Government's Predictive Agricultural Land Classification Maps in November 2017.
- 1.6 This Agricultural Assessment is being published to accompany pre-application consultation carried out under Articles 8 and 9 of the Development of National Significance (Procedure) (Wales) Order 2016. The formal pre-application consultation runs from Wednesday 7 August 2019 to Friday 29 September 2019.

The Author

- 1.7 The report has been prepared by Verity Drewett of Kernon Countryside Consultants Ltd (KCC). KCC is a specialist consultancy advising farmers, landowners and local

authorities on farm business, farm diversification and equine proposals. We are familiar with many different types of agricultural, horticultural and equine enterprises, and many forms of rural economic diversification, and the planning policy governing such enterprises. This Assessment follows a site visit made by a colleague in December 2014, during which the occupying farmer was interviewed and the site inspected. A subsequent review of aerial photography and a telephone conversation with the farmer were undertaken in August 2018 to verify and update the information obtained in 2014.

- 1.8 The desk-based assessment of agricultural land quality was undertaken by Rob Askew of Askew Land and Soil Limited.

2 THE PROPOSALS

- 2.1 The proposals seek the installation of solar arrays on agricultural land at Blaenhiraeth Farm / Penderi. Solar arrays are proposed in three blocks across the site, collectively extending to approximately 96 ha. In addition to the solar areas, land within the application area includes access tracks, temporary construction compounds, the laying of electricity cables and a small area for additional electrical infrastructure.
- 2.2 The proposed solar farm will involve the installation of photovoltaic panels for the generation of electricity to feed into the National Grid. The proposed photovoltaic panels will be installed in rows raised on a supporting framework. Cables between the rows of panels and between the solar areas will be buried in trenches. A very small amount of more substantial groundwork will be required to accommodate the small number of cabins housing the inverter and transformer units and the sub-station, and the creation of access tracks. The solar arrays will be surrounded by fences.
- 2.3 The proposed use will be temporary, for a period of approximately 35 years, after such time the solar panels and associated infrastructure will be removed.
- 2.4 A lease agreement will be signed between the landowner and the developer, with payment being made by way of an index linked rent.

3 AGRICULTURAL LAND QUALITY

Agricultural Land Quality

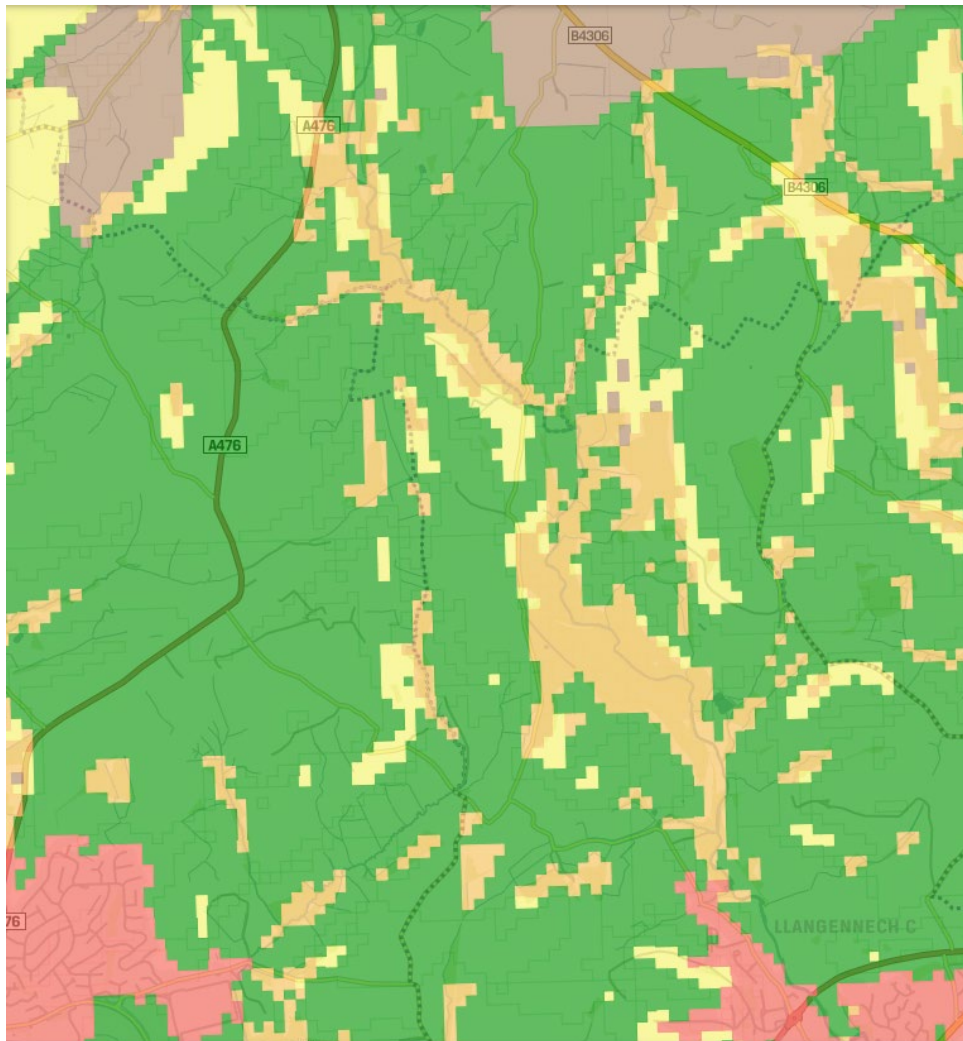
- 3.1 The Agricultural Land Classification (ALC) system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into five grades (Grade 1 '*Excellent*' 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*' (BMV) category as defined in paragraph 4.10.1 of Planning Policy Wales (10th Edition, December 2018). Further details of the ALC system are set out by Natural England (also relevant to Wales) in its Technical Information Note 049, given as **Appendix KCC1**.

Published Data

- 3.2 The site is identified on the provisional ALC map for Wales (1977) in an area of Grade 4 and undifferentiated Grade 3 agricultural land. The provisional ALC map is reproduced at **Plan KCC1**.
- 3.3 Provisional ALC maps are not sufficiently accurate to allow a full assessment of an individual field or development site and, as advised, should not be used other than for general guidance. Further, the provisional maps were created before the most recent guidelines were published (MAFF, 1988¹) and cannot be relied upon for accuracy. The provisional ALC maps do not differentiate between Subgrades 3a and 3b. The revised guidelines also more clearly state the effects of the interaction between climate and soils.
- 3.4 The Welsh Government has confirmed that the site has not been the subject of a detailed ALC survey in the past. When this enquiry was made back in 2014 given the lack of detailed survey work the only way to obtain a more definitive view on the likely agricultural land quality grade was to carry out a desk based ALC survey. Accordingly a desk based survey was undertaken and a copy of this desk-based report is attached at **Appendix KCC 2**.
- 3.5 However in November 2017 the Welsh Government published an on-line resource which sets out predictive ALC mapping across the whole of Wales. An extract from the predictive ALC website <http://lle.gov.wales/map/alc> is set out in **Figure KCC 1** below with the approximate outline of the Site highlighted in red.

¹ Ministry of Agriculture, Fisheries and Food (MAFF) '*Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land*', October 1988.

Insert KCC 1 : Extract from the Welsh Government Predictive ALC Plans



3.6 The extract from the Predictive Maps, as was done in our desk based ALC survey, shows that land quality across the Site can be no better than Grade 3b due to climate restrictions.

4 FARMING CIRCUMSTANCES

Agricultural Use

- 4.1 The land is in the ownership of a farming family based at Blaenhiraeth Farm which lies to the immediate north of the most southerly block of proposed solar panels. The holding extends to approximately 174 ha (430 acres), including all land within the site area plus a few additional parcels of agricultural land and woodland in the immediate area. The family owns / has rights over a further 535 ha (c. 1, 320 acres) of land near Brecon, including some common land (c. 170 ha / 420 acres) which is farmed in conjunction with other farmers. In total, therefore, the family owns / has rights over around 715 ha (circa 1, 770 acres) and the business farms across approximately 525 ha (c. 1, 300 acres, excluding an allowance for woodland) plus 170 ha common land.
- 4.2 All land at Blaenhiraeth is currently down to pasture and has been organic since 1999, although at the current time the family are not marketing their stock as organic. The family had operated a dairy enterprise on the holding since the mid-1970s, but due to the age of the landowners and the lack of immediate family wanting to succeed in 2017 the family took the decision to sell the dairy herd, but retained some cows to run a Suckler Cow herd from Blaenhiraeth as well as Brecon.
- 4.3 The business now runs a herd of 200 Suckler Cows with all off-spring being taken through to strong stores which are sold to a specialist finishing unit at circa 18 – 24 months of age. The combined farms support around 800 head of cattle, which are accommodated over the winter months in farm buildings at Blaenhiraeth, Penderi and at Brecon. Sheep in the ownership of other farmers (predominately from North Wales) graze the farms over the winter months.
- 4.4 The holding has historically been entered into the Glastir agri-environment scheme with an emphasis on organic production, however the farms current scheme has come to an end and they have not yet been accepted into the new scheme.
- 4.5 Full-time labour is provided by two family members, one of whom is now past retirement age with a full-time worker employed on the farm at Brecon.

5 PLANNING POLICY CONTEXT

National Planning Policy

- 5.1 National planning policy guidance governing non-agricultural development of agricultural land is set out in Planning Policy Wales (10th Edition, December 2018) (PPW) and the accompanying Technical Advice Note 6: Planning for Sustainable Rural Communities (TAN 6) (July 2010).
- 5.2 PPW seeks to protect BMV agricultural land. It states at paragraph 4.10.1 that, **“in the case of agricultural land”**, land of grades 1, 2 and 3a **“should be conserved as a finite resource for the future”**.
- 5.3 TAN 6 advises planning authorities to **“consider the quality of agricultural land and other agricultural factors”** (paragraph 6.2.1).
- 5.4 PPW also seeks to support rural diversification. Paragraph 7.3.3 states that **“local planning authorities should adopt a positive approach to development associated with farm diversification in rural areas.”**
- 5.5 TAN 6 further advises that **“planning authorities should support the diversification of the rural economy”** and **“facilitate diversification of the rural economy by accommodating the needs of both traditional rural industries and new enterprises”** (paragraph 3.1.2).
- 5.6 TAN 8 which was published in 2005 sets out the Government’s policy on Renewable Energy however it does not provide any specific policy on field-scale solar development.

Local Planning Policy

- 5.6 Local planning policy is set out in the Carmarthenshire Local Development Plan, adopted in December 2014 (‘the LDP’).
- 5.7 At paragraph 5.2.4 of the LDP, the Council describes the approximate quantity of agricultural land in the county and states **“the majority classified as grade 3a and 4 with a small tranche of grade 2 land in the south-east of the County”** (sic). It is not known if the Council has undertaken an analysis to distinguish land quality across the county between Subgrades 3a and 3b.
- 5.8 Bullet point ‘g’ of LDP policy SP14 seeks to protect the best and most versatile agricultural land **“(Grade 2 and 3a)”**.

5.9 Farm diversification is broadly supported. Policy EMP14: Farm Diversification will permit schemes where, inter alia:

a) **“it is subordinate to, compatible with and supports the continued operation of the agricultural activity of the existing working farm”**; and

b) **“it is of a scale and nature appropriate to the existing farm operation”**.

National Practice Guidance

5.10 In February 2011, the Welsh Government published Practice Guidance: Planning Implications of Renewable and Low Carbon Energy, including solar PV arrays. The Guidance recognises **“that a significant proportion of proposals for solar PV arrays will be on agricultural land”** and that the use of **“high quality agricultural land”** and the **“reversibility”** of proposals will be of consideration in determining whether an EIA is required.

5.11 This Practice Guidance has not been updated / revised since 2011.

6 ASSESSMENT

Agricultural Land

- 6.1 A desk-based assessment of land quality was undertaken and it determined that land within the proposed solar areas cannot be graded higher than Grade 3b ('moderate' quality) due to a direct climate limitation. The findings of this desk-based agricultural land classification survey have subsequently been validated by the publication of the predictive agricultural land classification plans.
- 6.2 It is therefore confirmed that the land within the solar areas is not BMV agricultural land.
- 6.3 Further, although the proposal relates to the non-agricultural development of agricultural land but does not involve the irreversible loss of that land to agriculture. The installation of the solar panels will require relatively unobtrusive construction methods, with only the frames of the panels being pile-driven into the ground. Cables between rows of panels will be buried in trenches. Small inverter cabins will be stationed on the land and access tracks provided.
- 6.4 Land within the solar areas will be available for continued agricultural use for the duration of the solar tenancy. The site will be capable of being grazed by sheep. Cattle will not graze around the panels, the animals being too large, and grass will not be cut for silage whilst the panels are in place. In the short term the full range of potential agricultural uses to which the land can be put will be reduced whilst the solar panels are in place, but the general management of the site will remain unchanged (the grassland will continue to provide grazing for livestock).
- 6.5 At the end of the solar tenancy, the panels and cables will be capable of being pulled from the ground and the small quantities of electricity generating equipment removed. The pasture will be able to be returned to a full range of uses, if the landowning farmer so wishes. This temporary nature is unlike other forms of non-agricultural development such as housing or industrial developments which irreversibly develop agricultural land and prevent any return to agriculture in the future. Even if BMV land were affected, which it will not be, the proposals do not involve the irreversible development of agricultural land. The **"finite resource"** will be conserved for future agricultural use (PPW).
- 6.6 Our desk-based ALC assessment indicated that areas to the very east of the Site, may fall into the Subgrade 3a category where they are located below 90 m AOD, unless more limiting factors downgrade the classification. These areas are outside the fenced solar areas and are included for underground cables. Once the cables have been buried, the

land will be restored to full agricultural use for the duration of the solar tenancy. The ALC grading of these small areas is not, therefore, a relevant consideration.

Effects on the Occupying Farm Business

- 6.7 The Site area extend to approximately 96 ha of agricultural land. These areas will no longer be available for cattle grazing or silage production. The fenced solar areas represent just over 18% of agricultural land under the exclusive control of the farm business (i.e. excluding the common land). The solar arrays will accordingly occupy only a small proportion of the area of agricultural land available to the farm business.
- 6.8 The farmers have recently sold their long-standing dairy enterprise, in a bid to reduce the work load associated with the farm. The reduction in forage / cattle grazing area as a result of the solar development, which will be off-set by the rental income that will be received from the solar operators, will enable the family to further reduce the number of cattle that are run by the business enabling the older generation to actually step back from much of the physical work that is associated with running a large Suckler Cow herd.
- 6.9 The existing beef enterprise will be able to continue from both farms albeit on a reduced basis. However this reduced scale will still provide sufficient employment for the two remaining members of staff. No farm buildings are affected.
- 6.10 The landowners will receive a rental income for the duration of the solar tenancy (a period of approximately 35 years). Income and expenditure associated with agriculture can be volatile so a long term solar agreement would provide the business with a source of regular, predictable income which would enhance the continued resilience and viability of this family-run holding, helping to secure the long-term viability of the business for the next generation. The proposal would therefore **“facilitate diversification of the rural economy”** (TAN6) whilst being **“subordinate to, compatible with and supports the continued operation of the agricultural activity of the existing working farm”** and **“is of a scale and nature appropriate to the existing farm operation** (local policy EMP14).

Impacts on the Adjacent Agricultural Land

- 6.11 Approximately 78 ha of land will remain outside the solar areas at Blaenhiraeth Farm, once the temporary compounds have been removed and the connecting cables have been buried. This land will continue to be available for cattle grazing and forage production..
- 6.12 The farm business will have use of the proposed access tracks outside the fenced areas as part of their usual farming activities. The proposals will not impact upon drainage outside the proposed areas. Adjacent agricultural land will be unaffected.

7 SUMMARY AND CONCLUSIONS

- 7.1 This report provides a review of the effects of a proposed solar farm on agricultural land at Blaenhiraeth Farm and Penderi, to the north of Llanelli.
- 7.2 Solar arrays are proposed across three parcels of land extending to approximately 96 ha. The occupying farm business farms across 500 ha or so plus has access / rights across common land.
- 7.3 A desk-based assessment of agricultural land quality, undertaken in December 2014, which has subsequently been verified following the publication of the Welsh Government's Predictive ALC plans in November 2018, has determined that land within the solar areas cannot be graded higher than Subgrade 3b due to a climate limitation.
- 7.4 In policy terms, no significant weight needs to be accorded to agricultural land quality.
- 7.5 Furthermore, the land will not be irreversibly developed and will remain in agricultural use as the grazing of sheep will be possible across the site whilst the solar arrays are in place.
- 7.6 One farm businesses is affected. The proposed solar farm:
- i. will provide the landowning farm business with a stable income for the duration of the tenancy of the solar farm which will enable the older generation, who are well past retirement age, to retire from the physical work associated with the livestock enterprise;
 - ii. will remain capable of agricultural use (the grazing of sheep); and
 - iii. will not affect the ability of adjacent agricultural land to be used for continued agricultural production.

Appendix KCC1

Natural England
Technical Information Note 049 –
Agricultural Land Classification
(December 2012)

Agricultural Land Classification: protecting the best and most versatile agricultural land

Most of our land area is in agricultural use. How this important natural resource is used is vital to sustainable development. This includes taking the right decisions about protecting it from inappropriate development.

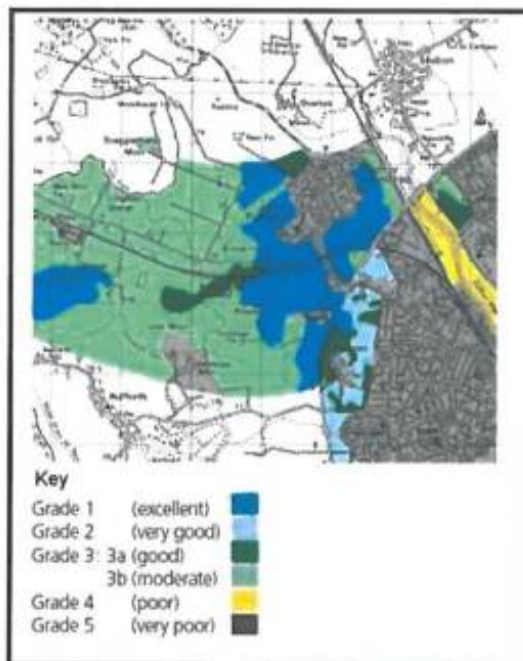
Policy to protect agricultural land

Government policy for England is set out in the National Planning Policy Framework (NPPF) published in March 2012 (paragraph 112). Decisions rest with the relevant planning authorities who should take into account the economic and other benefits of the best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of higher quality. The Government has also re-affirmed the importance of protecting our soils and the services they provide in the Natural Environment White Paper The Natural Choice: securing the value of nature (June 2011), including the protection of best and most versatile agricultural land (paragraph 2.35).

The ALC system: purpose & uses

Land quality varies from place to place. The Agricultural Land Classification (ALC) provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system. It helps

underpin the principles of sustainable development.



Agricultural Land Classification - map and key

Agricultural Land Classification: protecting the best and most versatile agricultural land

The ALC system classifies land into five grades, with Grade 3 subdivided into Subgrades 3a and 3b. The best and most versatile land is defined as Grades 1, 2 and 3a by policy guidance (see Annex 2 of NPPF). This is the land which is most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non food uses such as biomass, fibres and pharmaceuticals. Current estimates are that Grades 1 and 2 together form about 21% of all farmland in England; Subgrade 3a also covers about 21%.

The ALC system is used by Natural England and others to give advice to planning authorities, developers and the public if development is proposed on agricultural land or other greenfield sites that could potentially grow crops. The Town and Country Planning (Development Management Procedure) (England) Order 2010 (as amended) refers to the best and most versatile land policy in requiring statutory consultations with Natural England. Natural England is also responsible for Minerals and Waste Consultations where reclamation to agriculture is proposed under Schedule 5 of the Town and Country Planning Act 1990 (as amended). The ALC grading system is also used by commercial consultants to advise clients on land uses and planning issues.

Criteria and guidelines

The Classification is based on the long term physical limitations of land for agricultural use. Factors affecting the grade are climate, site and soil characteristics, and the important interactions between them. Detailed guidance for classifying land can be found in: *Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988):

- **Climate:** temperature and rainfall, aspect, exposure and frost risk.
- **Site:** gradient, micro-relief and flood risk.
- **Soil:** texture, structure, depth and stoniness, chemical properties which cannot be corrected.

The combination of climate and soil factors determines soil wetness and droughtiness.

Wetness and droughtiness influence the choice of crops grown and the level and consistency of yields, as well as use of land for grazing livestock. The Classification is concerned with the inherent potential of land under a range of farming systems. The current agricultural use, or intensity of use, does not affect the ALC grade.

Versatility and yield

The physical limitations of land have four main effects on the way land is farmed. These are:

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

The ALC gives a high grading to land which allows more flexibility in the range of crops that can be grown (its 'versatility') and which requires lower inputs, but also takes into account ability to produce consistently high yields of a narrower range of crops.

Availability of ALC information

After the introduction of the ALC system in 1966 the whole of England and Wales was mapped from reconnaissance field surveys, to provide general strategic guidance on land quality for planners. This Provisional Series of maps was published on an Ordnance Survey base at a scale of One Inch to One Mile in the period 1967 to 1974. These maps are not sufficiently accurate for use in assessment of individual fields or development sites, and should not be used other than as general guidance. They show only five grades: their preparation preceded the subdivision of Grade 3 and the refinement of criteria, which occurred after 1976. They have not been updated and are out of print. A 1:250 000 scale map series based on the same information is available. These are more appropriate for the strategic use originally intended and can be downloaded from the Natural England [website](http://magic.defra.gov.uk/). This data is also available on 'Magic', an interactive, geographical information website <http://magic.defra.gov.uk/>.

Since 1976, selected areas have been re-surveyed in greater detail and to revised

Agricultural Land Classification: protecting the best and most versatile agricultural land

guidelines and criteria. Information based on detailed ALC field surveys in accordance with current guidelines (MAFF, 1988) is the most definitive source. Data from the former Ministry of Agriculture, Fisheries and Food (MAFF) archive of more detailed ALC survey information (from 1988) is also available on <http://magic.defra.gov.uk/>. Revisions to the ALC guidelines and criteria have been limited and kept to the original principles, but some assessments made prior to the most recent revision in 1988 need to be checked against current criteria. More recently, strategic scale maps showing the likely occurrence of best and most versatile land have been prepared. Mapped information of all types is available from Natural England (see *Further information* below).

New field survey

Digital mapping and geographical information systems have been introduced to facilitate the provision of up-to-date information. ALC surveys are undertaken, according to the published Guidelines, by field surveyors using handheld augers to examine soils to a depth of 1.2 metres, at a frequency of one boring per hectare for a detailed assessment. This is usually supplemented by digging occasional small pits (usually by hand) to inspect the soil profile. Information obtained by these methods is combined with climatic and other data to produce an ALC map and report. ALC maps are normally produced on an Ordnance Survey base at varying scales from 1:10,000 for detailed work to 1:50 000 for reconnaissance survey.

There is no comprehensive programme to survey all areas in detail. Private consultants may survey land where it is under consideration for development, especially around the edge of towns, to allow comparisons between areas and to inform environmental assessments. ALC field surveys are usually time consuming and should be initiated well in advance of planning decisions. Planning authorities should ensure that sufficient detailed site specific ALC survey data is available to inform decision making.

Consultations

Natural England is consulted by planning authorities on the preparation of all development

plans as part of its remit for the natural environment. For planning applications, specific consultations with Natural England are required under the Development Management Procedure Order in relation to best and most versatile agricultural land. These are for non agricultural development proposals that are not consistent with an adopted local plan and involve the loss of twenty hectares or more of the best and most versatile land. The land protection policy is relevant to all planning applications, including those on smaller areas, but it is for the planning authority to decide how significant the agricultural land issues are, and the need for field information. The planning authority may contact Natural England if it needs technical information or advice.

Consultations with Natural England are required on all applications for mineral working or waste disposal if the proposed afteruse is for agriculture or where the loss of best and most versatile agricultural land will be 20 ha or more. Non-agricultural afteruse, for example for nature conservation or amenity, can be acceptable even on better quality land if soil resources are conserved and the long term potential of best and most versatile land is safeguarded by careful land restoration and aftercare.

Other factors

The ALC is a basis for assessing how development proposals affect agricultural land within the planning system, but it is not the sole consideration. Planning authorities are guided by the National Planning Policy Framework to protect and enhance soils more widely. This could include, for example, conserving soil resources during mineral working or construction, not granting permission for peat extraction from new or extended mineral sites, or preventing soil from being adversely affected by pollution. For information on the application of ALC in Wales, please see below.

Agricultural Land Classification: protecting the best and most versatile agricultural land

Further information

Details of the system of grading can be found in: *Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

Please note that planning authorities should send all planning related consultations and enquiries to Natural England by e-mail to consultations@naturalengland.org.uk. If it is not possible to consult us electronically then consultations should be sent to the following postal address:

Natural England
Consultation Service
Hornbeam House
Electra Way
Crewe Business Park
CREWE
Cheshire
CW1 6GJ

ALC information for Wales is held by Welsh Government. Detailed information and advice is available on request from Ian Rugg (ian.rugg@wales.gsi.gov.uk) or David Martyn (david.martyn@wales.gsi.gov.uk). If it is not possible to consult us electronically then consultations should be sent to the following postal address:

Welsh Government
Rhodfa Padarn
Llanbadarn Fawr
Aberystwyth
Ceredigion
SY23 3UR

Natural England publications are available to download from the Natural England website: www.naturalengland.org.uk.

For further information contact the Natural England Enquiry Service on 0300 060 0863 or e-mail enquiries@naturalengland.org.uk.

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Appendix KCC1

Desk based ALC Survey

DESK BASED ALC SURVEY OF LAND AT PENDERI

NOVEMBER 2014

Methodology

- A.1 The work has been carried out by a Chartered Scientist, who is a 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). This assessment has been carried out by a soil scientist who meets the requirements of the IPSS Professional Competency Scheme for ALC. The IPSS Professional Competency Scheme is endorsed, amongst others, by the Welsh Government, the Science Council, and the Institute of Environmental Management and Assessment (IEMA).
- A.2 The assessment is based on a desk-top study of the relevant published information on climate, topography, geology and soil and has been carried out in accordance with the Ministry of Agriculture, Fisheries and Food (MAFF) '*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').

Study Area

- A.3 An area of approximately 143 ha has been considered, to the north and south of the river valley associated with Afon Morlais. The solar areas are located within this study area.

Factors Affecting ALC

- A.4 As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:
- climate;
 - site;
 - soil; and
 - interactive limitations.
- A.5 The factors are considered in turn below.

Climate

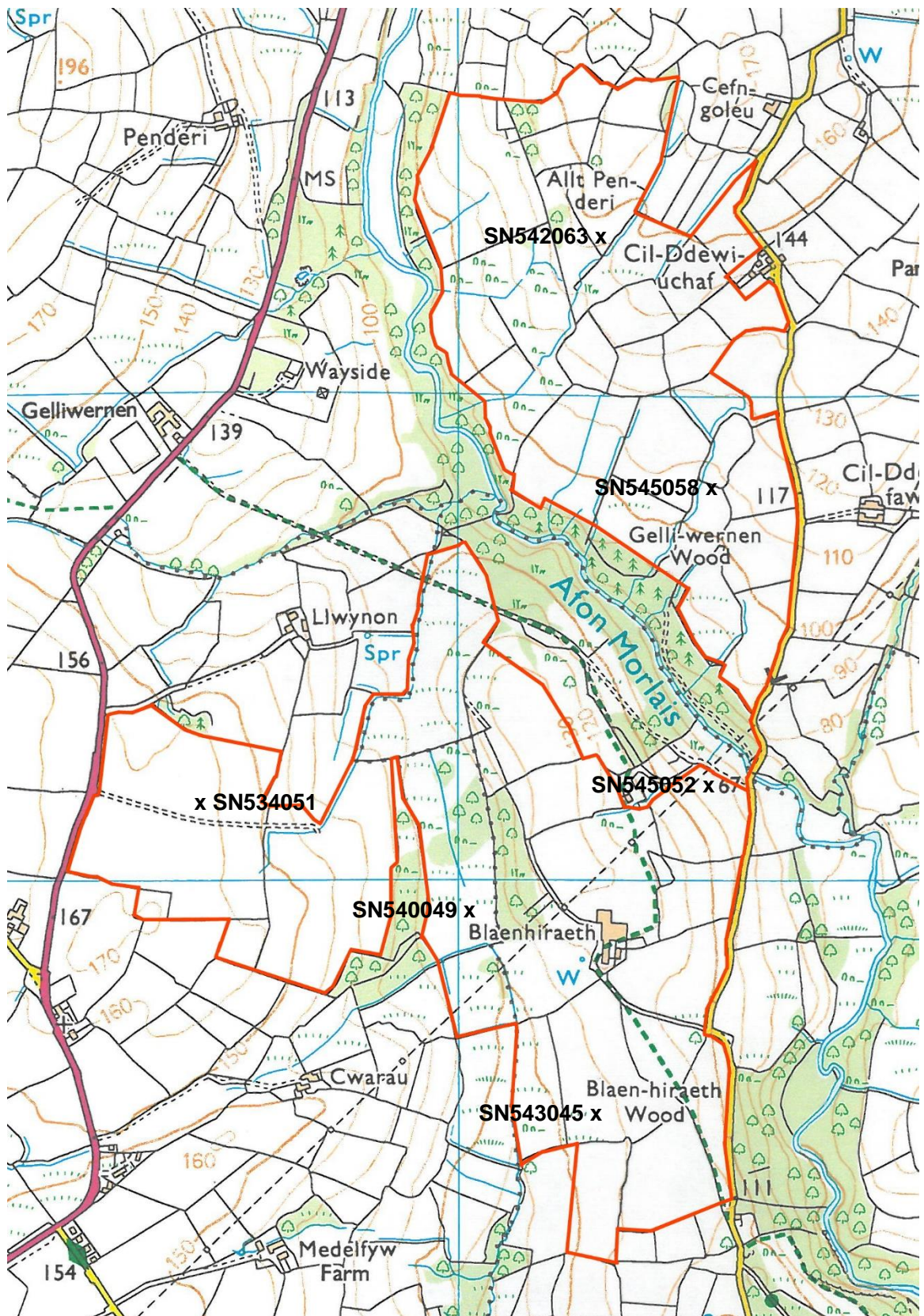
- A.6 Interpolated climate data relevant to the determination of ALC within the study area is given in Table 1 below. Due to the size of the study area, six national grid reference points at varying altitudes have been considered in order to accurately assess any climate limitations.

Table 1: ALC Climate Data for Blaenhiraeth / Penderi, Llangennech

Climate Parameter	SN540049	SN542063	SN545052	SN534051	SN543045	SN545058
Average Altitude (m)	115	132	85	166	109	101
Accumulated Temperature above 0°C (January – June)	1428	1408	1462	1370	1435	1444
Average Annual Rainfall (mm)	1430	1459	1419	1489	1426	1432
Field Capacity Days (FCD)	276	280	274	284	275	276
Moisture Deficit (mm) Wheat	53	50	57	45	54	54
Moisture Deficit (mm) Potatoes	32	28	38	22	33	35
Best Grade	3b	3b	3a/3b	3b	3b	3b

A.7 The Grid Reference points at which climate data was calculated are also shown at Insert A1.

Insert A1: OS extract – land quality study area and Grid Reference climate points



- A8 At 90 m Above Ordnance Datum (AOD) and above, the climate within the study area limits agricultural land quality to Subgrade 3b at best. One location analysed, at SN 545 052 to the north-east of the farm buildings at Blaenhiraeth Farm, is identified at below 90 m AOD and is, according to climate data for ALC, on the border between Subgrades 3a and 3b. A very small area of land to the east of location SN 545 052 is shown to be as low as approximately 75 m AOD and would therefore fall into the Subgrade 3a category at best, in the absence of other limiting factors.
- A.9 With reference to Figure 1 '*Grade according to climate*' of the ALC Guidelines, the quality of agricultural land across the majority of the study area can be graded no higher than Subgrade 3b in the absence of any other limiting factors (i.e. site and soil).

Other Factors

- A.10 Consideration is now given to other factors which affect the ALC grading of agricultural land.

Site

- A.11 With regards to the ALC Guidelines, agricultural land quality can be limited by one or more of three main site factors, as follows:

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

Gradient and Micro-relief

- A.12 With reference to published Ordnance Survey mapping, the southern area of the study area is situated on a broadly east-facing slope with an elevation of approximately 166 m AOD at the highest point in the west and approximately 75 m AOD in the east. The northern area lies on a south-facing slope with an elevation of approximately 166 m AOD at the highest point in the north and approximately 85 m AOD in the south. Gradient is not thought to be a limiting factor across the majority of the study area although a site survey would confirm this.
- A.13 Likewise, it is not thought that micro-relief is a limiting factor for agricultural land quality but a site survey would confirm.

Risk of Flooding

- A.14 From an Environment Agency (EA) Flood Risk Map, none of the study is at risk of flooding by rivers or the sea. Therefore, the risk of flooding is not 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.

Soil

Geology / Soil Parent Material

- A.15 British Geological Survey (BGS) information available online has been utilised to identify the Bedrock underlying the study area and to determine whether or not the bedrock is covered by any Superficial (Drift) Deposits. This provides information on soil forming materials across the study area.
- A.16 The majority of the study area is underlain by bedrock geology described by the BGS (1:50,000) as sandstone of the Brithdir Member with some bands of mudstone, siltstone and sandstone of the Brithdir Member present across the study area.
- A.17 The BGS Superficial Deposit map (1:50,000) indicates that the south of the study area is, in the main, not covered by superficial deposits. Some Devensian Till (Diamicton) is present in the west, with a small area of Peat also present. The north of the study area has sporadic coverings of Devensian Till (Diamicton) with clay, silt, sand and gravel Alluvium along the stream to the south of the northern area.

Published Information on Soil

- A.18 Provisional information for soils across the study area 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 across the study area is covered by soil grouped in the Neath Association. The main physical characteristics of these soils are summarised below.
- A.19 Fine loamy brown soils over sandstone dominate the Neath association. It is extensive in South West England and Wales and is scattered throughout the Midlands. The Neath soils, typical brown earths, are permeable and well drained, with brown, clay loam upper horizons containing fine sandstone and siltstone fragments which increase in number downwards, as the soils pass into rubbly Head or fractured bedrock. A typical profile comprise of a dark brown, moderately stony, clay loam topsoil. The subsoil comprises of a yellowish brown, moderately stony, clay loam with sandstone at approximately 50 cm depth. The published information indicates soils are well drained due to the permeable subsoils.

Interactive Limitations

- A.20 Due to the average annual rainfall (ref. Table 1), agricultural land across the study area is predicted to be at field capacity (i.e. near saturation point) for between 274 and 284 days per year, mainly over the autumn, winter and spring. This will, in interaction with topsoil

texture, cause an 'interactive limitation' to agricultural land quality across the study area – namely soil wetness.

- A.21 Where topsoils are medium clay loam and well drained (Wetness Class I), they will be limited to Subgrade 3a in this climate area (more than 225 field capacity days). Where topsoils are heavy clay loam and Wetness Class I, land quality will be limited to Subgrade 3b. Any soil profiles in Wetness Class II will be limited to Subgrade 3b for both medium and heavy clay loams.

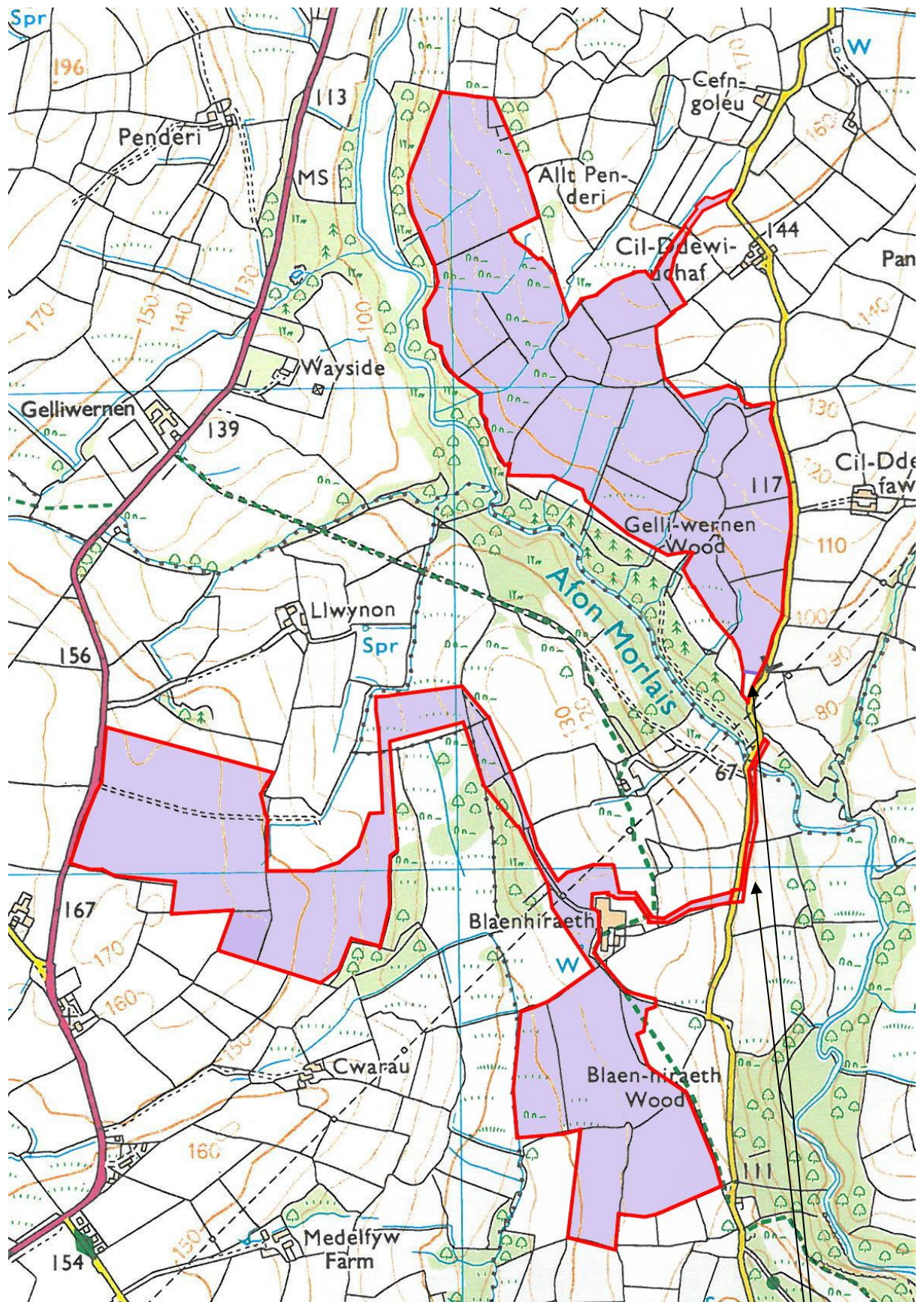
Likely ALC Grade across the Study Area

- A.22 From the published information above, it has been determined that the quality of land is limited by climate to Subgrade 3b across the vast majority of the study area, in the absence of any other limiting factor.
- A.23 Land which is at 90 m AOD or above and cannot be graded higher than Subgrade 3b in this climate area is shown shaded purple at Insert 2 below (from Ordnance Survey mapping at a scale of 1:25,000).
- A.24 There are very small areas (shown at Insert 2) which may be graded as high as Subgrade 3a in the absence of other limiting factors, being on the border of Subgrade 3a / 3b at approximately 85 m AOD and Subgrade 3a below 80 m AOD.

Likely ALC Grade across the Solar Areas

- A.25 Land within the three solar areas is limited to Subgrade 3b at best, due to a direct climate limitation.

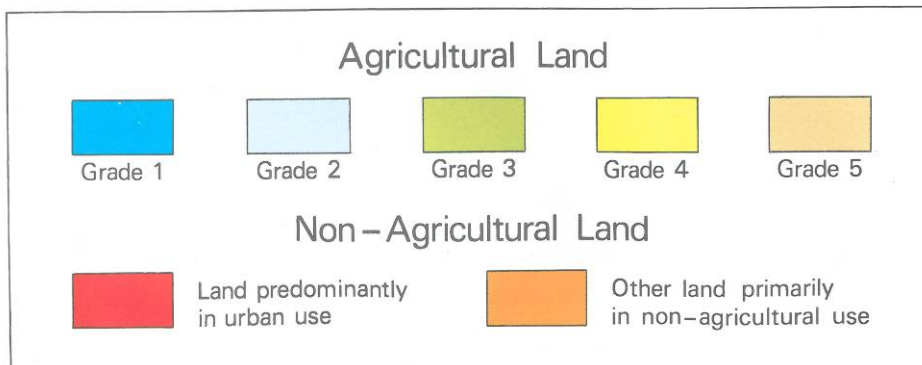
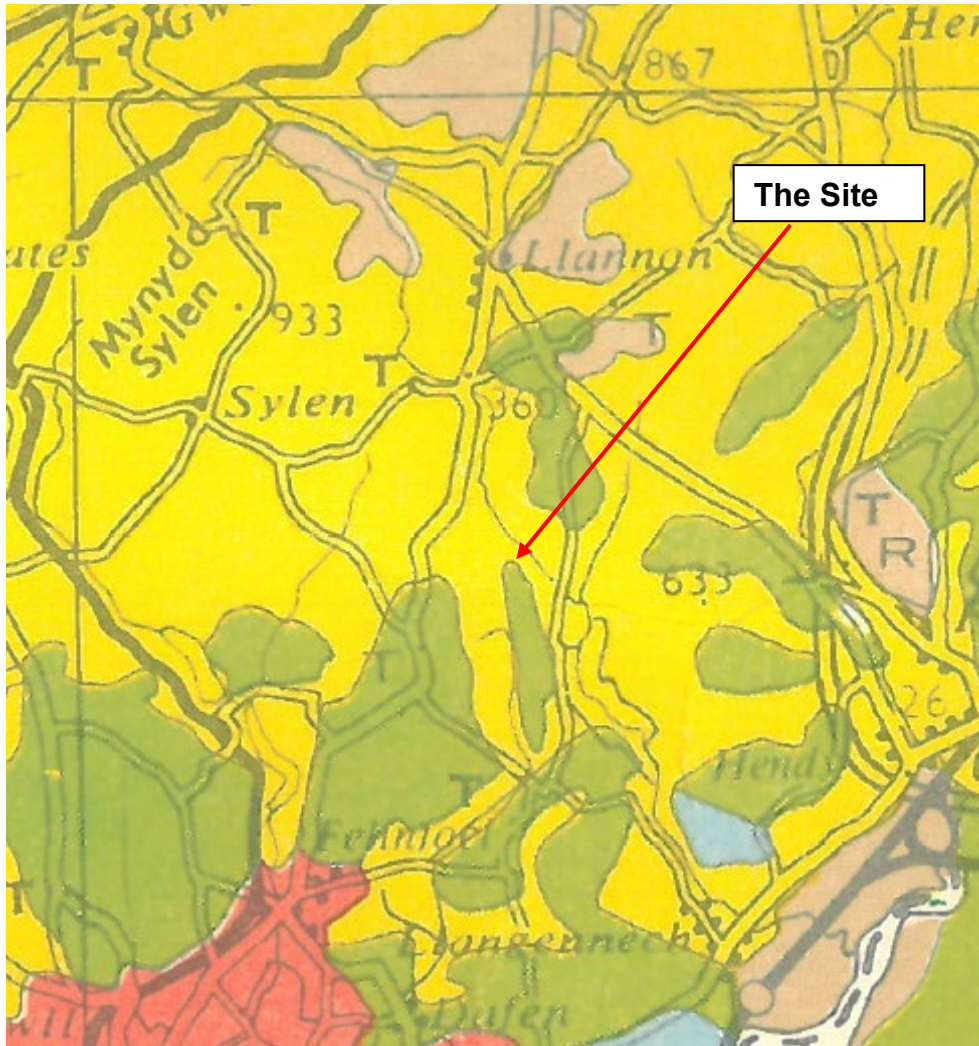
Insert A2: OS extract – land at 90 m AOD or above, limited to Subgrade 3b at best



Areas below 90 m AOD

Plan KCC1

Extract from the Provisional ALC Map
(1977)



NORTH



PLAN	KCC 1		
TITLE	Extract from the Provisional ALC Plan (1977)		
SITE	Blaenhiraeth / Penderi Solar Farm		
CLIENT	Voltaia		
NUMBER	KCC1858/01A 08/18 vmd		
DATE	July 2019	SCALE	NTS

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