



Development of national significance in the renewable energy sector

Environmental Statement Technical Appendices First Addendum

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

VARIATION SUBMISSION

DECEMBER 2020 | BRS.4254



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APPENDIX 0.1

**DRAFT CONSTRUCTION ENVIRONMENTAL
MANAGEMENT PLAN**



Development of national significance in the renewable energy sector

Construction Environmental Management Plan Version A

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

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1. INTRODUCTION

- 1.1 This draft Construction Environmental Management Plan (CEMP) has been prepared to support a planning application for a Development of National Significance (DNS) for the construction, operation, management and subsequent decommissioning of a solar farm at Blaenhiraeth Farm, Llangennech, Llanelli, SA14 8PX.
- 1.2 Following a formal request made by the Inspector on 26 October 2020 this CEMP has been produced to set out the commitments of the applicant and developer (Votalia UK Ltd) towards securing specific mitigation measures and best working practices to adequately protect environmental resources during the construction phase of the development, including potential impacts on human receptors. The draft CEMP also sets out details on the construction working approach, including details on proposed working hours, construction compounds, control of lighting, management of vehicle movements, wheel washing facilities and waste removal.
- 1.3 The draft CEMP sets out the construction principles to be applied during the build out of the Penderi Solar farm. This document sits alongside the Construction and Ecological Management Plan (CEcMP)¹ prepared by Clarkson and Woods Ecological Consultants.
- 1.4 Appropriate methodologies for the mitigation of water-related effects including pollution prevention measures and other potential environmental effects are described in this draft Plan. These measures will ensure that the watercourses adjacent to the site are adequately protected and that impacts on European designated sites downstream are avoided. Water features within and adjacent to the site are shown in Appendix 1.
- 1.5 The draft CEMP is submitted in support of the application to outline the measures which will be implemented by the applicant during the construction phase of the development once the DNS consent is granted by the Welsh Government. The intention is for it to be converted into a final CEMP following discussion with and approval by the Local Planning Authority (LPA). This process will be secured by an appropriately worded planning condition attached to the DNS consent. The final detailed CEMP will be in accordance with this draft CEMP and must be adhered to

¹ The CEcMP sets out management prescriptions to safeguard the landscape, hedgerows and ecological features within the site during the construction phase; as well as installation of habitat features for future benefit of the biodiversity within the site

throughout the construction works by the contractor appointed by the applicant to undertake the development (referred to in this document as the Contractor). The CEMP should be read alongside the CEcMP.

2. ROLES AND RESPONSIBILITIES

2.1 The following table will be completed once details are known:

Role	Responsibilities	Contact Details
Construction Manager/Site Supervisor	Overall responsibility for the organisation and implementation of this CEMP and the CEcMP. Ensure the site induction includes an introduction to the CEMP and CEcMP	TBC
Site Environmental Manager	Monitor site works and ensure no negative impacts on the environment occur. Conduct appropriate monitoring to ensure the CEMP and CEcMP are being adhered to. The Site Environmental Manager will also be responsible for conducting toolbox talks at the commencement of new activities, which will also draw from the CEMP and CEcMP.	TBC
Ecological Clerk of Works	Provide ecological advice and conduct monitoring during construction.	TBC
Emergency Contact	Natural Resources Wales - Pollution Hotline 0300 065 3000	

3. WORKING HOURS

3.1 Site working hours will be 08:00hrs to 20:00hrs Monday to Saturday. Deliveries will be outside of the traditional weekday peak hours (i.e. 10:00hrs to 16:00hrs or 18:00 to 20:00hrs). Variation to the site working hours would only be expected in exceptional circumstances where the need arises to protect plant, personnel or the environment. Further details on the highway movements linked to construction is provided in the Construction Traffic Management Plan.

3.2 Exceptional circumstances in the above context are defined as reasonably unforeseeable circumstances which would result in the curtailment of construction activity, causing an increase in health and safety risk to humans (determined by the construction Site Manager or a risk to wildlife).

4. WORK PROGRAM

- 4.1 The main construction period will take place outside the winter months when precipitation is lower and ground conditions more stable.
- 4.2 A detailed construction schedule will be supplied within this CEMP at a later date, once planning has been obtained. The work program will ensure that areas of higher risk of surface run-off or soil damage (see Appendix 1) are prioritised during drier months.

5. CONTROL OF LIGHTING

- 5.1 The construction activities will generally be undertaken during daylight hours. If construction is required to take place during the winter, the shorter daylight hours may require some temporary lighting to be deployed during construction however this will be avoided as far as practicable.
- 5.2 Any construction lighting will be deployed in accordance with the following recommendations to reduce or remove impacts on human and ecological receptors:
- The use of lighting will be minimised to that required for safe site operations;
 - Lighting will utilise directional fittings to minimise outward light spill and glare;
 - Lighting will be directed towards the middle of the site rather than towards the boundaries.
- 5.3 Lighting is required at the substation – the design of this lighting will be informed by a full Lighting Plan with input from a lighting consultant and ecologist. The design of the lighting will aim to reduce lightspill onto adjacent habitats.
- 5.4 The lighting design and lighting plan will be included within this document upon finalisation, prior to construction commencing.

6. ECOLOGICAL CLERKS OF WORKS

- 6.1 As detailed in the CEcMP, an Ecological Clerk of Works will be appointed by the Site Manager. The appointment shall be for the period from commencement of development to final commissioning of the Development or end of the construction period, whichever is the later.

- 6.2 The ECoW shall be a suitably qualified Ecologist with at least two years' experience. The ecologist will need to hold (or be accredited under) NRW licenses including bat and dormouse in case emergencies arise involving these species. Clarkson & Woods (01934 712500) should be contacted by the Site Manager prior to appointing the ECoW to ensure a suitably qualified Ecologist is instructed to fulfil this role.
- 6.3 The ECoW will be responsible for delivering the prescriptions and objectives requiring ecological expertise during the construction stages. They shall assist and advise the developer (Votalia UK Ltd) and the Site Manager, as required, in their adherence to the requirements of the CEMP and CEcMP.
- 6.4 The ECoW will be available for monitoring purposes (see Section 20) and on an "on call" basis during the construction phase of the development.

7. CONSTRUCTION PRINCIPLES

- 7.1 The site will be set up and managed with consideration to the principles laid out below:
- **Considerate:** All work is to be carried out with positive consideration to the needs of local businesses, neighbours, site personnel, visitors, and the public.
 - **Environment:** Be aware of the environmental impact on the site and minimise the effects of dust, noise, light and air pollution. Attention will be paid to waste management to reuse and recycle materials where possible.
 - **Cleanliness:** The site will be kept clean and in good order at all times. Site facilities, offices, toilets and drying rooms will be maintained to a good standard. Surplus materials and rubbish will not be allowed to accumulate on the site or spill over into the surroundings and dirt and dust from construction operations kept to a minimum.
 - **Good Neighbour:** General information regarding the works will be provided for all neighbours affected by the work. Full and regular communication with neighbours, including adjacent residents, farmsteads and businesses, regarding programming and site activities to be maintained from prestart to completion.

- **Respectful:** Respectable and safe standards of dress to be maintained at all times. Pride in the management and appearance of the site and the surrounding environment shown at all times.
- **Safe:** Construction operations and site vehicle movements are to be carried out with care and consideration for the safety of site personnel, visitors, the public and the environment.
- **Responsible:** Ensure that everyone associated with the site understands implements and complies with this code.

7.2 The health, safety and environmental expectations are as follows:

- To have no accidents or dangerous occurrences on site
- To have no occupational ill health arising from the project
- To ensure no environmental damage occurs from the project
- To ensure the least disruption to the local community from the project, and
- To exclude as far as is reasonably practicable all unauthorised persons from the project

8. POLLUTION PREVENTION

8.1 To avoid pollution incidents which may impact the watercourses within or adjacent to the site, measures for the safe storage of chemicals and materials shall be implemented.

8.2 Any potential contaminants (fuel, oils and chemicals) used during construction will be stored in designated compounds on an impermeable surface, at least 15m from any watercourse. These will be securely locked away when not in use.

8.3 Where bunds or similar containment systems are used at fuel/chemical/COSHH storage and handling areas, that they should be sized to hold 110% of the capacity for a single container/drum/tank, or where there is more than one container/drum/tank, not less than 110% of the largest container or 25% of their aggregate capacity, whichever is the greater. This is in line with CIRIA guidance.

- 8.4 Appropriate pollution control measures will be employed in accordance with those outlined in the NetRegs document Guidance for Pollution Prevention (GPP) 5: Works and maintenance in or near water (February 2018). Although not endorsed by Natural Resources Wales (as NRW do not currently provide good practice guidelines following the withdraw of Pollution Prevention Guidelines (PPG) 5), measures in this document (accessed at: <http://www.netregs.org.uk/media/1418/gpp-5-works-and-maintenance-in-or-near-water.pdf>) should nevertheless be followed in order to prevent pollution of the nearby watercourses and ensure any pollution events are dealt with swiftly.
- 8.5 A spill kit must be kept on site with sand, earth or commercial products for the containment of fuel and other material spillages. All staff will receive appropriate training in the use of these kits and are to be made aware of where the kit is stored.
- 8.6 A detailed pollution/spill response plan will be kept within the site office.
- 8.7 In the event of an accidental spillage, the following procedures will occur:
- The source of the spill will be stopped and any surrounding site personnel informed
 - The Site Environmental Manager will be informed immediately
 - The spill will be contained through use of a spill kit or other available materials.
 - If the spill occurs close to a watercourse or other sensitive habitat, measures will be taken to ensure that the spill does not affect this area (this may include covering with ground mats, creation of a bund or channel)
 - If required, the Site Environmental Manager will contact NRW to inform them of the situation.

9. THE MANAGEMENT OF SEDIMENT AND SURFACE WATERS

- 9.1 The CEMP must include measures which will reduce the risk of silt and waste entering the receiving watercourses during construction. High risk areas are detailed within Appendix 1.
- 9.2 Within the higher risk areas, mitigation will be installed adjacent to watercourses (between the construction area and the watercourse) **prior** to construction

commencing as a precautionary approach. This may include a geofabric fence or straw/hay bales. These areas are shown in principal within the map in Appendix 1, but will be agreed once this CEMP is finalised. The map in Appendix 1 will be updated to show where preventative measures will be introduced (such as the location of silt fencing to be installed).

9.3 The management of sediment and surface water run-off generated during the construction phase of the Development will be controlled through good practice construction techniques.

9.4 Major construction works (e.g., large-scale earthworks) will be minimised during heavy precipitation events. The CEMP will be required to include precautions to be taken if the weather is wet during construction, the precautions and mitigation measures include: -

- Planning the construction work to minimise repeated trips over the ground;
- Forming the permeable tracks early in the process;
- Using machines with low pressure tyres – eg farm type machinery;
- Monitoring the weather and being alert to the implications of wet weather;
- Inspecting surfaces to identify areas at risk of causing silt pollution to watercourses;
- Restricting operations in areas vulnerable to causing pollution, especially in wet weather;
- Keeping a store of straw/hay bales and geofabric fence equipment to delay and filter runoff;
- Being ready with trained staff to deploy the equipment if a risk of silt pollution arises;
- Early preparation, seeding and protection to encourage vegetation to establish on all bare areas as soon as possible after construction.

9.5 The following minimum buffer zones will be implemented for ditches and watercourses on site (as shown in Appendix 1). No development will be proposed

within these minimum buffer zones, with an exception for fence crossings, culverts and access tracks.

- A 15m buffer between the development and the Afon Morlais
- A 7m buffer between the development and any watercourse on site
- A 4m buffer for any ephemeral watercourse on site.

9.6 The first step towards preventing silt pollution from the proposed development shall be to minimise the generation of silt-laden runoff. This can be achieved by the Site Manager carefully planning the site works so that activities likely to generate silt-laden runoff are carried out during drier weather, and erosion of surface soils and excavations is controlled. The second step is to treat surface water containing silt prior to it entering watercourses. Prior to commencement of construction, a double layer of high-performance silt fencing will be installed between sources of siltation and watercourses where vegetation clearance, temporary stockpiling of soil or other materials, or access/egress routes are required. Where silt fencing cannot be installed, straw bales or other measures will be adopted to prevent silt-laden water from flowing overground or via the existing network into watercourses.

9.7 Environmental emergency response measures are required in the event that either of these two steps fail. The emergency response procedure is set out below:

- Any environmental incidents will be reported directly to the Site Environmental Manager
- The emergency response will be led by the Site Environmental Manager
- Measures will be put in place immediately such as the installation of silt fencing or hay bales. Surface water may need to be redirected from watercourses through the use of swales or attenuation pools.
- NRW will be contacted if appropriate to report the incident

10. FOUL DRAINAGE

10.1 During the construction phase, 'Porta-loo' type facilities, or equivalent, will be used and emptied by a waste contractor, therefore nullifying any potential effects on drainage ditches and watercourses.

11. CONSTRUCTION COMPOUNDS

11.1 During the construction phase, one main construction compound (located within Parcel B) and up to two satellite compounds (one each for Parts A and C). The temporary construction compounds would comprise: -

- Temporary portacabins providing office and welfare facilities for construction operatives
- Parking area for construction and workers vehicles
- Secure compound for storage
- Temporary hardstanding
- Wheel washing facilities
- Temporary gated compound
- Storage bins for recyclables and other waste
- Passing bays would be provide between the compound and site access.

11.2 All construction vehicles will exit through the wheel wash area in order to reduce the spread of mud and dirt onto the local highway network. Temporary roadways may be utilised to access parts of the development site and this would be guided by weather conditions at time of construction. The objective would be to use temporary matting to avoid excessive soil disturbance or compaction.

11.3 The temporary construction compound will be removed after the completion of works, or each phase of works if development is constructed in phases. The decommissioning of the temporary site compounds will also be carefully managed in stages to minimise soil disturbance and compaction as equipment is removed from the site.

12. DUST AND EMISSION MITIGATION

12.1 Residential areas potentially exposed to dust may be present in close proximity to the site and will be regarded as sensitive receptors during construction period. The following three principles are well established and are central to the control measures suggested in this guidance. They follow a hierarchy to control the emissions of dust and other emissions to air, and reduce human exposure:

- Prevention
- Suppression
- Containment

12.2 These principles are embedded in this document and are promoted in a way that is appropriate to the scale of a particular development and the potential exposure of site workers, residential areas and other susceptible receptors. Dust can be created from movement of construction traffic and from general construction activities and can be carried by prevailing winds impacting upon the local area. Construction traffic carrying loose material will be covered to reduce dust generation. This measure will be combined with wheel washing at site access points. A water bowser will be provided for dust suppression on site if necessary and areas of concern can be 'dampened down' during periods of dry weather. If necessary, arrangements will be made for sweeping public highways in the vicinity of the site access using a standard road sweeper. The Site Manager will be responsible for determining if additional measures will be required.

12.3 A site log book will be used to record details and actions taken in response to exceptional incidents or dust causing episodes.

13. LOCAL COMMUNITY RESPONSIBILITY

13.1 The Site Manager will manage and co-ordinate on-site environmental activities and act as a point of contact for local residents. Liaison between the Construction Contractor and local residents will seek to ensure that any concerns are resolved quickly.

13.2 The Site Manager will be responsible for briefing the construction staff on the measures contained in the final CEMP; fulfilling environmental obligations on site; attending to any on-site environmental incidents or concerns; reporting and monitoring any environmental incidents; and ensuring waste management procedures are followed.

14. THE MANAGEMENT AND MOVEMENT OF CONCRETE

14.1 Ready-mix concrete will be used for the substation and transformer foundations and as such concrete will not be batched on site. If the truck cannot discharge directly into the works then transport to move the concrete from the delivery truck

to the works must be provided. On completion of discharge and before the truck returns to public highway the discharge chute will be cleaned. The Contractor will provide suitable facilities, such as lined skip, within the construction compound. The ready-mix concrete delivery lorries will then return to the batching plant for washout. Excess concrete will be sent back to the batching plant.

- 14.2 To prevent pollution, it is important that all concrete pours are planned in advance and that specific procedures are adopted where there may be a risk of surface water or groundwater contamination.

15. THE MANAGEMENT AND MOVEMENT OF OTHER MATERIALS

- 15.1 A summary of the type and quantities of all materials to be imported into the site will be detailed within the final CEMP.

16. HYDROCARBON CONTAMINATION

- 16.1 Machinery, plant and vehicles have the potential to cause pollution via hydrocarbon contamination. All vehicles and plant used for construction must be maintained to good working order to ensure that there is minimal risk for potential fuel or oil leaks within the site. Refuelling of any plant and site-based vehicles will be carried out by a suitably qualified person to ensure that potential pollution incidents are prevented, and a quick response plan is implemented should a spill occur. Fuel delivery and refuelling will take place in the construction compound(s).

17. SOIL MANAGEMENT PLAN

- 17.1 Key threats to the soil resource at construction sites are the trafficking of vehicles/plant and incorrect handling, which can cause damage to soil structure through compaction and smearing. These effects compromise the ability of the soil to perform its functions, such as providing adequate amounts of water, air and nutrients to plant roots. The risk of compaction and smearing increases with soil wetness. To minimise the risk of damage to soil structure, the generic guidance for construction sites is as follows:

- no trafficking of vehicles/plant over in situ or banded soils to occur outside demarcated working areas;
- no trafficking of vehicles/plant on reinstated soil (topsoil or subsoil);

- where practicable soil handling, when soil moisture content is above the plastic limit (the moisture content at which soil begins to behave as a plastic material and the soil is deemed too wet to handle without causing damage to the soil structure), will be avoided. Where operational constraints require the disturbance of plastic soil material, suitable remediation should be specified for instance the wind rowing of loose tipped material;
- soil handling should be by excavator and dump truck as per sheets 1 to 4 of the Defra Good Practice Guide for Handling Soils;
- avoid handling of soils to be carried out during periods of prolonged, heavy rainfall;
- no mixing of topsoil with subsoil, or of soil with other materials;
- soil only to be stored in designated soil storage areas to be agreed as part of the approved CEMP;
- plant and machinery only work when ground or soil surface conditions enable their maximum operating efficiency (i.e. when machinery is not at risk of being bogged down or skidding causing compaction or smearing); and
- all plant and machinery must always be maintained in good working condition to ensure that the soil is stripped correctly, for example to ensure that the depth of the strip can be accurately controlled, and to minimise the risk of contamination through spillages.

18. SEGREGATION OF CONSTRUCTION WASTE

18.1 Key environmental considerations for construction sites include the reduction of waste and the re-use of recycling of waste materials. Waste such as packaging, plastic, pallets, metal, general waste, etc, will be segregated on site and removed from site by an appointed waste contractor(s) for either reuse, recycling or disposal.

19. CRUSHING / SCREENING OF MATERIALS ON-SITE

19.1 Construction will not involve the use of a mobile unit for crushing / screening of material on site.

20. MONITORING AND REPORTING

20.1 A monitoring program will be implemented to ensure the all procedures within this CEMP are being adhered to and to check for any problems which may lead to damage of watercourses in order to implement remedial actions.

Monitoring

20.2 The monitoring program will comprise:

- A monitoring programme for all watercourses on site. As a minimum, they should be checked daily or more frequently dependent on the nature/location of works.
- Initial check of site by ECoW prior to construction commencing and once the protective fencing has been installed to ensure that all buffers have been appropriately demarcated;
- Daily site checks, to include visual inspection of the watercourses in the vicinity of the site, by the Site Environmental Manager or appointed staff (who have been briefed on this document). This will include a check of any protective measures (silt fencing, hay bales) as well as a check of water quality to record discolouration, odour, oily sheen or litter. A log will be kept on site of these checks and any problems identified as well as remedial measures implemented;
- A site visit by an ecologist every two weeks during the construction period to check the water courses and that the mitigation measures outlined in this document are in place and functioning appropriately. Water samples will also be taken during each visit.

20.3 Water samples will be taken at 4 points both upstream and downstream of the development on the Afon Morlais and Afon Dafen (approximate locations of points are shown in Appendix 1) in order to assess water quality. Likely parameters will be pH, electrical conductivity, temperature, dissolved oxygen and total suspended solids.

20.4 Where there are significant differences in water quality between the two sample points, the causes will be investigated. This may require a walk of the length of the

watercourse and any adjoining ditches in order to identify sources of pollution or silt runoff. Remedial measures will be implemented as required.

- 20.5 The ECoW will also be available on an “on call” basis during the construction period.

Reporting

- 20.6 A quarterly report will be issued by the ECoW to Lindsey Rendle, the Local Planning Authority Ecologist. The report will include a detailed log of monitoring activities by the Site Environmental Manager and ecologist. It will detail and breaches of the CEMP and the remedial steps taken. It will also include results of the water samples taken.

21. NON-OPEN CUT (TRENCHLESS) CROSSING

- 21.1 The preferred method for laying cables is by burying them in an open-cut trench along the road and across the listed Bridge. The alternative option to crossing the river Morlais is via a trenchless crossing.
- 21.2 At the pre-commencement stage it is intended to carry out a conditional survey of the Bridge structure including all masonry and parapets and then to drill a series of 16mm pilot holes to confirm the depth of the road makeup at the crown. This will verify whether a depth of 350mm from the crown is achievable for the open cut trenching. If the necessary depth for the open-cut trenching cannot be undertaken, then the alternative directional drill option under the river Morlais will be implemented. Trenchless drilling has the advantage of minimising impacts to surface areas and reducing the levels of reinstatement requirement. It is a well-established and appropriate technique for crossing difficult terrains and sensitive features.
- 21.3 There are several non-excavation drilling techniques. These include auger boring, micro-tunnelling and direct pipe. The non-open cut crossing under the river Morlais would be undertaken at a minimum depth of 2m below the riverbed. If non-open cut crossing is required, then the actual design would be submitted to the local planning authority for approval prior to construction. The methods to be used will be finalised following the outcome of the conditional survey and will be subject to the results of a geotechnical site investigation and detailed discussions with the Local Planning Authority. Construction is likely to be of longer duration than open

cut methods due to the engineering activities required. Construction techniques would be carried out in accordance with Health and Safety Regulations.

- 21.4 For auger boring, the technique requires the excavation of pits on either side of the crossing to aid the installation of the pipeline. The depth of the pits depends on the nature of the crossing and the local ground conditions. De-watering and sheet piling etc may be utilised if required to ensure a safe crossing design. A launch pit is excavated on one side of the crossing, following this a smaller reception pit is excavated on the opposite side of the crossing to receive the bore. Additional land is required on both sides of the crossing to accommodate the excavated material from the pits and the pipe, and to allow for the construction plant associated with the crossing. For auger bore, a pipe string is welded above ground and an auger drill inserted into it. A 'cutting head' is fixed to the auger drill at the front of the pipe string and rails installed in the floor of the pit for the unit to run on.
- 21.5 Power is transmitted to the auger drill via a power unit that is temporarily fastened to the rear of the pipe string and attached on to the rails. This pipe string is lowered into the thrust pit and is supported by crane-type side booms. Surveyors then line and level the pipe string to ensure it is installed in the correct location and at the correct depth. A combination of the rotation of the auger drill within the pipe string and a hydraulic thrust located on the power unit installs the pipe string. The excavated material is drawn from the cutting head, down the auger drill flutes exiting from the rear of the pipe string adjacent to the power unit.
- 21.6 For microtunnelling, the method involves the use of steerable remote control pipe-jacking. As with auger drill, it requires temporary launch and reception pits, drilling fluid management and associated equipment. Pre-cast concrete jacking pipes are placed behind a microtunnelling machine with a cutting head lubricated with water or a mud mix. Small quantities of bentonite may also be used to reduce friction. The excavated material is removed with the drill fluid and is returned to the surface via a slurry pipe through the tunnel entrance where the fluid is filtered to remove the cuttings and returned to temporary mud storage tanks for re-use. A thrust wall is constructed at the launch pit from which to jack the pipe forward. As the tunnel progresses new segments of pipe are attached at the launch pit until the microtunnel reaches the reception pit, where the drill bit is detached from the tunnel and removed. The jacked pipe can be the final pipe itself or a sleeve through which a smaller pipe is then threaded. Commonly the microtunnel crossing

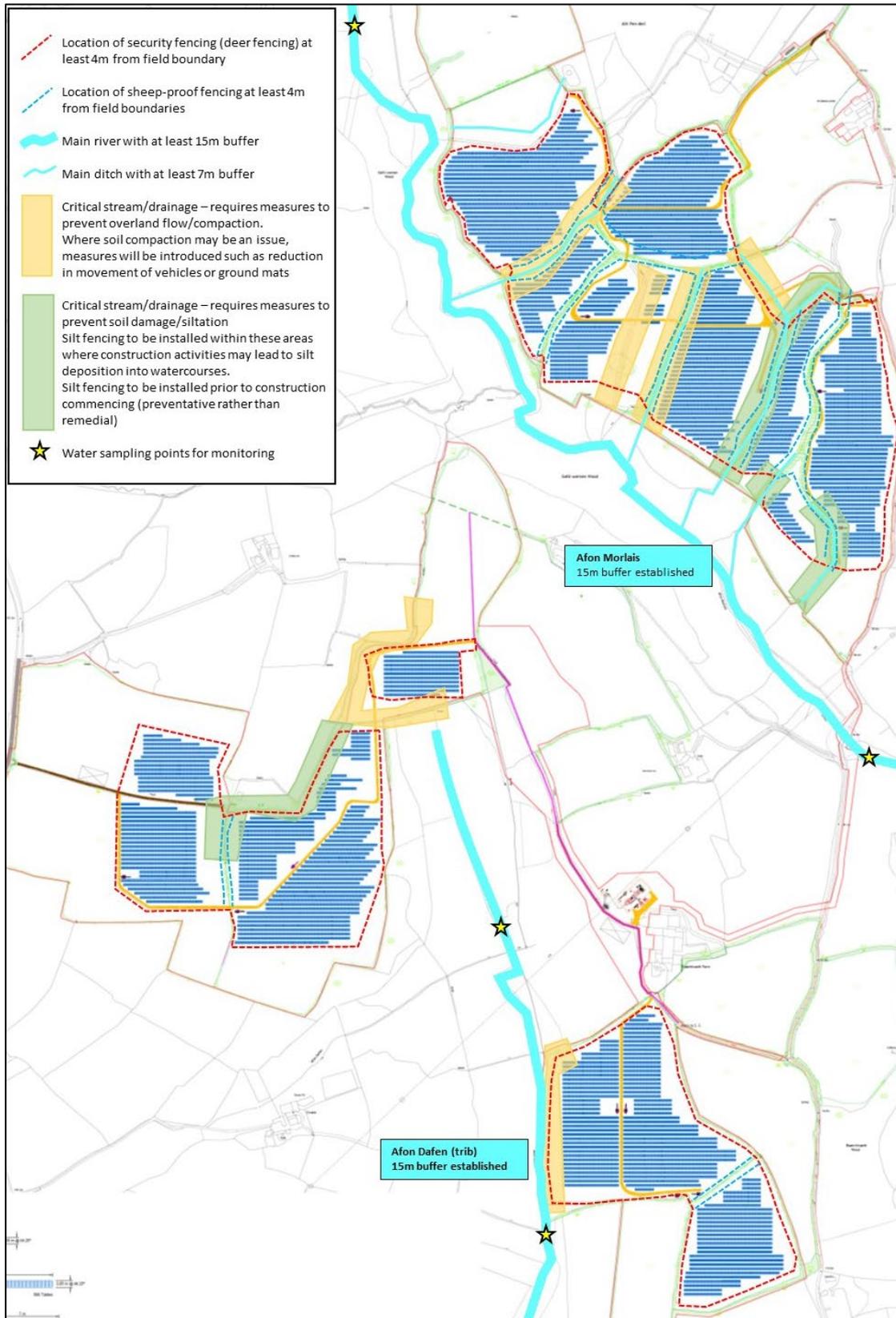
technique is used to cross infrastructure such as railway lines, major rivers and major highways such as motorways. The microtunnel is a crossing technique that performs well in a variety of ground conditions and gives the best guarantee of little or no settlement. The technique is very accurate and by increasing the depth of such high risk crossings the possibility of settlement is reduced even further.

- 21.7 The direct pipe technique can be utilised as an alternative to the Horizontal directional drilling or microtunnel. This method uses the product pipe directly (rather than a concrete carrier sleeve) which is welded to the end of the microtunnelling machine. It is pushed forward by rams which push the pipe and the microtunnelling machine forward together. The microtunnelling machine has interchangeable cutting bits so it can deal with a variety of ground conditions. This technique tends to be used on longer crossings where there may be a number of obstacles to navigate.

22. RECOMMENDATIONS

The purpose of this draft CEMP is to outline the commitments which Voltalia is making towards the delivery of appropriate pollution protection techniques that will be adopted by the appointed Contractor. This document demonstrates the measures that could be used during the construction phase to adequately protect environmental resources, including potential impact upon human receptors, as well as provide appropriate detail on the construction working approach. Post-consent, this draft CEMP will require updating in accordance with approved documentation by the appointed Contractor prior to any construction commencing onsite. The updated detailed CEMP will be submitted to the LPA for approval prior to commencement of the development to specify the details of the persons / bodies responsible for the activities associated with the CEMP and emergency contact details.

Appendix 1: Location and Protection of Watercourses – Draft to be finalised at later date



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APPENDIX 6.1

DETAILED LVIA METHODOLOGY

1. LANDSCAPE AND VISUAL IMPACT ASSESSMENT METHODOLOGY

1.1 This Landscape and Visual Impact Assessment (LVIA) has been undertaken with regards to best practice, as outlined within the following publications:

- Guidelines for Landscape and Visual Impact Assessment (3rd Edition, 2013) - Landscape Institute / Institute of Environmental Management and Assessment;
- Photography and photomontage in landscape and visual assessment (2011) - Landscape Institute Advice Note 01/11;
- LANDMAP Methodology: Guidance for Wales; Visual & Sensory, Natural Resources Wales (2016);
- Welsh Governments' Assessment of Onshore Wind and Solar Energy Potential in Wales undertaken by Arup (June 2019);
- Carmarthenshire Wind and Solar Energy Supplementary Planning Guidance (Adopted June 2019); and
- Carmarthenshire Solar PV Development – Landscape Sensitivity and Capacity Study (October 2016).

1.2 GLVIA3 states within paragraph 1.1 that "*Landscape and Visual Impact Assessment (LVIA) is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and on people's views and visual amenity.*"¹

1.3 GLVIA3 also states within paragraph 1.17 that when identifying landscape and visual effects there is a "*need for an approach that is in proportion to the scale of the project that is being assessed and the nature of the likely effects. Judgement needs to be exercised at all stages in terms of the scale of investigation that is appropriate and proportional.*"²

1.4 GLVIA3 recognises within paragraph 2.23 that "*professional judgement is a very important part of LVIA. While there is some scope for quantitative measurement of some relatively objective matters much of the assessment must rely on qualitative judgements*"³ undertaken by a landscape consultant or a Chartered Member of the Landscape Institute (CMLI).

¹ Para 1.1, Page 4, GLVIA, 3rd Edition

² Para 1.17, Page 9, GLVIA, 3rd Edition

³ Para 2.23, Page 21, GLVIA, 3rd Edition

1.5 GLVIA3 notes in paragraph 1.3 that "LVIA may be carried out either formally, as part of an Environmental Impact Assessment (EIA), or informally, as a contribution to the 'appraisal' of development proposals and planning applications."⁴

1.6 The effects on cultural heritage and ecology are not considered within this LVIA.

Study Area

1.7 The study area for this LVIA covers a 5km radius from the site. However, the main focus of the assessment was taken as a radius of 2km from the site as it is considered that even with clear visibility the proposals would not be perceptible in the landscape beyond this distance.

Effects Assessed

1.8 Landscape and visual effects are assessed through professional judgements on the sensitivity of landscape elements, landscape character, visual receptors and representative viewpoints combined with the predicted magnitude of change arising from the proposals. The landscape and visual effects have been assessed in the following sections:

- Effects on landscape elements;
- Effects on landscape character; and
- Effects on visual amenity.

1.9 Sensitivity is defined in GLVIA3 as "a term applied to specific receptors, combining judgments of susceptibility of the receptor to a specific type of change or development proposed and the value related to that receptor."⁵ Various factors in relation to the value and susceptibility of landscape elements, landscape character, visual receptors or representative viewpoints are considered below and cross referenced to determine the overall sensitivity as shown in Table 1:

⁴ Para 1.3, Page 4, GLVIA, 3rd Edition

⁵ Glossary, Page 158, GLVIA 3rd Edition

Table 1, Overall sensitivity of landscape and visual receptors				
	VALUE			
SUSCEPTIBILITY		HIGH	MEDIUM	LOW
	HIGH	High	High	Medium
	MEDIUM	High	Medium	Medium
	LOW	Medium	Medium	Low

1.10 Magnitude of change is defined in GLVIA3 as "a term that combines judgements about the size and scale of the effect, the extent over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration."⁶ Various factors contribute to the magnitude of change on landscape elements, landscape character, visual receptors and representative viewpoints.

1.11 The sensitivity of the landscape and visual receptor and the magnitude of change arising from the proposals are cross referenced in Table 9 to determine the overall degree of landscape and visual effects.

2. EFFECTS ON LANDSCAPE ELEMENTS

2.1 The effects on landscape elements are limited to within the site and includes the direct physical change to the fabric of the land, such as the removal of woodland, hedgerows or grassland to allow for the proposals.

Sensitivity of Landscape Elements

2.2 Sensitivity is determined by a combination of the value that is attached to a landscape element and the susceptibility of the landscape element to changes that would arise as a result of the proposals – see pages 88-90 of GLVIA3. Both value and susceptibility are assessed on a scale of high, medium or low.

⁶ Glossary, Page 158, GLVIA 3rd Edition

2.3 The criteria for assessing the value of landscape elements and landscape character is shown in Table 2:

Table 2, Criteria for assessing the value of landscape elements and landscape character	
HIGH	<p>Designated landscape including but not limited to World Heritage Sites, National Parks, Areas of Outstanding Natural Beauty considered to be an important component of the country's character experienced by a high number of people.</p> <p>Landscape condition is good and components are generally maintained to a high standard.</p> <p>In terms of seclusion, enclosure by land use, traffic and movement, light pollution and presence/absence of major infrastructure, the landscape has an elevated level of tranquillity.</p> <p>Rare or distinctive landscape elements and features are key components that contribute to the landscape character of the area.</p>
MEDIUM	<p>Undesignated landscape including urban fringe and rural countryside considered to be a distinctive component of the national or local landscape character.</p> <p>Landscape condition is fair and components are generally well maintained.</p> <p>In terms of seclusion, enclosure by land use, traffic and movement, light pollution and presence/absence of major infrastructure, the landscape has a moderate level of tranquillity.</p> <p>Rare or distinctive landscape elements and features are notable components that contribute to the character of the area.</p>
LOW	<p>Undesignated landscape including urban fringe and rural countryside considered to be of unremarkable character. Landscape condition may be poor and components poorly maintained or damaged.</p> <p>In terms of seclusion, enclosure by land use, traffic and movement, light pollution and presence/absence of major infrastructure, the landscape has limited levels of tranquillity.</p> <p>Rare or distinctive elements and features are not notable components that contribute to the landscape character of the area.</p>

2.4 The criteria for assessing the susceptibility of landscape elements and landscape character is shown in Table 3:

Table 3, Criteria for assessing landscape susceptibility	
HIGH	<p>Scale of enclosure – landscapes with a low capacity to accommodate the type of development being proposed owing to the interactions of topography, vegetation cover, built form, etc.</p> <p>Nature of land use – landscapes with no or little existing reference or context to the type of development being proposed.</p> <p>Nature of existing elements – landscapes with components that are not easily replaced or substituted (e.g. ancient woodland, mature trees, historic parkland, etc).</p> <p>Nature of existing features – landscapes where detracting features, major infrastructure or industry is not present or where present has a limited influence on landscape character.</p>
MEDIUM	<p>Scale of enclosure – landscapes with a medium capacity to accommodate the type of development being proposed owing to the interactions of topography, vegetation cover, built form, etc.</p> <p>Nature of land use – landscapes with some existing reference or context to the type of development being proposed.</p> <p>Nature of existing elements – landscapes with components that are easily replaced or substituted.</p> <p>Nature of existing features – landscapes where detracting features, major infrastructure or industry is present and has a noticeable influence on landscape character.</p>
LOW	<p>Scale of enclosure – landscapes with a high capacity to accommodate the type of development being proposed owing to the interactions of topography, vegetation cover, built form, etc.</p> <p>Nature of land use – landscapes with extensive existing reference or context to the type of development being proposed.</p> <p>Nature of existing features – landscapes where detracting features or major infrastructure is present and has a dominating influence on the landscape.</p>

2.5 Various factors in relation to the value and susceptibility of landscape elements are assessed and cross referenced to determine the overall sensitivity as shown in Table 1.

Magnitude of Change on Landscape Elements

- 2.6 Professional judgement has been used to determine the magnitude of change on individual landscape elements within the site as shown in Table 4:

Table 4, Criteria for assessing magnitude of change for landscape elements	
HIGH	Total loss/gain of a landscape element.
MEDIUM	Partial loss/gain or alteration to part of a landscape element.
LOW	Minor loss/gain or alteration to part of a landscape element.
NEGLIGIBLE	No loss/gain or very limited alteration to part of a landscape element.

3. EFFECTS ON LANDSCAPE CHARACTER

- 3.1 Landscape character is defined as the "*distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.*"⁷
- 3.2 The assessment of effects on landscape character considers how the introduction of new landscape elements physically alters the landform, landcover, landscape pattern and perceptual attributes of the site or how visibility of the proposals changes the way in which the landscape character is perceived.

Sensitivity of Landscape Character

- 3.3 Sensitivity is determined by a combination of the value that is attached to a landscape and the susceptibility of the landscape to changes that would arise as a result of the proposals – see pages 88-90 of GLVIA3. Both value and susceptibility are assessed on a scale of high, medium or low.
- 3.4 The criteria for assessing the value of landscape character is shown in Table 2.
- 3.5 The criteria for assessing the susceptibility of landscape character is shown in Table 3.

⁷ Glossary, Page 157, GLVIA 3rd Edition

3.6 The overall sensitivity is determined through cross referencing the value and susceptibility of landscape character as shown in Table 1.

Magnitude of Change on Landscape Character

3.7 Professional judgement has been used to determine the magnitude of change on landscape character as shown in Table 5:

Table 5, Criteria for assessing magnitude of change on landscape character	
HIGH	Introduction of major new elements into the landscape or some major change to the scale, landform, landcover or pattern of the landscape.
MEDIUM	Introduction of some notable new elements into the landscape or some notable change to the scale, landform, landcover or pattern of the landscape.
LOW	Introduction of minor new elements into the landscape or some minor change to the scale, landform, landcover or pattern of the landscape.
NEGLIGIBLE	No notable or appreciable introduction of new elements into the landscape or change to the scale, landform, landcover or pattern of the landscape.

4. EFFECTS ON VISUAL AMENITY

4.1 Visual amenity is defined within GLVIA3 as *the "overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area."*⁸

4.2 The effects on visual amenity considers the changes in views arising from the proposals in relation to visual receptors including settlements, residential properties, transport routes, recreational facilities and attractions; and representative viewpoints or specific locations within the study area as agreed with the Local Planning Authority.

⁸ Page 158, Glossary, GLVIA 3rd Edition

Sensitivity of Visual Receptors

- 4.3 Sensitivity is determined by a combination of the value that is attached to a view and the susceptibility of the visual receptor to changes in that view that would arise as a result of the proposals – see pages 113-114 of GLVIA3. Both value and susceptibility are assessed on a scale of high, medium or low.
- 4.4 The criteria for assessing the value of views is shown in Table 6:

Table 6, Criteria for assessing the value of views	
HIGH	Views with high scenic value within designated landscapes including but not limited to World Heritage Sites, National Parks, Areas of Outstanding Natural Beauty, etc. Likely to include key viewpoints on OS maps or reference within guidebooks, provision of facilities, presence of interpretation boards, etc.
MEDIUM	Views with moderate scenic value within undesignated landscape including urban fringe and rural countryside.
LOW	Views with unremarkable scenic value within undesignated landscape with partly degraded visual quality and detractors.

- 4.5 The criteria for assessing the susceptibility of views is shown in Table 7:

Table 7, Criteria for assessing visual susceptibility	
HIGH	Includes occupiers of residential properties and people engaged in recreational activities in the countryside using public rights of way (PROW).
MEDIUM	Includes people engaged in outdoor sporting activities and people travelling through the landscape on minor roads and trains.
LOW	Includes people at places of work e.g. industrial and commercial premises and people travelling through the landscape on major roads and motorways.

Magnitude of Change on Visual Receptors

- 4.6 Professional judgement has been used to determine the magnitude change on visual receptors as shown in Table 8:

Table 8, Criteria for assessing magnitude of change for visual receptors	
HIGH	Major change in the view that has a defining influence on the overall view with many visual receptors affected.
MEDIUM	Some change in the view that is clearly visible and forms an important but not defining element in the view.
LOW	Some change in the view that is appreciable with few visual receptors affected.
NEGLIGIBLE	No notable change in the view.

5. SIGNIFICANCE OF LANDSCAPE AND VISUAL EFFECTS

- 5.1 The likely significance of effects is dependent on all of the factors considered in the sensitivity and the magnitude of change upon the relevant landscape and visual receptors. These factors are assimilated to assess whether or not the proposed development will have a likely significant or not significant effect. The variables considered in the evaluation of the sensitivity and the magnitude of change are reviewed holistically to inform the professional judgement of significance.
- 5.2 A likely **significant** effect will occur where the combination of the variables results in the proposed development having a definitive effect on the view. A **not significant** effect will occur where the appearance of the proposed development is not definitive, and the effect continues to be defined principally by its baseline condition.
- 5.3 Within Table 9 below, the major effects highlighted in dark grey are considered to be significant in terms of the EIA Regulations. The moderate effects highlighted in light grey are potentially significant, and a summary justification is provided as to whether the effect in question is significant or not significant. It should be noted that whilst an individual effect may be significant, it does not necessarily follow that the proposed development would be unacceptable in the planning balance. The

cross referencing of the sensitivity and magnitude of change on the landscape and visual receptor determines the significance of effect as shown in Table 9:

Table 9, Significance of landscape and visual effects				
		Sensitivity		
		HIGH	MEDIUM	LOW
Magnitude of Change	HIGH	Major	Major	Moderate
	MEDIUM	Major	Moderate	Minor
	LOW	Moderate	Minor	Minor
	NEGLIGIBLE	Negligible	Negligible	Negligible

6. TYPICAL DESCRIPTORS OF LANDSCAPE SIGNIFICANCE OF EFFECTS

6.1 The typical descriptors of landscape significance of effects are detailed within Table 10 below:

Table 10, Typical Descriptors of Landscape Significance of Effects	
MAJOR BENEFICIAL	Typically, the landscape resource has a high sensitivity with the proposals representing a high beneficial magnitude of change and/or the proposed changes would: <ul style="list-style-type: none"> - enhance the character (including value) of the landscape; - enhance the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development; - enable a sense of place to be enhanced.
MODERATE BENEFICIAL	Typically, the landscape resource has a medium sensitivity with the proposals representing a medium beneficial magnitude of change and/or the proposed changes would: <ul style="list-style-type: none"> - enhance the character (including value) of the landscape; - enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development; - enable a sense of place to be restored.
MINOR BENEFICIAL	Typically, the landscape resource has a low sensitivity with the proposals representing a low beneficial magnitude of change and/or the proposed changes would: <ul style="list-style-type: none"> - complement the character (including value) of the landscape;

	<ul style="list-style-type: none"> - maintain or enhance characteristic features or elements; - enable some sense of place to be restored.
NEGLIGIBLE	<p>Typically, the proposed changes would (on balance) maintain the character (including value) of the landscape and would:</p> <ul style="list-style-type: none"> - be in keeping with landscape character and blend in with characteristic features and elements; - Enable a sense of place to be maintained.
MINOR ADVERSE	<p>Typically, the landscape resource has a low sensitivity with the proposal representing a low adverse magnitude of change and/or the proposed changes would:</p> <ul style="list-style-type: none"> - not quite fit the character (including value) of the landscape; - be a variance with characteristic features and elements; - detract from sense of place.
MODERATE ADVERSE	<p>Typically, the landscape resource has a medium sensitivity with the proposals representing a medium adverse magnitude of change and/or the proposed changes would:</p> <ul style="list-style-type: none"> - conflict with the character (including value) of the landscape; - have an adverse effect on characteristic features or elements; - diminish a sense of place.
MAJOR ADVERSE	<p>Typically, the landscape resource has a high sensitivity with the proposals representing a high adverse magnitude of change and/or the proposed changes would:</p> <ul style="list-style-type: none"> - be at variance with the character (including value) of the landscape; - degrade or diminish the integrity of a range of characteristic features and elements or cause them to be lost; - change a sense of place.

7. TYPICAL DESCRIPTORS OF VISUAL SIGNIFICANCE OF EFFECTS

7.1 The typical descriptors of visual significance of effects are detailed within Table 11 below:

Table 11, Typical Descriptors of Visual Significance of Effects	
MAJOR BENEFICIAL	Typically, the visual receptor is of high sensitivity with the proposals representing a high magnitude of change and/or the proposals would result in a major improvement in the view.
MODERATE BENEFICIAL	Typically, the visual receptor is of medium sensitivity with the proposals representing a medium magnitude of change and/or the proposals would result in a clear improvement in the view.

MINOR BENEFICIAL	Typically, the visual receptor is of low sensitivity with the proposals representing a low magnitude of change and/or the proposals would result in a slight improvement in the view.
NEGLIGIBLE	Typically, the proposed changes would be in keeping with, and would maintain, the existing view or where (on balance) the proposed changes would maintain the quality of the view (which may include adverse effects which are offset by beneficial effects for the same receptor) or due to distance from the receptor, the proposed change would be barely perceptible to the naked eye.
MINOR ADVERSE	Typically, the visual receptor is of low sensitivity with the proposals representing a low magnitude of change and/or the proposals would result in a slight deterioration in the view.
MODERATE ADVERSE	Typically, the visual receptor is of medium sensitivity with the proposals representing a medium magnitude of change and/or the proposals would result in a clear deterioration in the view.
MAJOR ADVERSE	Typically, the visual receptor is of high sensitivity with the proposals representing a high magnitude of change and/or the proposals would result in a major deterioration in the view.

8. NATURE OF EFFECTS

8.1 GLVIA3 includes an entry that states "*effects can be described as positive or negative (or in some cases neutral) in their consequences for views and visual amenity.*"⁹ GLVIA3 does not, however, state how negative or positive effects should be assessed and therefore becomes a matter of subjective judgement rather than reasoned criteria. Third party representations often refers to the industrial character and imposition of solar arrays. Whilst local objectors would undoubtedly view the proposals in this way, equally, other people would simply view the development as essential infrastructure that should be delivered as a matter of urgency to tackle climate change. This disparity of opinions or public attitudes from negative to positive is known within LVIA as valency. Due to inconsistencies with the assessment of negative or positive effects a precautionary approach is applied to this LVIA that assumes all landscape and visual effects are considered to be negative or adverse unless otherwise stated.

⁹ Para 6.29, Page 113, GLVIA 3rd Edition

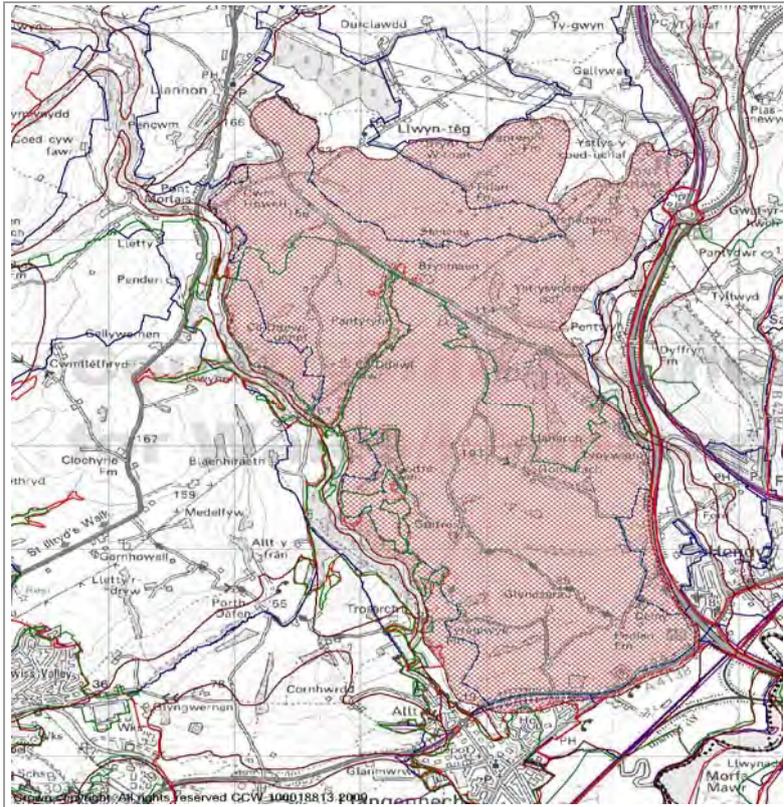
APPENDIX 6.2

LANDMAP DATA SHEET

Geological Landscape

Aspect Area Name	Goitte-Brynmaer
Aspect Area Classification	Lowland hills and valleys/Lowland glacial and fluvioglacial depositional terrain/Other (Level 3)
Aspect Area Code	CRMRTGL267

Date Of Survey :
30/12/2008



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Monitoring

Has the information ever been verified in the field?	No
Does this area have a special or functional link with an adjacent area?	No

Description

If Classification is "Other", specify here	Glacio-depositional topography / veneer
What is the geographical and topographical character of this area?	Undulating wedge-shaped section of terrain between the Gwlli and Morlais valleys. Comprises several low knolls of Upper Carboniferous 'Coal Measures' sandstone with glacial clay (Quaternary: Pleistocene) between and around. Generally rises from S to N. Largest knoll, in the Brynmaer area, rises to around 193m above surrounding platform.
Where drift dominated, what is the dominant drift deposit?	Glacial
Where drift dominated, what is the major sediment that characterises the area?	Boulder clay/till
What is the characteristic Level 3 component of the area?	Other (Glacio-depositional topography / veneer)
Which of the following is a significant contributor to the geological character of the area?	Stratigraphic formation(s) (Warwickshire Group: Pennant Sandstone Formation (=South Wales Pennant Formation / 'Upper Coal Measures'.) [CARBONIFEROUS, PENNSYLVANIAN: 'WESTPHALIAN' (BOLSOVIAN to WESTPHALIAN D)], 'Lower Pennant Measures' in N [BOLSOVIAN], 'Upper Pennant Measures', in S [WESTPHALIAN D]. Minor glacial till [QUATERNARY: PLEISTOCENE].) Superficial deposits (Glacial till (QUATERNARY: PLEISTOCENE) cover extensive.) Active processes (Stream, spring) Past processes (Glacial)
What active geological and	Stream, spring

geomorphological processes are significant in this area?	
What Level 4 components are notable in this area?	Slope Hill top Spring
Are there any pedological processes that are significant in the area or have had a landscape forming effect?	Not known
Are there components of significant hydrological importance?	Yes (Stream, spring)
Is there current mineral extraction?	No
Has there been mineral extraction in the past?	Yes (coal)
Are there SSSI/GCR sites here?	No
Are there geological SINIC, 2nd tier, or RIGS sites in the area?	No
Evaluation	
Value	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Condition	Good (Rural area with no significant development.)
Trend	Constant (Rural area with no significant development.)
Recommendations	
Existing management	Generally Appropriate
Existing management remarks:	Rural area with no significant development.
Principal management recommendations	Ensure that no features or natural systems of geological or geomorphological significance in the area are lost or damaged (e.g. due to development or forestry). Complete RIGS survey of Coalfield area (including Devonian-Carboniferous successions) and ensure that selected sites are safeguarded using Local Plan policies and constraint mapping.
Guideline	Long Term (Ensure that no features or natural systems of geological or geomorphological significance in the area are lost or damaged (e.g. due to development or forestry).) Long Term (Complete RIGS survey of Coalfield area (including Devonian-Carboniferous successions) and ensure that selected sites are safeguarded using Local Plan policies and constraint mapping.)
Tolerance To Change	
Are there any significant threats to the current integrity and condition of the Earth Heritage features of the area?	Not known
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	Most (Aspect Area boundaries surveyed at 1:10,000 using aerial photographs, mapped at 1:25,000.)
What baseline information source was used for Aspect Area boundary mapping?	Other (1:50,000 British Geological Survey maps, 1:10,000 aerial photographs (as stereo pairs), OS 1:25,000 Landranger topographical maps.)
If OS Data was used, what was the scale?	1:25,000
What is the justification for the Aspect Area boundaries?	Break of slope at edge of drift filled depression or valley systems and base of valley sides / escarpment above.
Evaluation Matrix	
Evaluation Criteria: Research Value	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed

	elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Educational Value	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Historical Value	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Rarity / Uniqueness	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Classic Example	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Overall Evaluation	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Justification of overall evaluation	No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.
Bibliography	
List the key sources used for this assessment	ORDNANCE SURVEY 1998b, Explorer Map 178 (1:25, 000). INSTITUTE OF GEOLOGICAL SCIENCES 1977, Sheet 230 (Drift), 1:50,000 Geological Series; ARCHER, A.A. 1968, Memoir of the Geological Survey of Great Britain (England and Wales), (Sheets 229 pt, 230, 246), HMSO. STRAHAN, A. et al. 1907, Memoirs of the Geological Survey (England and Wales), HMSO;
Assessment	
Additional Assessments	None
Additional Comments	

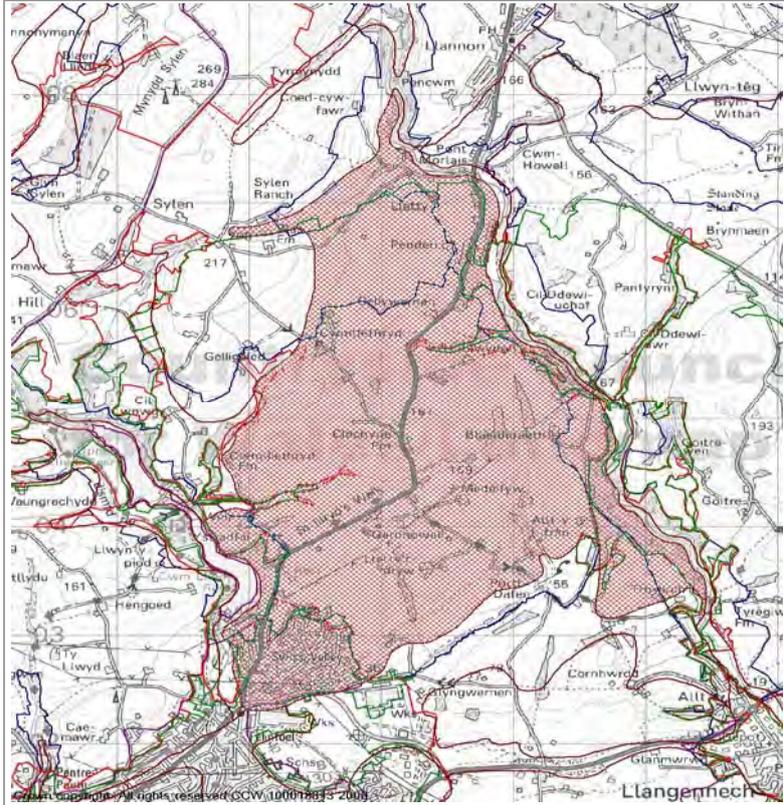
Geological Landscape

Aspect Area Name Swiss Valley

Aspect Area Classification Lowland hills and valleys/Lowland glacial and fluvio-glacial depositional terrain/Other (Level 3)

Aspect Area Code CRMRTGL243

Date Of Survey :
30/12/2008



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Monitoring

Has the information ever been verified in the field?

No

Does this area have a special or functional link with an adjacent area?

No

Description

If Classification is "Other", specify here Glacio-depositional topography / veneer

What is the geographical and topographical character of this area? Undulating raised surface within the Upper Carboniferous sandstone dominated massif N of Llanelli. Characterised by knolls and ridges of sandstone emerging from glacial clay cover (Quaternary: Pleistocene).

Where drift dominated, what is the dominant drift deposit? Glacial

Where drift dominated, what is the major sediment that characterises the area? Boulder clay/till

What is the characteristic Level 3 component of the area? Other (Glacio-depositional topography / veneer)

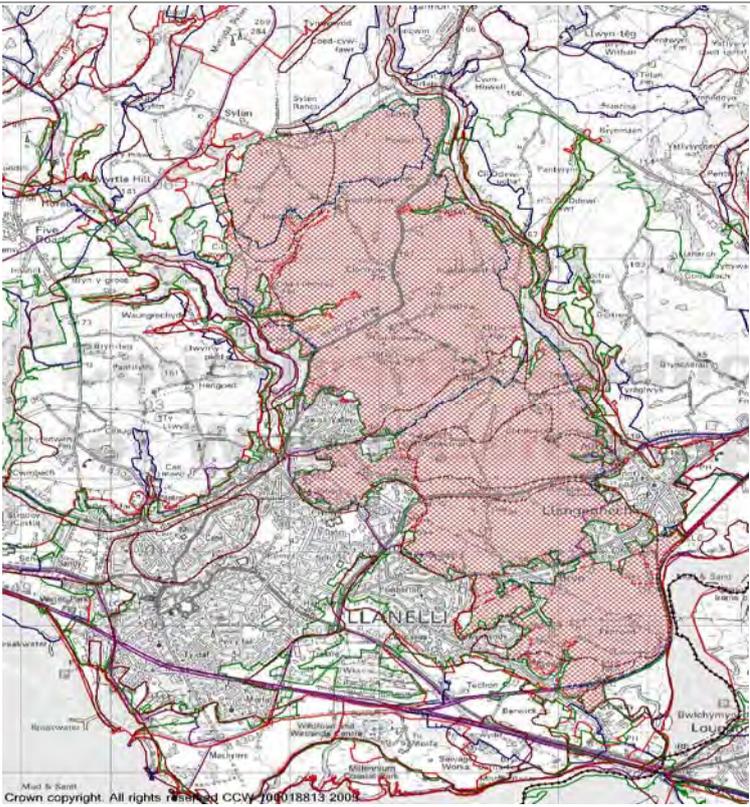
Which of the following is a significant contributor to the geological character of the area?
Stratigraphic formation(s) (Warwickshire Group: Pennant Sandstone Formation (=South Wales Pennant Formation / 'Upper Coal Measures'.) including 'Lower Pennant Measures' in N [CARBONIFEROUS, PENNSYLVANIAN 'WESTPHALIAN' (BOLSOVIAN)], 'Upper Pennant Measures' in S [CARBONIFEROUS, PENNSYLVANIAN: 'WESTPHALIAN' (WESTPHALIAN D)].)
Superficial deposits (Glacial till dominates [QUATERNARY: PLEISTOCENE].)
Active processes (Stream)
Past processes (Glacial)

What active geological and geomorphological processes are significant in this area? Stream

What Level 4 components are notable in this area?	Slope Hill top Urban / industrial development
Are there any pedological processes that are significant in the area or have had a landscape forming effect?	No
Are there components of significant hydrological importance?	Yes (Stream)
Is there current mineral extraction?	No
Has there been mineral extraction in the past?	Not known
Are there SSSI/GCR sites here?	No
Are there geological SINIC, 2nd tier, or RIGS sites in the area?	No
Evaluation	
Value	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Condition	Good (Rural area with no significant development.)
Trend	Constant (Rural area with no significant development.)
Recommendations	
Existing management	Generally Appropriate
Existing management remarks:	Rural area with no significant development.
Principal management recommendations	Ensure that no features or natural systems of geological or geomorphological significance in the area are lost or damaged (e.g. due to development or forestry). Complete RIGS survey of Coalfield area (including Devonian-Carboniferous successions) and ensure that selected sites are safeguarded using Local Plan policies and constraint mapping.
Guideline	Long Term (Ensure that no features or natural systems of geological or geomorphological significance in the area are lost or damaged (e.g. due to development or forestry).) Medium Term (Complete RIGS survey of Coalfield area (including Devonian-Carboniferous successions) and ensure that selected sites are safeguarded using Local Plan policies and constraint mapping.)
Tolerance To Change	
Are there any significant threats to the current integrity and condition of the Earth Heritage features of the area?	Not known
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	Most (Aspect Area boundaries surveyed at 1:10,000 using aerial photographs, mapped at 1:25,000.)
What baseline information source was used for Aspect Area boundary mapping?	Other (1:50,000 British Geological Survey maps, 1:10,000 aerial photographs (as stereo pairs), OS 1:25,000 Landranger topographical maps.)
If OS Data was used, what was the scale?	1:25,000
What is the justification for the Aspect Area boundaries?	Break of slope at base of solid geology massifs above and junction with valley systems below.
Evaluation Matrix	
Evaluation Criteria: Research Value	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Educational Value	Moderate (No regionally significant sites/ landforms noted during

	present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Historical Value	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Rarity / Uniqueness	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Classic Example	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Evaluation Criteria: Overall Evaluation	Moderate (No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.)
Justification of overall evaluation	No regionally significant sites/ landforms noted during present survey and geology/ geomorphology considered to be typical of feature/ process and is either widespread, better exposed elsewhere or not currently known to be exceptional.
Bibliography	
List the key sources used for this assessment	ORDNANCE SURVEY 1998b, Explorer Map 178 (1:25, 000). INSTITUTE OF GEOLOGICAL SCIENCES 1977, Sheet 230 (Drift), 1:50,000 Geological Series; ARCHER, A.A. 1968, Memoir of the Geological Survey of Great Britain (England and Wales), (Sheets 229 pt, 230, 246), HMSO.
Assessment	
Additional Assessments	None
Additional Comments	

Landscape Habitats

Aspect Area Name	Llanelli East	
Aspect Area Classification	Dry (Relatively) Terrestrial Habitats/Grassland & Marsh/Mosaic (Level 3)	
Aspect Area Code	CRMRTLH024	
<p>Date Of Survey : 25/08/2005</p>		<p>Crown Copyright. All rights reserved CCW 100018813 2005</p>

Monitoring

Date of monitoring?	
Monitoring undertaken by	
Has the information ever been verified in the field?	No
Does this area have a special or functional link with an adjacent area?	No
What is the total land area within the boundary (in hectares)?	1984 (ha)

Description

What are the dominant soil types? (specify up to 3 types)	Brown soils Podzolic
What Phase 1 habitat types are present? Only select the five most dominant types and, for each of these, specify below what percentage of the Aspect Area is made up of these.	Semi-improved Neutral Grassland (6%) Improved Grassland (78%) Arable (4%) Buildings (2%) Not Accessed Land (2%)
Does the area contain habitats of international importance?	Not known
Does the area contain BAP habitats?	Yes
If yes, which BAP habitats?	Lowland Mixed Deciduous Woodland Ancient and/or Species Rich Hedgerows Lowland Meadows
Does the area contain protected sites?	No
Approximately what proportion of the Aspect Area is within the protected site?	
Does the area support important species?	Not known

If yes, which species? (for each of the species, also note the source of information)	
Are there any significant threat species present in abundance? (Field visit required)	Not known
What other features significantly influence the biodiversity in this area?	Hedgerows
Are any of these features in a very good condition? (Field visit required)	
Are any of these features in a poor condition? (Field visit required)	
What are the main land management activities taking place in the area? (Field visit required)	Cultivation Stock grazing
Do any of the above appear to have an appreciable positive impact on biodiversity? (Field visit required)	
Do any of the above appear to have an appreciable negative impact on biodiversity? (Field visit required)	
Is the biodiversity in the area in any way threatened?	Not known
Are there clear opportunities to improve the biodiversity aspect of this area?	
Summarise the key features that define this area's biodiversity character	Rolling landscape on a ridge between the Morlais and Lliedi valleys dominated by agriculturally improved grasslands... Small watercourses form the focus for semi-natural habitat and biodiversity interest...
Evaluation	
Value	Moderate
Condition	Unassessed
Trend	Unassessed
Recommendations	
Existing management	Unassessed
Existing management remarks:	
Principal management recommendations	Please refer to the Local Biodiversity Action Plan for Carmarthenshire which details key actions to safeguard specific ecological receptors including habitats and species...
Guideline	
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	All
What baseline information source was used for Aspect Area boundary mapping?	Other (CCW Phase 1 Habitat Survey Data (Electronic Data Source))
If OS Data was used, what was the scale?	
What is the justification for the Aspect Area boundaries?	Agriculturally improved land without the high proportion of notable grassland habitat associated with the neighbouring Carmarthen Coalfield aspect area (CMLH39)...
Evaluation Matrix	
Evaluation Criteria: Priority Habitats	Moderate (Areas of neutral grassland and semi-natural broad-leaved woodland present...)
Evaluation Criteria: Significance	Unassessed
Evaluation Criteria: Opportunity	Unassessed

Evaluation Criteria: Expansion rates	Unassessed
Evaluation Criteria: Sensitivity	Unassessed
Evaluation Criteria: Connectivity/Cohesion	Unassessed
Evaluation Criteria: Habitat Evaluation	Moderate
Evaluation Criteria: Importance for key species	Unassessed
Evaluation Criteria: Overall Evaluation Habitat and Species	Moderate
Justification of overall evaluation	Improved agricultural landscape with semi-natural habitat of field boundaries and watercourses forming the focus of biodiversity interest...

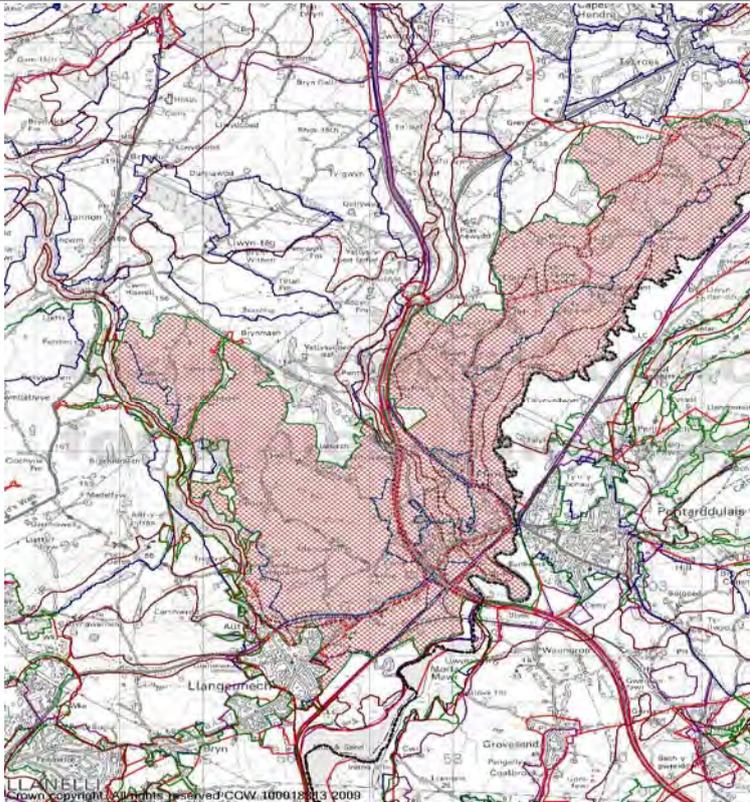
Bibliography

List the key sources used for this assessment	CCW Phase 1 Habitat Survey Data (Electronic Data Source)... CCW Designated Sites (Electronic Data Source)... JNCC (2003)... Protected Sites - www...jncc...gov...uk
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Assessment

Additional Assessments	
Additional Comments	

Landscape Habitats

Aspect Area Name	Llangennech	
Aspect Area Classification	Dry (Relatively) Terrestrial Habitats/Grassland & Marsh/Mosaic (Level 3)	
Aspect Area Code	CRMRTLH097	
<p>Date Of Survey : 25/08/2005</p>		

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Monitoring

Date of monitoring?	
Monitoring undertaken by	
Has the information ever been verified in the field?	Yes (Boundary justified using Phase 1 Habitat Survey data / aerial photographs and broadly verified by a field visit (16 August 2005)...)
Does this area have a special or functional link with an adjacent area?	No
What is the total land area within the boundary (in hectares)?	2140 (ha)

Description

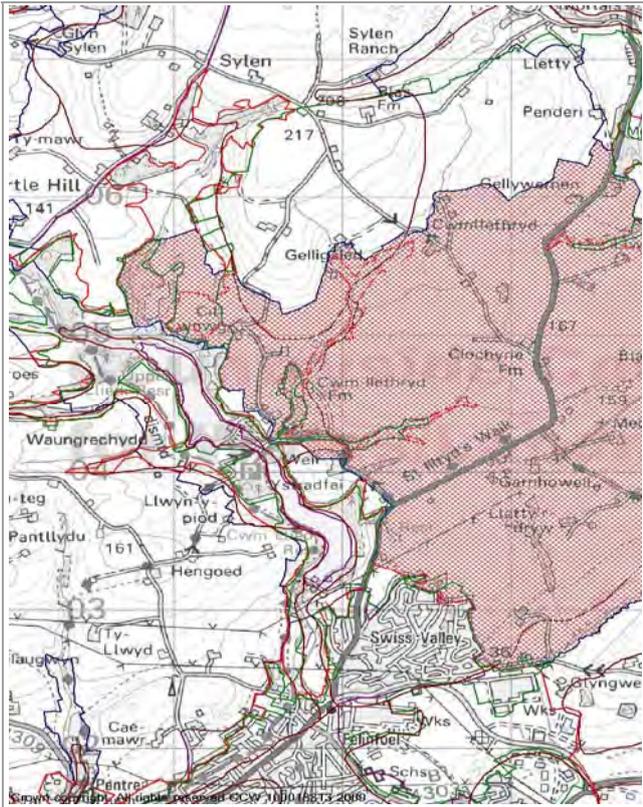
What are the dominant soil types? (specify up to 3 types)	Brown soils Podzolic Ground-water gley soils
What Phase 1 habitat types are present? Only select the five most dominant types and, for each of these, specify below what percentage of the Aspect Area is made up of these.	Semi-natural Broadleaved Woodland (4%) Improved Grassland (79%) Arable (2%) Buildings (5%) Not Accessed Land (2%)
Does the area contain habitats of international importance?	Not known
Does the area contain BAP habitats?	Yes
If yes, which BAP habitats?	Lowland Mixed Deciduous Woodland Ancient and/or Species Rich Hedgerows Purple Moor Grass & Rush Pastures
Does the area contain protected sites?	No
Approximately what proportion of the Aspect Area is within the protected site?	

Does the area support important species?	Not known
If yes, which species? (for each of the species, also note the source of information)	
Are there any significant threat species present in abundance? (Field visit required)	Not known
Are any of these features in a very good condition? (Field visit required)	
Are any of these features in a poor condition? (Field visit required)	
What are the main land management activities taking place in the area? (Field visit required)	Stock grazing
Do any of the above appear to have an appreciable positive impact on biodiversity? (Field visit required)	
Do any of the above appear to have an appreciable negative impact on biodiversity? (Field visit required)	
Is the biodiversity in the area in any way threatened?	Not known
Are there clear opportunities to improve the biodiversity aspect of this area?	
Summarise the key features that define this area's biodiversity character	Rolling landscape on the flanks of the lower Loughor valley dominated by improved grasslands but including rough grassland, scrub and woodland on steeper slopes and bordering watercourses...
Evaluation	
Value	Moderate
Condition	Unassessed
Trend	Unassessed
Recommendations	
Existing management	Unassessed
Existing management remarks:	
Principal management recommendations	Please refer to the Local Biodiversity Action Plan for Carmarthenshire which details key actions to safeguard specific ecological receptors including habitats and species...
Guideline	
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	All
What baseline information source was used for Aspect Area boundary mapping?	Other (CCW Phase 1 Habitat Survey Data (Electronic Data Source))
If OS Data was used, what was the scale?	
What is the justification for the Aspect Area boundaries?	Agriculturally improved landscape without the high proportion of notable grassland habitat associated with the neighbouring Carmarthen Coalfield aspect area (CMLH39)...
Evaluation Matrix	
Evaluation Criteria: Priority Habitats	Unassessed
Evaluation Criteria: Significance	Unassessed
Evaluation Criteria: Opportunity	Unassessed
Evaluation Criteria: Expansion rates	Unassessed
Evaluation Criteria: Sensitivity	Unassessed

Evaluation Criteria: Connectivity/Cohesion	Unassessed
Evaluation Criteria: Habitat Evaluation	Moderate
Evaluation Criteria: Importance for key species	Unassessed
Evaluation Criteria: Overall Evaluation Habitat and Species	Moderate
Justification of overall evaluation	Improved agricultural landscape with semi-natural habitat of field boundaries, steep slopes and watercourses forming the focus of biodiversity interest...
Bibliography	
List the key sources used for this assessment	CCW Phase 1 Habitat Survey Data (Electronic Data Source)... CCW Designated Sites (Electronic Data Source)... JNCC (2003)... Protected Sites - www...jncc...gov...uk
Assessment	
Additional Assessments	
Additional Comments	

Historic Landscape

Aspect Area Name	CLOCHYRIE
Aspect Area Classification	Rural environment/Agricultural /Irregular Fieldsapes (Level 3)
Aspect Area Code	CRMRTL39530



Date Of Survey : 01/01/2003

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Monitoring

Has the information ever been verified in the field?	
Does this area have a special or functional link with an adjacent area?	No

Description

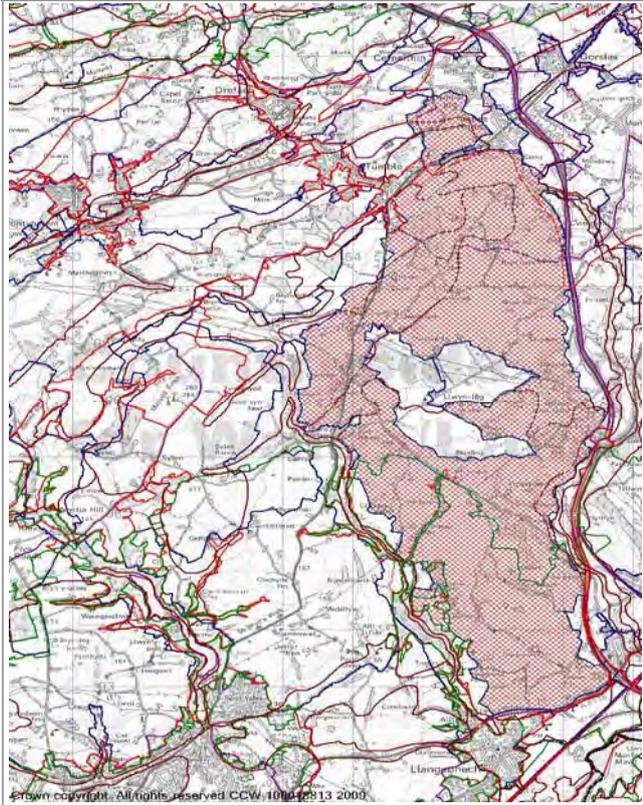
If Classification is "Other", specify here	
Summary Description / Key Patterns and Elements	CLOCHYRIE, An area of irregular medium to large field enclosures, mostly of improved pasture with areas of woodland... The settlement pattern is one of dispersed farmsteads and cottages... Most significant archaeological element(s): Possible Neolithic and Bronze Age barrows, post med settlement
If working at level 3, the classification describes the dominant historic pattern, but which other patterns are important to the historical pattern of this area? (Tick all that apply)	<input type="checkbox"/> Communications <input type="checkbox"/> Woodland <input type="checkbox"/> Non-nucleated Settlement
Which traditional boundary types prevail in the area? (Tick all that apply)	<input type="checkbox"/> Hedgerow
What is the nature of any significant archaeological interest in the area? (Tick all that apply)	<input type="checkbox"/> Relict-Earthworks <input type="checkbox"/> Documentary <input type="checkbox"/> Buried-dry <input type="checkbox"/> Buildings & Structures
Which chronological period is dominant in the area?	<input type="checkbox"/> Prehistoric <input type="checkbox"/> Post Medieval (1536+)
Has a Historic Landscape Characterisation been undertaken here?	No
Are there SMR sites here?	Yes

Are there SAMs here?	Yes
Are there Listed Buildings here?	No
Are there Registered Historic Parks and Gardens here?	No
Are there Conservation Areas here?	No
Are there World Heritage Sites here?	
Is the area within a Registered Landscape of Historic Interest?	No
Evaluation	
Value:	High (High - A good example of a Carmarthenshire agricultural landscape. It contributes to the general historic landscape character of the wider region.)
Condition:	Unassessed
Trend:	Unassessed
Recommendations	
Existing management	Unassessed
Existing management remarks:	
Principal management recommendations	
Guideline	
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	All
What baseline information source was used for Aspect Area boundary mapping?	
If OS Data was used, what was the scale?	
What is the justification for the Aspect Area boundaries?	
Evaluation Matrix	
Evaluation Criteria: Integrity	Outstanding (Outstanding - Landscape is 'complete' with little modern development/intrusion to hinder the visibility of the overall landscape and its patterns.) Outstanding (Outstanding - Landscape is 'complete' with little modern development/intrusion to hinder the visibility of the overall landscape and its patterns.)
Evaluation Criteria: Survival	N/A (Outstanding - most landscape elements survive.)
Evaluation Criteria: Condition	Outstanding (Outstanding - The majority of individual elements survive in very good condition.) Outstanding (Outstanding - The majority of individual elements survive in very good condition.)
Evaluation Criteria: Rarity	Representative (Moderate - This type of landscape can be paralleled elsewhere in Carmarthenshire. It contains few or no components that are of national importance.)
Evaluation Criteria: Potential	Moderate (Moderate - Potential for future landscape study is high to outstanding but interpretation and amenity potential is lower.)
Evaluation Criteria: Overall Evaluation	High (High - This area scores highly in most categories but its potential and rarity scores are moderate. It is a typical example of a Carmarthenshire agricultural landscape.)
Justification of overall evaluation	LANDMAP criteria.
Bibliography	
List the key sources used for this assessment	
Assessment	

Additional Assessments	
Additional Comments	

Historic Landscape

Aspect Area Name	LLANNON
Aspect Area Classification	Rural environment/Agricultural /Irregular Fieldsapes (Level 3)
Aspect Area Code	CRMRTL39536



Date Of Survey : 01/01/2003

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Monitoring

Has the information ever been verified in the field?	
Does this area have a special or functional link with an adjacent area?	No

Description

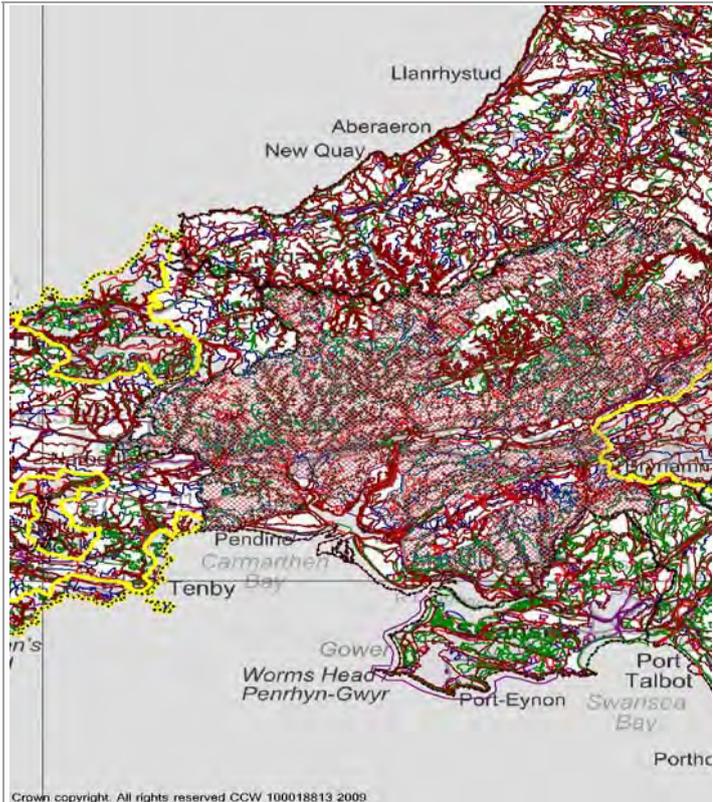
If Classification is "Other", specify here	
Summary Description / Key Patterns and Elements	LLANNON, An expansive area characterised by medium sized irregular field enclosures and a settlement pattern of dispersed farmsteads and cottages, but also encompassing the nucleated settlement of Llannon... Most significant archaeological element(s): Bryn Maen Standing Stone and other BA ritual mons...
If working at level 3, the classification describes the dominant historic pattern, but which other patterns are important to the historical pattern of this area? (Tick all that apply)	Extractive Communications Woodland Processing/Manufacturing Recreational
Which traditional boundary types prevail in the area? (Tick all that apply)	Hedgerow
What is the nature of any significant archaeological interest in the area? (Tick all that apply)	Relict-Earthworks Documentary Buried-dry Relict-Stone Monuments Buildings & Structures Industrial Archaeology
Which chronological period is dominant in the area?	Prehistoric Medieval (to 1536) Post Medieval (1536+)
Has a Historic Landscape Characterisation	No

been undertaken here?	
Are there SMR sites here?	Yes
Are there SAMs here?	Yes
Are there Listed Buildings here?	Yes
Are there Registered Historic Parks and Gardens here?	No
Are there Conservation Areas here?	No
Are there World Heritage Sites here?	
Is the area within a Registered Landscape of Historic Interest?	No
Evaluation	
Value:	High (High - A good example of a Carmarthenshire agricultural landscape. It contributes to the general historic landscape character of the wider region.)
Condition:	Unassessed
Trend:	Unassessed
Recommendations	
Existing management	Unassessed
Existing management remarks:	
Principal management recommendations	
Guideline	
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	All
What baseline information source was used for Aspect Area boundary mapping?	
If OS Data was used, what was the scale?	
What is the justification for the Aspect Area boundaries?	
Evaluation Matrix	
Evaluation Criteria: Integrity	Outstanding (Outstanding - Landscape is 'complete' with little modern development/intrusion to hinder the visibility of the overall landscape and its patterns.) Outstanding (Outstanding - Landscape is 'complete' with little modern development/intrusion to hinder the visibility of the overall landscape and its patterns.)
Evaluation Criteria: Survival	N/A (Outstanding - most landscape elements survive.)
Evaluation Criteria: Condition	Outstanding (Outstanding - The majority of individual elements survive in very good condition.) Outstanding (Outstanding - The majority of individual elements survive in very good condition.)
Evaluation Criteria: Rarity	Representative (Moderate - This type of landscape can be paralleled elsewhere in Carmarthenshire. It contains few or no components that are of national importance.)
Evaluation Criteria: Potential	Moderate (Moderate - Potential for future landscape study is high to outstanding but interpretation and amenity potential is lower.)
Evaluation Criteria: Overall Evaluation	High (High - This area scores highly in most categories but its potential and rarity scores are moderate. It is a typical example of a Carmarthenshire agricultural landscape.)
Justification of overall evaluation	LANDMAP criteria, supported by field visits and local knowledge.
Bibliography	
List the key sources used for this	

assessment	
Assessment	
Additional Assessments	
Additional Comments	

Cultural Landscape

Aspect Area Name	Rural Carmarthenshire
Aspect Area Classification	Influences/Material expressions/Rural/Other Rural (specify) (Level 4)
Aspect Area Code	CRMRTCL061



Date Of Survey : 02/03/2008

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Monitoring

Has the information ever been verified in the field?	No
Does this area have a special or functional link with an adjacent area?	Yes (The whole Study Area)

Description

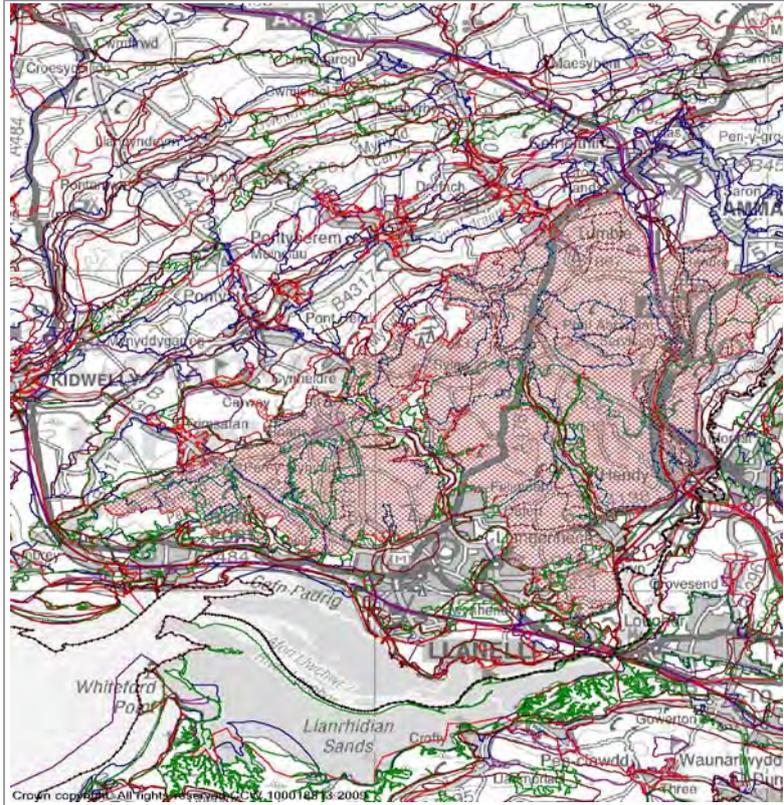
If Classification is "Other", specify here	"Other rural" selected to reflect the overall image of Carmarthenshire as being a rural county
The classification at level 3 describes the dominant cultural context, but which other contexts are important to the cultural landscape of this area?	Rural Infrastructure Places Customs Other ("Other rural" selected to reflect the overall image of Carmarthenshire as being a rural county)
Which level 4 classes are particularly significant to the cultural landscape character of this area - Influences?	Forestry Fishing/ hunting Rural Settlement Other Rural (specify) ("Other rural" selected to reflect the overall image of Carmarthenshire as being a rural county) Minerals & Mining Power Generation & Distribution Light Industry & Technology Tourism Agricultural Rural Crafts Trade, Retail & Commercial Communications & Transport
Which level 4 classes are particularly significant to the cultural landscape character of this area - Associations?	Places & Place Names Leisure/Recreation Social Events & Institutions Sense of Place

	<p>Famous People Land Holdings Land Divisions Religions & Beliefs Politics Educational Movements Art Literature Music Language Folklore/ Folk memory Press</p>
To what extent do the context and level 4 details selected contribute to the cultural identity, local distinctiveness or sense of place of the area?	Very Strong (The wide range of Level 4 details reflect the cultural diversity of this Aspect Area and of the Study Area as a whole)
To what extent is the cultural information widely recognised or appreciated?	Nationally (The aesthetic qualities and cultural attributes of the County are recognised nationally)
Are there any artistic expressions that are particularly famous or associated with the Aspect Area?	Yes (See other entries)
Are there any people / movements / institutions that are particularly famous or associated with the Aspect Area?	Yes (See other entries)
Is there any folklore or are there legends that are particularly famous or associated with the Aspect Area?	Yes (See other entries)
Are there any events/traditions that are particularly famous or associated with the Aspect Area?	Yes (See other entries)
Are there any technical / scientific discoveries that are particularly famous or associated with the Aspect Area?	Not known
What are the attributes of the cultural elements in the Aspect Area?	Mixed
What chronological periods are culturally dominant in the area?	<p>Post 1950 Inter War Victorian & Edwardian Georgian Late Medieval Medieval Early Christian Roman Pre-Roman</p>
Are there certain place-names in the area that are particularly significant?	Yes
If yes, give examples of the place-names and their significance	See other entries
Summary Description: (no more than 150 words)	Multi-faceted appearance but largely homogenous cultural use in the form of farming... The county of Carmarthenshire is so large, and indeed so topographically, culturally and socially diverse as between its various components, that it is not possible within resources to characterise all its cultural features other than those which have a special resonance... However, on the basis that historically, and currently, the principal cultural activity is farming, and recognising that the landscape changes from coastal flats to rugged and inaccessible high points riven by mountain river and stream valleys with undulating landscapes of soothing attractiveness, this catch-all designation appears to be appropriate...
Evaluation	
Value:	High
Condition:	Unassessed
Trend:	Unassessed
Recommendations	

Existing management:	Generally Inappropriate
Existing management remarks:	Generally inappropriate in the sense that the centuries old principal pastime of farming has undergone radical change; in addition, the hedgerows, hedge banks and walls are in a poor state
Principal management recommendations	Avoid encroachment by development into the countryside
Guideline	Long Term (Seek to improve the appearance of the landscape - one of the country's principal assets)
Tolerance To Change	
Are there any significant threats to the current integrity and condition of the Cultural Landscape features of the area?	Yes (Decline in environmental husbandry)
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 4
At 1:10,000, how much of the Aspect Area boundary is precise?	Most (This is a huge are surrounding other smaller cultural Aspect Areas)
What baseline information source was used for Aspect Area boundary mapping?	OS Raster
If OS Data was used, what was the scale?	1: 10,000
What is the justification for the Aspect Area boundaries?	This is a huge are surrounding other smaller cultural Aspect Areas
Evaluation Matrix	
Evaluation Criteria: Recognition/transparency	Internationally/nationally recognised (The aesthetic qualities and cultural attributes of the County are recognised nationally)
Evaluation Criteria: Period	Strongly apparent (The breadth of cultural periods represented in the County are recognised nationally)
Evaluation Criteria: Rarity	Commonplace (Many other similarly rural counties of Wales possess similar attributes)
Evaluation Criteria: Documentation	Unassessed
Evaluation Criteria: Group Value	Exceptional (The collective aesthetic qualities and cultural attributes of the County are recognised nationally)
Evaluation Criteria: Survival	N/A (The traditional agricultural base is slowly being eroded)
Evaluation Criteria: Vulnerability	Vulnerable (The traditional agricultural base is slowly being eroded)
Evaluation Criteria: Diversity	Highly complex (The Aspect Area encompasses a very wide range of cultural activities, both general and specific to the region)
Evaluation Criteria: Potential	Unassessed
Evaluation Criteria: Overall Evaluation	High (High for the varying topography of each of the areas being emblematic of the beauties of the countryside, and for the survival of its principal cultural activity of farming)
Justification of overall evaluation	see Q 40
Bibliography	
List the key sources used for this assessment	Carmarthenshire Unitary Development Plan, 2006 Observations
Assessment	
Additional Assessments	none
Additional Comments	

Visual and Sensory

Aspect Area Name	Llanelli Hills
Aspect Area Classification	Lowland/Rolling Lowland/Mosaic Rolling Lowland (Level 3)
Aspect Area Code	CRMRTVS557



Date Of Survey :
25/07/2005

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Monitoring

Has the information ever been verified in the field?	Yes (1:10,000)
Does this area have a special or functional link with an adjacent area?	Yes (These rolling hills rise up to the Mynydd Sylen plateau.)
During which season(s) was fieldwork carried out?	N/A

Description

Summary Description	An area of rolling hills and small valleys that descend from Mynydd Sylen (upland) to the urban area around Llanelli, similar to the rolling hills north of the Tywi valley and east of Carmarthen. The area is enclosed, with a strong network of hedges around relatively small fields and some woodland. There are scattered farms and narrow lanes with high hedges throughout the area, and a few small but growing settlements. It remains largely rural in character. Pylons cross sections of this area.
Physical Form And Elements: Topographic Form?	Rolling/Undulating
Physical Form And Elements: Landcover Pattern?	Field Pattern/Mosaic
Physical form and elements: Settlement pattern	Scattered Rural/Farm
Physical form and elements: Boundary type	Mixture
Aesthetic Qualities: Scale?	Medium
Aesthetic Qualities: Sense of Enclosure?	Enclosed
Aesthetic Qualities: Diversity?	Diverse
Aesthetic Qualities: Texture?	Coarse

Aesthetic Qualities: Lines?	Curved
Aesthetic Qualities: Colour?	Moderate Contrasts
Aesthetic Qualities: Balance?	Balanced
Aesthetic Qualities: Unity?	Unity
Aesthetic Qualities: Pattern?	Organised
Aesthetic Qualities: Seasonal Interest?	Mixed
Other Factors: Level of Human Access?	Infrequent
Other Factors: Night Time Light Pollution?	Negligible (Few settlements only where limited night light will occur.)
Other Factors: Use of Construction Materials?	Generally Inappropriate
What materials? Give Details:	New residential development does not make use of traditional materials (nor designs), e.g Five Roads. Other similar examples within the area exist south-east of Sylen.
There are attractive views...	...neither in or out (Rolling farmland with views towards the coast.)
There are detractive views...	...neither in or out (Little interrupts this attractive rolling landscape other than the pylons.)
Perceptual and Other Sensory Qualities	Tranquil Sheltered
What is the sense of place/local distinctiveness	Moderate (While this is a scenically attractive area, it does not have a very strong sense of place.)
Evaluation	
Value:	Moderate (Moderate - an area of local importance for its rural landscapes.)
Condition:	Unassessed
Trend:	Declining (The landscape of this area is under pressure for development and this is tending to erode its rural character, particularly on the edge of settlements, as urban style houses are added to small previously rural settlements e.g. Five Roads.)
Recommendations	
Existing management	Unassessed
Existing management remarks:	Managed for stock rearing - grazing and cutting silage in an appropriate way. Some edge of settlement residential developments which are not always in keeping with the landscape have taken place.
Principal management recommendation:	Resist further piece-meal development in rural areas, ensure that development within settlements reflects vernacular styles and that appropriate materials are used.
Guideline	Immediate (Resist further piece-meal development in rural areas,) Immediate (Ensure that development within settlements reflects vernacular styles and that appropriate materials are used.) Immediate (Conserve the semi-natural habitats that exist in this area as they add diversity to the landscape)
Define the key qualities that should be conserved:	The integrity of this area, a quiet rural area close to Llanelli, largely un-spoilt with extensive views towards the coast in parts.
Define the key qualities that should be enhanced:	Make more of the vernacular building styles in this area, resist its urbanisation.
Define the key qualities that should be changed:	N/A.
Define the key elements that should be conserved:	Conserve the field pattern, the field and woodland mosaic, together with the semi-natural habitats and the small rural settlements.
Define the key elements that should be enhanced:	Enhance the vernacular buildings in this area and enhance standards of new design in this area where it is acceptable to develop/restore.
Define the key elements that should be changed:	Urbanisation of the small rural settlements.
Tolerance To Change	
Are there any significant threats to the current integrity and condition of the visual & sensory features of the area?	Yes (Continuing development of the settlements.)

Aspect Area Boundary

To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	Most (Field survey, aerial photos, and OS data.)
What baseline information source was used for Aspect Area boundary mapping?	OS Raster
If OS Data was used, what was the scale?	1: 10,000 and 1: 25,000
What is the justification for the Aspect Area boundaries?	The area identifies the rolling hills between the Mynydd Sylen plateau and the urban areas (field boundaries and woodland edges have been utilised to provide more definite boundaries). The steep wooded valleys are not included. It should be noted that the Aspect Area is formed by four geographically separate areas against LANDMAP methodology, this is considered acceptable however as they are very close to each other and artificially joining them together would include in some landscape which is not in keeping with the Aspect Area.

Bibliography

List the key sources used for this assessment	Aerial photos, raster images and OS maps.
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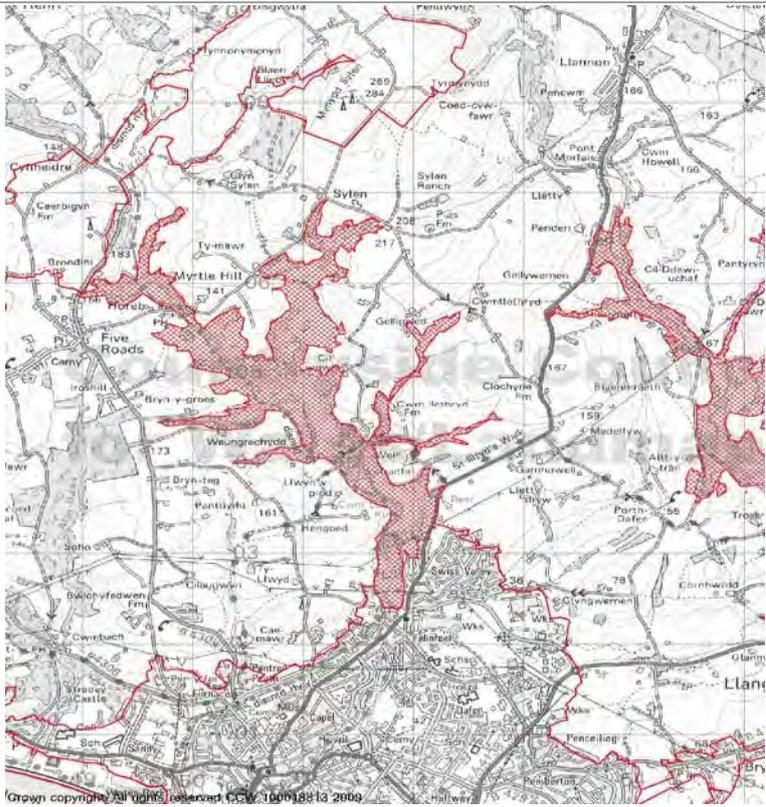
Evaluation Matrix

Evaluation Criteria: Scenic quality	Moderate (Some very attractive areas and extensive views of the coast, that may justify being evaluated as high but overall moderate importance - due to lots of new development etc.)
Evaluation Criteria: Integrity	Moderate (Moderate on account of the amount of development in this area, and the roads which traverse it.)
Evaluation Criteria: Character	Moderate (The area does not have a very distinct character.)
Evaluation Criteria: Rarity	Representative (Similar areas of rolling hills north of the Tywi and east of Carmarthen, that are less disrupted by development and roads.)
Evaluation Criteria: Overall Evaluation	Moderate (Moderate - an area of local importance for its rural landscapes.)
Justification of overall evaluation	The area is of moderate importance for its rural landscapes and provides an attractive area of countryside in the hinterland of Llanelli.

Assessment

Additional Assessments	N/A.
Additional Comments	

Visual and Sensory

Aspect Area Name	Swiss Valley and Morlais Valley	
Aspect Area Classification	Lowland/Lowland Valleys/Wooded Lowland Valleys (Level 3)	
Aspect Area Code	CRMRTVS988	
Date Of Survey : 12/06/2006		

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Monitoring

Has the information ever been verified in the field?	Yes (1:10000)
Does this area have a special or functional link with an adjacent area?	Yes (These two steep sided wooded valleys dissect the Llanelli Hills area.)
During which season(s) was fieldwork carried out?	N/A

Description

Summary Description	Steep sided and well wooded valleys, Swiss valley with its distinctive reservoirs and the Morlais Valley with its river. Swiss valley is easily accessible on foot and cycle and is used for recreation but with the minimum of infrastructure., the Morlais valley is also accessible on foot. The reservoirs have a very natural feel to them and the woodland grades into the water's edge. There are very attractive internal views over the water, or along the river, and because of the steep valley sides there are few views out of the area. Both valleys feel enclosed and remote from the busier landscapes that surround them. The woodland in Swiss valley is mostly broad-leaved and in the Morlais there are more conifers. Both valleys are very peaceful and unspoilt and appear to be enjoyed for recreation, particularly Swiss valley. Both valleys are without settlements.
Physical Form And Elements: Topographic Form?	Hills/Valleys
Physical Form And Elements: Landcover Pattern?	Mixture
Physical form and elements: Settlement pattern	No settlements
Physical form and elements: Boundary type	None

Aesthetic Qualities: Scale?	Small
Aesthetic Qualities: Sense of Enclosure?	Enclosed
Aesthetic Qualities: Diversity?	Diverse
Aesthetic Qualities: Texture?	Coarse
Aesthetic Qualities: Lines?	Curved
Aesthetic Qualities: Colour?	Moderate Contrasts
Aesthetic Qualities: Balance?	Harmonious
Aesthetic Qualities: Unity?	Unity
Aesthetic Qualities: Pattern?	Regular
Aesthetic Qualities: Seasonal Interest?	Mixed
Other Factors: Level of Human Access?	Rare
Other Factors: Night Time Light Pollution?	Negligible (No sources.)
Other Factors: Use of Construction Materials?	Appropriate
What materials? Give Details:	No development, but the recreation infrastructure is appropriate.
There are attractive views...	...within (Attractive views over the water in Swiss valley and along the river in Morlais valley.)
There are detractive views...	...neither in or out (N/A)
Perceptual and Other Sensory Qualities	Attractive Tranquil Sheltered
What is the sense of place/local distinctiveness	Strong (Strong, particularly in Swiss valley)
Evaluation	
Value:	High (High on account of the scenic qualities of Swiss valley and the tranquil views it provides over the reservoirs. Scores high against 3 criteria and moderate for rarity.)
Condition:	Unassessed
Trend:	Unassessed
Recommendations	
Existing management	Generally Appropriate
Existing management remarks:	Management for recreations appear sympathetic to the sense of place and is low key. The cycle way along the old railway has fitted in well.
Principal management recommendation:	Manage to conserve the sense of place of these two valleys and provide appropriate infrastructure for recreation in these areas.
Guideline	Immediate (Conserve the sense of place associated with these areas.) Immediate (Manage to provide appropriate infrastructure for recreation - cycling, walking, fishing, that is unobtrusive in the landscape) Immediate (Conserve and enhance the views over the reservoir or along the river)
Define the key qualities that should be conserved:	The enclosed secluded, and restful feel to these valleys, they feel miles away from the busy centre of Llanelli.
Define the key qualities that should be enhanced:	N/A
Define the key qualities that should be changed:	N/A
Define the key elements that should be conserved:	Conserve the variety of views and visual elements within these landscape - water and woodland, and the interface between these.
Define the key elements that should be enhanced:	Enhance further the Morlais river corridor, and the views along this valley.
Define the key elements that should be changed:	N/A
Tolerance To Change	
Are there any significant threats to the	Yes (Management of the woodland could threaten the integrity and

current integrity and condition of the visual & sensory features of the area?	condition of both valleys and is more likely in the Morlais valley where there are commercial crops.)
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Aspect Area Boundary

To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	Most (Aerial photos, OS data and field visits.)
What baseline information source was used for Aspect Area boundary mapping?	OS Raster
If OS Data was used, what was the scale?	1:10,000 and 1:25,000
What is the justification for the Aspect Area boundaries?	The boundaries denote the change in landscape from well wooded steep sided valleys, to a more open landscape of rolling hills where agriculture is the dominant land use. The boundary is in general the woodland edge on the break of slope with a number of other woodland areas that are adjoining also being included within the Aspect Area. It should be noted that the Aspect Area is formed by two geographically separate areas against LANDMAP methodology, this is considered acceptable however as they are very close to each other and artificially joining them together would include in some landscape which is not in keeping with the Aspect Area.

Bibliography

List the key sources used for this assessment	OS data, aerial photos and field visits.
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Evaluation Matrix

Evaluation Criteria: Scenic quality	High (Swiss valley, is a particularly attractive area,with woodland and water .)
Evaluation Criteria: Integrity	High (Nothing interrupts these landscapes.)
Evaluation Criteria: Character	High (Distinct character on account of the steep wooded valley sides and the water bodies.)
Evaluation Criteria: Rarity	Representative (Valleys like this area rare in this locality but not throughout the county, although the mix of water and woodland in the Swiss valley is more unusual, it does exist in some of the larger river valleys.)
Evaluation Criteria: Overall Evaluation	High (Considered as landscapes of high value, because of their considerable scenic qualities even though they are of local rather than county importance.)
Justification of overall evaluation	The scenic qualities with the juxtaposition of the water and woodland, and the un-spoilt character of this area are considered to contribute to its overall evaluation as high.

Assessment

Additional Assessments	In this part of the county these valleys are considered to be high landscape quality.
Additional Comments	

APPENDIX 6.3

ARBORICULTURAL SURVEY



**ARBORICULTURAL SURVEY, IMPACT ASSESSMENT AND PROTECTION
PLAN**

ON BEHALF OF

VOLTALIA UK LTD

FOR

A PROPOSED SOLAR FARM DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE

AT

BLAENHIRAETH FARM, LLANGENNECH, LLANELLI

Prepared by: Andrew Cunningham FdSc (Arb), Tech Cert (AA), M.ArborA
Checked by: Richard Hyett MSc, BSc (Hons), M.ArborA, MICFor
Reference: V.2630

Validation statement for application registration

This report is submitted to Planning Inspectorate Wales to accompany a planning application for a development of national significance. The report contains arboricultural information relating to a proposed solar farm development at Blanhiraeth Farm, Llangennech, Llanelli, South Wales.

To satisfy the DNS validation requirements, this report contains the following:

- A full tree survey compliant with the requirements of BS5837:2012 'Trees in relation to design, demolition and construction – recommendations' undertaken by a competent and qualified Arboriculturist.
- A suitably scaled plan with a north point and the tree survey information.
- An assessment of the impacts of the proposed development on the existing trees. This includes recommendations of which trees should be removed/retained and the proposed protection measures.
- Heads of Terms for an arboricultural method statement outlining appropriate methods of tree protection and any specific technical construction methods needed to implement the design proposals.

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APPENDICES:

APPENDIX 1 – SITE LOCATION PLAN

APPENDIX 2 – TREE SURVEY METHODOLOGY AND SCHEDULE

APPENDIX 3 – TREE SURVEY AND CONSTRAINTS PLAN

APPENDIX 4 – TREE SURVEY PLAN WITH ANCIENT WOODLAND INVENTORY 2011 OVERLAY

APPENDIX 5 – ARBORICULTURAL IMPACT ASSESSMENT SCHEDULE

APPENDIX 6 - TREE RETENTION AND REMOVAL PLAN

APPENDIX 7 – TREE PROTECTION PLAN

REVISIONS:

Date	Rev	Description of revision	Initials
06.08.18	-	First issue	ACU
31.07.19	A	Revised layout	ACU
09.01.20	B	Revised layout	RH
26.03.20	C	Updated with Ancient Woodland Inventory information	IM
16.12.20	D	Updated layout	RH

1. EXECUTIVE SUMMARY

- 1.1 The proposed development is a solar farm development and associated infrastructure. The site is located on three separate parcels of land (areas A, B and C) at Blaehiraeth Farm which is located approximately three miles to the north of Llanelli, South Wales.
- 1.2 A total of one-hundred and fifty-four survey items were identified during the tree survey. These were mostly of low to moderate-quality trees, although areas of high-quality woodlands were also present within the site.
- 1.3 The development proposals will result in minor sectional removals of hedgerows and groups to allow the installation of the access tracks and connecting cable routes across each of the three areas. The vegetation removal is minor in nature and is considered acceptable in arboricultural terms.
- 1.4 To ensure adequate ground clearance for construction traffic minor facilitation pruning will also be required to some retained vegetation. The anticipated facilitation pruning will not have any long-term impact on the health of the relevant trees.
- 1.5 It is considered that the potential impacts during the construction process could easily be managed by ensuring the security perimeter fence and additional temporary tree protective fencing is installed before any construction activities commence on site. Therefore, from an arboricultural perspective, it is considered that the development proposals are acceptable in arboricultural terms.

2. INTRODUCTION

- 2.1 This Arboricultural Impact Assessment report 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.
- 2.2 The trees contained within the site were surveyed in December 2014 as part of a previous survey. Since this time, the red-line boundary and site conditions have changed and therefore it was appropriate to re-survey the current tree stock to ensure the captured data is current and complete. The re-survey was undertaken on the 19th June and the 18th July 2018. A subsequent site visit to review cable routes was undertaken on the 9th July 2019.
- 2.3 Barton Hyett Associates is instructed by Voltalia UK Ltd, to inspect the trees that could affect or be affected by the development proposal at the land known as Blanhiraeth Farm, Llangennech, Llanelli; hereafter referred to as 'the site'. The site is split in to three distinct areas which surround the main farm. These areas have been named areas A, B and C and are interconnected through existing farm tracks and sections of the highway.
- 2.4 This report, in compliance with BS5837:2012 'Trees in relation to design, demolition and construction - recommendations' is required to accompany the submission of a detailed planning application for a solar farm development and associated infrastructure.
- 2.5 The scope of the instruction was to visit the site and to re-survey relevant trees, hedges and shrub masses in accordance with BS5837:2012 and to prepare the following information:
- Tree survey summary
 - Schedule of tree survey data
 - Tree survey and constraints plan
- 2.6 With reference to the above information and BS5837:2012, Barton Hyett Associates was also instructed to assess the impact of the proposed development on the site's arboricultural resource and to produce the following:
- Arboricultural impact assessment
 - Tree retention and removal plan
 - Tree protection plan

3. REPORT LIMITATIONS

- 3.1 The tree survey was undertaken from ground level and observations have been made solely from visual inspections for the purposes of assessment in terms relevant to planning and development. Only binoculars, mallet and a probe have been used to aid tree assessment. No invasive or non-invasive internal decay detection devices have been used in assessing tree condition.
- 3.2 The recommendations and conclusions in this report relate only to the conditions found on this site at the time of the site visit and inspection. The recommendations contained within this report are valid for a period of 12 months from the date of this report.
- 3.3 Any significant alteration to the site that may affect the trees that are present or have planning implications (level changes, additional tree works, post extreme weather events, hydrological changes) will necessitate a re-assessment of the trees and the site.
- 3.4 This report is prepared for planning purposes only and does not evaluate the degree of risk posed by trees.
- 3.5 Trees are living organisms and self-supporting dynamic structures. Their physiological and structural condition can change rapidly in response to a wide range of biotic/abiotic factors. They have the potential to fail structurally, without prior manifestation of any reasonably observable symptoms. It is therefore not possible to categorically state that any tree is 'safe'.
- 3.6 It is beyond the scope of this report to comment in relation to structural damage – direct or indirect, existing or potential – that might be associated with vegetation growth, or vegetation-related soil subsidence or heave.
- 3.7 Any management recommendations set out within this report are of an advisory and preliminary nature only and relate to trees within the context of current site use. Any physical alterations to site conditions subsequent to the date of the site survey will have the potential to change/invalidate the findings and recommendations of this report.

4. DOCUMENTS AND INFORMATION PROVIDED

4.1 For the purposes of carrying out the assessment I have been provided with, and made reference to, the following information:

- Topographical survey plan – Vermessungsburo -13-475 – fields 1-10 – 09.13.
- General implementation plan – Voltalia – DV_LV_101_04 REV 01 – 09.12.20.

5. DESCRIPTION OF SITE AND TREES

5.1 The site is located on three separate areas of land (areas A, B and C) at Blaehiraeth Farm which is located approximately three miles to the north of Llanelli, South Wales. A Site location plan can be found at **APPENDIX 1** of this report.

- Nearest Post code: SA14 8PX
- Grid reference (approx. centre of site): SN 54364 05839

5.2 All three areas of the site are located within a rural location and at the time of survey were being utilised for the grazing of livestock. Typical for the rural location, most fields are contained by boundary hedgerows, some of which have been subject to management in the form of flailing. However, at the time of survey, the majority of hedgerows were in an unmanaged condition. Contained within most hedgerows are mature standard broadleaved trees, with large areas of woodland also present across all three sites.

5.3 Area A is the most northern part of the site, closest to Blaenhiraeth Farm and the largest of the three areas. The land is accessed from existing farm tracks on the eastern boundary from a narrow country lane. It generally slopes from east to west and is dominated by a large area of mixed mature woodland that is located around a watercourse and skirts the entire length of the western and southern boundaries to the site. Within the site interior there is a large number of irregular shaped fields of varying sizes. These are generally contained by unmanaged hedgerows/groups with large early-mature to mature broadleaved trees. There are also drainage ditches skirting most of the hedgerows and towards the watercourse in the south-west. The northern and eastern boundaries are marked by either unmanaged boundary hedgerows/ tree groups or by small wooded areas. This site is surrounded by continuation of agricultural pastoral farmland, small farmsteads and domestic residential properties.

5.4 Area B is located to the west of Blaenhiraeth Farm and is the second largest site. This site contains four large fields and slopes gently and then abruptly from west to east and then rising again to the east. All fields are contained by either managed or unmanaged hedgerows or groups with the occasional mature tree. The main arboricultural features of Area B are large areas of broadleaved woodland which are located within the eastern region of this area. The site is surrounded by a mix of agricultural farmland, areas of woodland. The A476 trunk road borders the western boundary and provides access in to the site. It is also connected to Area C through an established farm track.

5.5 Area C is located on land close to Blaehiraeth Farm itself but is situated to the south-west of main farm buildings. Access is from the main access drive to the farmhouse. The site consists of four irregularly shaped fields located to the west of the main farmhouse. The entire site slopes

from east to west. Each field is contained by managed hedgerows/groups which at the time of survey had been subject to flailing works. There are small groups of mature trees located within some of these hedgerows which are located sporadically throughout the site. As with areas A and B, it is also surrounded by agricultural farmland.

5.6 All three areas contain woodland which is identified in the Ancient Woodland Inventory 2011 as being one of three categories. These are Ancient Semi-Natural Woodland (ASNW), Plantation on Ancient Woodland Sites (PAWS) and Restored Ancient Woodland Sites (RAWS)¹. Natural Resources Wales spatial data of the Inventory has been overlaid on the Tree Survey and Constraints Plan to produce the separate plan at **APPENDIX 4** of this report. The following colour scheme is used for the data:

- Ancient Semi-Natural Woodland (ASNW) - Green
- Plantation on Ancient Woodland Sites (PAWS) - Brown
- Restored Ancient Woodland Sites (RAWS) – Orange

5.7 The application of the Ancient Woodland Inventory to the features surveyed at the site is discussed in **Section 8 – Tree Survey Findings**.

¹ For further details of the Ancient Woodland Inventory 2011 and the woodland categories see: <https://naturalresources.wales/evidence-and-data/research-and-reports/ancient-woodland-inventory/>

6. STATUTORY PROTECTION

Statutory tree protection

- 6.1 I have contacted Carmarthenshire County Council, the Local Planning Authority (LPA), and they have confirmed that the site is not located within a Conservation Area and that none of the trees on either Site A, B or C are currently protected by Tree Preservation Order (TPO). The following information is provided for advisory purposes.
- 6.2 Notwithstanding specific exemptions and in general terms, a TPO prevents the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction of protected trees or woodlands without the prior written consent of the LPA.
- 6.3 Penalties for contravention of a TPO tend to reflect the extent of damage caused but can, in the event of a tree being destroyed, result in a fine of up to £25,000 if convicted in a Magistrates' Court, or an unlimited fine if the matter is determined by the Crown Court.
- 6.4 On many non-residential sites (excluding specific exemptions) there is also a statutory restriction relating to tree felling that relates to quantities of timber that can be removed within set time periods. In basic terms, it is an offence to remove more than 5 cubic metres of timber in any one calendar quarter without having first obtained a felling licence from Natural Resources Wales.
- 6.5 Any proposed tree works that are planned to be carried out on site must be carried out in accordance with the statutory controls outlined.

Statutory Wildlife Protection

- 6.6 Although preliminary visual checks from ground level of likely wildlife habitats are made at the time of surveying, detailed ecological assessments of wildlife habitats are not made by the arboriculturist and fall outside of the scope for this report.
- 6.7 Trees which contain holes, splits, cracks and cavities could potentially provide a habitat for protected species such as bats in addition to birds and small mammals. In some instances specialist ecological advice may be required. This may result in tree works being carried out following a detailed climbing inspection to the tree to ensure that protected species or their nests/roosts are not disturbed. If any are found, the site manager, owner or consulting arboriculturist should be informed and appropriate action taken as recommended by the appointed Ecologist or Natural Resources Wales.
- 6.8 It is advised that tree/hedgerow works are carried out with the understanding that birds will generally nest in trees, hedges and shrubs between March and August. This time period only

provides an indication of likely nesting times and as such diligence is required when undertaking tree works at all times.

- 6.9 Irrespective of the time of year, and other than any actions approved under General Licence, it is an offence to intentionally kill, injure or take any wild bird or to intentionally take, damage or destroy the nest or eggs of any wild bird. Ideally, tree operations should be avoided during the likely bird nesting period. However, any tree works should always only be carried out following a preliminary visual check of the vegetation.
- 6.10 For information, the Wildlife and Countryside Act 1981 (as amended), The Countryside and Rights of Way Act 2000 (as amended) and the Conservation of Habitat and Species Regulations 2010, form the basis of the statutory legislation for flora and fauna in Wales.
- 6.11 Any proposed tree works that are planned to be carried out on site must be carried out in accordance with any relevant statutory controls, outlined above.

7. ARBORICULTURAL SURVEY

Site visit

7.1 Barton Hyett Associates visited the site on two separate occasions (19th June and 18th July 2018) to carry out the re-survey. The weather at the time of the visits was cloudy and wet; these conditions in no way hindered my ability to view the trees. All observations were made from ground level (aided by the Visual Tree Assessment method – Mattheck and Breloer, 1994²) and all dimensions were measured unless otherwise stated as estimated in the survey schedules.

Methodology

7.2 The survey was undertaken in accordance with BS5837:2012 and the methodology is set out within **APPENDIX 2** of this report.

7.3 The tree survey findings are recorded in the tree survey schedule at **APPENDIX 2** of this report.

7.4 Within the tree survey schedule, each surveyed tree (T), group (G), woodland (W) or hedgerow (H) on or adjacent to the site is given a reference number which refers to its position on the tree survey and constraints plan which can be found at **APPENDIX 3** of this report.

² The Body Language of Trees: A Handbook for Failure Analysis (Research for Amenity Trees)

8. TREE SURVEY FINDINGS

8.1 A summary of the tree survey quality assessment findings that are relevant to the current proposals are shown in table form below:

	Total	A - High quality trees whose retention is most desirable.	B - Moderate quality trees whose retention is desirable.	C - Low quality trees which could be retained but should not significantly constrain the proposal.	U - Very poor quality trees that should be removed unless they have high conservation value.
Trees	35	3	18	10	4
Groups	79	7	42	29	1
Hedgerows	31	0	3	28	0
Woodland	9	7	2	0	0
Total	154	17	65	67	5

8.2 A total of one-hundred and fifty-four survey items were identified during the most recent tree survey. It should be noted that a total of three trees (T27, T48 and T92) had been removed since the original 2014 survey was undertaken (one Category C, and two Category U trees). In addition, twenty-six additional survey items were also recorded as part of the 2018 survey.

8.3 The survey identified sixty-seven items as low-quality (Category C). These included twenty-nine tree groups, twenty-eight hedgerows and ten individual trees. These items had either more significant physiological/structural defects which would limited their useful life expectancy or were considered less prominent within the landscape due to their overall size and form. Their useful life expectancy is considered to be somewhere in the region of 10+ years.

8.4 A total of sixty-five survey items were identified as moderate-quality (Category B) and included forty-two tree groups, eighteen individual trees, three hedgerows and two areas of woodland. These were considered good in their physiological and/or structural condition or were significant in the landscape. Their anticipated life expectancy is considered to be in the region of 20+ years.

8.5 Seventeen survey items were identified as high-quality (Category A). These included seven tree groups, seven areas of woodland and three individual trees. The individual trees were considered to be good specimen trees is reasonably good health. The tree groups and woodlands gained a high-quality categorisation due to their prominence within the landscape and their overall collective form. These are likely to contribute to the site for at least 40 years.

8.6 A total of five items were identified as Category U and considered unsuitable for retention in the site's current context. As mentioned above, two of these trees had been removed since the 2014 previous survey. The normal recommendation is to remove Category U trees irrespective of the development proposals. However, given their ecological value and that the trees are located away from the proposed development, they can be retained.

8.7 Of the surveyed features, five woodlands, one group of trees and three individual trees appear to be within the categories of ancient woodland identified in the Ancient Woodland Inventory 2011.

These are:

- Ancient Semi-Natural Woodland (ASNW) – Green – Two sections of W70
- Plantation on Ancient Woodland Sites (PAWS) – Brown – One section of W70
- Restored Ancient Woodland Sites (RAWS) – Orange – W17, W70, W100, W120, W142, G44, T45, T45a, T49

8.8 Select photographs of the site are shown on the following pages:



Photoview 1: Looking south from central region of site B. Typical maintained hedgerow with standard trees within this area.



Photoview 2: Looking south from the eastern region of Area B. Note the significant high-quality woodland W47 at centre frame.



Photoview 3: Area for proposed sub-station to the north of the main farmhouse within area C. Note limited arboricultural constraints within this area except for G6 (adjacent to pylon).



Photoview 4: looking south within the northern region of area B. Note moderate quality group G149 (left of centre) and G150 (right of centre) which are typical groups of trees within this area.

9. IDENTIFICATION OF PRELIMINARY TREE CONSTRAINTS

- 9.1 In accordance with BS5837:2012, below ground constraints, or root protection areas (RPAs), for the surveyed trees have been plotted onto the tree survey plan for the site. These are represented as a circle centred on the base of each tree stem with a radius of 12 times stem diameter measured at 1.5m above ground level.
- 9.2 With reference to BS5837:2012, a root protection area (RPA) is defined as “a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree’s viability, and where the protection of the roots and soil structure should be treated as a priority”. “The default position [when considering design layout in relation to RPAs] should be that structures are located outside the RPAs of trees to be retained”.
- 9.3 BS5837:2012 states (4.6.2) that, “where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced.” The BS goes on to state that, “modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution,” and that any deviation from the original circular plot should take into account:
- morphology and disposition of roots
 - topography and drainage
 - soil type and structure
 - the likely tolerance of the tree to root damage/disturbance
- 9.4 In this instance, the default circular RPA’s have been used throughout the survey.
- 9.5 Root systems can be damaged in a number of ways as follows:
- Severance of a root will destroy all parts of the root beyond that point. The larger the root severed, the greater the impact on the tree. If roots are damaged close to the trunk, the anchorage and stability of the tree can be affected
 - The root bark protects the root from decay and is also essential for further root growth. If damage to the bark extends around the whole circumference, the root beyond that point will be killed
 - Soil compaction, which may occur from storage of material or passage of heavy equipment over the root area, can restrict and even prevent gaseous diffusion through

the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.

- Lowering the soil level will strip out the mass of roots near the surface
- Raising soil levels will have the same effect as soil compaction
- Incorrect selection and application of herbicide
- Spillage of oils or other harmful materials

9.6 Above ground constraints posed by trees describe the capacity for trees to have an overbearing or dominating effect on new developments. Typical above ground constraints include a number or combination of inconveniences including shading, branch spread, movement of trees during strong winds and so on. If not adequately considered, above ground constraints can lead to repeated requests to fell or heavily prune retained and protected trees.

10. DESCRIPTION OF PROPOSED DEVELOPMENT

- 10.1 The proposed development is for a solar farm and associated infrastructure which is situated with agricultural fields surrounding Blaenhiraeth farm. It will be sited at three separate parcels of land (areas A, B and C). The location for these sites is shown on the site location plan at **APPENDIX 1**.
- 10.2 Each of the three sites will be inter-connected by existing farm tracks or surrounding country lanes.
- 10.3 Access to area A will be from two separate access tracks on the eastern boundary of the site. Both access routes will utilise existing farm entrances from the adjacent highway.
- 10.4 There are two main access points into area B, one is via an existing farm entrance from the main road located on the western boundary of the site, the other is from an existing farm track from Blaenhiraeth farm within the northern region of area B.
- 10.5 Access into area C is via the existing drive in to Blaenhiraeth Farm which is located to the south of the main farm buildings.
- 10.6 The detailed proposed layout is shown on the tree protection plan at **APPENDIX 7**.

11. ARBORICULTURAL IMPACT ASSESSMENT (AIA)

11.1 With reference to BS5837:2012 'Trees in relation to design, demolition and construction', this AIA evaluates the direct and indirect effects of the proposals on the site's arboricultural resource.

11.2 The AIA considers the effects of any tree loss required to implement the detailed design as well as any reasonably foreseeable potentially damaging activities proposed in the vicinity of retained trees. With reference to BS5837:2012 and the nature of the proposals, such activities might include:

- Tree removals to facilitate the design
- Demolition of hard surfaces in proximity to retained trees
- Soil compaction in proximity to retained trees
- Direct impact damage to trees and roots associated with construction operations

11.3 The AIA schedule (at **APPENDIX 5**) is an interpretation by an Arboriculturist of the detailed proposals in relation to the existing arboricultural constraints on site. The schedule provides a tree-by-tree/group-by-group assessment of the level of potential impacts of the proposals. This assessment is cross referenced against tree/group qualities in order to provide evaluations of the degree of significance of the anticipated arboricultural impacts.

11.4 The AIA schedule subsequently sets out preventative measures and other mitigation proposals to reduce, insofar as possible, the level of arboricultural impact and its corresponding significance. This 'adjusted' significance may be considered either in terms of an individual survey item, for example in the context of the use of tree protection barriers, or (where mitigation planting is concerned) in the wider context of the site's overall arboricultural resource.

Description of proposed arboricultural losses

11.5 A summary of anticipated individual tree losses in relation to the proposed development is shown in table form below and illustrated on the tree retention and removal plan at **APPENDIX 6**:

Quality Category	Trees proposed for removal due to development	Total number of removals per category	Percentage of removals
A	0	0	0%
B	0	0	0%
C	0	0	0%
Totals	0	0	0%

11.6 The above table shows that to implement the proposed development, no individual trees or entire tree groups will need to be removed.

11.7 However, to construct the proposed access track and to accommodate the installation of below ground connecting cables a number of sectional hedgerow/group removals will be required. In total 70 linear metres of hedgerow require removal along with some small sections of tree from within tree groups. The relevant vegetation is as follows:

H5, H26, H59, H131, H132 and H135 along with, G98, G106, and G140

11.8 These removals are considered minor when relating them to the retained arboricultural resource throughout the site. None of the removals appear within the Ancient Woodland Inventory 2011. All sectional hedgerow removals are shown on the Tree Retention Removal Plan at **APPENDIX 6**.

11.9 Any required hedgerow removal will be undertaken using hand tools only (pruning saws and chainsaws). Where stumps need to be removed this will done with a pedestrian stump grinder. Sections of hedgerow must not be removed using excavators.

11.10 The site perimeter security fence will be installed without removing any sections of hedgerow. This will be achieved by installing the fence tight to the outer edge of the hedgerow.

11.11 Five survey items are identified as Category U and considered unsuitable for retention in the sites current context. It should be noted that three of these have been removed since last tree survey in 2014. The two remaining trees had major structural and/or structural and physiological defects which have impacts their overall health. It is recommended that these items me removed in accordance with good arboricultural management and irrespectively of the development proposals.

Significance of proposed arboricultural losses

- 11.12 It can be seen from the AIA schedule at **APPENDIX 5** of this report, that the majority of arboricultural impacts of the proposed development are considered to be 'insignificant' and minor (short-term) with a very small number of impacts identified to be of 'moderate' (short to medium-term) significance.
- 11.13 The most significant impacts arise from the sectional removals of hedgerows to allow access road and cable route installation. However, these removals will have very limited impact on the overall canopy cover across the site with virtually no loss of public visual amenity. This loss can be easily mitigated through the new planting proposed on the site.

Impacts on retained trees

- 11.14 The AIA schedule provides a detailed description of potential impacts but a summary of those that have been considered is provided below.

Demolition and site clearance

- 11.15 No building will have to be demolished and no clearance will have to be undertaken to implement the development proposals.

Facilitation pruning

- 11.16 Minor facilitation pruning is anticipated to be required to provide adequate ground clearance to install the site perimeter security fence. and for the new access track through the site (G60, G61, G72, G77, T79, G85, G87, G88, G96, H105 and W142). These works are likely to be minimal in nature (crown lifting) in order to achieve in the region of 2.5-3m of ground clearance.
- 11.17 The most significant tree works relate to W142. These trees were located adjacent to an existing farm track where their branches were noted to be approximately two metres from ground level above the track. These trees will have to be crown lifted to achieve at least 4m of ground clearance, however, if undertaken appropriately this work will only a minor impact on the trees overall health and visual appearance.
- 11.18 All work should be carried out in accordance with industry best practice (BS3998:2010 – *Tree Work – Recommendations*), current wildlife legislation and in-line with the contractor's site-specific risk assessment.

Tree Protective fencing

- 11.19 It is considered that the site perimeter security fence will be able to function effectively as a tree protection barrier. However, this will have to be installed prior to the commencement of any construction works on the site. As such, the majority of the trees on the site will not require the default tree protection specification as described within the BS5837:2012.
- 11.20 However, temporary tree protection barriers will be required for some of the retained trees and hedgerows where the site security perimeter fencing will offer no tree protection.
- 11.21 Due to the significant in size of the site, it is considered that to install full BS:5837:2012 specification fencing throughout is unrealistic. Therefore, it is proposed that full specification fencing is utilised within high intensity construction activity areas and a downgraded lower specification fencing such as 'euro-mesh' is utilised in low intensity areas. This will have to be agreed with the local authority before installation takes place. All currently proposed tree protection is shown on the Tree Protection Plan at **APPENDIX 7**.

Installation of the security fencing

- 11.22 Within some areas, the security fence is shown to enter the RPAs of some of the retained trees (e.g. T49). Due to the limited nature of these works (driven 200mm diameter fence posts), these trees are likely to be resilient without any major impacts to their overall health. If roots are encountered, then the project arboriculturist must be consulted and recommendations set out within BS5837:2012 shall be adhered to.
- 11.23 The site perimeter security fence will be installed without removing any sections of hedgerow. This will be achieved by installing the fence tight to the outer edge of the hedgerow. The security fence alignment will need to be locally adjusted on site to avoid the need for tree removal (where it passes through tree groups or adjacent retained trees) and to ensure a suitable clearance (>3m) to the stems of established trees.
- 11.24 Any required hedgerow removal will be undertaken using hand tools only (pruning saws and chainsaws). Where stumps need to be removed this will be done with a pedestrian stump grinder. Sections of hedgerow must not be removed using excavators.

Installation of solar panels

- 11.25 The strings of panels have been positioned so not to conflict with retained vegetation, therefore impacts from their installation are significantly low. However, if during construction activities it is found that there may be a conflict between the retained trees, then advice shall be gained from the project arboriculturist.

Underground cable installation

- 11.26 The solar arrays within each of the three areas will be linked by an underground cable which will also provide access in to the main grid via the new sub-station. The proposed layout shows that this will be positioned close to (or through) the RPAs of some vegetation on the site. There is potential for this phase of the project to have a detrimental impact to some of these trees, therefore, the position of the cable should be located so not to conflict with their RPAs.
- 11.27 The proposed layout shows an underground cable route to link sites B and C. This route follows the access road (north, east then south). This route has potential to impact adjacent trees and therefore any works within this area would be subject to a detailed arboricultural method statement (AMS) and watching brief.
- 11.28 The route of the cable which links sites A and B has been positioned either adjacent to existing vegetation or within the existing highway. Part of this route extends through Gelli-wernen wood (W70), although it should be noted that the route is not within the area of the wood identified as RAWS on the Ancient Woodland Inventory. The proposed cable route has been revised to ensure the required trench is excavated in the centre of the existing road (although possibly not where the road crosses the existing bridges). In addition, the route has been adjusted to meet the existing highway south of W70 to avoid potential tree loss in the woodland area. By taking this route the impacts to adjacent trees should be minimised, however, all works through the woodland area (W70) must be subject to a detailed arboricultural method statement prepared in conjunction with the appointed contractor. It is also proposed that the 50m of trench north of the northernmost bridge within W70 will be excavated under a watching brief.
- 11.29 In some areas (adjacent to G140, G143) the cable is shown to cross some vegetation. It is considered that there is adequate space to move the position of the cable so that it sites outside RPAs and reducing the need to remove or prune.
- 11.30 Any required hedgerow removal for cable routes will be undertaken using hand tools only (pruning saws and chainsaws). Where stumps need to be removed this will done with a pedestrian stump grinder. Sections of hedgerow must not be removed using excavators.

Site compound

- 11.31 The proposed layout shows that each of the three areas (A, B and C) have clearly defined the location for the construction compound. These are positioned away from retained trees and outside their RPAs. These areas will provide welfare facilities, contractor parking and areas to store materials. It should be noted that additional tree protection fencing will be required in these areas as shown on the tree protection plan at **APPENDIX 7**.

Ground level changes

- 11.32 Due to the nature of the proposed development, minimal ground disturbance is required. Therefore, it is anticipated that ground levels will remain unchanged. However, if during the construction phase it is found that ground level change is required close to trees, then advice should be gained from the project arboriculturist.

Foundations for transformers

- 11.33 Foundations will have to be excavated to allow the concrete bases of the transformer housing. In all areas, the proposed layout indicates that these to be positioned away from retained trees and vegetation. However, if during the construction phase it is found that any excavations are required close to retained trees, then advice should be gained from the project arboriculturist.

Hard surfacing

- 11.34 Hard surfacing in the form of new access roads will be required across all sites. This is likely to be a crushed stone construction. To allow this to be installed, a single 5m section of group G98 will have to be removed. This removal is minor when considered against the wider arboricultural resource being retained. In addition, the loss could easily be mitigated through additional planting as part of the wider landscape planting for the site.
- 11.35 It should be noted, that the new access for the site will utilise existing established farm tracks (adjacent to G140, G141, W142, G150). Within these areas impacts to adjacent trees should be minimal as the tracks have been historically compacted which would have restricted root growth in to these areas. Furthermore, existing farm gates will also be utilised to reduce the need for additional sectional hedgerow removals.

12. TREE PROTECTION PLAN (TPP)

12.1 A Tree Protection Plan is attached at **APPENDIX 7** of this report.

12.2 In accordance with BS5837:2012 the TPP is superimposed onto the proposed site layout plan and based on the topographical survey.

12.3 Where practical the TPP has been drawn to ensure the square metre area of the RPA's for individual trees has been maintained and also that the RPAs cover the likely rooting area of individual trees. Any hard surfacing and structures within the RPAs of trees to be retained are highlighted on the TPP. In addition, where relevant, the TPP shows indicative locations of protective barriers (forming Construction Exclusion Zones in relation to RPAs of retained trees).

12.4 The preparation of the TPP has considered the following factors where relevant:-

- Site construction access;
- intensity and nature of construction activity;
- contractors car parking;
- phasing of construction works;
- availability of special construction techniques;
- spatial requirements for:
 - Temporary and permanent apparatus and service runs;
 - Foundation excavations and construction works;
 - Cranes, plant scaffolding and access during works;
 - Site huts, toilets (including drainage) and other temporary structures;
 - Storage (either temporary or long-term) of materials, spoil, fuel and mixing of concrete.
- All changes in ground levels including location of retaining walls, steps and adequate allowance for foundations of such walls and backfillings;

12.5 The tree protection measures shown on the Tree Protection Plan demonstrate the feasibility of the proposed development in relation to retained trees. However, they must be implemented with specific reference to a finalised tree protection plan and an arboricultural method statement that is relevant to the proposals.

13. HEADS OF TERMS FOR AN ARBORICULTURAL METHOD STATEMENT

13.1 BS5837:2012 (Figure 1) recommends that detailed/technical design of tree protection and arboricultural methodologies should be resolved and finalised following on from the approval of the feasibility of a scheme by the relevant regulatory body.

13.2 Annex B and Table B.1 of BS5837:2012, an informative, advises that arboricultural method statement heads of terms are a sufficient level of information in order to deliver tree-related information into the planning system. The table also advises that a detailed arboricultural method statement might reasonably be required as a 'reserved matter' or planning condition.

13.3 In relation to the above site, it is anticipated that arboricultural working methods are likely to be quite straightforward. A draft, 'heads of terms' is set out below:

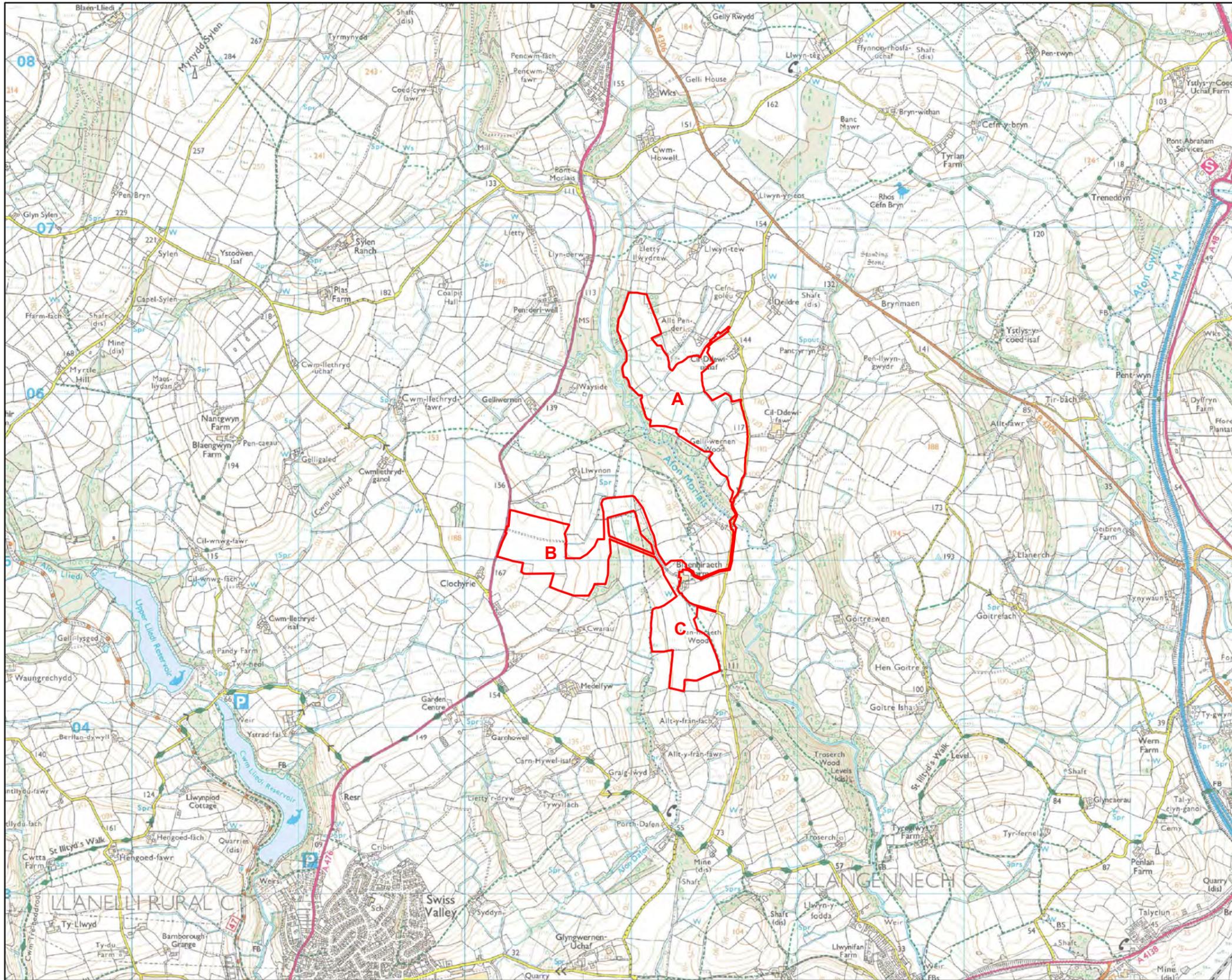
- Project Arboriculturist – schedule of monitoring and supervision
- Pre-commencement site meeting
- Tree removals and facilitation pruning
- Erection of the perimeter security fencing
- Erection of additional tree protection barriers
- Main construction phase
- Watching brief on cable installation
- Removal of tree protection barriers
- Final landscaping including tree planting.

14. SUMMARY

- 14.1 This Arboricultural Impact Assessment report 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.
- 14.2 The site is located on three separate parcels of land (areas A, B and C) around Blaehiraeth Farm which is situated approximately three miles to the north of Llanelli, South Wales. All three areas that make up the site are located within a rural location and are currently being utilised for grazing livestock. Typical for the rural location most fields are contained by boundary hedgerows, some of which have been subject to recent management in the form of flailing, however the majority is in an unmanaged condition. Contained within most hedgerows there are mature standard broadleaves trees, with large areas of woodland also present on all sites.
- 14.3 A total of one-hundred and fifty-four survey items were identified during the most recent tree survey. This included seventy-nine groups, thirty-five individual trees, thirty-one hedgerows and nine areas of woodland. Of these arboricultural features, seventeen were identified as high-quality, sixty-five as moderate-quality and sixty-seven as low-quality.
- 14.4 A total of five survey items were identified as Category U and considered unsuitable for retention within the current site context. Three of these trees have been previously removed, however, it is recommended that the remaining trees be removed under good arboricultural management.
- 14.5 The proposed development will not result in the loss of any individual trees. The proposed development will only result in minimal sectional removals of hedgerows which relate to the installation of cable routes. These impacts are regarded as 'insignificant', occasionally rising to 'moderate' within the impact assessment schedule. This loss can be readily mitigated by the proposed additional tree planting elsewhere on the site.
- 14.6 If the security fencing is installed and other tree protection measures are implemented before any construction activities on site commence, the potential for impacts to occur to retained trees and hedgerows can be avoided.
- 14.7 Some of the works required during the construction phase (such as underground cable installation) must be carried out in accordance with a detailed arboricultural method statement (AMS) and watching brief by the project Arboriculturist. This document must be based on the final approved development and following the grant of planning consent.
- 14.8 In summary, subject to the implementation of the advice contained within this report the proposed development is acceptable from an arboricultural perspective.

APPENDIX 1

SITE LOCATION PLAN



KEY

Site Boundary



Information based on all known constraints.
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6.1 | FIGURE

Site Location Plan | TITLE

1:25,000 @ A3 | SCALE

BRS.4254_22-B | DWG. NO.

APPENDIX 2

TREE SURVEY METHODOLOGY AND SCHEDULE

TREES, HEDGEROWS, GROUPS, WOODLAND

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
T1	Hawthorn	4.5	-	200	-	1.5	-	2.0	-	1.5	-	2.0	-	1.0	-	West	1.0	-	EM	Shrubby tree on field edge, poor form.	Fair	Fair	10+	C1	2.4	18
H2	Hawthorn	1.5	-	100	#	n/a	-	n/a	-	1.0	-	1.0	-	n/a	-	n/a	n/a	-	EM	Managed hedgerow adjacent to access drive, flailed to current dimensions.	Fair	Fair	10+	C2	1.2	5
T3	Laburnum	5.0	-	200	#	2.0	-	3.0	-	2.5	-	2.5	-	1.0	-	South	1.5	-	M	Multi stemmed tree adjacent to access drive, dieback throughout canopy.	Fair	Poor	<10	C1	2.4	18
H4	Bramble, Gorse.	1.5	-	100	#	1.0	-	1.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Broken managed hedgerow adjacent to farm track, overrun with bramble.	Fair	Fair	<10	C2	1.2	5
H5	Blackthorn, Bramble, Gorse.	2.0	-	100	#	1.0	-	1.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Managed hedgerow, gappy in places, some trees grown up to 5m.	Fair	Fair	10+	C2	1.2	5
G6	Ash, Holly, Oak, Hawthorn	9-12	#	300	#	N/a	#	N/a	#	6	-	5	-	n/a	-	n/a	4.5	-	M	Stunted by open aspect, thinning crowns and misshapen poor forms, some dieback. Average heights and dbh recorded.	Fair	Fair	10+	C2	3.6	41
T7	Oak (English)	10.0	-	910	-	8.0	-	8.0	-	7.5	-	7.0	-	2.5	-	South	2.0	-	M	Really Good form, no obvious defects, poaching by cattle around base. Some deadwood in crown, good ecological value.	Good	Good	40+	A1	10.9	375

Ref	Species	Hgt	Est	Stem dia	Est	Spread							Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area		
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction									Canopy	Est
G8	Oak (English)	17.0	-	600	#	8.0	-	n/a	-	n/a	-	n/a	-	n/a	-	n/a	2.5	-	M	Group of trees on edge of woodland, heavily weighted to the north, ivy obscuring most stems, good as a collective. Average heights and dbh recorded.	Good	Good	40+	B2	7.2	163
W9	Alder, Hawthorn, Oak, Willow, Hazel	17.0	#	400	#	As on plan							n/a	-	n/a	1.0	-	M	Adjacent boundary, narrow strip of trees, predominantly alder, adjacent to stream, good collective form. Average heights and crown spread recorded. Significant arboricultural feature.	Fair	Good	20+	B2	4.8	72	
H10	Hawthorn, Hazel, Holly	2.0	-	100	#	As on plan							n/a	-	n/a	0.0	-	M	Managed boundary hedgerow, flailed to current dimensions. Some trees in hedge have grown up to standards and to 6m in height, average dbh recorded.	Fair	Fair	20+	C2	1.2	5	
G11	Ash, Sycamore, Oak	17.0	-	800	#	11	-	10	-	N/a	-	N/a	-	n/a	-	n/a	3.0	-	M	Four mature trees located in hedgerow, good individual and collective form, minor deadwood, stems obscured by ivy, average dbh recorded.	Good	Good	40+	A2	9.6	290
T12	Oak (Sessile)	9.0	-	550	#	6.0	-	6.5	-	5.0	-	6.0	-	4.0	-	South west	3.5	-	M	Tree located in hedgerow, ivy obscuring stem, dbh estimated, high crown, minor deadwood throughout.	Fair	Good	40+	B2	6.6	137

Ref	Species	Hgt	Est	Stem dia	Est	Spread							Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area		
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction									Canopy	Est
H13	Hawthorn, Blackthorn, Holly, Hazel, Gorse.	2.0	-	100	#	As on plan							n/a	-	n/a	n/a	-	M	Managed boundary hedgerow, average of 1.5m wide, average dbh recorded, partially hedge bank, gappy in places, stunted growth, flailed to current dimensions.	Fair	Fair	10+	C2	1.2	5	
H14	Hawthorn, Blackthorn, Holly	2.0	-	120	#	1.0	-	1.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Hedge bank, flailed to current dimensions, minor gaps in places. Dbh average recorded.	Fair	Fair	10+	C2	1.4	7
H15	Hawthorn, Blackthorn, Holly, Hazel.	2.5	-	200	#	1.0	-	1.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Hedge bank, thicker and older than H14, gaps in places, shallow ditch to north.	Good	Fair	20+	B2	2.4	18
G16	Holly, Birch, Willow, Hawthorn, Ash, Oak	12.0	-	400	#	6.0	-	6.0	#	n/a	-	n/a	-	n/a	-	n/a	2.5	-	M	Self set trees located in hedgerow, shallow 1m drainage ditch to the north, evidence of being laid in past, ivy partially obscuring stems, good form. Heights range from 6-12m, dbh range from 100-500mm.	Good	Good	20+	B2	4.8	72
H17	Hawthorn, Blackthorn, Hazel, Ash, Holly, Goat willow.	2.0	-	100	#	n/a	-	n/a	-	1.5	-	1.5	-	n/a	-	n/a	n/a	-	M	Gappy managed hedge bank, overrun with fern and bramble, spreading thicket in places. Thicker towards the south.	Fair	Fair	10+	C2	1.2	5
G18	Ash (Common)	18.0	-	350	#	7.5	-	7.0	#	n/a	-	n/a	-	n/a	-	n/a	2.0	-	M	Group of historically laid ash in corner of field, stem stems in group. Good collective form.	Fair	Good	20+	B2	4.2	55
H19	Hawthorn, Blackthorn, Hazel	2.0	-	100	#	1.0	-	1.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Managed hedge bank on southern boundary to site. Gaps in places. Average dbh recorded.	Fair	Fair	10+	C2	1.2	5

Ref	Species	Hgt	Est	Stem dia	Est	Spread							Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area		
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction									Canopy	Est
G20	Hawthorn, Oak, Holly, Hazel, Goat willow, Ash	7.5	#	300	#	n/a	-	n/a	-	6.0	#	6.0	-	n/a	-	n/a	3.0	-	M	Row of stunted trees along boundary, stem diameter range from 100-450mm. Height 6-8m. Good as collective form, most trees located on bank - probably grown un from unmanaged hedgerow. Ivy partially obscuring stems, average height recorded. Some declining stems in group.	Fair	Good	20+	B2	3.6	41
G21	Hawthorn, Oak, Holly, Hazel, Goat willow, Blackthorn, Rowan, pear	8.0	#	250	#	7.0	-	7.0	#	n/a	-	n/a	-	n/a	-	n/a	3.0	-	M	Unmanaged hedgerow grown up, average height recorded, some standards to 12m. Dbh range from 100- 450mm, northern edge flailed.	Good	Good	20+	B2	3.0	28
G22	Oak (Sessile)	10.0	-	600	-	6.0	-	6.0	-	n/a	-	n/a	-	n/a	-	n/a	4.0	-	M	Two trees located on field edge, good form as individuals or as collective, some minor deadwood in crowns, ivy partially obscuring stems.	Fair	Good	20+	B2	7.2	163
G23	Ash, oak, beech, holly	15.0	-	500	#	7.0	-	n/a	-	n/a	-	86.0	-	n/a	-	n/a	2.5	-	M	Group of trees in corner of field, suppressed form due to open aspect, some trees show evidence of historic coppicing works, located on bank, good collective form. Average heights and dbh recorded, 8m overhang in to field to west.	Fair	Good	20+	B2	6.0	113
H24	Hawthorn, Blackthorn, Hazel, Holly.	2.0	-	100	-	n/a	-	n/a	-	1.0	-	1.0	-	n/a	-	n/a	n/a	-	M	Managed hedgerow, flailed to current dimensions, wide in places, gaps in places	Fair	Fair	10+	C2	1.2	5

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
T25	Oak (English)	9.0	-	400	-	5.5	-	5.0	-	5.0	-	5.0	-	2.0	-	South west	3.0	-	M	Located adjacent to gateway and within hedgerow, minor deadwood throughout, good form	Good	Good	20+	B1	4.8	72
H26	Hawthorn, Blackthorn, Hazel, Beech, Privet, Holly	3.0	-	150	#	n/a	-	n/a	-	1.5	-	1.5	-	n/a	-	n/a	n/a	-	M	Boundary hedgerow adjacent to main road, gate access through central section, managed to current dimensions, good screen for road. Drainage ditch down part of eastern edge, some standards to 8m contained within.	Good	Fair	20+	B2	1.8	10
T27	Hawthorn	2.5	-	150	#	1.0	-	0.5	-	1.5	-	1.0	-	n/a	-	n/a	0.5	-	M	Tree removed since originally survey.	Fair	Fair	10+	C1	1.8	10
T28	Beech (Common)	14.0	-	800	#	8.0	-	7.5	-	8.0	-	7.0	-	2.5	-	East	5.0	-	M	Tree located on boundary and within hedgerow, no access to measure dbh, crown lifted in past, stunted form, moderate dieback in canopy-mostly to western edge. Epicormic growth on stem.	Fair	Fair	10+	C1	9.6	290
H29	Hawthorn, Holly, Hazel, Goat willow, Beech, Ash	2.5	-	150	#	1.5	-	1.5	-	n/a	-	n/a	-	0.0	-	n/a	n/a	-	M	Boundary hedge bank, flailed to current dimensions. Drainage ditch to northern edge. Gaps in places.	Good	Fair	20+	C2	2.4	18
T30	Oak	5.0	-	325	#	3.5	-	3.0	-	5.5	-	2.0	-	1.5	-	South	4.0	-	EM	Poor form, stunted growth, epicormic growth to stem, pruned away from power lines in past.	Fair	Fair	<10	C1	3.6	41

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
G31	Oak, plum	8.0	-	500	#	5.0	-	4.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Largest dbh recorded, dbh range from 200-500mm, suppressed form, located on bank.	Fair	Good	20+	B2	6.0	113
H32	Hawthorn, Sycamore, Field maple, Hazel, Holly, Elder	1.5	-	100	#	1.0	-	1.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Gappy sporadically placed hedgerow, recently failed, more dense towards the east. Average dbh recorded.	Fair	Fair	10+	C2	0.9	3
G33	Sycamore, Hawthorn, Ash	12.0	-	450	#	As on plan								n/a	-	n/a	n/a	-	M	Two groups of trees grown up in hedgerow, evidence of past layering/coppicing. Pruned away from powerlines. Good as a collective, suppressed form due to aspect. Largest dbh recorded, average heights recorded. Ivy obscuring some stems.	Good	Good	20+	B2	5.4	92
H34	Hazel, Hawthorn, Blackthorn	2.0	-	150	#	n/a	-	n/a	-	1.0	-	1.0	-	n/a	-	n/a	n/a	-	M	Managed hedgerow, large gaps in places-replaced with barbed wire.	Fair	Fair	10+	C2	1.8	10
T35	Ash (Common)	9.5	-	406	-	4.5	-	3.0	-	4.0	-	4.5	-	3.5	-	North	3.5	-	EM	Self-set tree located in hedgerow, multi stemmed, included union at base, canker infection throughout, minor dieback.	Fair	Fair	<10	C1	4.9	75

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						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
H36	Hazel, Hawthorn, Blackthorn, Goat willow, Oak, Ash, Holly	2-6	-	100	#	n/a	-	n/a	-	1.5	-	1.5	-	n/a	-	n/a	n/a	-	M	Managed boundary hedge bank, drainage ditch to the east, recently flailed, northern end of hedge is left unmanaged with oak, beech, holly, goat willow trees remaining-these trees have been subject to topping due to overhead power lines. Average dbh recorded.	Good	Fair	10+	C2	1.2	5
G37	Birch, Ash, Goat willow	7.5	#	200	-	n/a	-	n/a	-	3.0	-	3.0	-	n/a	-	n/a	2.0	-	EM	Three standard trees in hedgerow, average condition and form. Dieback to ash.	Fair	Fair	<10	C2	2.4	18
G38	Ash (Common)	15.0	-	425	#	5.5	-	6.0	-	n/a	-	n/a	-	n/a	-	n/a	5.0	-	M	Group of trees adjacent to access track, impact damage to stems, evidence of branches being torn off, pruned away from power lines in past, crown lifted. Average dbh recorded.	Fair	Fair	10+	C2	5.1	82
G39	Ash (Common)	13.0	-	400	#	5.0	-	5.0	-	n/a	-	n/a	-	n/a	-	n/a	4.0	-	EM	Group of two trees, dbh range from 200-450mm, crown lifted in past, stubs and tears remain.	Fair	Fair	10+	C2	4.8	72
G40	Hazel, Goat willow	6.0	-	125	-	n/a	-	n/a	-	4.0	#	4.0	#	n/a	-	n/a	n/a	-	EM	Scrubby group of trees on edge of field, drainage ditch to east.	Fair	Fair	10+	C2	1.5	7

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G41	Hazel, Hawthorn, Field maple, Beech, Ash, Oak	17.0	-	450	-	As on plan								n/a	-	n/a	2.0	-	M	Group of trees located on boundary bank. Dbh range from 150-750mm, heights from 6-17m. Unmanaged and scrubby in some areas. Good collective form. Some standing deadwood in group. Drainage ditch running adjacent to stems along site boundary. Good collective form.	Fair	Good	40+	B2	5.4	92
G42	Hazel, Hawthorn, Oak, Ash, Holly, Beech	17.0	-	450	#	6.0	-	6.0	-	n/a	-	n/a	-	n/a	-	n/a	2.0	-	M	Unmanaged hedgerow now grown up in to group of trees, drainage ditch running to the south-east of stems, mostly shrubby but with good mature standards of oak, ash and beech, sycamore. Central section removed and replanted. Average dbh recorded.	Fair	Good	40+	B2	5.4	92
H43	Hazel, Hawthorn, Blackthorn, Holly	2.5	-	150	#	n/a	-	n/a	-	1.5	-	1.5	-	n/a	-	n/a	n/a	-	M	Managed hedgerow, recent flailing operation, some stems left to east.	Fair	Fair	10+	C2	1.8	10
G44	Beech, Oak, Sycamore, Holly	20.5	-	1,500	#	As on plan								n/a	-	n/a	5.0	-	M	Group of mature trees located on eastern boundary as land slopes away to east, some failures within crown, good collective form, largest dbh recorded, dbh range from 300- 1500mm. Average heights recorded. Significant arboricultural feature.	Fair	Good	20+	B2	18.0	1018

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						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
T45	Beech (Common)	15.0	-	1,200	-	8.0	-	8.0	#	9.0	-	8.0	-	2.5	-	South east	1.5	-	M	Mature tree on field edge, has lost limbs in past-stubs remain, weighted to the east, significant tree.	Good	Fair	20+	B1	14.4	652
T45a	Sycamore	18.0		1,200	#	8.0		9.0		8.0	#	9.0		2.0		North	3.0	-	M	Mature sycamore in serious decline contained within group - fell and remove.	Poor	Poor	<10	U	14.4	652
T46	Elm (English)	16.5	-	400	-	1.0	-	1.0	-	1.0	-	1.0	-	4.0	-	West	n/a	-	M	Tree removed since originally survey.	Poor	Poor	<10	U	4.8	72
W47	Hazel, Hawthorn, Oak, Birch, Holly	18.5	#	600	#	As on plan								n/a	-	n/a	n/a	-	M	Broadleaved woodland, significant arboricultural feature, dbh range from 100-750mm, average heights and dbh recorded. Predominantly oak.	Good	Good	40+	A2	7.2	163
T48	Elm (English)	18.0	-	400	#	1.0	-	1.0	-	1.0	-	1.0	-	n/a	-	n/a	n/a	-	M	Dead standing tree on field edge. Recommend to fell.	Poor	Poor	<10	U	4.8	72
T49	Oak (English)	20.0	-	1,100	#	8.0	-	8.0	#	12.0	-	12.5	-	2.0	-	West	4.0	-	M	Mature tree on edge of woodland, pruned in past now with poor form, substantial tree, dbh estimated-no access due to undergrowth.	Good	Good	40+	B1	13.2	547
H50	Hazel, Hawthorn, Ash	2-3	-	100	#	n/a	-	n/a	-	1.0	-	1.0	-	n/a	-	n/a	n/a	-	M	Boundary hedgerow, recently flailed on field side, some standards left un cut.	Fair	Fair	10+	C2	1.2	5
T51	Ash (Common)	12.0	-	520	-	5.0	-	5.0	-	5.0	-	5.0	#	2.5	-	West	2.0	-	M	Old pollard/coppice, now grown up as multi-stemmed tree, good form. Some dieback in upper canopy.	Good	Fair	10+	C2	6.2	122

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G52	Oak, Ash, Beech, Hawthorn, Blackthorn	8.0	-	300	#	n/a	-	n/a	-	5.0	#	5.0	-	n/a	-	n/a	3.5	-	M	Stunted group of trees on field edge, understory of unmanaged thorn, standards of oak, ash, Beech to 9m, 5m overhang in to field. Land slopes away to the east.	Good	Fair	20+	B2	3.6	41
H53	Hazel, Hawthorn, Blackthorn	2.0	-	150	#	n/a	-	n/a	-	1.5	-	1.5	-	n/a	-	n/a	n/a	-	M	Managed boundary hedgerow, flailed to current dimensions. Average dbh recorded.	Good	Fair	10+	C2	1.8	10
G54	Holly, Hawthorn, Blackthorn, Oak, Ash, Sycamore, Goat Willow	6.5	-	200	#	3.0	-	3.0	-	n/a	-	n/a	-	n/a	-	n/a	2.0	-	M	Boundary group, mostly holly, some ash to 18m/450mm, some oak 350mm dbh, unmanaged. Average heights and dbh recorded. Gaps in places.	Good	Fair	20+	B2	2.4	18
W55	Ash, Oak, Scots pine, Sycamore, Holly, Larch, Goat willow.	18.0	-	450	#	As on plan								n/a	-	n/a	n/a	-	M	Small woodland group, some undergrowth but mostly standards. Good collective form, 5m overhang in to field. Some dieting ash trees close to boundar. Fell ash trees close to boundary.	Good	Good	40+	A2	5.4	92
G56	Hawthorn, Hazel, Oak, Willow	7.0	-	200	#	3.0	#	3.0	-	n/a	-	n/a	-	n/a	-	n/a	2.0	-	M	Shrubby group on field edge, mostly goat willow with occasional mature stunted oak.	Good	Fair	10+	C2	2.4	18
G57	Scots pine, Oak	12.0	-	450	-	5.0	#	7.0	-	n/a	-	n/a	-	n/a	-	n/a	2.5	-	M	Group of three trees on field boundary, good collective form, dbh estimated and averaged, minor deadwood throughout, suppressed form. Drainage ditch to south.	Fair	Good	20+	B2	5.4	92

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G58	Oak, Thorn	8.0	-	400	-	7.0	#	5.0	-	n/a	-	n/a	-	n/a	-	n/a	4.0	-	M	A number of multi stemmed trees situated on hedge bank, scrubby holly and thorn beneath. Suppressed form, average dbh recorded. Minor dieback to oak.	Fair	Good	20+	B2	4.8	72
H59	Hawthorn, Holly, Hazel, Sycamore, Blackthorn	2.5	-	100	#	1.5	-	1.5	-	1.5	-	1.5	-	n/a	-	n/a	n/a	-	M	Intensively managed hedgerow/hedge bank flailed recently to current dimensions. Width ranges from 1-3m. Good screen from highway.	Good	Fair	20+	C2	1.2	5
G60	Ash, Oak	10.0	-	300	#	As on plan								n/a	-	n/a	3.5	-	EM	Group of self-set trees on field edge, good as a collective. Some dieback in upper canopy.	Good	Good	10+	C2	2.4	18
G61	Ash, Oak, Beech	10.0	-	450	#	5.0	-	5.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	EM	Group of trees adjacent to access track, dbh range from 150-450mm, average height recorded. Good collective form.	Good	Good	40+	B2	3.6	41
G62	Goat willow	2.5	-	300	#	n/a	-	n/a	-	1.5	-	1.5	-	n/a	-	n/a	1.0	-	M	Shrubby group located on edge of field, reduced to existing hedge height.	Fair	Fair	10+	C2	3.6	41
G63	Ash (Common)	2.5	-	325	#	n/a	-	n/a	-	1.5	-	1.5	-	n/a	-	n/a	1.0	-	EM	Self-set trees located in boundary hedgerow, reduced to hedge height.	Good	Good	10+	C2	3.9	48

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						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
G64	Willow, Blackthorn, Hazel, Oak, Birch	9.0	-	300	#	n/a	-	n/a	-	4.5	-	4.5	#	n/a	-	n/a	1.5	-	M	Unmanaged hedgerow that has grown up to form a tree group. Stream running through central section, most trees located on bank. Good as collective. Trees becoming larger towards the southern edge. Some trees in decline in group.	Fair	Good	20+	B2	3.6	41
G65	Willow, Blackthorn, Hazel, Oak, Birch, Ash, Alder	9.0	-	200	#	n/a	-	n/a	-	3.0	-	3.0	-	n/a	-	n/a	n/a	-	M	Unmanaged hedgerow grown up in to group, marks the boundary between fields, average heights and dbh recorded. Drainage ditch running through central section of group. Becoming wider and dense towards southern edge.	Fair	Good	20+	B2	2.4	18
T66	Ash (Common)	15.0	-	346	-	7.0	-	5.5	-	6.5	-	6.5	#	0.5	-	North	2.0	-	M	Old coppiced tree, now multi stemmed, most stems obscured by ivy. Ditch to west of stem	Fair	Good	10+	C1	4.2	54
T67	Oak (English)	16.0	-	800	-	10.0	-	8.0	-	10.0	-	8.0	#	2.5	-	West	3.0	-	M	Good tree located in boundary group, ivy obscuring stem. Some past failures in crown, moderate sized deadwood. Ditch to west of stem.	Good	Fair	40+	A2	9.0	255
G68	Ash, holly	15.5	-	350	-	n/a	-	n/a	-	6.0	-	6.0	#	n/a	-	n/a	3.0	-	EM	Self set trees located in field boundary group, good as a collective, dbh estimated. Obvious dieback in upper canopy.	Fair	Fair	10+	C2	4.2	55

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G69	Oak (English)	14.0	-	600	-	n/a	-	n/a	-	7.5	-	7.5	-	n/a	-	n/a	4.0	-	M	Two mature trees located in boundary group, ditch running adjacent to stems, evidence of past failures- stubs remain, poor form due to undergrowth.	Fair	Good	40+	A2	7.2	163
W70	Holly, Sycamore, Beech, Ash, Oak	19.0	-	700	#	8.0	-	n/a	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Woodland running along south-west boundary of site, significant arboricultural feature, average heights recorded. Ditch running along northern edge of woodland adjacent to tree stems. Heights range from 17-25m. Mostly broadleaved with sections of spruce, stem diameters range from 75-800mm. Overhangs field by 10m in places. Some fallen trees in to field, some standing dead trees on field edge.	Good	Good	40+	A2	8.4	222
G71	Oak, Beech, Spruce	16.0	-	475	#	n/a	-	n/a	-	6.0	-	6.0	#	n/a	-	n/a	2.0	-	M	Mature group of tree on field boundary, ditch running to the east of stems. Most trees pollarded in past now grown up. Dbh range from 150-500mm. Average dbh recorded.	Fair	Good	40+	B2	5.7	102
G72	Willow, Blackthorn, Hazel, Oak, Birch, Ash, Holly	1.5	-	100	#	n/a	-	n/a	-	1.0	-	1.0	#	n/a	-	n/a	0.5	-	M	Group recently reduced to current dimensions. Gappy. Some trees lift as standards to 10m.	Fair	Good	10+	C2	2.4	18

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G73	Oak, beech	14.0	-	800	#	n/a	-	n/a	-	7.5	-	7.0	#	n/a	-	n/a	5.0	-	M	Group of three mature trees, largest dbh recorded, ivy obscuring stems, good form, minor deadwood throughout, good ecological value, drainage ditch adjacent to western edge. Canopies lifted in past.	Good	Good	20+	B2	9.6	289.567
T74	Oak (English)	10.0	-	600	-	7.0	-	6.0	-	7.0	-	6.5	#	2.5	-	South	5.0	-	M	Mature tree located in boundary group, canopy recently lifted, watercourse to west of stem within 1m.	Good	Good	40+	B1	7.2	163
G75	Oak (English)	15.0	-	700	#	n/a	-	n/a	-	9.0	-	7.0	#	n/a	-	n/a	1.5	-	M	Group of four stems on field edge, average dbh recorded, thinning crowns with moderate deadwood, good as a collective arboricultural feature.	Good	Fair	40+	A2	8.4	222
G76	Oak (English)	19.0	-	800	#	n/a	-	n/a	-	8.0	-	8.0	#	n/a	-	n/a	3.0	-	M	Two mature trees located in boundary group, ivy obscuring stems, no access to stem, dbh estimated, good collective form.	Good	Good	40+	A2	9.6	290
G77	Oak, Hazel, Beech, Holly, Gorse, Willow, Birch.	11.0	-	450	-	n/a	-	n/a	-	5.0	-	5.0	-	n/a	-	n/a	4.0	-	EM	Group of trees marking the boundary, drainage ditch to the west of stems, understorey recently reduced to 1.5m with standards.	Good	Good	20+	B2	5.4	92
T78	Oak (English)	16.0	-	800	#	8.0	#	7.5	-	8.0	-	7.0	-	2.0	-	East	4.5	-	M	Good form, located on bank in boundary group, wide spreading crown, minor deadwood throughout crown. No access to base - dbh estimated.	Fair	Good	40+	A2	9.6	290

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T79	Oak (English)	12.0	-	600	#	7.0	#	6.5	-	5.0	-	5.5	-	3.0	-	North	4.0	-	M	Mature tree adjacent to access track, good form, drainage ditch to the north, track 5m from stem to the south.	Fair	Good	40+	B1	7.2	163
T80	Oak (English)	12.0	-	600	#	7.0	-	6.0	-	7.0	-	7.0	-	1.5	-	South	4.0	-	M	Located adjacent to field edge and within area of scrubby vegetation, good form. No access to stem. Unbalanced canopy.	Good	Good	40+	B1	6.6	137
G81	Goat willow, Hazel, Oak, Birch, Beech, Alder	11.5	-	400	#	As on plan								n/a	-	n/a	n/a	-	M	Group of scrubby boundary trees, mostly birch and willow. Some trees in decline with standing deadwood. Average stem diameter recorded.	Good	Fair	20+	B2	4.8	72
T82	Oak (English)	10.0	-	500	#	7.0	#	7.0	-	8.0	#	7.0	#	2.0	-	East	2.0	-	M	Tree located in group, broad spreading crown, no access to base of tree, stem diameter and crown spread estimated. Evidence of past limb failure.	Fair	Good	40+	B1	6.0	113
T83	Oak (English)	11.5	-	602	-	7.5	-	7.5	-	8.0	-	9.0	-	2.5	-	South	2.0	-	M	Mature tree located adjacent to field entrance, twin stemmed, suppressed form, drainage ditch to east.	Fair	Good	40+	B1	7.2	164
G84	Oak, Willow, Holly, Hazel	9.0	-	350	#	n/a	-	n/a	-	4.0	-	4.0	-	n/a	-	n/a	2.0	-	M	Boundary group, unmanaged, occasional mature tree, good screen, dbh and height averaged.	Good	Good	20+	B2	4.2	55
G85	Oak, Goat willow, Beech	10.0	-	400	-	4.0	-	4.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Scrubby stunted boundary group, situated on bank with drainage ditch to the north, gappy in places, some trees in decline.	Fair	Fair	10+	C2	4.8	72

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						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
T86	Oak (English)	10.0	-	500	#	6.0	#	6.0	#	6.0	#	6.0	#	2.5	-	East	4.0	-	M	Mature tree located in boundary group, good form, no access to base, south-east of stem.	Good	Good	40+	B1	6.0	113
G87	Blackthorn, Goat willow, Hazel, Holly, Oak	8.0	-	250	#	3.0	-	3.0	-	n/a	-	n/a	-	n/a	-	n/a	0.5	-	M	Scrubby boundary group, drainage ditch to the south, better as collective, good screen, southern edge flailed back to field edge. Some larger trees to 10m in group.	Fair	Good	20+	C2	3.0	28.278
G88	Holly, Oak, Goat willow, Birch, Beech	8.0	-	275	-	n/a	-	n/a	-	3.5	-	3.5	-	n/a	-	n/a	0.5	-	M	Unmanaged boundary group, drainage ditch to the east, overrun with bramble, gaps in places, some trees in decline.	Fair	Fair	20+	B2	3.3	34
G89	Beech, Oak	15.0	-	600	#	n/a	-	n/a	-	7.0	-	7.0	-	n/a	-	n/a	2.0	-	M	Four mature trees located in boundary group. Good form, located on back, drainage ditch to the west, good form.	Good	Good	40+	A2	7.2	163
G90	Oak (English)	18.0	-	800	-	9.0	-	n/a	-	n/a	-	9.0	-	n/a	-	n/a	5.0	-	M	Group of three trees located in corner of field, poor form, lifted in past, evidence of branch failure, some retrenchment in canopy. epicormic growth on stems. Better as collective.	Good	Fair	20+	B2	9.6	290
G91	Oak, Holly	18.5	-	600	#	n/a	-	n/a	-	n/a	-	n/a	-	n/a	-	n/a	4.5	-	M	Small wooded copse within field, average dbh recorded. Good collective form, mostly oak with self set holly understory. Some trees in decline.	Good	Fair	40+	A2	7.2	163
T92	Oak (English)	11.5	-	500	-	3.0	-	2.0	-	4.0	-	3.5	-	2.0	-	South	2.0	-	M	Tree removed.	Poor	Poor	-	U	6.0	113

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
T93	Oak (English)	10.0	-	600	#	7.5	-	8.0	-	8.0	-	8.0	-	3.0	-	West	3.0	-	M	Mature tree located in hedgerow, evidence of past branch failure, good form. Drainage ditch to the east.	Good	Good	40+	B1	7.2	163
H94	Birch, Gorse, Hazel, Willow, Beech, Oak, Hawthorn, Blackthorn	1.5	-	100	-	n/a	-	n/a	-	2.0	-	2.0	-	n/a	-	n/a	n/a	-	M	Managed boundary hedgerow, two hedgerows running Parallel with drainage ditch between. Partially hedge bank.	Good	Fair	20+	C2	1.2	5
T95	Oak (English)	14.0	-	700	-	7.0	#	7.0	-	8.0	-	6.0	-	2.0	-	South west	5.0	-	M	Mature tree located in boundary group, no access to stem, minor cavities in stem, ivy partially obscuring stem, good form. Thinning canopy.	Good	Fair	40+	B1	7.2	163
G96	Willow, Birch, Hazel	7.0	-	200	#	4.0	-	4.0	#	n/a	-	n/a	-	n/a	-	n/a	2.0	-	M	Unmanaged boundary group, gaps in places, better as a collective.	Fair	Good	10+	C2	2.4	18
G97	Ash, Oak	16.0	-	300	-	6.0	-	6.0	#	n/a	-	n/a	-	n/a	-	n/a	2.0	-	M	Four multi-stemmed trees, ivy obscuring stems, self set within boundary group. Moderate dieback to some trees. Monitor condition.	Fair	Fair	10+	C2	3.6	41
G98	Ash, Oak, Beech, Willow, Gorse, Hawthorn	18.0	-	350	#	0.0	-	0.0	-	7.5	-	7.0	#	n/a	-	n/a	3.0	-	M	Ditch to the north-west, trees located on bank, good as a collective, dbh averaged out. Standard oak, ash and beech with willow, gorse, hazel understory. Thinning canopies to ash some in decline. Monitor condition/ fell dead ash.	Fair	Good	20+	B2	4.2	55

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
G99	Hawthorn, Holly, Goat willow, Blackthorn	6.0	-	150	#	0.0	-	0.0	-	3.5	-	3.5	#	0.0	-	n/a	4.0	-	M	Unmanaged boundary group, eastern edge flailed, ditch to north-west, good screen. Average dbh recorded.	Fair	Fair	10+	C2	1.8	10
W100	Oak, Sycamore, Birch, Ash, Hawthorn, Holly	18.0	-	400	#	0.0	-	8.0	-	0.0	-	n/a	-	n/a	-	n/a	4.5	-	M	Unmanaged wooded area, mostly oak. Significant arboricultural feature. All measurements estimated. Some trees in decline in group.	Fair	Good	40+	A2	4.8	72
G101	Hawthorn, Willow, Ash, Birch, Beech	6.0	-	300	#	As on plan								n/a	-	n/a	n/a	-	EM	Sporadic boundary group, heights range from 5-10m, average dbh recorded. Some dead declining trees in group.	Fair	Fair	10+	C2	3.6	41
T102	Ash	16.0	-	520	-	7.0	#	7.0	-	8.0	-	7.0	-	1.0	-	South	4.5	-	M	Old pollard/coppice now grown up, multi stemmed, ivy partially obscuring stems, land drops away to the north, dieback within upper canopy.	Fair	Fair	20+	B1	6.2	122
G103	Ash	16.0	-	400	#	6.0	-	6.0	-	n/a	-	n/a	-	n/a	-	n/a	4.0	-	M	Coppiced/pollarded in past, good collective form, dbh estimated and averaged. Dieback in upper canopy.	Fair	Good	20+	B2	4.8	72
W104	Goat willow, Ash, Oak, Birch, Alder	16.0	-	300	#	As on plan								n/a	-	n/a	2.0	-	EM	Narrow woodland copse, unmanaged. Average dbh recorded. Ditch skirts south-easterly boundary. 6m overhang in to field.	Fair	Good	20+	B2	3.6	41
H105	Holly, Hawthorn, Blackthorn	2.0	-	200	#	As on plan								n/a	-	n/a	n/a	-	M	Partially managed hedgerow, central section left at 5m. Ditch running along edge of hedgerow. Part hedge bank.	Good	Fair	20+	B2	2.4	18

Ref	Species	Hgt	Est	Stem dia	Est	Spread							Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area		
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction									Canopy	Est
G106	Blackthorn	5.0	-	100	#	As on plan							n/a	-	n/a	n/a	-	EM	Blackthorn thicket, unmanaged. Some self-set oaks.	Good	Good	10+	C2	1.2	5	
H107	Birch, Holly, Oak, Hawthorn, Blackthorn, Gorse.	1.5	-	80	#	n/a	-	n/a	-	1.0	-	1.0	-	n/a	-	n/a	n/a	-	EM	Hedge bank Adjacent to road, flailed to current dimensions, gappy. More bank than wall.	Fair	Fair	10+	C2	1.0	3
G108	Willow, Hazel	7.5	-	300	#	n/a	-	n/a	-	3.5	-	3.5	-	n/a	-	n/a	1.0	-	M	Scrubby group adjacent stream, some trees have been pollarded in past at 1.5m. Average dbh recorded.	Fair	Fair	10+	C2	3.6	41
H109	Gorse, Willow, Hazel, Ash	1.5	-	100	#	n/a	-	n/a	-	1.0	-	1.0	-	n/a	-	n/a	n/a	-	M	Managed boundary hedgerow, stream along south-east edge, flailed to current dimensions. Gaps in places. Some trees to 5m on western edge.	Good	Fair	10+	C2	1.2	5
G110	Birch, Holly, Hawthorn, Hazel, Gorse, Oak, Willow.	5.0	-	150	#	n/a	-	n/a	-	2.0	-	2.0	-	n/a	-	n/a	n/a	-	M	Scrubby mix of trees, gappy suppressed, some trees grown up to 6m with dbh ranging from 100-300mm. Some trees in decline.	Fair	Fair	10+	C2	1.8	10
T111	Oak (English)	16.0	-	550	-	7.0	-	7.0	-	7.0	-	6.0	-	4.0	-	South west	5.0	-	M	Mature tree located on bank, drainage ditch to north-west of stem.	Fair	Good	40+	B1	6.6	137
T112	Oak (English)	15.0	-	425	-	5.0	-	4.5	-	5.0	-	4.5	-	2.5	-	West	4.0	-	M	Mature tree located on bank, drainage ditch to north-west of stem, good form	Fair	Good	40+	B1	5.1	82

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
T113	Ash (Common)	19.0	-	600	#	5.5	-	6.0	-	6.0	-	5.5	-	3.0	-	North	2.0	-	M	Unable to access stem, dbh estimated, ivy obscuring stem, evidence of past failures, substantial tree. Thinning canopy, some dieback in upper canopy.	Fair	Fair	20+	B1	7.2	163
G114	Birch, Oak	16.0	-	500	#	n/a	-	n/a	-	7.0	-	7.0	#	0.0	-	n/a	5.0	-	M	Five trees in total, deadwood throughout crowns, good collective form, dbh estimated.	Fair	Good	40+	B2	6.0	113
T115	Ash (Common)	15.0	-	500	#	6.0	#	6.5	-	6.0	-	6.0	#	1.0	-	South	3.0	-	M	Multi stemmed tree located in boundary group, included unions, good form. Dieback in canopy, monitor condition.	Fair	Good	10+	C1	6.0	113
G116	Willow, Oak, Birch.	6.5	-	250		As per plan								n/a	-	n/a	n/a	-	EM	Scrubby group of trees on field edge, poor form. Average dbh recorded.	Fair	Fair	10+	C2	3.0	28
W117	Birch, Oak, Sycamore, Ash	18.0	-	400		As per plan								n/a	-	n/a	2.0	-	M	Off site woodland, good collective form, measurements estimated.	Good	Good	40+	A2	4.8	72
G118	Goat willow, Hazel	8.0	-	200	#	3.0	-	3.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	M	Unmanaged boundary group, gappy, mostly hazel located on bank, some recent failures in to field..	Good	Good	10+	C2	2.4	18
G119	Goat willow, Oak, Birch, Gorse, Sycamore, Hawthorn	9.0	-	400	-	n/a	-	n/a	-	4.0	-	4.0	-	n/a	-	n/a	1.0	-	M	Height range from 6-12m, some occasional trees in group, unmanaged hedgerow grown up in to boundary group. Good screen, average dbh recorded.	Good	Fair	20+	B2	3.0	28

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
W120	Sycamore, Oak, Ash, Holly, Hawthorn, Sweet chestnut	21.0	-	500	#	n/a	-	n/a	-	n/a	-	8.0	-	n/a	-	n/a	2.5	-	M	Small woodland copse adjacent to site, typical for an area of woodland, failures within, 8m overhang in to field. Substantial arboricultural feature. Contains some declining ash on boundary, consider removal of declining ash.	Good	Good	40+	A2	6.0	113
G121	Oak, Hawthorn, Ash, Sycamore	18.0	-	600	#	As on plan								n/a	-	n/a	2.5	-	M	Mature group of trees, largest oak, with other as understory. Largest dbh recorded, suppressed form. Ash trees declining with canopy dieback. Monitor ash.	Fair	Good	10+	B2	7.2	163
G122	Willow, Ash	8.5	-	275	#	As on plan								n/a	-	n/a	1.0	-	M	Mostly goat willow, most trees subsided and layered. Average dbh recorded.	Fair	Good	10+	C2	3.3	34
G123	Ash, Sycamore, Willow, Hawthorn	20.0	-	500	-	As on plan								n/a	-	n/a	2.0	-	M	Group of self-set trees growing in site of old buildings, dbh ranges from 125-600mm, average dbh recorded. Some trees subsided, deadwood throughout, especially ash. good collective form.	Fair	Good	20+	B2	6.0	113
T124	Ash (Common)	12.0	-	900	-	6.0	-	7.0	-	6.0	-	4.0	-	2.0	-	West	2.5	-	M	Old pollard, hollow stem pollarded with re growth, canker throughout, deadwood throughout. Good ecological value.	Poor	Fair	<10	B3	10.8	366
G125	Hawthorn, Ash, Oak, Gorse	5.0	-	150	#	2.0	-	2.0	-	n/a	-	n/a	-	n/a	-	n/a	n/a	-	EM	Scrubby group on northern boundary, gaps in places.	Fair	Fair	10+	C2	1.8	10

Ref	Species	Hgt	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary recommendations	Structural Condition	Phys. Condition	ULE	Quality grading	RPA Radii	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
G126	Oak (English)	11.0	#	600	#	6.0	-	6.0	-	n/a	-	n/a	-	n/a	-	n/a	2.0	-	M	Group of five trees on northern boundary, good individual and collectively, heights range from 9-13m, located on bank, average dbh recorded.	Good	Good	40+	A2	7.2	163
G127	Willow, Birch, Hazel, Thorn	9.0	#	275	#	As on plan								n/a	-	n/a	n/a	-	M	Heights range from 6-11m, average height and dbh recorded, scrubby sporadic vegetation situated along water course, some trees overrun with ivy. 6m wide in places. Some failures at western end.	Good	Fair	10+	C2	3.3	34
T128	Ash (Common)	19.0	-	620	-	8	-	7.5	-	8.0	-	8.0	-	2.5	-	North east	4.0	-	M	Mature tree located on field edge, suppressed form, evidence of past failures, stubs remain, ivy partially obscuring stem.	Fair	Good	20+	B1	7.4	174

METHODOLOGY

TREE SURVEY:

- The tree survey was carried out with reference to the methodology set out in BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.
- Trees were surveyed individually or as groups where it was considered that they had grown together to form cohesive arboricultural features either aerodynamically (trees that provide companion shelter), visually (eg avenues or screens) or culturally (including for biodiversity). However, where it was considered that there was an arboricultural need to differentiate between attributes trees within groups/woodlands were also surveyed as individuals
- The full tree survey findings are recorded in the following tree survey schedule.
- Within the tree survey schedule, each surveyed **TREE (T)**, **GROUP (G)**, **HEDGEROW (H)**, **WOODLAND (W)** or **SHRUB MASS** on or adjacent to the site is given a reference number which refers to its position on the tree survey and constraints plan.
- **TREE SPECIES** are listed by common name.

The DIMENSIONS taken are:

- **STEM-No.** Indicates the number of main stems (i.e. whether the trunk divides at or below 1.5m; (Used in the calculation of RPA.) "m-s" = Multi-stemmed.
- **DIAMETER** (in millimetres), obtained from the girth measured at approx.1.5m. For trees with 2 to 5 sub-stems, a notional figure is derived from the sum of their cross-sectional areas. For multi-stemmed trees the notional diameter may be estimated on the basis of the average stem size x the number of stems. (A notional diameter may be estimated where measurement is not possible.)
- **HEIGHT**, are measured in metres. They are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- The **CROWN SPREAD** are taken at the four cardinal points to derive an accurate representation of the tree crown. They are recorded up to the nearest half metre for dimensions up to 10m and to up the nearest whole metre for dimensions over 10m.
- **CROWN CLEARANCES** are expressed both as existing height above ground level of first significant branch along with its direction of growth (eg 2.5m-N), and also in terms of the overall canopy. Measurements are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- **ESTIMATES.** Where any measurement has had to be estimated, due to inaccessibility for example, this is indicated by a "#" suffix to the measurement as shown in the tree survey schedule.

LIFE STAGE is defined as follows:

- | | |
|----|---|
| Y | Young: normally stake dependent, establishing trees. Should be growing fast, usually primarily increasing in height more than spread, but as yet making limited impact upon the landscape. |
| SM | Semi-mature: Established young trees, normally of good vigour and still increasing in height, but beginning to spread laterally. Beginning to make an impact upon the local landscape & environment. Semi-Mature (still capable of being transplanted without preparation, up to 30cm girth and not yet sexually mature). |
| EM | Early-mature: Not yet having reached 75% of expected mature size. Established young trees, normally of good vigour and still increasing in height, but beginning to spread laterally. Beginning to make an impact upon the local landscape & environment. |
| M | Mature: Well-established trees, still growing with some vigour, but tending to fill out and increase spread. Bark may be beginning to crack & fissure. In the middle half of their safe, useful life expectancies. |
| LM | Late -Mature: In full maturity but possibly beyond mature and in a state of natural decline). Still retaining some vigour but any growth is slowing. |
-

PHYSIOLOGICAL CONDITION (HEALTH & VITALITY): Essentially a snapshot of the general health of the tree based upon its general appearance, its apparent vigour and the presence or absence of symptoms associated with poor health, physiological stress etc. (Fungal infections may be recorded here but decay giving rise to structural weakness would be recorded under 'Structural Condition' – see next parameter):

Good	no significant health issues.
Fair	indications of slight stress or minor disease (e.g. the presence of minor dieback/deadwood or of epicormic shoot growth)
Poor	Significant stress or disease noted; larger areas of dieback than above
Dead	(or Moribund)

STRUCTURAL CONDITION: Defects affecting the structural stability of the tree, including decay, significant dead wood, root-plate instability or significant damage to structural roots, weak forks (e.g. those where bark is included between the members) etc. etc. Classified as:

Good	No obvious structural defects: basically sound
Fair	Minor, potential or incipient defects
Poor	Significant defect(s) likely to lead to actual failure in the medium to long-term
Dead	(or Moribund)

REMAINING USEFUL LIFE EXPECTANCY: An estimate of the length of time in years that a tree might be expected to continue to make a useful contribution to the locality at an acceptable level of risk (based on an assumption of continued routine maintenance)

- less than 10 years
- 10+ years
- 20+ years
- 40+ years

QUALITY CATEGORY: Trees are classed as category **U, A, B or C**, based on criteria given in BS5837:2012; summary definitions as follow (see BS5837 for further details). Categories A, B and C are further characterised by the use of sub-categories, which attempt to identify what aspect of the tree is the main source of its perceived value:

(1) **arboricultural** qualities (2) **landscape** qualities and (3) **cultural, historic or ecological/conservation** qualities. Examples of these qualities for each of the three categories are given below, although these are indicative only.

Note: This is NOT a health and safety classification; the classification does not take into account any requirement for remedial tree care or ongoing maintenance apart from that which may affect the trees' general suitability for retention.

U **UNSUITABLE:** Trees likely to prove to be unsuitable for retention for longer than 10 years should any significant increase in site usage arise as a result of development.

Dead or moribund trees; those at risk of collapse or in terminal decline; trees that will be left unstable by other essential works such as the removal of nearby category U trees; trees infected by pathogens that could materially affect other trees; low quality trees that are suppressing better specimens

(Category U trees may have conservation values that it might be desirable to preserve.

It may also include trees that should be removed irrespective of any development proposals.)

A **HIGH QUALITY:** Trees or groups whose retention should be given a particularly high priority within the design process. Normally with an expected useful life expectancy of at least 40 years.

1. *Notably fine specimens; rare or unusual specimens; essential component trees within groups, semi-formal or formal plantings (e.g. dominant trees within an avenue etc.)*
2. *Trees, groups or woodlands of particular visual importance as landscape features.*
3. *Trees, groups or woodlands of particular significance by virtue of their conservation, historical, commemorative or other value (e.g. veteran trees or wood pasture.)*

B **MODERATE QUALITY:** Trees or groups of some importance with a likely useful life expectancy in excess of 20 years. Their retention would be highly desirable; selective removal of certain individuals may be acceptable, but only after full consideration of all alternative courses of action.

1. *Fair quality but not exceptional; good specimens showing some impairment (e.g. remediable defects, minor storm damage or poor past management.)*
2. *Acceptable trees situated such as to have little visual impact within the wider locality. Also numbers of trees, perhaps in groups or woodlands, whose value as landscape features is greater collectively than would warrant as individuals (such that the selective removal of an individual would not impact greatly upon the trees' overall, collective value).*
3. *Trees, groups or woodlands with clearly identifiable conservation or other cultural benefits.*

C **MINOR VALUE:** Trees or groups of rather low quality, although potentially capable of retention for at least approx. 10 years. Also small trees below 15cm diam.

Potentially retainable, but not of sufficient value to be regarded as a significant planning constraint.

1. *Unremarkable trees of very limited merit or of significantly impaired condition.*
2. *Trees offering only low or short-term landscape benefits; also secondary specimens within groups or woodlands whose loss would not significantly diminish their landscape value.*
Trees with extremely limited conservation or other cultural benefit.

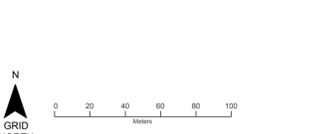
APPENDIX 3

TREE SURVEY & CONSTRAINTS PLAN

Tree No.	Species	RPA Radius M	RPA Area M2	Category
T11	Hawthorn	2.4	18	C1
H2	Hawthorn	1.2	9	C2
T3	Laburnum	2.4	18	C1
H4	Blackthorn	1.2	9	C2
H5	Blackthorn	1.2	9	C2
G6	Ash	1.2	9	C2
H7	Oak	1.2	9	C2
G8	Oak	1.2	9	C2
H9	Blackthorn	1.2	9	C2
H10	Hawthorn	1.2	9	C2
G11	Ash	1.2	9	C2
H12	Oak	1.2	9	C2
H13	Hawthorn	1.2	9	C2
H14	Hawthorn	1.2	9	C2
H15	Hawthorn	1.2	9	C2
H16	Hawthorn	1.2	9	C2
H17	Hawthorn	1.2	9	C2
G18	Ash	1.2	9	C2
H19	Hawthorn	1.2	9	C2
G20	Hawthorn	1.2	9	C2
G21	Hawthorn	1.2	9	C2
G22	Oak	1.2	9	C2
G23	Ash	1.2	9	C2
H24	Hawthorn	1.2	9	C2
T25	Oak	1.2	9	C2
H26	Hawthorn	1.2	9	C2
H27	Hawthorn	1.2	9	C2
H28	Hawthorn	1.2	9	C2
H29	Hawthorn	1.2	9	C2
H30	Oak	1.2	9	C2
G31	Oak	1.2	9	C2
H32	Hawthorn	1.2	9	C2
H33	Hawthorn	1.2	9	C2
H34	Hawthorn	1.2	9	C2
H35	Hawthorn	1.2	9	C2
H36	Hawthorn	1.2	9	C2
H37	Hawthorn	1.2	9	C2
H38	Hawthorn	1.2	9	C2
H39	Hawthorn	1.2	9	C2
H40	Hawthorn	1.2	9	C2
H41	Hawthorn	1.2	9	C2
H42	Hawthorn	1.2	9	C2
H43	Hawthorn	1.2	9	C2
H44	Hawthorn	1.2	9	C2
H45	Hawthorn	1.2	9	C2
H46	Hawthorn	1.2	9	C2
H47	Hawthorn	1.2	9	C2
H48	Hawthorn	1.2	9	C2
H49	Hawthorn	1.2	9	C2
H50	Hawthorn	1.2	9	C2
H51	Hawthorn	1.2	9	C2
H52	Hawthorn	1.2	9	C2
H53	Hawthorn	1.2	9	C2
H54	Hawthorn	1.2	9	C2
H55	Hawthorn	1.2	9	C2
H56	Hawthorn	1.2	9	C2
H57	Hawthorn	1.2	9	C2
H58	Hawthorn	1.2	9	C2
H59	Hawthorn	1.2	9	C2
H60	Hawthorn	1.2	9	C2
H61	Hawthorn	1.2	9	C2
H62	Hawthorn	1.2	9	C2
H63	Hawthorn	1.2	9	C2
H64	Hawthorn	1.2	9	C2
H65	Hawthorn	1.2	9	C2
H66	Hawthorn	1.2	9	C2
H67	Hawthorn	1.2	9	C2
H68	Hawthorn	1.2	9	C2
H69	Hawthorn	1.2	9	C2
H70	Hawthorn	1.2	9	C2
H71	Hawthorn	1.2	9	C2
H72	Hawthorn	1.2	9	C2
H73	Hawthorn	1.2	9	C2
H74	Hawthorn	1.2	9	C2
H75	Hawthorn	1.2	9	C2
H76	Hawthorn	1.2	9	C2
H77	Hawthorn	1.2	9	C2
H78	Hawthorn	1.2	9	C2
H79	Hawthorn	1.2	9	C2
H80	Hawthorn	1.2	9	C2
H81	Hawthorn	1.2	9	C2
H82	Hawthorn	1.2	9	C2
H83	Hawthorn	1.2	9	C2
H84	Hawthorn	1.2	9	C2
H85	Hawthorn	1.2	9	C2
H86	Hawthorn	1.2	9	C2
H87	Hawthorn	1.2	9	C2
H88	Hawthorn	1.2	9	C2
H89	Hawthorn	1.2	9	C2
H90	Hawthorn	1.2	9	C2
H91	Hawthorn	1.2	9	C2
H92	Hawthorn	1.2	9	C2
H93	Hawthorn	1.2	9	C2
H94	Hawthorn	1.2	9	C2
H95	Hawthorn	1.2	9	C2
H96	Hawthorn	1.2	9	C2
H97	Hawthorn	1.2	9	C2
H98	Hawthorn	1.2	9	C2
H99	Hawthorn	1.2	9	C2
H100	Hawthorn	1.2	9	C2
H101	Hawthorn	1.2	9	C2
H102	Hawthorn	1.2	9	C2
H103	Hawthorn	1.2	9	C2
H104	Hawthorn	1.2	9	C2
H105	Hawthorn	1.2	9	C2
H106	Hawthorn	1.2	9	C2
H107	Hawthorn	1.2	9	C2
H108	Hawthorn	1.2	9	C2
H109	Hawthorn	1.2	9	C2
H110	Hawthorn	1.2	9	C2
H111	Hawthorn	1.2	9	C2
H112	Hawthorn	1.2	9	C2
H113	Hawthorn	1.2	9	C2
H114	Hawthorn	1.2	9	C2
H115	Hawthorn	1.2	9	C2
H116	Hawthorn	1.2	9	C2
H117	Hawthorn	1.2	9	C2
H118	Hawthorn	1.2	9	C2
H119	Hawthorn	1.2	9	C2
H120	Hawthorn	1.2	9	C2
H121	Hawthorn	1.2	9	C2
H122	Hawthorn	1.2	9	C2
H123	Hawthorn	1.2	9	C2
H124	Hawthorn	1.2	9	C2
H125	Hawthorn	1.2	9	C2
H126	Hawthorn	1.2	9	C2
H127	Hawthorn	1.2	9	C2
H128	Hawthorn	1.2	9	C2
H129	Hawthorn	1.2	9	C2
H130	Hawthorn	1.2	9	C2
H131	Hawthorn	1.2	9	C2
H132	Hawthorn	1.2	9	C2
H133	Hawthorn	1.2	9	C2
H134	Hawthorn	1.2	9	C2
H135	Hawthorn	1.2	9	C2
H136	Hawthorn	1.2	9	C2
H137	Hawthorn	1.2	9	C2
H138	Hawthorn	1.2	9	C2
H139	Hawthorn	1.2	9	C2
H140	Hawthorn	1.2	9	C2
H141	Hawthorn	1.2	9	C2
H142	Hawthorn	1.2	9	C2
H143	Hawthorn	1.2	9	C2
H144	Hawthorn	1.2	9	C2
H145	Hawthorn	1.2	9	C2
H146	Hawthorn	1.2	9	C2
H147	Hawthorn	1.2	9	C2
H148	Hawthorn	1.2	9	C2
H149	Hawthorn	1.2	9	C2
H150	Hawthorn	1.2	9	C2
H151	Hawthorn	1.2	9	C2
H152	Hawthorn	1.2	9	C2
H153	Hawthorn	1.2	9	C2

Legend: - Tree removed since original survey

Tree Category	Symbol
Tree Category A - High Quality	Green circle with black outline
A Category - Hedgerow Group, Woodland	Green circle with black outline and horizontal lines
Tree Category B - Moderate Quality	Blue circle with black outline
B Category - Hedgerow Group, Woodland	Blue circle with black outline and horizontal lines
Tree Category C - Low Quality	Grey circle with black outline
C Category - Hedgerow Group, Woodland	Grey circle with black outline and horizontal lines
Tree Category U - Unsuitable for Retention	Red circle with black outline
U Category - Hedgerow Group, Woodland	Red circle with black outline and horizontal lines
Root Protection Area to BS 5837:2012	Red dashed line
Shrub Mass / Offset Tree / OOS (Out of scope)	Red solid line



KEY

BS 5837: 2012 Categories

Tree Category A - High Quality

A Category - Hedgerow Group, Woodland

Tree Category B - Moderate Quality

B Category - Hedgerow Group, Woodland

Tree Category C - Low Quality

C Category - Hedgerow Group, Woodland

Tree Category U - Unsuitable for Retention

U Category - Hedgerow Group, Woodland

Root Protection Area to BS 5837:2012

Shrub Mass / Offset Tree / OOS (Out of scope)

PROJECT TITLE
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630)
(Area A)

DRAWING TITLE
Tree Survey & Constraints

SCALE 1:2000 **DRAWING NUMBER** BHA_388_01

DRAWN BY DB **APPROVED BY** AC **REVISION** A **SHEET** 1 of 3 **DATE** 26/07/2018

CLIENT
Volltia

COORDINATE SYSTEM / DATUM
British National Grid / Newlyn Datum (AOD)

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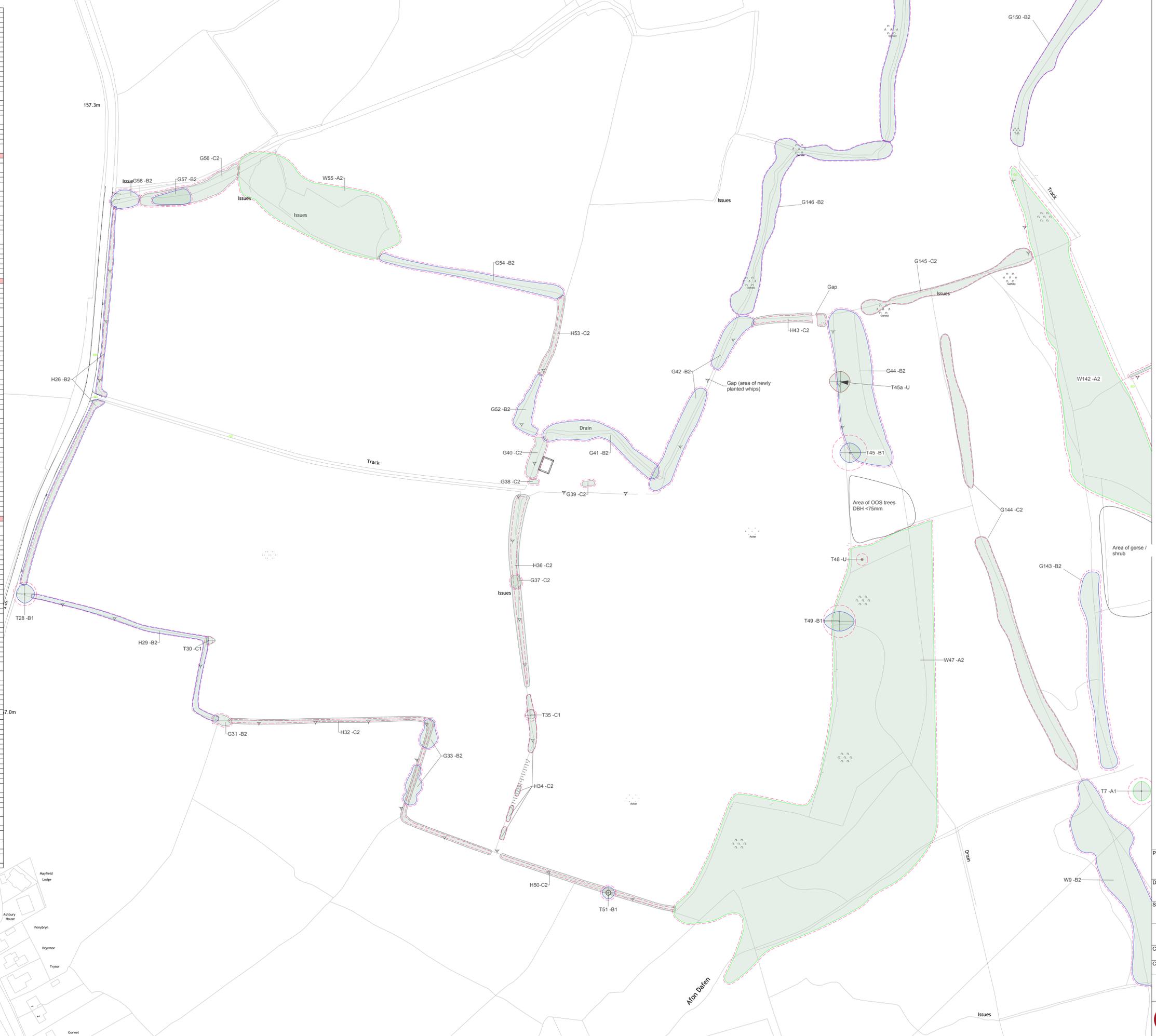
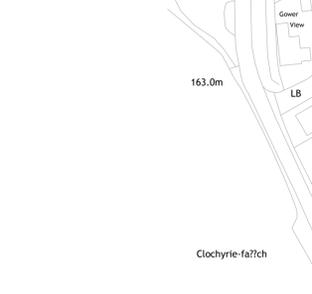
Barton Hyett Associates
Arboricultural Consultants

Tel: 01386 576161
Address: Office 5E, Deer Park Business Centre,
Eckington, Pershore, Worcestershire, WR10 3DN

Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

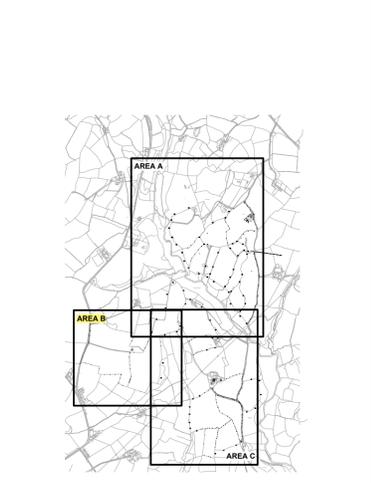
Tree No	Species	RPA Radius M	RPA Area M2	Category
H1	Hawthorn	2.4	18	C2
H2	Hawthorn	1.2	3.6	C2
H3	Hawthorn	2.4	18	C2
H4	Hawthorn	1.2	3.6	C2
H5	Blackthorn, Bramble, Gorse	1.2	3.6	C2
H6	Ash, Holly, Oak, Hawthorn	3.6	39.6	C2
H7	Oak (English)	10.8	375	A1
H8	Oak (English)	7.2	162	B2
H9	Alder, Hawthorn, Oak, Willow, Hazel	4.8	108	B2
H10	Hawthorn, Hazel, Holly	1.2	3.6	C2
H11	Ash, Sycamore, Oak	3.6	39.6	A2
H12	Oak (Sessile)	6.6	137	B2
H13	Hawthorn, Blackthorn, Holly, Hazel, Gorse	1.2	3.6	C2
H14	Hawthorn, Blackthorn, Holly	1.4	3.9	C2
H15	Hawthorn, Blackthorn, Holly, Hazel	2.4	7.2	B2
H16	Holly, Birch, Willow, Hawthorn, Ash, Oak	4.8	108	B2
H17	Hawthorn, Blackthorn, Hazel, Ash, Holly, Goat willow	1.2	3.6	C2
G18	Ash (Common)	4.2	75.6	B2
A19	Hawthorn, Blackthorn, Hazel	1.2	3.6	C2
G20	Hawthorn, Oak, Holly, Hazel, Goat willow, Ash	3.6	39.6	B2
G21	Hawthorn, Oak, Holly, Hazel, Goat willow	3	36	B2
G22	Oak (Sessile)	7.2	162	B2
G23	Ash, Oak, Birch, Holly	6	108	B2
H24	Hawthorn, Blackthorn, Hazel, Holly	1.2	3.6	C2
T25	Oak (English)	4.8	72	B1
H26	Holly	1.8	3.6	B2
T27	Hawthorn	1.8	3.6	C1
T28	Beech (Common)	9.6	290	C1
H29	Hawthorn, Holly, Hazel, Goat willow, Beech, Ash	2.4	43.2	C2
T30	Oak	3.6	43.2	C1
G31	Oak, Elm	6	108	B2
H32	Holly, Elder	0.9	0.9	B2
G33	Sycamore, Hawthorn, Field maple, Hazel	5.4	108	B2
H34	Hazel, Hawthorn, Ash	1.8	3.6	B2
H35	Hawthorn, Blackthorn	1.8	3.6	B2
T36	Ash (Common)	4.8	72	C1
H36	Hazel, Hawthorn, Blackthorn, Goat willow	1.2	3.6	C2
G37	Birch, Ash, Oak, Willow	2.4	39.6	C2
G38	Ash (Common)	6.6	137	C2
G39	Ash (Common)	4.8	108	C2
G40	Hazel, Goat willow	1.8	3.6	C2
G41	Hazel, Hawthorn, Field maple, Beech, Ash	5.4	108	B2
G42	Oak	5.4	108	B2
H43	Hazel, Hawthorn, Oak, Ash, Holly, Beech	5.4	108	B2
H44	Hazel, Hawthorn, Blackthorn, Holly	1.8	3.6	C2
G44	Beech, Oak, Sycamore, Holly	16	192	B2
T45	Beech (Common)	14.4	652	B1
T46	Sycamore	14.4	362	U
T47	Iron (English)	4.8	72	U
H47	Hazel, Hawthorn, Oak, Birch, Holly	7.2	108	A2
T48	Oak (English)	4.8	72	U
T49	Oak (English)	13.2	547	B1
H50	Hazel, Hawthorn, Ash	1.2	3.6	C2
H51	Ash (Common)	9.2	182	C2
G52	Oak, Ash, Beech, Hawthorn, Blackthorn	3.6	39.6	B2
H53	Hazel, Hawthorn, Blackthorn	1.8	3.6	C2
G54	Holly, Hawthorn, Blackthorn, Oak, Ash	2.4	39.6	B2
H55	Goat willow	2.4	39.6	A2
G56	Hawthorn, Hazel, Oak, Willow	2.4	39.6	C2
G57	Scots pine, Oak	5.4	108	B2
G58	Oak, Elm	4.8	108	B2
H59	Hawthorn, Holly, Hazel, Sycamore, Blackthorn	1.2	3.6	C2
G60	Ash, Oak	2.4	39.6	C2
G61	Ash, Oak, Beech	3.6	39.6	B2
G62	Goat willow	3.6	39.6	C2
G63	Ash (Common)	3.6	39.6	C2
G64	Willow, Blackthorn, Hazel, Oak, Birch, Ash	3.6	39.6	B2
G65	Willow, Blackthorn, Hazel, Oak, Birch, Ash, Alder	2.4	39.6	B2
T66	Ash (Common)	4.2	54	C1
T67	Oak (English)	9	225	A2
G68	Ash, Holly	4.2	39.6	C2
G69	Oak (English)	7.2	108	A2
W70	Holly, Sycamore, Beech, Ash, Oak	16	192	A2
G71	Oak, Beech, Sycamore	5.7	39.6	B2
G72	Holly	2.4	39.6	C2
G73	Oak, Beech	3.6	39.6	B2
T74	Oak (English)	7.2	163	B1
G75	Oak (English)	6.6	108	A2
G76	Oak (English)	3.6	39.6	A2
G77	Oak, Hazel, Beech, Holly, Gorse, Willow, Birch	5.4	108	B2
T78	Oak (English)	9.6	290	A2
T79	Oak (English)	7.2	163	B1
T80	Oak (English)	6.6	137	B1
G81	Goat willow, Hazel, Oak, Birch, Beech, Alder	4.8	108	B2
H82	Oak (English)	6	113	B1
T83	Oak (English)	7.2	164	B1
G84	Oak, Willow, Holly, Hazel	4.2	39.6	B2
G85	Oak, Goat willow, Beech	4.8	108	C2
T86	Oak (English)	6	113	B1
G87	Hawthorn, Goat willow, Hazel, Holly, Oak	3	39.6	C2
G88	Holly, Oak, Goat willow, Birch, Beech	1.3	3.6	B2
G89	Beech, Oak	7.2	108	A2
G90	Oak (English)	3.6	39.6	B2
G91	Oak, Holly	7.2	108	A2
H92	Oak (English)	6	113	U
T93	Oak (English)	7.2	163	B1
H94	Hawthorn, Blackthorn	1.2	3.6	C2
T95	Oak (English)	7.2	163	B1
G96	Willow, Birch, Hazel	2.4	39.6	C2
G97	Ash, Oak	3.6	39.6	C2
G98	Ash, Oak, Beech, Willow, Gorse, Hawthorn	4.2	39.6	B2
G99	Hawthorn, Holly, Goat willow, Blackthorn	1.8	3.6	C2
H100	Oak, Sycamore, Birch, Ash, Hawthorn, Holly	4.8	108	A2
G101	Hawthorn, Willow, Ash, Birch, Beech	3.6	39.6	C2
T102	Ash	6.2	122	B1
G103	Ash	4.8	108	B2
W104	Goat willow, Ash, Oak, Birch, Alder	3.6	39.6	B2
H105	Holly, Hawthorn, Blackthorn	2.4	39.6	B2
G106	Blackthorn	1.2	3.6	C2
H107	Birch, Holly, Oak, Hawthorn, Blackthorn	1	3.6	C2
G108	Willow, Hazel	3.6	39.6	C2
H109	Gorse, Willow, Hazel, Ash	1.2	3.6	C2
G110	Birch, Holly, Hawthorn, Hazel, Gorse, Oak	1.8	39.6	C2
T111	Oak (English)	6.6	137	B1
T112	Oak (English)	5.1	82	B1
T113	Ash (Common)	7.2	163	B1
G114	Birch, Oak	6	39.6	B2
T115	Ash (Common)	6	113	C2
G116	Willow, Oak, Birch	3	39.6	C2
W117	Birch, Oak, Sycamore, Ash	4.8	108	A2
G118	Goat willow, Hazel	2.4	39.6	C2
G119	Goat willow, Oak, Birch, Gorse, Sycamore, Hawthorn	3	39.6	B2
W120	Sycamore, Oak, Ash, Holly, Hawthorn, Sweet chestnut	5	75	A2
G121	Oak, Hawthorn, Ash, Sycamore	7.2	108	B2
G122	Willow, Ash	3.3	39.6	C2
G123	Ash, Sycamore, Willow, Hawthorn	6	39.6	B2
T124	Ash (Common)	10.8	366	B3
G125	Hawthorn, Ash, Oak, Gorse	1.8	39.6	C2
G126	Oak (English)	7.2	108	A2
G127	Willow, Birch, Hazel, Thorn	3.3	39.6	B1
T128	Ash (Common)	7.4	174	B1
G129	Oak, Ash, Willow, Birch, Beech, Sycamore	2.4	48	B2
H130	Holly, Hawthorn, Sycamore, Hazel	1.3	3.6	C2
H131	Hazel, Blackthorn, Hawthorn, Sycamore, Gorse	1	3	C2
H132	Hazel, Blackthorn, Hawthorn, Sycamore, Ash	4.1	39.6	C2
G133	Sycamore, Oak	4.1	39.6	C2
G134	Oak, Sycamore	3.6	290	B2
H135	Hawthorn, Ash	1.3	3.6	C2
G136	Pine, Cypress, Lime	1.3	3.6	C2
T137	Myrtle, Cypress	7.2	163	C1
H138	Hawthorn, Blackthorn, Hazel	1	3.6	C2
H139	Hawthorn, Blackthorn, Hazel	1	3.6	C2
G140	Birch, Hawthorn, Oak, Willow, Holly, Hazel	1.6	41	C2
G141	Oak, Sycamore, Holly, Birch	6	113	B2
W142	Oak, Sycamore, Birch, Beech, Rowan, Hawthorn, Hazel, Ash, Blackthorn	7.2	163	A2
G143	Oak, Willow, Birch	7.2	163	B2
G144	Birch, Willow	3.6	41	C2
G145	Willow, Birch, Oak, Blackthorn	3.6	41	C2
G146	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	7.2	163	B2
G147	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	7.2	163	B2
G148	Ash	4.8	72	U
H149	Rowan, Oak, Beech, Rhododendron, Birch	6	113	B2
G150	Sycamore, Willow	6	113	B2
H151	Beech, Sycamore, Hawthorn, Oak, Blackthorn, Hazel, Elm	9	225	B2
H152	Blackthorn, Willow, Elder, Hawthorn, Oak	2.4	18	C2
H153	Ash, Blackthorn, Hazel, Holly, Hawthorn	1	3	C2
H154	Rowan	3	3	C2
G155	Ash, Oak, Blackthorn, Hazel	4.1	39.6	B2

- Tree removed since original survey



KEY BS 5837: 2012 Categories

- Tree Category A - High Quality
- A Category - Hedgerow, Group, Woodland
- Tree Category B - Moderate Quality
- B Category - Hedgerow, Group, Woodland
- Tree Category C - Low Quality
- C Category - Hedgerow, Group, Woodland
- Tree Category U - Unsuitable for Retention
- U Category - Hedgerow, Group, Woodland
- Red Protection Area to BS 5837:2012
- Shrub Mass / Off-site Tree / OOS (Out of scope)



Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

N
GRID NORTH

0 20 40 60 80 100
Meters

PROJECT TITLE
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630) (Area B)

DRAWING TITLE
Tree Survey & Constraints

SCALE: 1:1500 @ A1 DRAWING NUMBER: BHA_388_01

DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
DB	AC	A	2 of 3	26/07/2018

CLIENT: **Volitalia**

COORDINATE SYSTEM / DATUM: **British National Grid / Newlyn Datum (AOD)**

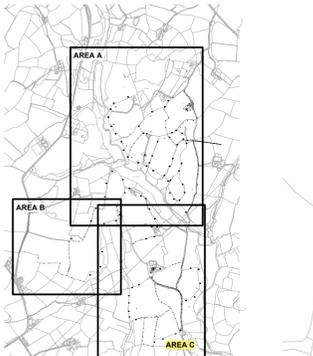
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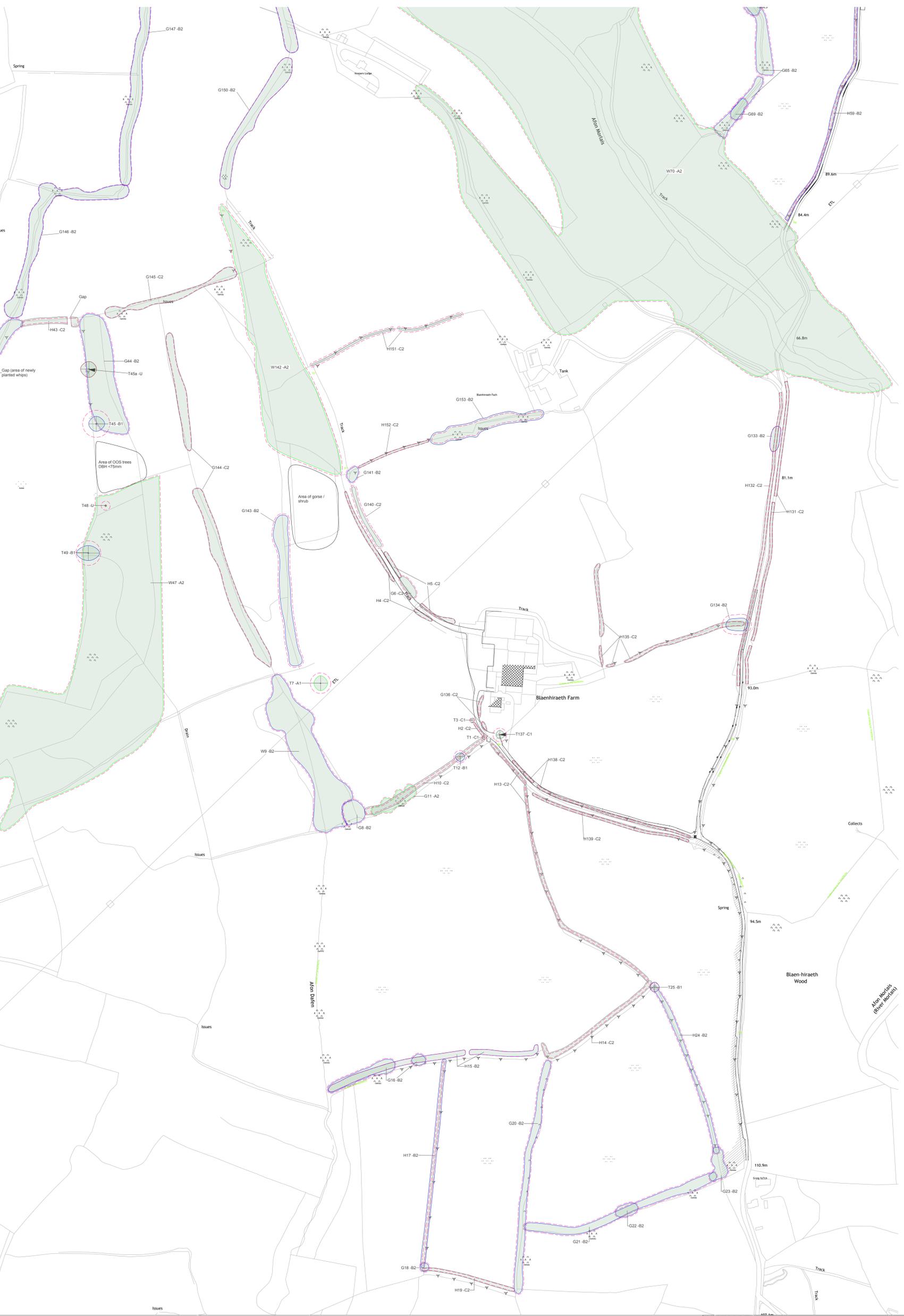
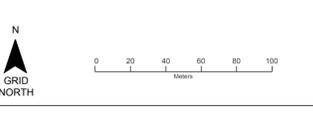
Tel: 01386 576161
Address: Office 5E, Deer Park Business Centre,
Eckington, Pershore, Worcestershire, WR10 3DN

Tree No.	Species	RPA Radius M	RPA Area M2	Category
T1	Hawthorn	2.4	18	C1
T2	Hawthorn	1.2	9	C2
T3	Laburnum	2.4	18	C1
T4	Blackthorn	1.2	9	C2
T5	Blackthorn	1.2	9	C2
T6	Ash	1.2	9	C2
T7	Ash	1.2	9	C2
T8	Ash	1.2	9	C2
T9	Ash	1.2	9	C2
T10	Ash	1.2	9	C2
T11	Ash	1.2	9	C2
T12	Ash	1.2	9	C2
T13	Ash	1.2	9	C2
T14	Ash	1.2	9	C2
T15	Ash	1.2	9	C2
T16	Ash	1.2	9	C2
T17	Ash	1.2	9	C2
T18	Ash	1.2	9	C2
T19	Ash	1.2	9	C2
T20	Ash	1.2	9	C2
T21	Ash	1.2	9	C2
T22	Ash	1.2	9	C2
T23	Ash	1.2	9	C2
T24	Ash	1.2	9	C2
T25	Ash	1.2	9	C2
T26	Ash	1.2	9	C2
T27	Ash	1.2	9	C2
T28	Ash	1.2	9	C2
T29	Ash	1.2	9	C2
T30	Ash	1.2	9	C2
T31	Ash	1.2	9	C2
T32	Ash	1.2	9	C2
T33	Ash	1.2	9	C2
T34	Ash	1.2	9	C2
T35	Ash	1.2	9	C2
T36	Ash	1.2	9	C2
T37	Ash	1.2	9	C2
T38	Ash	1.2	9	C2
T39	Ash	1.2	9	C2
T40	Ash	1.2	9	C2
T41	Ash	1.2	9	C2
T42	Ash	1.2	9	C2
T43	Ash	1.2	9	C2
T44	Ash	1.2	9	C2
T45	Ash	1.2	9	C2
T46	Ash	1.2	9	C2
T47	Ash	1.2	9	C2
T48	Ash	1.2	9	C2
T49	Ash	1.2	9	C2
T50	Ash	1.2	9	C2
T51	Ash	1.2	9	C2
T52	Ash	1.2	9	C2
T53	Ash	1.2	9	C2
T54	Ash	1.2	9	C2
T55	Ash	1.2	9	C2
T56	Ash	1.2	9	C2
T57	Ash	1.2	9	C2
T58	Ash	1.2	9	C2
T59	Ash	1.2	9	C2
T60	Ash	1.2	9	C2
T61	Ash	1.2	9	C2
T62	Ash	1.2	9	C2
T63	Ash	1.2	9	C2
T64	Ash	1.2	9	C2
T65	Ash	1.2	9	C2
T66	Ash	1.2	9	C2
T67	Ash	1.2	9	C2
T68	Ash	1.2	9	C2
T69	Ash	1.2	9	C2
T70	Ash	1.2	9	C2
T71	Ash	1.2	9	C2
T72	Ash	1.2	9	C2
T73	Ash	1.2	9	C2
T74	Ash	1.2	9	C2
T75	Ash	1.2	9	C2
T76	Ash	1.2	9	C2
T77	Ash	1.2	9	C2
T78	Ash	1.2	9	C2
T79	Ash	1.2	9	C2
T80	Ash	1.2	9	C2
T81	Ash	1.2	9	C2
T82	Ash	1.2	9	C2
T83	Ash	1.2	9	C2
T84	Ash	1.2	9	C2
T85	Ash	1.2	9	C2
T86	Ash	1.2	9	C2
T87	Ash	1.2	9	C2
T88	Ash	1.2	9	C2
T89	Ash	1.2	9	C2
T90	Ash	1.2	9	C2
T91	Ash	1.2	9	C2
T92	Ash	1.2	9	C2
T93	Ash	1.2	9	C2
T94	Ash	1.2	9	C2
T95	Ash	1.2	9	C2
T96	Ash	1.2	9	C2
T97	Ash	1.2	9	C2
T98	Ash	1.2	9	C2
T99	Ash	1.2	9	C2
T100	Ash	1.2	9	C2

Tree removed since original survey



Symbol	Description
Green circle	Tree Category A - High Quality
Light green circle	A Category - Hedgerow Group, Woodland
Blue circle	Tree Category B - Moderate Quality
Light blue circle	B Category - Hedgerow Group, Woodland
Grey circle	Tree Category C - Low Quality
Light grey circle	C Category - Hedgerow Group, Woodland
White circle	Tree Category U - Unsuitable for Retention
Red circle	U Category - Hedgerow Group, Woodland
Red dashed line	Root Protection Area to BS 5837:2012
Red solid line	Shrub Mass / Offset Tree / OOS (Out of scope)



PROJECT TITLE
Blainhiraeth Farm, Llangennech, Llanelli (V.2630)
(Area C)

DRAWING TITLE
Tree Survey & Constraints

SCALE: **1:2000** @ **A1** DRAWING NUMBER: **BHA_388_01**

DRAWN BY: **DB** APPROVED BY: **AC** REVISION: **A** SHEET: **3 of 3** DATE: **26/07/2018**

CLIENT: **Volitalia**

COORDINATE SYSTEM / DATUM: **British National Grid / Newlyn Datum (AOD)**

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Eckington, Pershore, Worcestershire, WR10 3DN

Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

APPENDIX 4

TREE SURVEY PLAN WITH ANCIENT WOODLAND INVENTORY 2011 OVERLAY

Tree No.	Species	RPA Radius M	RPA Area M2	Category
T11	Hawthorn	2.4	18	C1
H2	Hawthorn	1.2	9	C2
T3	Lilburnum	2.4	18	C1
H4	Blackthorn	1.2	9	C2
H5	Blackthorn	1.2	9	C2
G6	Ash	3.6	36	B2
H7	Oak	1.2	9	C2
G8	Oak	1.2	9	C2
H9	Blackthorn	1.2	9	C2
H10	Hawthorn	1.2	9	C2
G11	Ash	3.6	36	B2
H12	Oak	1.2	9	C2
H13	Hawthorn	1.2	9	C2
H14	Hawthorn	1.2	9	C2
H15	Hawthorn	1.2	9	C2
H16	Hawthorn	1.2	9	C2
H17	Hawthorn	1.2	9	C2
G18	Ash	3.6	36	B2
H19	Hawthorn	1.2	9	C2
G20	Hawthorn	1.2	9	C2
G21	Hawthorn	1.2	9	C2
G22	Oak	1.2	9	C2
G23	Ash	3.6	36	B2
H24	Hawthorn	1.2	9	C2
T25	Oak	4.8	72	B1
H26	Hawthorn	1.2	9	C2
H27	Hawthorn	1.2	9	C2
H28	Hawthorn	1.2	9	C2
H29	Hawthorn	1.2	9	C2
T30	Oak	3.6	41	C1
G31	Oak	1.2	9	C2
H32	Hawthorn	1.2	9	C2
H33	Hawthorn	1.2	9	C2
H34	Hawthorn	1.2	9	C2
H35	Hawthorn	1.2	9	C2
H36	Hawthorn	1.2	9	C2
H37	Hawthorn	1.2	9	C2
H38	Hawthorn	1.2	9	C2
H39	Hawthorn	1.2	9	C2
H40	Hawthorn	1.2	9	C2
H41	Hawthorn	1.2	9	C2
H42	Hawthorn	1.2	9	C2
H43	Hawthorn	1.2	9	C2
H44	Hawthorn	1.2	9	C2
H45	Hawthorn	1.2	9	C2
H46	Hawthorn	1.2	9	C2
H47	Hawthorn	1.2	9	C2
H48	Hawthorn	1.2	9	C2
H49	Hawthorn	1.2	9	C2
H50	Hawthorn	1.2	9	C2
H51	Hawthorn	1.2	9	C2
H52	Hawthorn	1.2	9	C2
H53	Hawthorn	1.2	9	C2
H54	Hawthorn	1.2	9	C2
H55	Hawthorn	1.2	9	C2
H56	Hawthorn	1.2	9	C2
H57	Hawthorn	1.2	9	C2
H58	Hawthorn	1.2	9	C2
H59	Hawthorn	1.2	9	C2
H60	Hawthorn	1.2	9	C2
H61	Hawthorn	1.2	9	C2
H62	Hawthorn	1.2	9	C2
H63	Hawthorn	1.2	9	C2
H64	Hawthorn	1.2	9	C2
H65	Hawthorn	1.2	9	C2
H66	Hawthorn	1.2	9	C2
H67	Hawthorn	1.2	9	C2
H68	Hawthorn	1.2	9	C2
H69	Hawthorn	1.2	9	C2
H70	Hawthorn	1.2	9	C2
H71	Hawthorn	1.2	9	C2
H72	Hawthorn	1.2	9	C2
H73	Hawthorn	1.2	9	C2
H74	Hawthorn	1.2	9	C2
H75	Hawthorn	1.2	9	C2
H76	Hawthorn	1.2	9	C2
H77	Hawthorn	1.2	9	C2
H78	Hawthorn	1.2	9	C2
H79	Hawthorn	1.2	9	C2
H80	Hawthorn	1.2	9	C2
H81	Hawthorn	1.2	9	C2
H82	Hawthorn	1.2	9	C2
H83	Hawthorn	1.2	9	C2
H84	Hawthorn	1.2	9	C2
H85	Hawthorn	1.2	9	C2
H86	Hawthorn	1.2	9	C2
H87	Hawthorn	1.2	9	C2
H88	Hawthorn	1.2	9	C2
H89	Hawthorn	1.2	9	C2
H90	Hawthorn	1.2	9	C2
H91	Hawthorn	1.2	9	C2
H92	Hawthorn	1.2	9	C2
H93	Hawthorn	1.2	9	C2
H94	Hawthorn	1.2	9	C2
H95	Hawthorn	1.2	9	C2
H96	Hawthorn	1.2	9	C2
H97	Hawthorn	1.2	9	C2
H98	Hawthorn	1.2	9	C2
H99	Hawthorn	1.2	9	C2
H100	Hawthorn	1.2	9	C2
H101	Hawthorn	1.2	9	C2
H102	Hawthorn	1.2	9	C2
H103	Hawthorn	1.2	9	C2
H104	Hawthorn	1.2	9	C2
H105	Hawthorn	1.2	9	C2
H106	Hawthorn	1.2	9	C2
H107	Hawthorn	1.2	9	C2
H108	Hawthorn	1.2	9	C2
H109	Hawthorn	1.2	9	C2
H110	Hawthorn	1.2	9	C2
H111	Hawthorn	1.2	9	C2
H112	Hawthorn	1.2	9	C2
H113	Hawthorn	1.2	9	C2
H114	Hawthorn	1.2	9	C2
H115	Hawthorn	1.2	9	C2
H116	Hawthorn	1.2	9	C2
H117	Hawthorn	1.2	9	C2
H118	Hawthorn	1.2	9	C2
H119	Hawthorn	1.2	9	C2
H120	Hawthorn	1.2	9	C2
H121	Hawthorn	1.2	9	C2
H122	Hawthorn	1.2	9	C2
H123	Hawthorn	1.2	9	C2
H124	Hawthorn	1.2	9	C2
H125	Hawthorn	1.2	9	C2
H126	Hawthorn	1.2	9	C2
H127	Hawthorn	1.2	9	C2
H128	Hawthorn	1.2	9	C2
H129	Hawthorn	1.2	9	C2
H130	Hawthorn	1.2	9	C2
H131	Hawthorn	1.2	9	C2
H132	Hawthorn	1.2	9	C2
H133	Hawthorn	1.2	9	C2
H134	Hawthorn	1.2	9	C2
H135	Hawthorn	1.2	9	C2
H136	Hawthorn	1.2	9	C2
H137	Hawthorn	1.2	9	C2
H138	Hawthorn	1.2	9	C2
H139	Hawthorn	1.2	9	C2
H140	Hawthorn	1.2	9	C2
H141	Hawthorn	1.2	9	C2
H142	Hawthorn	1.2	9	C2
H143	Hawthorn	1.2	9	C2
H144	Hawthorn	1.2	9	C2
H145	Hawthorn	1.2	9	C2
H146	Hawthorn	1.2	9	C2
H147	Hawthorn	1.2	9	C2
H148	Hawthorn	1.2	9	C2
H149	Hawthorn	1.2	9	C2
H150	Hawthorn	1.2	9	C2
H151	Hawthorn	1.2	9	C2
H152	Hawthorn	1.2	9	C2
H153	Hawthorn	1.2	9	C2
H154	Hawthorn	1.2	9	C2
H155	Hawthorn	1.2	9	C2
H156	Hawthorn	1.2	9	C2
H157	Hawthorn	1.2	9	C2
H158	Hawthorn	1.2	9	C2
H159	Hawthorn	1.2	9	C2
H160	Hawthorn	1.2	9	C2
H161	Hawthorn	1.2	9	C2
H162	Hawthorn	1.2	9	C2
H163	Hawthorn	1.2	9	C2
H164	Hawthorn	1.2	9	C2
H165	Hawthorn	1.2	9	C2
H166	Hawthorn	1.2	9	C2
H167	Hawthorn	1.2	9	C2
H168	Hawthorn	1.2	9	C2
H169	Hawthorn	1.2	9	C2
H170	Hawthorn	1.2	9	C2
H171	Hawthorn	1.2	9	C2
H172	Hawthorn	1.2	9	C2
H173	Hawthorn	1.2	9	C2
H174	Hawthorn	1.2	9	C2
H175	Hawthorn	1.2	9	C2
H176	Hawthorn	1.2	9	C2
H177	Hawthorn	1.2	9	C2
H178	Hawthorn	1.2	9	C2
H179	Hawthorn	1.2	9	C2
H180	Hawthorn	1.2	9	C2
H181	Hawthorn	1.2	9	C2
H182	Hawthorn	1.2	9	C2
H183	Hawthorn	1.2	9	C2
H184	Hawthorn	1.2	9	C2
H185	Hawthorn	1.2	9	C2
H186	Hawthorn	1.2	9	C2
H187	Hawthorn	1.2	9	C2
H188	Hawthorn	1.2	9	C2
H189	Hawthorn	1.2	9	C2
H190	Hawthorn	1.2	9	C2
H191	Hawthorn	1.2	9	C2
H192	Hawthorn	1.2	9	C2
H193	Hawthorn	1.2	9	C2
H194	Hawthorn	1.2	9	C2
H195	Hawthorn	1.2	9	C2
H196	Hawthorn	1.2	9	C2
H197	Hawthorn	1.2	9	C2
H198	Hawthorn	1.2	9	C2
H199	Hawthorn	1.2	9	C2
H200	Hawthorn	1.2	9	C2

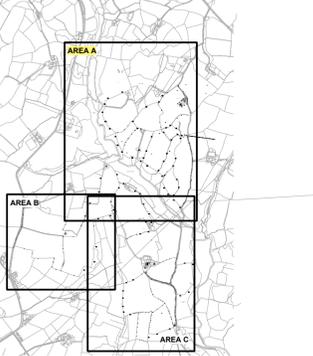
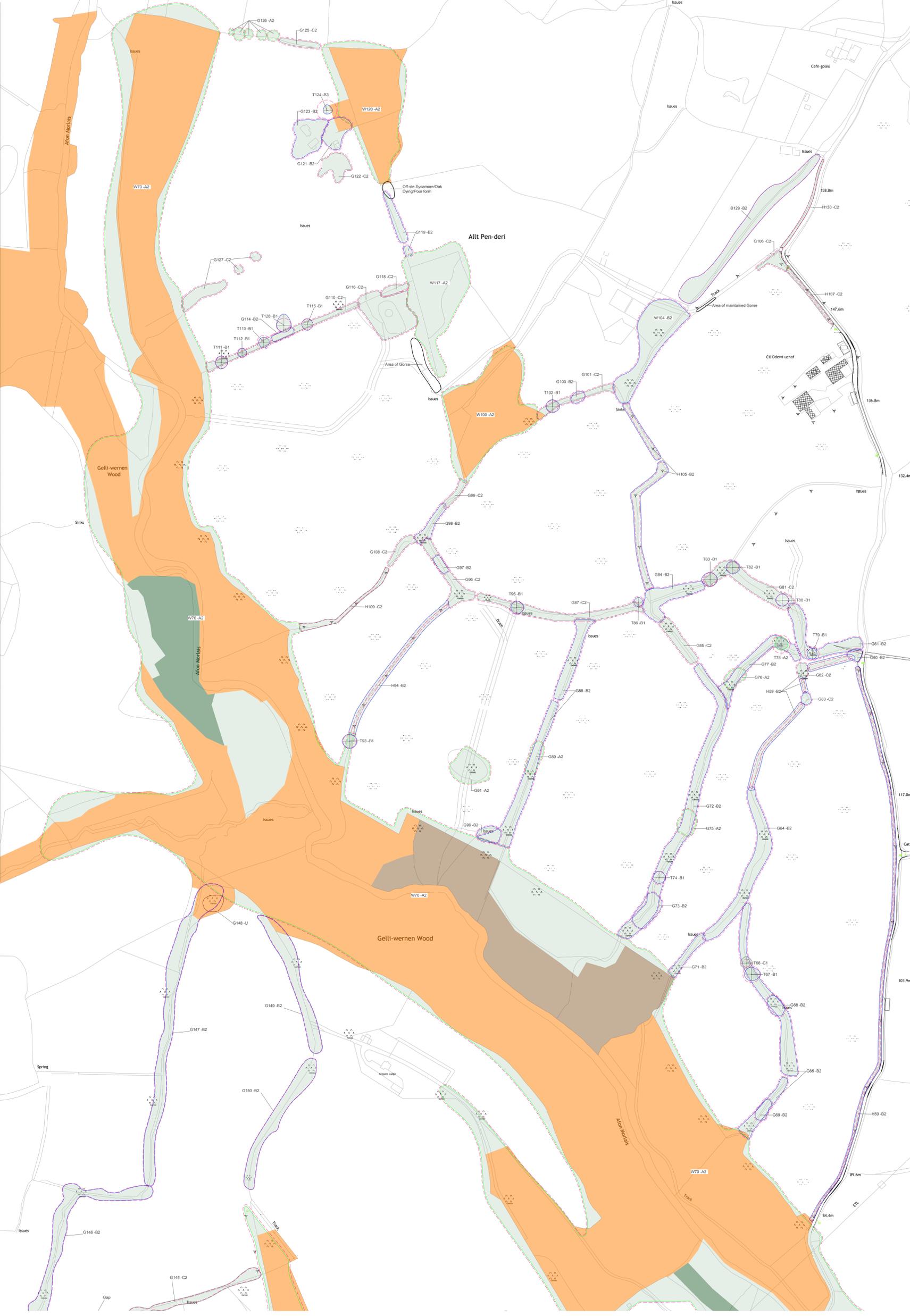
Tree removed since original survey

KEY

- BS 5837: 2012 Categories
- Tree Category A - High Quality
- A Category - Hedgerow, Group, Woodland
- Tree Category B - Moderate Quality
- B Category - Hedgerow, Group, Woodland
- Tree Category C - Low Quality
- C Category - Hedgerow, Group, Woodland
- Tree Category U - Unsuitable for Retention
- U Category - Hedgerow, Group, Woodland
- Root Protection Area to BS 5837:2012
- Shrub Mass / Offset Tree / OOS (Out of scope)
- Ancient Semi Natural Woodland
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

GRID NORTH

0 20 40 60 80 100
Meters



PROJECT TITLE
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630)
(Area A)

DRAWING TITLE
Tree Survey & Constraints

SCALE 1:2000 **DRAWING NUMBER** BHA_388_01

DRAWN BY SD **APPROVED BY** IM **REVISION** B **SHEET** 1 of 3 **DATE** 25/03/2020

CLIENT
Volltia

COORDINATE SYSTEM / DATUM
British National Grid / Newlyn Datum (AOD)

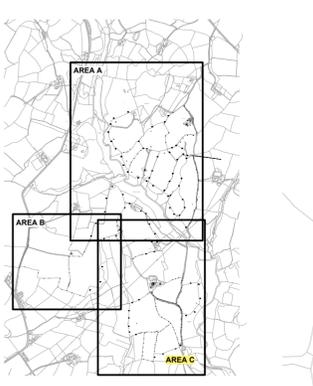
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Arboricultural Consultants

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Address: Office 5E, Deer Park Business Centre,
Eckington, Pershore, Worcestershire, WR10 3DN

Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

Tree No.	Species	RPA Radius M	RPA Area M2	Category
T1	Hawthorn	2.4	18	C1
T2	Hawthorn	1.2	9	C2
T3	Laburnum	2.4	18	C1
T4	Blackthorn	1.2	9	C2
T5	Blackthorn	1.2	9	C2
T6	Ash	3.6	36	B1
T7	Oak	10.8	108	A1
T8	Oak	7.2	54	B2
T9	Almond	4.8	36	B2
T10	Hawthorn	1.2	9	C2
T11	Oak	6.0	36	B2
T12	Oak	6.0	36	B2
T13	Hawthorn	1.2	9	C2
T14	Hawthorn	1.2	9	C2
T15	Hawthorn	2.4	18	C1
T16	Holly	1.8	14	B2
T17	Holly	1.8	14	B2
T18	Holly	1.8	14	B2
T19	Holly	1.8	14	B2
T20	Holly	1.8	14	B2
T21	Holly	1.8	14	B2
T22	Holly	1.8	14	B2
T23	Holly	1.8	14	B2
T24	Holly	1.8	14	B2
T25	Holly	1.8	14	B2
T26	Holly	1.8	14	B2
T27	Holly	1.8	14	B2
T28	Holly	1.8	14	B2
T29	Holly	1.8	14	B2
T30	Holly	1.8	14	B2
T31	Holly	1.8	14	B2
T32	Holly	1.8	14	B2
T33	Holly	1.8	14	B2
T34	Holly	1.8	14	B2
T35	Holly	1.8	14	B2
T36	Holly	1.8	14	B2
T37	Holly	1.8	14	B2
T38	Holly	1.8	14	B2
T39	Holly	1.8	14	B2
T40	Holly	1.8	14	B2
T41	Holly	1.8	14	B2
T42	Holly	1.8	14	B2
T43	Holly	1.8	14	B2
T44	Holly	1.8	14	B2
T45	Holly	1.8	14	B2
T46	Holly	1.8	14	B2
T47	Holly	1.8	14	B2
T48	Holly	1.8	14	B2
T49	Holly	1.8	14	B2
T50	Holly	1.8	14	B2
T51	Holly	1.8	14	B2
T52	Holly	1.8	14	B2
T53	Holly	1.8	14	B2
T54	Holly	1.8	14	B2
T55	Holly	1.8	14	B2
T56	Holly	1.8	14	B2
T57	Holly	1.8	14	B2
T58	Holly	1.8	14	B2
T59	Holly	1.8	14	B2
T60	Holly	1.8	14	B2
T61	Holly	1.8	14	B2
T62	Holly	1.8	14	B2
T63	Holly	1.8	14	B2
T64	Holly	1.8	14	B2
T65	Holly	1.8	14	B2
T66	Holly	1.8	14	B2
T67	Holly	1.8	14	B2
T68	Holly	1.8	14	B2
T69	Holly	1.8	14	B2
T70	Holly	1.8	14	B2
T71	Holly	1.8	14	B2
T72	Holly	1.8	14	B2
T73	Holly	1.8	14	B2
T74	Holly	1.8	14	B2
T75	Holly	1.8	14	B2
T76	Holly	1.8	14	B2
T77	Holly	1.8	14	B2
T78	Holly	1.8	14	B2
T79	Holly	1.8	14	B2
T80	Holly	1.8	14	B2
T81	Holly	1.8	14	B2
T82	Holly	1.8	14	B2
T83	Holly	1.8	14	B2
T84	Holly	1.8	14	B2
T85	Holly	1.8	14	B2
T86	Holly	1.8	14	B2
T87	Holly	1.8	14	B2
T88	Holly	1.8	14	B2
T89	Holly	1.8	14	B2
T90	Holly	1.8	14	B2
T91	Holly	1.8	14	B2
T92	Holly	1.8	14	B2
T93	Holly	1.8	14	B2
T94	Holly	1.8	14	B2
T95	Holly	1.8	14	B2
T96	Holly	1.8	14	B2
T97	Holly	1.8	14	B2
T98	Holly	1.8	14	B2
T99	Holly	1.8	14	B2
T100	Holly	1.8	14	B2



KEY

- BS 5837: 2012 Categories
- Tree Category A - High Quality
- A Category - Hedgerow, Group, Woodland
- Tree Category B - Moderate Quality
- B Category - Hedgerow, Group, Woodland
- Tree Category C - Low Quality
- C Category - Hedgerow, Group, Woodland
- Tree Category U - Unsuitable for Retention
- U Category - Hedgerow, Group, Woodland
- Root Protection Area to BS 5837:2012
- Shrub Mass / Off-site Tree / OOS (Out of scope)
- Ancient Semi Natural Woodland
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

PROJECT TITLE
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630)
(Area C)

DRAWING TITLE
Tree Survey & Constraints

SCALE 1:2000 **DRAWING NUMBER** BHA_388_01

DRAWN BY SD **APPROVED BY** IM **REVISION** B **SHEET** 3 of 3 **DATE** 25/03/2020

CLIENT **Volitalia**

COORDINATE SYSTEM / DATUM
 British National Grid / Newlyn Datum (AOD)

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Barton Hyett Associates
 Arboricultural Consultants

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 Eckington, Pershore, Worcestershire, WR10 3DN

Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

APPENDIX 5

ARBORICULTURAL IMPACT SCHEDULE

ARBORICULTURAL IMPACTS SCHEDULE

BLAENHIRAETH FARM, LLANGENNECH, LLANELLI

PROJECT NO:V.2630

CLIENT: VOLTALIA UK LTD

SURVEYOR: ACU

DATE: JULY 2019 (UPDATED DEC 2020)



No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
T1	Hawthorn	C1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Use of tree protection barriers in accordance with BS5837:2012.	Slight	Insignificant	No
H2	Hawthorn	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Use of tree protection barriers in accordance with BS5837:2012.	Slight	Insignificant	No
T3	Laburnum	C1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Use of tree protection barriers in accordance with BS5837:2012.	Slight	Insignificant	No
H4	Bramble, Gorse.	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Use of tree protection barriers in accordance with BS5837:2012.	Slight	Insignificant	No
H5	Blackthorn, Bramble, Gorse.	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Sectional removal required.	Low	Insignificant	Use of tree protection barriers in accordance with BS5837:2012. Position of cable to be located within existing track. Underground cable to be installed in accordance with an approved AMS. Additional planting as part of the landscaping scheme for the site.	Slight	Insignificant	partial
G6	Ash, Holly, Oak, Hawthorn	C2	.Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Sectional removal may be required.	Low	Insignificant	Use of tree protection barriers in accordance with BS5837:2012. Position cable route to north of group.	Slight	Insignificant	No
T7	Oak (English)	A1	Retain - remote from development	None	None	None	None	None	No
G8	Oak (English)	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No
W9	Alder, Hawthorn, Oak, Willow, Hazel	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Slight	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	None	None	No
H10	Hawthorn, Hazel, Holly	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No
G11	Ash, Sycamore, Oak	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Moderate	No
T12	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No

ARBORICULTURAL IMPACTS SCHEDULE

BLAENHIRAETH FARM, LLANGENNECH, LLANELLI

PROJECT NO:V.2630

CLIENT: VOLTALIA UK LTD

SURVEYOR: ACU

DATE: JULY 2019 (UPDATED DEC 2020)



No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
H13	Hawthorn, Blackthorn, Holly, Hazel, Gorse.	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Insignificant	No
H14	Hawthorn, Blackthorn, Holly	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Insignificant	No
H15	Hawthorn, Blackthorn, Holly, Hazel.	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
G16	Holly, Birch, Willow, Hawthorn, Ash, Oak	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required. Security fencing proposed through RPA.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012. install tree protection fencing in accordance with BS5837:2012. All tree work in accordance with BS3998:2010. Guidance from Arboriculturist if required.	Low	Minor	No
H17	Hawthorn, Blackthorn, Hazel, Ash, Holly, Goat willow.	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No
G18	Ash (Common)	B2	Retain - remote from development	None	None	None	None	None	No
H19	Hawthorn, Blackthorn, Hazel	C2	Retain - remote from development	None	None	None	None	None	No
G20	Hawthorn, Oak, Holly, Hazel, Goat willow, Ash	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Slight	Insignificant	No
G21	Hawthorn, Oak, Holly, Hazel, Goat willow, Blackthorn, Rowan	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. All tree work to be carried out in accordance with BS3998:2010.	Slight	Insignificant	No
G22	Oak (English)	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
G23	Ash, oak, beech, holly	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No

ARBORICULTURAL IMPACTS SCHEDULE

BLAENHIRAETH FARM, LLANGENNECH, LLANELLI

PROJECT NO:V.2630

CLIENT: VOLTALIA UK LTD

SURVEYOR: ACU

DATE: JULY 2019 (UPDATED DEC 2020)



No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
H24	Hawthorn, Blackthorn, Hazel, Holly.	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No
T25	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No
H26	Hawthorn, Blackthorn, Hazel, Beech, Privet, Holly	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Removal of 5m from southern end of northern section for visibility splay.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012. Mitigation planting	Slight	Insignificant	No
T27	Hawthorn	C1	Removed since last survey	None	None	N/a	None	None	N/a
T28	Beech (Common)	B1	Retain - remote from development	None	None	None	None	None	No
H29	Hawthorn, Holly, Hazel, Goat willow, Beech, Ash	B2	Retain - remote from development	None	None	None	None	None	No
T30	Oak	C1	Retain - remote from development	None	None	None	None	None	No
G31	Oak, Pear, Elder	C2	Retain - remote from development	None	None	None	None	None	No
H32	Hawthorn, Sycamore, Field maple, Hazel, Holly, Elder	C2	Retain - remote from development	None	None	None	None	None	No
G33	Sycamore, Hawthorn, Ash	B2	Retain - remote from development	None	None	None	None	None	No
H34	Hazel, Hawthorn, Blackthorn	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Insignificant	No
T35	Ash (Common)	C1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Insignificant	No
H36	Hazel, Hawthorn, Blackthorn, Goat willow, Oak, Ash, Holly	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Low	Insignificant	No

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G37	Birch, Ash, Goat willow	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Insignificant	No
G38	Ash (Common)	C2	Retain - remote from development	None	None	None	None	None	No
G39	Ash (Common)	C2	Retain - remote from development	None	None	None	None	None	No
G40	Hazel, Goat willow	C2	Retain - remote from development	None	None	None	None	None	No
G41	Hazel, Hawthorn, Field maple, Beech, Ash, Oak	B2	Retain - remote from development	None	None	None	None	None	No
G42	Hazel, Hawthorn, Oak, Ash, Holly, Beech	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
H43	Hazel, Hawthorn, Blackthorn, Holly	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Access road to utilise existing farm access.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Low	Insignificant	No
G44	Beech, Oak, Sycamore, Holly	B2	Retain - remote from development	None	None	None	None	None	No
T45	Beech (Common)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
T45a	Beech (Common)	U	Remove due to physiological condition irrespective of development proposals.	High	Minor	All tree work to be carried out in accordance with BS3998:2012.	Medium	Minor	Yes
T46	Elm (English)	U	Remove due to physiological condition irrespective of development proposals.	High	Minor	All tree work to be carried out in accordance with BS3998:2010.	Medium	Minor	Yes
W47	Hazel, Hawthorn, Oak, Birch, Holly	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Moderate	No
T48	Elm (English)	U	Removed since last survey	None	None	N/A	None	None	N/a
T49	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Security fencing/potential cable route through RPA.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012. Install temporary ground protection in accordance with BS5837:2012. All excavations within RPA to be carried out in accordance with an approved Arboricultural Method statement and watching brief.	Low	Minor	No

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H50	Hazel, Hawthorn, Ash	C2	Retain - remote from development	None	None	None	None	None	No
T51	Ash (Common)	B1	Retain - remote from development	None	None	None	None	None	No
G52	Oak, Ash, Beech, Hawthorn, Blackthorn	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
H53	Hazel, Hawthorn, Blackthorn	C2	Retain - remote from development	None	None	None	None	None	No
G54	Holly, Hawthorn, Blackthorn, Oak, Ash, Sycamore, Goat Willow	B2	Retain - remote from development	None	None	None	None	None	No
W55	Ash, Oak, Scots pine, Sycamore, Holly, Larch, Goat willow.	B2	Retain - remote from development	None	None	None	None	None	No
G56	Hawthorn, Hazel, Oak, Willow	C2	Retain - remote from development	None	None	None	None	None	No
G57	Scots pine, Oak	B2	Retain - remote from development	None	None	None	None	None	No
G58	Oak, Thorn	B2	Retain - remote from development	None	None	None	None	None	No
H59	Hawthorn, Holly, Hazel, Sycamore, Blackthorn	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Partial removal for installation of access road/cable installation. Some facilitation pruning/minor removals required at entrance to site.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012. All tree work in accordance with BS3998:2010. Additional planting as part of the landscaping scheme for the site. Cable to be installed in accordance with an approved arboricultural method statement (AMS) and watching brief.	Low	Minor	Partial
G60	Ash, Oak	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012. All tree work in accordance with BS3998:2010.	Low	Minor	No
G61	Ash, Oak, Beech	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012. All tree work in accordance with BS3998:2010	Low	Minor	No

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G62	Goat willow	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Low	Insignificant	No
G63	Ash (Common)	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G64	Willow, Blackthorn, Hazel, Oak, Birch	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G65	Willow, Blackthorn, Hazel, Oak, Birch, Ash, Alder	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required to allow access.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
T66	Ash (Common)	C1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Use of tree protection barriers in accordance with BS5837:2012.	Low	Insignificant	No
T67	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G68	Holly, Ash	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
G69	Oak (English)	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
W70	Holly, Sycamore, Beech, Ash, Oak	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Cable route to pass through southern region.	Medium	Major	Site perimeter fence to offer protection in accordance with BS5837:2012. Underground cable installation to be carried out in accordance with an approved AMS and watching brief.	Low	Moderate	No
G71	Oak, Beech, Spruce	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G72	Willow, Blackthorn, Hazel, Oak, Birch, Ash, Holly	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G73	Oak, beech	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No

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T74	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G75	Oak (English)	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Use of tree protection barriers in accordance with BS5837:2012.	Low	Moderate	No
G76	Oak (English)	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Low	Moderate	No
G77	Oak, Hazel, Beech, Holly, Gorse, Willow, Birch.	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
T78	Oak (English)	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Low	Moderate	No
T79	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required.	High	Major	Use of tree protection barriers in accordance with BS5837:2012. All tree work in accordance with BS3998:2010.	Medium	Moderate	No
T80	Oak (English)	B1	Retain - remote from development	None	None	None	None	None	No
G81	Goat willow, Hazel, Oak, Birch, Beech, Alder	C2	Retain - remote from development	None	None	None	None	None	No
T82	Oak (English)	B1	Retain - remote from development	None	None	None	None	None	No
T83	Oak (English)	B1	Retain - remote from development	None	None	None	None	None	No
G84	Oak, Willow, Holly, Hazel	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012.	Slight	Insignificant	No
G85	Oak, Goat willow, Beech	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012. All tree work in accordance with BS3998:2010.	Low	Insignificant	No
T86	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	High	Major	Site perimeter fence to offer protection in accordance with BS5837:2012.	Medium	Moderate	No

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G87	Blackthorn, Goat willow, Hazel, Holly, Oak	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Use of tree protection barriers in accordance with BS5837:2012.	Low	Insignificant	No
G88	Holly, Oak, Goat willow, Birch, Beech	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required at existing gateway. Minor facilitation pruning required adjacent to new access road.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G89	Beech, Oak	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Use of tree protection barriers in accordance with BS5837:2012.	Low	Moderate	No
G90	Oak (English)	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No
G91	Oak, Holly	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Use of tree protection barriers in accordance with BS5837:2012.	Low	Moderate	No
T92	Oak (English)	U	Removed since last survey	None	None	N/A	None	None	N/a
T93	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
H94	Birch, Gorse, Hazel, Willow, Beech, Oak, Hawthorn, Blackthorn	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
T95	Oak (English)	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G96	Willow, Birch, Hazel	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required adjacent new access track.	Medium	Minor	Use of tree protection barriers in accordance with BS5837:2012. All tree works to be undertaken in accordance with BS3998:2010.	Low	Insignificant	No
G97	Ash, Oak	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
G98	Ash, Oak, Beech, Willow, Gorse, Hawthorn	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Sectional removal required for new access road.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012. All tree works to be undertaken in accordance with BS3998:2010. Additional planting as part of the landscaping scheme for the site.	Low	Minor	Partial

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G99	Hawthorn, Holly, Goat willow, Blackthorn	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Insignificant	No
W100	Oak, Sycamore, Birch, Ash, Hawthorn, Holly	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Major	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Moderate	No
G101	Hawthorn, Willow, Ash, Birch, Beech	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Insignificant	No
T102	Ash	B1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
G103	Ash	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
W104	Goat willow, Ash, Oak, Birch, Alder	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	High	Major	Use of tree protection barriers in accordance with BS5837:2012.	Medium	Moderate	No
H105	Holly, Hawthorn, Blackthorn	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Minor facilitation pruning required for new access track.	High	Major	Site perimeter fence to offer protection in accordance with BS5837:2012. Use of tree protection barriers in accordance with BS5837:2012. All tree work in accordance with BS3998:2010.	Medium	Moderate	No
G106	Blackthorn	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Sectional removal required to allow new access track to be constructed.	High	Moderate	Use of tree protection barriers in accordance with BS5837:2012. All tree work in accordance with BS3998:2010. Additional planting as part of the landscaping scheme for the site.	Medium	Minor	Partial.
H107	Birch, Holly, Oak, Hawthorn, Blackthorn, Gorse.	C2	Retain - remote from development	None	None	None	None	None	No
G108	Willow, Birch	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Use of tree protection barriers in accordance with BS5837:2012.	Low	Insignificant	No
H109	Gorse, Willow, Hazel, Ash	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Minor	Use of tree protection barriers in accordance with BS5837:2012.	Low	Insignificant	No
G110	Birch, Holly, Hawthorn, Hazel, Gorse, Oak, Willow.	C2	Retain - remote from development	None	None	None	None	None	No
T111	Oak (English)	B1	Retain - remote from development	None	None	None	None	None	No

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T112	Oak (English)	B1	Retain - remote from development	None	None	None	None	None	No
T113	Ash (Common)	B1	Retain - remote from development	None	None	None	None	None	No
G114	Birch, Oak	B2	Retain - remote from development	None	None	None	None	None	No
T115	Ash (Common)	B1	Retain - remote from development	None	None	None	None	None	No
G116	Willow, Oak, Birch.	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	Slight	Insignificant	No
W117	Birch, Oak, Sycamore, Ash	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Slight	Minor	Site perimeter fence to offer protection in accordance with BS5837:2012.	None	None	No
G118	Goat willow, Hazel	C2	Retain - remote from development	None	None	None	None	None	No
G119	Goat willow, Oak, Birch, Gorse, Sycamore, Hawthorn	B2	Retain - remote from development	None	None	None	None	None	No
W120	Sycamore, Oak, Ash, Holly, Hawthorn, Sweet chestnut	A2	Retain - remote from development	None	None	None	None	None	No
G121	Oak, Hawthorn, Ash, Sycamore	B2	Retain - remote from development	None	None	None	None	None	No
G122	Willow, Ash	C2	Retain - remote from development	None	None	None	None	None	No
G123	Ash, Sycamore, Willow, Hawthorn	B2	Retain - remote from development	None	None	None	None	None	No
T124	Ash (Common)	B3	Retain - remote from development	None	None	None	None	None	No
G125	Hawthorn, Ash, Oak, Gorse	C2	Retain - remote from development	None	None	None	None	None	No

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G126	Oak (English)	A2	Retain - remote from development	None	None	None	None	None	No
G127	Willow, Birch, Hazel, Thorn	C2	Retain - remote from development	None	None	None	None	None	No
T128	Ash (Common)	B1	Retain - remote from development	None	None	None	None	None	No
G129	Oak, Ash, Willow, Birch, Beech, Sycamore	B2	Retain - remote from development	None	None	None	None	None	No
H130	Holly, Hawthorn, Sycamore, Hazel	C2	Retain - remote from development	None	None	None	None	None	No
H131	Hazel, Blackthorn, Hawthorn, Sycamore, Gorse.	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Sectional removal required to install underground cable.	Low	Insignificant	All tree work to be carried out in accordance with BS3998:2010. Use tree protection fencing in accordance with BS5837:2012. Additional planting as part of the landscaping scheme for the site.	Slight	Insignificant	Partial
H132	Hazel, Blackthorn, Hawthorn, Sycamore, Ash.	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Sectional removal required to install underground cable.	Low	Insignificant	All tree work to be carried out in accordance with BS3998:2010. Use tree protection fencing in accordance with BS5837:2012. Additional planting as part of the landscaping scheme for the site.	Slight	Insignificant	Partial
G133	Sycamore, Oak	B2	Retain - remote from development	None	None	None	None	None	No
G134	Oak, Sycamore	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Close to underground cable route.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012.	Low	Minor	No
H135	Hawthorn, Ash	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Close to underground cable route.	Medium	Minor	Use of tree protection barriers in accordance with BS5837:2012. Utilise existing gaps within group. Additional planting as part of the landscaping scheme for the site.	Low	Insignificant	No
G136	Pine, Cypress, Lilac	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Located within garden area.	None	None	None	None	None	No
T137	Leyland cypress	C1	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Located within garden area.	None	None	None	None	None	No
H138	Hawthorn, Blackthorn, Hazel	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Adjacent to access road to farm.	Low	Insignificant	None	Low	Insignificant	No

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CLIENT: VOLTALIA UK LTD

SURVEYOR: ACU

DATE: JULY 2019 (UPDATED DEC 2020)



No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
H139	Hawthorn, Blackthorn, Hazel	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Sectional removal required for access to compound.	Medium	Minor	None	Medium	Minor	No
G140	Birch, Hawthorn, Oak, Willow, Holly, Hazel	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Underground cable route proposed within RPA. Partial removal	Medium	Minor	Use of tree protection barriers in accordance with BS5837:2012. Position of cable to be located within existing track.	Low	Insignificant	Partial
G141	Oak, Sycamore, Holly, Birch	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Adjacent access track.	Medium	Moderate	Use of tree protection barriers in accordance with BS5837:2012. Install cable outside RPA.	Low	Minor	No
W142	Oak, Sycamore, Birch, Beech, Rowan, Hawthorn, Hazel, Ash, Blackthorn.	A2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities. Access will utilise existing track and potential cable route. Facilitation pruning required to trees adjacent to track.	Medium	Major	Use of tree protection barriers in accordance with BS5837:2012. All tree work to be carried out in accordance with BS3998:2010. Underground cable to be installed in accordance with an approved arboricultural method statement (AMS) and watching brief.	Low	Moderate	No
G143	Oak, Willow, Birch	B2	Retain - remote from development	None	None	None	None	None	No
G144	Birch, Willow	C2	Retain - remote from development	None	None	None	None	None	No
G145	Willow, Birch, Oak, Blackthorn	C2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Low	Insignificant	Site perimeter fence to offer protection in accordance with BS5837:2012. Position to north of group.	Slight	Insignificant	No
G146	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	B2	Retain to enhance development. Potential above and below ground impacts associated with typical construction activities.	Medium	Moderate	Site perimeter fence to offer protection in accordance with BS5837:2012.	Low	Minor	No
G147	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	B2	Retain - remote from development	None	None	None	None	None	No
G148	Ash	U	Retain - remote from development	None	None	None	None	None	No
G149	Rowan, Oak, Beech, Rhododendron, Birch, Sycamore, Willow	B2	Retain - remote from development	None	None	None	None	None	No
G150	Beech, Sycamore, Hawthorn, Oak, Blackthorn, Hazel, Elm.	B2	Retain - remote from development	None	None	None	None	None	No

ARBORICULTURAL IMPACTS SCHEDULE

BLAENHIRAETH FARM, LLANGENNECH, LLANELLI

PROJECT NO:V.2630

CLIENT: VOLTALIA UK LTD

SURVEYOR: ACU

DATE: JULY 2019 (UPDATED DEC 2020)



No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
H151	Blackthorn, Willow, Elder, Hawthorn, Oak.	C2	Retain - remote from development	None	None	None	None	None	No
H152	Ash, Blackthorn, Hazel, Holly, Hawthorn, Rowan,	C2	Retain - remote from development	None	None	None	None	None	No
G153	Ash, Oak, Blackthorn, Hazel	B2	Retain - remote from development	None	None	None	None	None	No

AIA SIGNIFICANCE MATRIX

Arboricultural Impact Assessment Significance Matrix							
		Level of Impact					
		High	Medium	Low	Slight	None	
		e.g. removal required to facilitate development. Excessive root severance. Excessive above ground pruning. Hedgerows: >50% loss of overall length.	e.g root damage, soil compaction or above ground impacts tree management works unacceptable in terms of BS3998:2010. Hedgerows: >25% loss of overall length.	e.g. minor fine root loss, installation of no dig surfacing, temporary ground protection. Moderate tree works within the parameters of BS3998:2010. Hedgerows: 5-10% loss of overall length.	e.g.very minor works within root protection areas for example the installation of lightweight fencing or soft landscaping. Hedgerows: <5% loss of overall length.	E.g. trees located at a significant distance from development and construction activities.	
BS5837:2012 Quality Assessment Category	A	Major	Major	Moderate	Minor	None	Significance of effect
	B	Major	Moderate	Minor	Insignificant	None	
	C	Moderate	Minor	Insignificant	Insignificant	None	
	U	Minor	Minor	Insignificant	Insignificant	None	
		Significance of effect					

SIGNIFICANCE OF EFFCET - DEFINITIONS

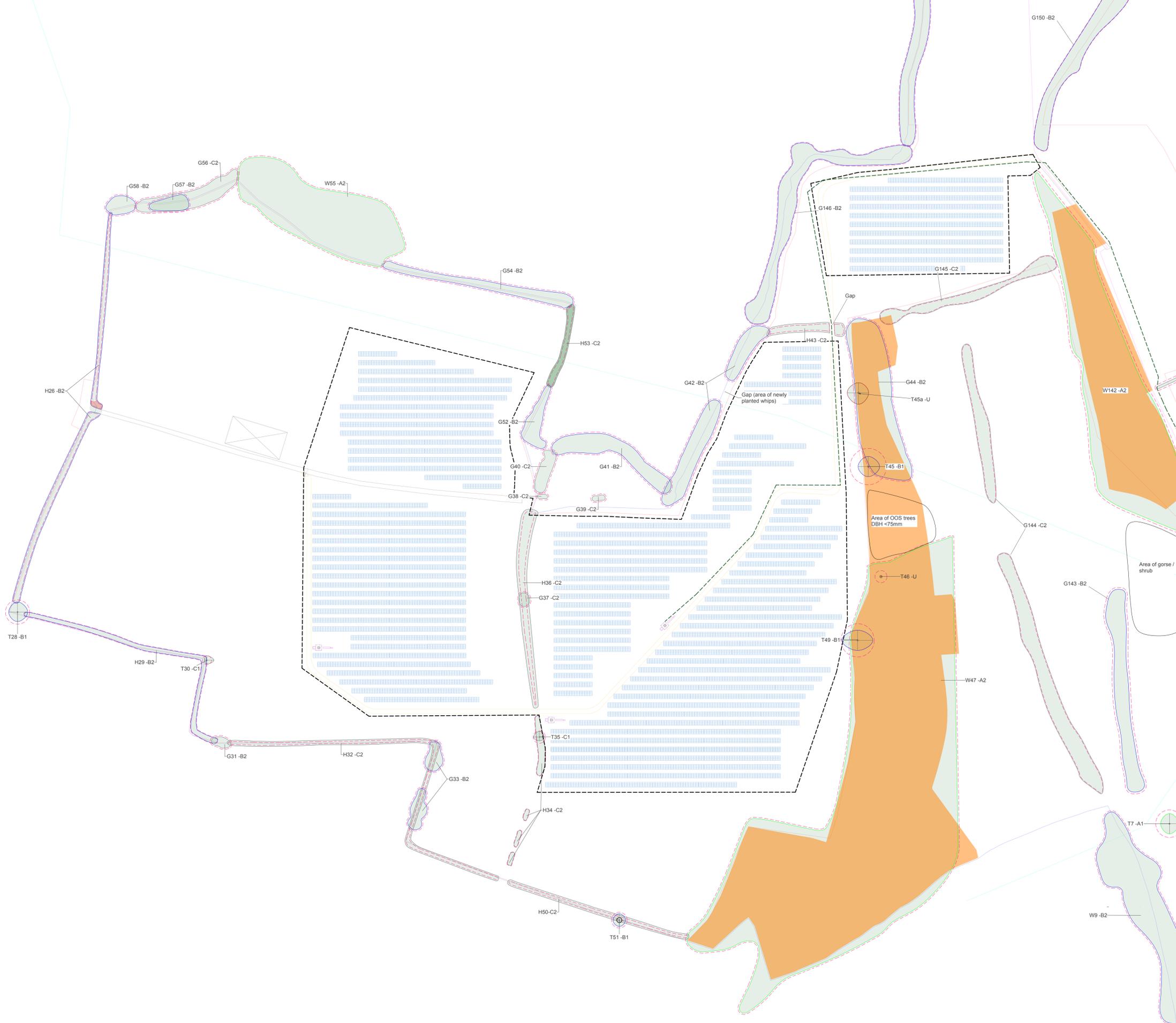
Major	Removal/acute damage to structural integrity/vitality/appearance of a high quality arboricultural feature. Depending on circumstances, may result in the loss of all/greater majority of public visual amenity value. Mitigation planting unlikely to be effective except in the long term (40+ years).
Moderate	In the case of damage: unlikely to give rise to tree death but likely to noticeably reduce vitality and deterioration of appearance in the short and medium term, with corresponding a reduction in public visual amenity value where relevant. Tree removals that can be effectively mitigated in the medium term (20-40 years). For example notable crown dieback, foliage discolouration, low leaf density, or tree management works unacceptable in terms of BS3998:2010.
Minor	Short-term damage with limited distribution that can be reasonably compensated for by new growth. Unlikely to result in observable symptoms of damage in relation to structural integrity/vitality/appearance. No obvious impact on public visual amenity. Tree removals that can be mitigated in the short-term (10-20 years)
Insignificant	Minimal damage in very small amounts. No obvious impact on public visual amenity.
None	No impact to above or below ground components of tree reasonably anticipated.

APPENDIX 6

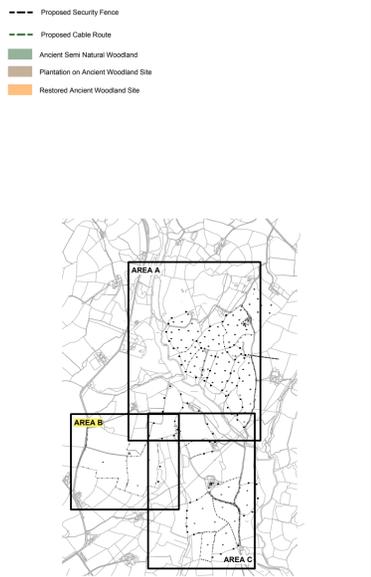
TREE RETENTION AND REMOVAL PLAN

Tree No	Species	RPA Radius M	RPA Area M2	Category
H1	Hawthorn	2.4	18	C1
H2	Hawthorn	1.2	9	C2
D3	Alumroot	2.4	18	C1
H4	Hawthorn	1.2	9	C2
H5	Blackthorn, Bramble, Gorse	1.2	9	C2
G6	Ash, Holly, Oak, Hawthorn	3.6	27	C2
T7	Oak (English)	10.8	375	A1
G8	Oak (English)	7.2	27	B2
W9	Alder, Hawthorn, Oak, Willow, Hazel	4.8	18	B2
H10	Hawthorn, Hazel, Holly	1.2	9	C2
G11	Ash, Sycamore, Oak	3.6	27	A2
T12	Oak (Sessile)	6.6	137	B2
H13	Hawthorn, Blackthorn, Holly, Hazel, Gorse	1.2	9	C2
H14	Hawthorn, Blackthorn, Holly	1.4	10	C2
H15	Hawthorn, Blackthorn, Holly, Hazel	2.4	18	B2
G16	Holly, Birch, Willow, Hawthorn, Ash, Oak	4.8	18	B2
H17	Hawthorn, Blackthorn, Hazel, Ash, Holly, Goat willow	1.2	9	C2
G18	Ash (Common)	4.2	16	B2
A19	Hawthorn, Blackthorn, Hazel	1.2	9	C2
G20	Hawthorn, Oak, Holly, Hazel, Goat willow, Ash	3.6	27	B2
G21	Hawthorn, Oak, Holly, Hazel, Goat willow, Blackthorn, Bramble, Hazel	3	9	B2
G22	Oak (Sessile)	7.2	27	B2
G23	Ash, Oak, Birch, Holly	6	27	B2
H24	Hawthorn, Blackthorn, Hazel, Holly	1.2	9	C2
T25	Oak (English)	4.8	72	B1
H26	Holly	1.8	9	B2
T27	Hawthorn	1.8	9	C1
T28	Beech (Common)	9.6	290	C1
H29	Hawthorn, Holly, Hazel, Goat willow, Beech, Ash	2.4	18	C2
T30	Oak	3.6	41	C1
G31	Oak, Elm	6	36	B2
H32	Hawthorn, Sycamore, Field maple, Hazel	0.9	9	C2
G33	Sycamore, Hawthorn, Ash	3.4	19	B2
H34	Hazel, Hawthorn, Blackthorn	1.8	18	C2
T35	Ash (Common)	4.8	72	C1
H36	Hazel, Hawthorn, Blackthorn, Goat willow	1.2	9	C2
G37	Birch, Ash, Goat willow	2.4	18	C2
G38	Ash (Common)	6.1	29	C2
G39	Ash (Common)	4.8	19	C2
G40	Hazel, Goat willow	1.8	18	C2
H41	Hazel, Hawthorn, Field maple, Beech, Ash, Oak	3.4	19	B2
G42	Hazel, Hawthorn, Oak, Ash, Holly, Beech	3.4	19	B2
H43	Hazel, Hawthorn, Blackthorn, Holly	1.8	18	C2
G44	Beech, Oak, Sycamore, Holly	16	19	B2
T45	Beech (Common)	14.4	652	B1
T46	Sycamore	14.4	652	U
H47	Hazel, Hawthorn, Oak, Birch, Holly	7.2	27	A2
T48	Oak (English)	4.8	72	U
T49	Oak (English)	13.2	547	B1
H50	Hazel, Hawthorn, Ash	1.2	9	C2
T51	Ash (Common)	9.2	122	C2
G52	Oak, Ash, Beech, Hawthorn, Blackthorn	3.6	36	B2
H53	Hazel, Hawthorn, Blackthorn	1.8	18	C2
G54	Holly, Hawthorn, Blackthorn, Oak, Ash	2.4	18	B2
G55	Sycamore, Goat willow	2.4	18	B2
A56	Ash, Oak, Spine pine, Sycamore, Holly, Larch, Goat willow	2.4	18	A2
G56	Hawthorn, Hazel, Oak, Willow	2.4	18	C2
G57	Scots pine, Oak	5.4	19	B2
G58	Oak, Elm	4.8	27	B2
H59	Hawthorn, Holly, Hazel, Sycamore, Blackthorn	1.2	9	C2
G60	Ash, Oak	2.4	18	C2
G61	Ash, Oak, Beech	3.6	19	C2
G62	Goat willow	3.6	19	C2
G63	Ash (Common)	3.9	29	C2
G64	Willow, Blackthorn, Hazel, Oak, Birch	3.6	19	B2
G65	Willow, Blackthorn, Hazel, Oak, Birch, Ash, Alder	2.4	18	B2
T66	Ash (Common)	4.2	54	C1
T67	Oak (English)	7	255	A2
G68	Ash, Holly	4.2	18	C2
G69	Oak (English)	7.2	27	A2
W70	Holly, Sycamore, Beech, Ash, Oak	16	19	A2
G71	Oak, Beech, Sycamore	5.7	19	B2
G72	Holly	2.4	18	C2
G73	Oak, Hazel	3.6	19	B2
T74	Oak (English)	7.2	163	B1
G75	Oak (English)	6.6	108	A2
G76	Oak (English)	3.6	36	A2
G77	Oak, Hazel, Beech, Holly, Gorse, Willow, Birch	5.4	19	B2
T78	Oak (English)	9.6	290	A2
T79	Oak (English)	7.2	163	B1
T80	Oak (English)	6.6	137	B1
G81	Goat willow, Hazel, Oak, Birch, Beech, Alder	4.8	19	B2
H82	Oak (English)	6	113	B1
T83	Oak (English)	7.2	164	B1
G84	Oak, Willow, Holly, Hazel	4.2	19	B2
G85	Oak, Goat willow, Beech	4.8	19	C2
T86	Oak (English)	6	113	B1
G87	Hawthorn, Goat willow, Hazel, Holly, Oak	3	9	C2
G88	Holly, Oak, Goat willow, Birch, Beech	3.3	19	B2
G89	Beech, Oak	7.2	27	A2
G90	Oak (English)	3.6	19	B2
G91	Oak, Holly	7.2	27	A2
H92	Oak (English)	6	113	U
T93	Oak (English)	7.2	163	B1
H94	Beech, Gorse, Hazel, Willow, Beech, Oak, Hawthorn, Blackthorn	1.2	9	C2
T95	Oak (English)	7.2	163	B1
G96	Willow, Birch, Hazel	2.4	18	C2
G97	Ash, Oak	3.6	19	C2
G98	Ash, Oak, Beech, Willow, Gorse, Hawthorn	4.2	19	B2
G99	Hawthorn, Holly, Goat willow, Blackthorn	1.8	18	C2
G100	Oak, Sycamore, Birch, Ash, Hawthorn, Holly, Hawthorn, Willow, Ash, Birch, Beech	3.6	19	C2
T102	Ash	6.2	122	B1
G103	Ash	4.8	19	B2
W104	Goat willow, Ash, Oak, Birch, Alder	3.6	19	B2
H105	Holly, Hawthorn, Blackthorn	2.4	18	B2
G106	Blackthorn	1.2	9	C2
H107	Birch, Holly, Oak, Hawthorn, Blackthorn, Gorse	1	9	C2
G108	Willow, Hazel	3.6	19	C2
H109	Gorse, Willow, Hazel, Ash	1.2	9	C2
G110	Birch, Holly, Hawthorn, Hazel, Gorse, Oak	1.8	19	C2
T111	Oak (English)	6.6	137	B1
T112	Oak (English)	5.1	82	B1
T113	Ash (Common)	7.2	163	B1
G114	Birch, Oak	6	36	B2
T115	Ash (Common)	6	113	C1
G116	Willow, Oak, Birch	3	9	C2
W117	Birch, Oak, Sycamore, Ash	4.8	19	A2
G118	Goat willow, Hazel	2.4	18	C2
G119	Goat willow, Oak, Birch, Gorse, Sycamore, Hawthorn	3	19	B2
W120	Sycamore, Oak, Ash, Holly, Hawthorn, Sweet chestnut	6	19	A2
G121	Oak, Hawthorn, Ash, Sycamore	7.2	19	B2
G122	Willow, Ash	3.3	19	C2
G123	Ash, Sycamore, Willow, Hawthorn	6	19	B2
T124	Ash (Common)	10.8	366	B3
H125	Hawthorn, Ash, Oak, Gorse	1.8	19	C2
G126	Oak (English)	7.2	19	A2
G127	Willow, Birch, Hazel, Thorn	3.3	19	C2
T128	Ash (Common)	7.4	174	B1
G129	Oak, Ash, Willow, Birch, Beech, Sycamore	2.4	18	B2
H130	Holly, Hawthorn, Sycamore, Hazel	1.3	9	C2
H131	Hazel, Blackthorn, Hawthorn, Sycamore, Gorse	1	9	C2
H132	Hazel, Blackthorn, Hawthorn, Sycamore, Ash	4.1	9	C2
G133	Sycamore, Oak	4.1	9	B2
G134	Oak, Sycamore	3.6	290	B2
H135	Hawthorn, Ash	1.3	9	C2
G136	Pine, Cypress, Larch	1.3	9	C2
T137	Leyland cypress	7.2	163	C1
H138	Hawthorn, Blackthorn, Hazel	1	9	C2
H139	Hawthorn, Blackthorn, Hazel	1	9	C2
G140	Beech, Hawthorn, Oak, Willow, Holly, Hazel	1.6	41	C2
G141	Oak, Sycamore, Holly, Birch	6	113	B2
W142	Oak, Sycamore, Birch, Beech, Rowan, Hawthorn, Hazel, Ash, Blackthorn	7.2	163	A2
G143	Oak, Willow, Birch	7.2	163	B2
G144	Birch, Willow	3.6	41	C2
G145	Willow, Birch, Oak, Blackthorn	3.6	41	C2
G146	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	7.2	163	B2
G147	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	7.2	163	B2
G148	Ash	4.8	72	U
G149	Sycamore, Willow	6	113	B2
G150	Beech, Sycamore, Hawthorn, Oak, Blackthorn, Hazel, Elm	9	225	B2
H151	Blackthorn, Willow, Elder, Hawthorn, Oak	2.4	18	C2
H152	Roseau	3	9	C2
G153	Ash, Oak, Blackthorn, Hazel	4.1	9	B2

- Tree removed since original survey



- KEY** BS 5837: 2012 Categories
- Tree Category A - High Quality
 - A Category - Hedgerow, Group, Woodland
 - Tree Category B - Moderate Quality
 - B Category - Hedgerow, Group, Woodland
 - Tree Category C - Low Quality
 - C Category - Hedgerow, Group, Woodland
 - Tree Category U - Unsuitable for Retention
 - U Category - Hedgerow, Group, Woodland
 - Root Protection Area to BS 5837:2012
 - Shrub Mass / Off-site Tree / OOS (Out of scope)
 - Trees / Hedgerow to be Removed: removals for security fence/cable route to be 1m in width - illustration is indicative only
- Proposed Security Fence
 Proposed Cable Route
 ■ Ancient Semi Natural Woodland
 ■ Plantation on Ancient Woodland Site
 ■ Restored Ancient Woodland Site



Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

N
 GRID NORTH
 0 20 40 60 80 100
 Meters

PROJECT TITLE
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630) (Area B)

DRAWING TITLE
Tree Retention & Removal Plan

SCALE: 1:1500 @ A1 DRAWING NUMBER: BHA_388_02

DRAWN BY	APPROVED BY	REVISION	SHEET	DATE
SD	RH	D	2 of 3	15/12/2020

CLIENT: **Voltalia UK**

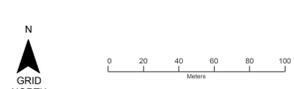
COORDINATE SYSTEM / DATUM: **British National Grid / Newlyn Datum (AOD)**

Tree No.	Species	RPA Radius M	RPA Area M2	Category
T11	Hawthorn	2.4	18	C1
H2	Hawthorn	1.2	9	C2
T3	Laburnum	2.4	18	C1
H4	Bramble, Gorse	1.2	9	C2
H5	Blackthorn, Bramble, Gorse	1.2	9	C2
G6	Ash, Holly, Oak, Hawthorn	3	27	C2
T7	Oak (English)	10.9	109	A1
G8	Oak (English)	7.2	54	B2
H9	Alder, Hawthorn, Oak, Willow, Hazel	1.8	14	B2
H10	Hawthorn, Hazel, Holly	1.2	9	C2
G11	Ash, Sycamore, Oak	6.6	50	A2
T12	Oak (English)	6.6	50	B2
H13	Hawthorn, Blackthorn, Holly, Hazel, Gorse	1.2	9	C2
H14	Hawthorn, Blackthorn, Holly	1.2	9	C2
H15	Hawthorn, Blackthorn, Holly, Hazel	2.4	18	B2
G16	Holly, Birch, Willow, Hawthorn, Ash, Oak	1.8	14	B2
H17	Hawthorn, Blackthorn, Hazel, Ash, Holly, Goat	1.8	14	B2
H18	Hawthorn, Blackthorn, Hazel, Ash, Holly, Goat	1.8	14	B2
G19	Ash (Common)	4.2	32	B2
H20	Hawthorn, Blackthorn, Hazel	1.2	9	C2
H21	Hawthorn, Blackthorn, Hazel, Goat willow, Ash	1.8	14	B2
G22	Hawthorn, Oak, Holly, Hazel, Goat willow, Blackthorn, Birch, Pear	3	23	B2
G23	Oak (English)	7.2	54	B2
G24	Ash, Oak, Beech, Holly	6	48	B2
H24	Hawthorn, Blackthorn, Hazel, Holly	1.2	9	C2
T25	Oak (English)	4.8	36	B1
H26	Hawthorn, Blackthorn, Hazel, Birch, Privet, Holly	1.8	14	B2
T27	Holly	1.8	14	B2
T28	Beech (Common)	9.6	72	C1
H29	Hawthorn, Holly, Hazel, Goat willow, Beech	2.4	18	B2
T30	Oak	3.6	27	C1
G31	Oak, Ash	6	48	B2
H32	Hawthorn, Sycamore, Field maple, Hazel, Holly, Elm	1.8	14	B2
G33	Sycamore, Hawthorn, Ash	5.4	41	B2
H34	Hazel, Hawthorn, Blackthorn	1.8	14	B2
T35	Ash (Common)	4.2	32	C1
H36	Hazel, Hawthorn, Blackthorn, Goat willow	1.2	9	C2
G37	Birch, Ash, Goat willow	2.4	18	B2
G38	Ash (Common)	5.1	39	B2
G39	Ash (Common)	4.2	32	B2
G40	Hazel, Goat willow	1.5	11	B2
G41	Hazel, Hawthorn, Field maple, Beech, Ash	5.4	41	B2
G42	Hazel, Hawthorn, Oak, Ash, Holly, Beech	1.8	14	B2
H43	Hazel, Hawthorn, Blackthorn, Holly	1.8	14	B2
G44	Beech, Oak, Sycamore, Holly	1.8	14	B2
T45	Beech (Common)	14.4	108	B1
T46	Sycamore	14.4	108	U
T47	Oak (English)	6.6	50	B2
H47	Hazel, Hawthorn, Oak, Birch, Holly	7.2	54	A2
T48	Elm (English)	4.8	36	U
T49	Oak (English)	10.2	77	B1
H50	Hazel, Hawthorn, Ash	1.2	9	C2
T51	Ash (Common)	1.2	9	C2
G52	Oak, Ash, Beech, Hawthorn, Blackthorn	3.6	27	B2
H53	Hazel, Hawthorn, Blackthorn	1.8	14	B2
H54	Hazel, Hawthorn, Blackthorn, Oak, Ash	1.8	14	B2
G54	Sycamore, Goat willow	7.4	56	B2
H55	Oak, Sycamore, Hawthorn, Sycamore, Holly, Larch	5.4	41	B2
G56	Goat willow	2.4	18	B2
G57	Scots pine, Oak	5.4	41	B2
G58	Oak, Thorn	4.8	36	B2
H59	Hawthorn, Holly, Hazel, Sycamore, Blackthorn	1.2	9	C2
G60	Ash, Oak	2.4	18	B2
G61	Ash, Oak, Beech	3.6	27	B2
G62	Goat willow	3.6	27	B2
G63	Ash (Common)	3.6	27	B2
G64	Willow, Blackthorn, Hazel, Oak, Birch	3.6	27	B2
H64	Willow, Blackthorn, Hazel, Oak, Birch, Ash	2.4	18	B2
T66	Ash (Common)	4.2	32	C1
T67	Oak (English)	4.2	32	B2
G68	Ash, Holly	4.2	32	C2
G69	Oak (English)	7.2	54	A2
H70	Holly, Sycamore, Beech, Ash, Oak	6.4	49	A2
G71	Oak (English)	9.6	72	B2
G72	Oak, Hazel, Beech, Holly, Gorse, Willow, Birch	5.4	41	B2
T73	Holly	2.4	18	B2
G74	Oak, Beech	6.6	50	B2
T74	Oak (English)	7.2	54	B1
G75	Oak (English)	6.4	49	A2
G76	Oak (English)	9.6	72	A2
G77	Oak, Hazel, Beech, Holly, Gorse, Willow, Birch	5.4	41	B2
T78	Oak (English)	9.6	72	A2
T79	Oak (English)	7.2	54	B1
H80	Oak (English)	6.6	50	B1
G81	Goat willow, Hazel, Oak, Birch, Beech, Alder	4.8	36	B2
T82	Oak (English)	6	48	B1
T83	Oak (English)	7.2	54	B1
G84	Oak, Willow, Holly, Hazel	4.8	36	B2
G85	Oak, Goat willow, Beech	4.8	36	B2
T86	Oak	6	48	B1
G87	Blackthorn, Goat willow, Hazel, Holly, Oak	3	23	B2
G88	Holly, Oak, Goat willow, Birch, Beech	3.3	25	B2
G89	Beech, Oak	2.4	18	B2
G90	Oak (English)	6.6	50	B2
T91	Oak, Holly	7.2	54	B1
T92	Oak (English)	6	48	B1
T93	Oak (English)	7.2	54	B1
H94	Birch, Gorse, Hazel, Willow, Beech, Oak	1.2	9	C2
T95	Oak (English)	7.2	54	B1
G96	Willow, Birch, Hazel	2.4	18	B2
G97	Ash, Oak	3.6	27	B2
G98	Ash, Oak, Beech, Willow, Gorse, Hawthorn	1.2	9	C2
G99	Hawthorn, Holly, Goat willow, Blackthorn	1.8	14	B2
H100	Oak, Sycamore, Birch, Ash, Hawthorn, Holly	4.8	36	A2
G101	Hawthorn, Willow, Ash, Birch, Beech	3.6	27	B2
T102	Ash	6.2	48	B1
G103	Ash	4.8	36	B2
H104	Goat willow, Ash, Oak, Birch, Alder	3.6	27	B2
H105	Holly, Hawthorn	1.2	9	C2
G106	Blackthorn	1.2	9	C2
H107	Birch, Holly, Oak, Hawthorn, Blackthorn, Gorse	1	8	B2
G108	Willow, Hazel	3.6	27	B2
H109	Gorse, Willow, Hazel, Ash	1.2	9	C2
G110	Birch, Holly, Hawthorn, Hazel, Gorse, Oak, Willow	1.8	14	B2
T111	Oak (English)	6.6	50	B1
T112	Oak (English)	5.1	39	B1
T113	Ash (Common)	7.2	54	B1
G114	Birch, Oak	6	48	B2
T115	Ash (Common)	6	48	B1
G116	Willow, Oak, Birch	3	23	B2
H117	Birch, Oak, Sycamore, Ash	4.8	36	A2
G118	Goat willow, Hazel	2.4	18	B2
G119	Goat willow, Oak, Birch, Gorse, Sycamore, Hawthorn	3	23	B2
H120	Sycamore, Oak, Ash, Holly, Hawthorn, Sweet Chestnut	6	48	B2
G121	Oak, Hawthorn, Ash, Sycamore	7.2	54	B2
G122	Willow, Ash	3.3	25	B2
G123	Ash, Sycamore, Willow, Hawthorn	6	48	B2
T124	Ash (Common)	10.8	81	B3
G125	Hawthorn, Ash, Oak, Gorse	1.8	14	B2
G126	Oak (English)	7.2	54	A2
G127	Willow, Birch, Hazel, Thorn	3.3	25	B2
G128	Ash (Common)	7.4	56	B1
H129	Oak, Ash, Willow, Birch, Beech, Sycamore	2.4	18	B2
H130	Holly, Hawthorn, Sycamore, Hazel	1.3	10	B2
H131	Hazel, Blackthorn, Hawthorn, Sycamore, Gorse	1	8	B2
H132	Hazel, Blackthorn, Hawthorn, Sycamore, Ash	4.1	32	B2
G133	Sycamore, Oak	1.1	8	B2
G134	Oak, Sycamore	9.6	72	B2
H135	Hawthorn, Ash	1.3	10	B2
G136	Pine, Cypress, Larch	1.3	10	B2
T137	Juniper, Gorse	7.2	54	C1
H138	Hawthorn, Blackthorn, Hazel	1	8	B2
H139	Hawthorn, Blackthorn, Hazel	1	8	B2
G140	Birch, Hawthorn, Oak, Willow, Holly, Hazel	3.6	27	B2
G141	Oak, Sycamore, Holly, Birch	6	48	B2
H142	Oak, Sycamore, Birch, Beech, Hazel, Hawthorn, Hazel, Ash, Blackthorn	7.2	54	A2
G143	Oak, Willow, Birch	7.2	54	B2
G144	Birch, Willow	3.6	27	A1
G145	Willow, Birch, Oak, Blackthorn	3.6	27	A1
G146	Oak, Ash, Willow, Beech, Hazel, Rowan	7.2	54	B2
G147	Hawthorn, Birch	7.2	54	B2
G148	Ash	4.8	36	U
G149	Rowan, Oak, Beech, Rhododendron, Birch, Sycamore, Willow	6	48	B2
G150	Beech, Sycamore, Hawthorn, Oak	9	68	B2
H151	Blackthorn, Hazel, Elm	1.8	14	B2
H152	Blackthorn, Willow, Elm, Hawthorn, Oak	2.4	18	B2
H153	Ash, Blackthorn, Hazel, Holly, Hawthorn	1	8	B2
G153	Ash, Oak, Blackthorn, Hazel	4.1	32	B2

Tree removed since original survey



KEY	
	Tree Category A - High Quality
	A Category - Hedgerow, Group, Woodland
	Tree Category B - Moderate Quality
	B Category - Hedgerow, Group, Woodland
	Tree Category C - Low Quality
	C Category - Hedgerow, Group, Woodland
	Tree Category U - Unsuitable for Retention
	U Category - Hedgerow, Group, Woodland
	Root Protection Area to BS 5837:2012
	Shrub Mass / Offsite Tree / OOS (Out of scope)
	Trees / Hedgerow to be removed: removals for security fenceable route to be 1m in width - illustration is indicative only
	Proposed Security Fence
	Proposed Cable Route
	Ancient Semi Natural Woodland
	Plantation on Ancient Woodland Site
	Restored Ancient Woodland Site



PROJECT TITLE			
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630) (Area C)			
DRAWING TITLE			
Tree Retention & Removal Plan			
SCALE		DRAWING NUMBER	
1:2000	@ A1	BHA_388_02	
DRAWN BY	APPROVED BY	REVISION	SHEET
SD	RH	D	3 of 3
DATE			
15/12/2020			
CLIENT			
Voitalia UK			
COORDINATE SYSTEM / DATUM			
British National Grid / Newlyn Datum (AOD)			
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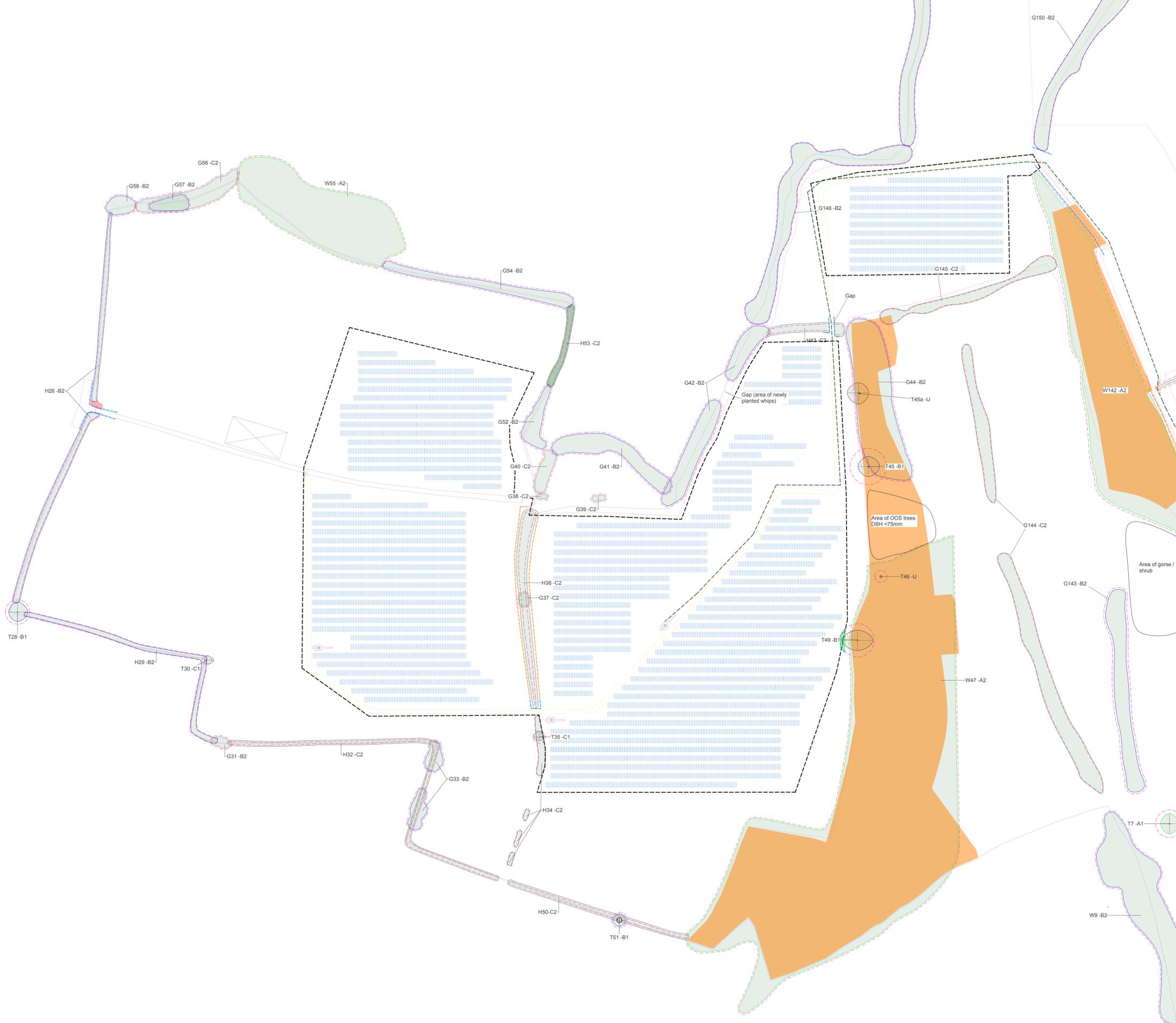
Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

APPENDIX 7

TREE PROTECTION PLAN

Tree No.	Species	RPA Radius M.	RPA Area M2	Category
H2	Hawthorn	1.2	0.9	C2
H3	Hawthorn	1.2	0.9	C2
H4	Hawthorn	1.2	0.9	C2
H5	Blackthorn, Bramble, Gorse	1.2	0.9	C2
H6	Ash, Holly, Oak, Hawthorn	1.8	2.5	C2
H7	Oak (English)	10.9	375	A1
H8	Oak (English)	7.2	163	B1
H9	Alder, Hawthorn, Oak, Willow, Hazel	4.8	0.9	B2
H10	Hawthorn, Hazel, Holly	1.2	0.9	C2
H11	Ash, Sycamore, Oak	3.6	0.9	A2
H12	Oak (Sessile)	6.6	137	B2
H13	Hawthorn, Blackthorn, Holly, Hazel, Gorse	1.2	0.9	C2
H14	Hawthorn, Blackthorn, Holly	1.4	0.9	C2
H15	Hawthorn, Blackthorn, Holly, Hazel	2.4	0.9	B2
H16	Holly, Birch, Willow, Hawthorn, Ash, Oak	4.8	0.9	B2
H17	Hawthorn, Blackthorn, Hazel, Ash, Holly, Goat willow	1.2	0.9	C2
H18	Ash (Common)	4.2	0.9	B2
H19	Hawthorn, Blackthorn, Hazel	1.2	0.9	C2
H20	Hawthorn, Oak, Holly, Hazel, Goat willow, Ash	3.6	0.9	B2
H21	Hawthorn, Oak, Holly, Hazel, Goat willow, Blackthorn, Bramble, Hazel	3	0.9	B2
H22	Oak (Sessile)	7.2	0.9	B2
H23	Ash, Oak, Birch, Holly	6	0.9	B2
H24	Hawthorn, Blackthorn, Hazel, Holly	1.2	0.9	C2
H25	Oak (English)	4.8	0.9	B1
H26	Holly	1.8	0.9	B2
H27	Hawthorn	1.8	0.9	C1
H28	Beech (Common)	9.6	200	C1
H29	Hawthorn, Holly, Hazel, Goat willow, Beech, Ash	2.4	0.9	C2
H30	Oak	3.6	0.9	C1
H31	Oak, Elm	6	0.9	B2
H32	Holly, Elder	0.9	0.9	C2
H33	Sycamore, Hawthorn, Field maple, Hazel	5.4	0.9	B2
H34	Hazel, Hawthorn, Blackthorn	1.8	0.9	C2
H35	Ash (Common)	4.8	0.9	C2
H36	Hazel, Hawthorn, Blackthorn, Goat willow	1.2	0.9	C2
H37	Birch, Ash, Goat willow	2.4	0.9	C2
H38	Ash (Common)	6.6	0.9	C2
H39	Ash (Common)	4.8	0.9	C2
H40	Hazel, Goat willow	1.8	0.9	C2
H41	Hazel, Hawthorn, Field maple, Beech, Ash	5.4	0.9	B2
H42	Hazel, Hawthorn, Oak, Ash, Holly, Beech	5.4	0.9	B2
H43	Hazel, Hawthorn, Blackthorn, Holly	1.8	0.9	C2
H44	Beech, Oak, Sycamore, Holly	16	0.9	B2
H45	Beech (Common)	14.4	652	B1
H46	Sycamore	14.4	652	U
H47	Iron (English)	4.8	72	U
H48	Hazel, Hawthorn, Oak, Birch, Holly	7.2	0.9	A2
H49	Oak (English)	13.2	547	B1
H50	Hazel, Hawthorn, Ash	1.2	0.9	C2
H51	Ash (Common)	9.2	122	C2
H52	Oak, Ash, Beech, Hawthorn, Blackthorn	3.6	0.9	B2
H53	Hazel, Hawthorn, Blackthorn	1.8	0.9	C2
H54	Holly, Hawthorn, Blackthorn, Oak, Ash	2.4	0.9	B2
H55	Goat willow	5.4	0.9	A2
H56	Hawthorn, Hazel, Oak, Willow	2.4	0.9	C2
H57	Scots pine, Oak	5.4	0.9	B2
H58	Oak, Elm	4.8	0.9	B2
H59	Hawthorn, Holly, Hazel, Sycamore, Blackthorn	1.2	0.9	C2
H60	Ash, Oak	2.4	0.9	C2
H61	Ash, Oak, Beech	3.6	0.9	C2
H62	Goat willow	3.6	0.9	C2
H63	Ash (Common)	3.6	0.9	C2
H64	Willow, Blackthorn, Hazel, Oak, Birch	3.6	0.9	B2
H65	Alder	2.4	0.9	B2
H66	Ash (Common)	4.2	0.9	C1
H67	Oak (English)	9	255	A2
H68	Ash, Holly	4.2	0.9	C2
H69	Oak (English)	7.2	0.9	A2
H70	Holly, Sycamore, Beech, Ash, Oak	16	0.9	A2
H71	Oak, Beech, Birch	5.7	0.9	B2
H72	Holly	2.4	0.9	C2
H73	Oak, Beech	3.6	0.9	B2
H74	Oak (English)	7.2	163	B1
H75	Oak (English)	6.6	0.9	A2
H76	Oak (English)	6.6	0.9	A2
H77	Oak, Hazel, Beech, Holly, Gorse, Willow	5.4	0.9	B2
H78	Oak (English)	9.6	200	A2
H79	Oak (English)	7.2	163	B1
H80	Oak (English)	6.6	137	B1
H81	Goat willow, Hazel, Oak, Birch, Beech, Alder	4.8	0.9	B2
H82	Oak (English)	6	113	B1
H83	Oak (English)	7.2	164	B1
H84	Oak, Willow, Holly, Hazel	4.2	0.9	C2
H85	Oak, Goat willow, Beech	4.8	0.9	C2
H86	Oak (English)	6	113	B1
H87	Hawthorn, Goat willow, Hazel, Holly, Oak	3	0.9	C2
H88	Holly, Oak, Goat willow, Birch, Beech	3.3	0.9	B2
H89	Beech, Oak	7.2	0.9	A2
H90	Oak (English)	3.6	0.9	B2
H91	Oak, Holly	7.2	0.9	A2
H92	Oak (English)	6	113	U
H93	Oak (English)	7.2	163	B1
H94	Birch, Gorse, Hazel, Willow, Beech, Oak	1.2	0.9	C2
H95	Oak (English)	7.2	163	B1
H96	Willow, Birch, Hazel	2.4	0.9	C2
H97	Ash, Oak	3.6	0.9	C2
H98	Ash, Oak, Beech, Willow, Gorse, Hawthorn	4.2	0.9	C2
H99	Hawthorn, Holly, Goat willow, Blackthorn	1.8	0.9	C2
H100	Oak, Sycamore, Birch, Ash, Hawthorn, Holly	4.2	0.9	C2
H101	Hawthorn, Willow, Ash, Birch, Beech	3.6	0.9	C2
H102	Ash	6.2	122	B1
H103	Ash	4.8	0.9	B2
H104	Goat willow, Ash, Oak, Birch, Alder	3.6	0.9	B2
H105	Holly, Hawthorn, Blackthorn	2.4	0.9	B2
H106	Blackthorn	1.2	0.9	C2
H107	Birch, Holly, Oak, Hawthorn, Blackthorn	1	0.9	C2
H108	Willow, Hazel	3.6	0.9	C2
H109	Gorse, Willow, Hazel, Ash	1.2	0.9	C2
H110	Birch, Holly, Hawthorn, Hazel, Gorse, Oak	1.8	0.9	C2
H111	Oak (English)	6.6	137	B1
H112	Oak (English)	5.1	92	B1
H113	Ash (Common)	7.2	163	B1
H114	Birch, Oak	6	0.9	B2
H115	Ash (Common)	6	113	C2
H116	Willow, Oak, Birch	3	0.9	C2
H117	Birch, Oak, Sycamore, Ash	4.8	0.9	A2
H118	Goat willow, Hazel	2.4	0.9	C2
H119	Goat willow, Oak, Birch, Gorse, Sycamore, Hawthorn	3	0.9	B2
H120	Sycamore, Oak, Ash, Holly, Hawthorn, Sweet chestnut	6	0.9	A2
H121	Oak, Hawthorn, Ash, Sycamore	7.2	0.9	B2
H122	Willow, Ash	3.3	0.9	C2
H123	Ash, Sycamore, Willow, Hawthorn	6	0.9	B2
H124	Ash (Common)	10.8	366	B3
H125	Hawthorn, Ash, Oak, Gorse	1.8	0.9	C2
H126	Oak (English)	7.2	0.9	A2
H127	Willow, Birch, Hazel, Thorn	3.3	0.9	C2
H128	Ash (Common)	7.4	174	B1
H129	Oak, Ash, Willow, Birch, Beech, Sycamore	2.4	0.9	B2
H130	Holly, Hawthorn, Sycamore, Hazel	1.3	0.9	C2
H131	Hazel, Blackthorn, Hawthorn, Sycamore, Gorse	1	0.9	C2
H132	Hazel, Blackthorn, Hawthorn, Sycamore, Ash	4.1	0.9	C2
H133	Sycamore, Oak	4.1	0.9	B2
H134	Oak, Sycamore	9.6	200	B2
H135	Hawthorn, Ash	1.3	0.9	C2
H136	Pine, Cypress, Larch	1.3	0.9	C2
H137	Leyland cypress	7.2	163	C1
H138	Hawthorn, Blackthorn, Hazel	1	0.9	C2
H139	Hawthorn, Blackthorn, Hazel	1	0.9	C2
H140	Birch, Hawthorn, Oak, Willow, Holly, Hazel	1.6	0.9	A1
H141	Oak, Sycamore, Holly, Birch	6	113	B2
H142	Oak, Sycamore, Birch, Beech, Rowan, Hawthorn, Hazel, Ash, Blackthorn	7.2	163	A2
H143	Oak, Willow, Birch	7.2	163	B2
H144	Birch, Willow	3.6	0.9	C2
H145	Willow, Birch, Oak, Blackthorn	3.6	0.9	C2
H146	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	7.2	163	B2
H147	Oak, Ash, Willow, Beech, Hazel, Rowan, Hawthorn, Birch	7.2	163	B2
H148	Ash	4.8	72	U
H149	Rowan, Oak, Beech, Rhododendron, Birch	6	113	B2
H150	Sycamore, Willow	6	113	B2
H151	Beech, Sycamore, Hawthorn, Oak, Blackthorn, Hazel, Elm	9	255	B2
H152	Blackthorn, Willow, Elder, Hawthorn, Oak	2.4	0.9	C2
H153	Ash, Blackthorn, Hazel, Holly, Hawthorn	3	0.9	C2
H154	Rowan	3	0.9	C2
H155	Ash, Oak, Blackthorn, Hazel	4.1	92	B2

- Tree removed since original survey

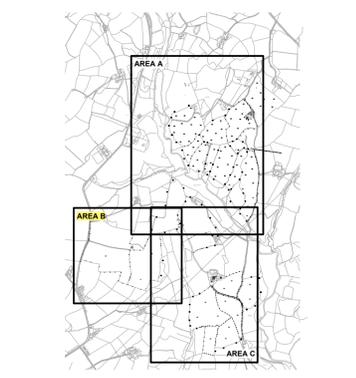


KEY BS 5837: 2012 Categories

- Tree Category A - High Quality
- A Category - Hedgerow, Group, Woodland
- Tree Category B - Moderate Quality
- B Category - Hedgerow, Group, Woodland
- Tree Category C - Low Quality
- C Category - Hedgerow, Group, Woodland
- Tree Category U - Unsuitable for Retention
- U Category - Hedgerow, Group, Woodland

Road Protection Area to BS 5837:2012
 Proposed Security Fence
 Proposed Cable Route
 Tree Protection Barrier to BS 5837:2012
 Downgraded Tree Protection Barrier to be agreed with LPA

All works to be undertaken in accordance with an approved arboricultural method statement and watching brief
 Ancient Semi Natural Woodland
 Plantation on Ancient Woodland Site
 Restored Ancient Woodland Site



BS 5837:2012 Figure 3 Examples of above-ground watching systems

For more details refer to BS 5837:2012 'Tree protection in design, installation and maintenance' chapters 2,3

PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT.

TREE PROTECTION AREA
 (Class A & B trees) (Classes C1 & C2 trees) (Class U trees)
 This area is to be maintained in accordance with the approved plans and drawings for this development. Any work within this area must be undertaken in accordance with the approved arboricultural method statement and watching brief.

Tree Protection Barrier - Barrier to be erected prior to the commencement of works on site and not to be altered or removed until works are complete (cross check with specific requirements of any relevant planning conditions)

Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

N
 GRID NORTH
 0 20 40 60 80 100
 Meters

PROJECT TITLE
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630) (Area B)

DRAWING TITLE
Tree Protection Plan

SCALE
1:1500 @ A1

DRAWING NUMBER
BHA_388_03

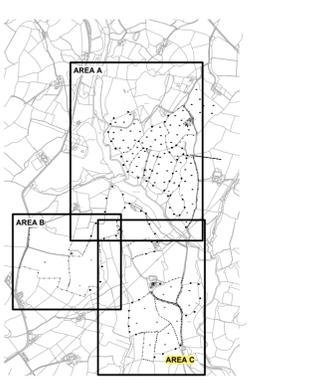
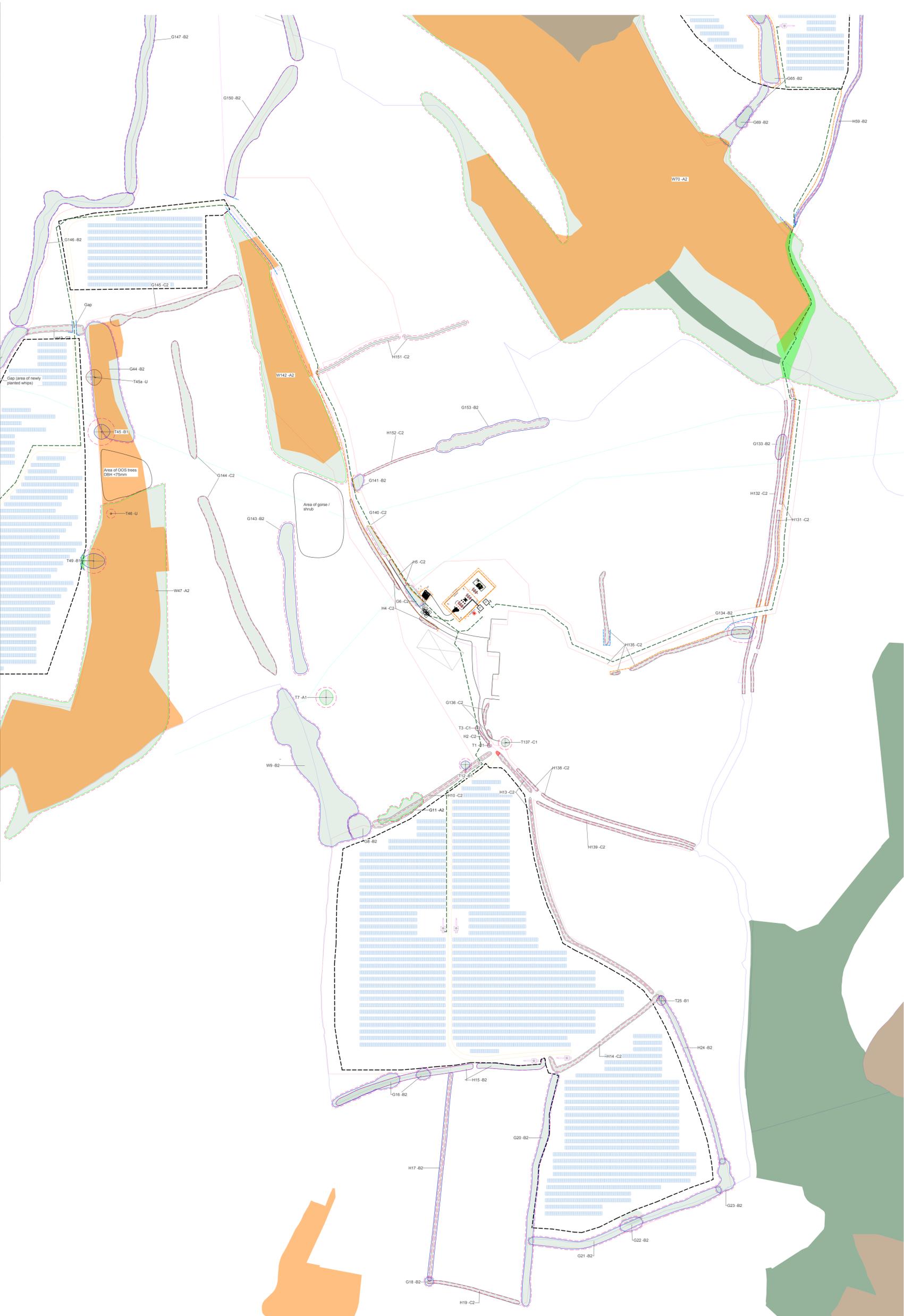
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SD	RH	D	2 of 3	15/10/2020

CLIENT
Voltalia UK

COORDINATE SYSTEM / DATUM
British National Grid / Newlyn Datum (AOD)

Barton Hyett Associates
 Arboricultural Consultants
 Tel: 01386 576161
 Address: Office 5E, Deer Park Business Centre, Eckington, Pershore, Worcestershire, WR10 3DN

Tree No.	Species	RPA Radius M	RPA Area M2	Category
T1	Hawthorn	2.4	18	C1
T2	Hawthorn	1.2	9	C2
T3	Laborum	2.4	18	C1
T4	Blackthorn	1.2	9	C2
T5	Blackthorn	1.2	9	C2
T6	Ash	3.6	36	B1
T7	Oak	10.8	108	A1
T8	Oak	7.2	54	B2
T9	Alnus	1.2	9	C2
T10	Hawthorn	1.2	9	C2
T11	Ash	3.6	36	B1
T12	Oak	10.8	108	A1
T13	Hawthorn	1.2	9	C2
T14	Hawthorn	1.2	9	C2
T15	Hawthorn	1.2	9	C2
T16	Holly	1.8	16	B2
T17	Holly	1.8	16	B2
T18	Holly	1.8	16	B2
T19	Holly	1.8	16	B2
T20	Holly	1.8	16	B2
T21	Holly	1.8	16	B2
T22	Holly	1.8	16	B2
T23	Holly	1.8	16	B2
T24	Holly	1.8	16	B2
T25	Holly	1.8	16	B2
T26	Holly	1.8	16	B2
T27	Holly	1.8	16	B2
T28	Holly	1.8	16	B2
T29	Holly	1.8	16	B2
T30	Holly	1.8	16	B2
T31	Holly	1.8	16	B2
T32	Holly	1.8	16	B2
T33	Holly	1.8	16	B2
T34	Holly	1.8	16	B2
T35	Holly	1.8	16	B2
T36	Holly	1.8	16	B2
T37	Holly	1.8	16	B2
T38	Holly	1.8	16	B2
T39	Holly	1.8	16	B2
T40	Holly	1.8	16	B2
T41	Holly	1.8	16	B2
T42	Holly	1.8	16	B2
T43	Holly	1.8	16	B2
T44	Holly	1.8	16	B2
T45	Holly	1.8	16	B2
T46	Holly	1.8	16	B2
T47	Holly	1.8	16	B2
T48	Holly	1.8	16	B2
T49	Holly	1.8	16	B2
T50	Holly	1.8	16	B2
T51	Holly	1.8	16	B2
T52	Holly	1.8	16	B2
T53	Holly	1.8	16	B2
T54	Holly	1.8	16	B2
T55	Holly	1.8	16	B2
T56	Holly	1.8	16	B2
T57	Holly	1.8	16	B2
T58	Holly	1.8	16	B2
T59	Holly	1.8	16	B2
T60	Holly	1.8	16	B2
T61	Holly	1.8	16	B2
T62	Holly	1.8	16	B2
T63	Holly	1.8	16	B2
T64	Holly	1.8	16	B2
T65	Holly	1.8	16	B2
T66	Holly	1.8	16	B2
T67	Holly	1.8	16	B2
T68	Holly	1.8	16	B2
T69	Holly	1.8	16	B2
T70	Holly	1.8	16	B2
T71	Holly	1.8	16	B2
T72	Holly	1.8	16	B2
T73	Holly	1.8	16	B2
T74	Holly	1.8	16	B2
T75	Holly	1.8	16	B2
T76	Holly	1.8	16	B2
T77	Holly	1.8	16	B2
T78	Holly	1.8	16	B2
T79	Holly	1.8	16	B2
T80	Holly	1.8	16	B2
T81	Holly	1.8	16	B2
T82	Holly	1.8	16	B2
T83	Holly	1.8	16	B2
T84	Holly	1.8	16	B2
T85	Holly	1.8	16	B2
T86	Holly	1.8	16	B2
T87	Holly	1.8	16	B2
T88	Holly	1.8	16	B2
T89	Holly	1.8	16	B2
T90	Holly	1.8	16	B2
T91	Holly	1.8	16	B2
T92	Holly	1.8	16	B2
T93	Holly	1.8	16	B2
T94	Holly	1.8	16	B2
T95	Holly	1.8	16	B2
T96	Holly	1.8	16	B2
T97	Holly	1.8	16	B2
T98	Holly	1.8	16	B2
T99	Holly	1.8	16	B2
T100	Holly	1.8	16	B2



KEY

BS 5837:2012 Categories

- Tree Category A - High Quality
- Tree Category B - Moderate Quality
- Tree Category C - Low Quality
- Tree Category U - Unsuitable for Retention

Downgraded Tree Protection Barrier to be agreed with LPA

All works to be undertaken in accordance with an approved arboricultural method statement and watched!

Ancient Semi Natural Woodland

Plantation on Ancient Woodland Site

Restored Ancient Woodland Site

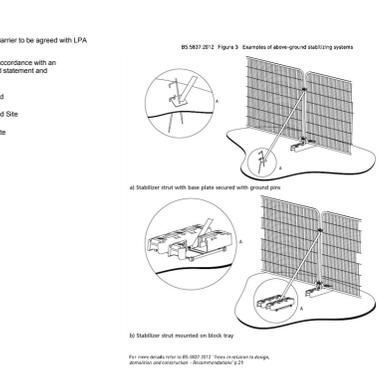
Stabilizer strut with base plate secured with ground pins

Stabilizer strut mounted on block tray

Proposed Security Fence

Proposed Cable Route

Tree Protection Barrier to BS 5837:2012



PROTECTIVE FENCING. THIS FENCING MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND DRAWINGS FOR THIS DEVELOPMENT

TREE PROTECTION AREA - KEEP OUT!

WORKERS MUST WEAR HIGH VISIBLE CLOTHING AT ALL TIMES. ANY BREACH OF THE PROTECTION AREA MUST BE REPORTED IMMEDIATELY TO THE SUPERVISOR.

Tree Protection Barrier - Barrier to be erected prior to the commencement of works on site and not to be altered or removed until works are complete (cross check with specific requirements of any relevant planning conditions)

PROJECT TITLE
Blaenhiraeth Farm, Llangennech, Llanelli (V.2630) (Area C)

DRAWING TITLE
Tree Protection Plan

SCALE 1:2000 **DRAWING NUMBER** BHA_388_03

DRAWN BY SD **APPROVED BY** RH **REVISION** D **SHEET** 3 of 3 **DATE** 15/12/2020

CLIENT Voitalia UK

COORDINATE SYSTEM / DATUM British National Grid / Newlyn Datum (AOD)

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Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

APPENDIX 6.4

RESIDENTIAL VISUAL AMENITY ASSESSMENT



PENDRI / BLAENHIRAETH SOLAR FARM
LAND AT BLAENHIRAETH FARM
LLANELLI, CARMARTHENSHIRE

RESIDENTIAL VISUAL AMENITY ASSESSMENT (RVAA)
ON BEHALF OF VOLTALIA UK LTD | DECEMBER 2020 | BRS.4254_40A

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4.	PROPOSED DEVELOPMENT	6
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7.	LANDSCAPE PLANNING POLICY	102
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FIGURES:	
1	SITE LOCATION PLAN
2	LANDSCAPE MITIGATION AND ENHANCEMENT PLAN
3	SITE LOCATION PLAN AND RESIDENTIAL RECEPTORS

1. INTRODUCTION

1.1 This Residential Visual Amenity Assessment (RVAA) has been prepared on behalf of Voltalia UK Ltd in support of the proposed 34.4 MW solar photovoltaic (PV) development on approximately 96.27 hectares of land at Blaenhiraeth Farm, Llanelli, SA14 8PX.

1.2 Due to the generating capacity, the planning application constitutes a Development of National Significance (DNS) and will be determined by the Welsh Government on the recommendation of the Planning Inspectorate Wales (PINS). The EIA Scoping Direction 3213164 issued by the PINS on 3rd May 2019 requested the additional assessment of views from the surrounding residential properties. This request followed the consultation response from Carmarthenshire County Council on 18th April 2019 within Appendix A of the Scoping Direction which noted that:

“It is advised that the assessment of impacts to residential properties as presented within the Draft Environmental Statement is not conclusive, the methodology is not transparent or clearly defined. It would be expected that individual assessments be undertaken for each residential property, including site visits and photographic representation. This should be included prior to determination of any DNS application to enable approval.”¹

1.3 This RVAA (Rev A) considers the effects on residential visual amenity in relation to the updated site layout shown in Voltalia Drawing DV_LV_101_02_03. The RVAA has been resubmitted in response to the further information requested from PINS within the letter dated 26/10/2020 under DNS Regulation 15 (2). In response to these requests from PINS and Carmarthenshire County Council within the Local Impact Report (LIR), the following variations within the updated site layout have been further assessed:

- Removal of two areas of solar panels to the west of Site B near LVIA viewpoint 8A/B on the A476 Llannon Road as requested by Carmarthenshire County Council (paragraph 6.5 of the LIR);
- Removal of an area of solar panels to the south of Site B at closest proximity to the residential property at Cware Farm, Fferm y cware (6);
- Relocation of the temporary site compound to the west of Site B to appear set back from the A476 Llannon Road near LVIA Viewpoint 8A/B;
- Relocation of the temporary site compound previously located to the south of Site C to the north west of the Blaenhiraeth Farm near the existing farm complex, pylons and proposed grid connection point as requested by Carmarthenshire County Council (paragraph 6.8 of the LIR);
- Minor realignment of the solar arrays within Site A to ensure that the 7 metre buffer would be maintained from the existing watercourses and ditches;
- Additional tree planting proposed on the landscape mitigation plans to reflect the updated site layout at locations that would not cause future overshadowing of the solar arrays as requested by Carmarthenshire County Council (paragraph 6.8 of the LIR);

- Revisions to the alignment of the 2m high security (deer) fencing to accord with the resubmitted site layout and to appear further set back from the existing hedgerows; and

- Changes to the CCTV specifications to include a reduction in pole height from 4 to 3 metres and change to timber poles to allow integration with the security (deer) fencing and to reduce these visual effects.

1.4 Other planning application details would remain the same in comparison to the previous submissions. The elevations of the proposed solar arrays would be 2.75m above ground level and the security (deer) fencing would be approximately 2m above ground level. The substation and grid connection point would be located to the north west of Blaenhiraeth Farm near the existing pylons and transmission lines. The operational lifespan of the proposed development would be 35 years.

1.5 This RVAA (Rev A) has been undertaken with regards to the best practice within the Landscape Institute’s Guidelines for Landscape and Visual Impact Assessment 3rd Edition (GLVIA3) and more specifically within the Landscape Institute’s Technical Guidance Note 2/19.

1.6 It is a widely accepted and long held planning principle that no individual person has a private right to a view. However, there are situations where the effect on the outlook or the visual amenity of a residential property and associated living conditions would be so great that it would not be considered in the public interest to permit such conditions to occur where they did not previously exist. This is a high threshold in terms what would be regarded as unacceptable in terms of residential visual amenity and is usually associated with the assessment of wind farm developments as opposed solar PV developments of low vertical elevation.

1.7 The requirement for Residential Visual Amenity Assessment (RVAA) generally concerns wind farm planning applications that would potentially give rise to unacceptable effects on residential visual amenity due to their vertical elevation. In this regard, Inspector Lavender within the Carland Cross Appeal Decision (APP/D0840/A/0921030260) summarised within paragraph 23 that:

“The planning system is designed to protect public rather than private interests, but both interests coincide here where, for example, a visual intrusion is of such a magnitude as to render a property an unattractive place to live. This is because it is not in the public interest to create such living conditions where they did not exist before. This I do not consider that simply being able to see a turbine or turbines from a particular window or part of a garden of a house is sufficient reason to find the visual impact unacceptable (even though a particular occupier might find it objectionable). However, when turbines are present in such number, size and proximity that they represent an unpleasantly overwhelming and unavoidable presence in main views from a house or garden, there is every likelihood that the property concerned would come to be widely regarded as unattractive (rather than simply less attractive, but not necessarily uninhabitable) place in which to live.”²

1.8 This threshold regarding the acceptability of visual effects on the living conditions of residential properties in the public interest has become widely known within the renewables sector as the ‘Lavender Test’. This RVAA seeks to determine whether or not the proposed development would give rise to significant visual effects on the surrounding residential properties and whether the solar arrays would appear oppressive, overbearing or overwhelming on living conditions as a matter for the public interest.

1.9 This RVAA has been undertaken by Chartered Members of the Landscape Institute (CMLI) within Pegasus Group between May 2019 and December 2020 and should be read in conjunction with the Landscape and Visual Impact Assessment (Rev A) undertaken within Chapter 6 of the Environmental Statement (ES).

1 Section 7.6, page 8, PINS Scoping Direction (18/04/2019)

2 Paragraph 23, Carland Cross Appeal Decision (APP/D0840/A/0921030260)

2. METHODOLOGY

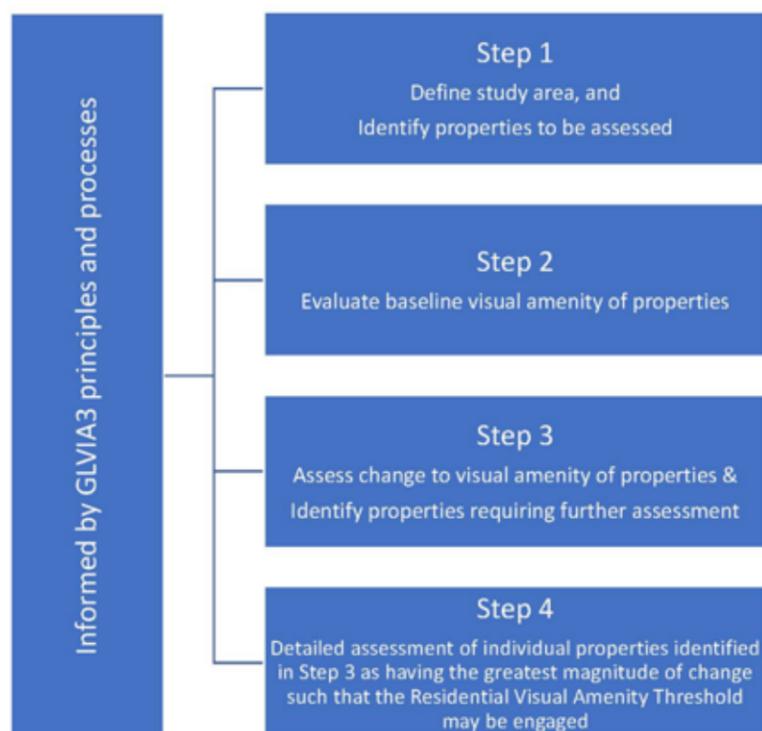
2.1 This RVAA draws upon the overarching best practice within the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment 3rd Edition (GLVIA3) and Technical Guidance Note 2/19. The TGN advises in paragraph 1.6 that:

*"It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing new development in the landscape. In itself this does not necessarily cause a planning concern. However, there are situations where the effect on the outlook / visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions where they did not exist before."*³

2.2 In accordance with the Technical Guidance Note 2/19, this RVAA comprises a four stage process including:

1. Definition of the scope and study area for the assessment – informed by the description of the proposed development, defining the study area extent and scope of the assessment with respect to the properties to be included;
2. Evaluation of the baseline visual amenity for the surrounding residential properties – having regard to the landscape and visual context and the development proposed;
3. Assessment of the likely change to the visual amenity of the residential properties in accordance with GLVIA3 principles and processes; and
4. Further assessment in respect of the acceptable threshold for residential visual amenity and living conditions in the public interest.

2.3 The process is summarised within the diagram below as an extract on page 7 of the Technical Guidance Note 2/19 as shown below:



3 Paragraph 1.6, Technical Guidance Note 2/19, Residential Visual Amenity Assessment

Definition of the Scope and Study Area

2.4 The scope and study area of residential properties included within this RVAA has been informed by the findings of the LVIA, the Zone of Theoretical Visibility (ZTV) mapping, post code data and consultation with Carmarthenshire County Council together with subsequent requests from the residents themselves following the public consultation event held on 13th August 2019. The scope of residential properties included within this RVAA are shown on Figure 1, Site Location Plan and Residential Receptors.

2.5 Given the type and scale of the proposed solar PV development and the dispersed nature of the surrounding residential properties, the likelihood of any significant visual effects is considered to be restricted to those within the immediate surroundings of the site. This was mainly due to the limited vertical elevation of the proposed solar arrays to a maximum height of +2.75 metres above ground level (agl) in comparison to a wind turbine, for example. However, if a particular concern was raised by a local resident through public consultation, this was further investigated.

2.6 Letters were sent to each of the residential properties based upon post code data provided by Carmarthenshire County Council to request access to the individual properties, curtilages and private gardens for the assessment. If no response was received, 'proxy viewpoints' have been undertaken from publicly accessible locations as close as possible to the residential property in question. If this was not possible, proxy viewpoints have been undertaken from within the site itself facing back towards the residential property.

2.7 The following residential properties have been included within the scope of this RVAA as shown on Figure 1:

1. Blaenhiraeth Farm, Llangennech, Llanelli, SA14 8PX
2. Blaenhiraeth Fach, Llangennech, Llanelli, SA14 8PX
3. Keepers Lodge, Llangennech, Llanelli, SA14 8PX
4. Cilddewi Fawr, Llannon, Llanelli, SA14 8JZ
5. Cilddewi Uchaf, Llannon, Llanelli, SA14 8JZ
6. Cware Farm, Fferm y cware, Felinfoel, SA14 8EZ
7. Ashbury House, Llannon Road, Llanelli, SA14 8EZ
8. Mayfield House, Llannon Road, Llanelli, SA14 8EZ
9. Clochyrrie Farm, Felinfoel, Llanelli, SA14 8EZ
10. Llwynon Farm, Llannon, Llanelli, SA14 8HJ
11. Wayside, Llannon, Llanelli, SA14 8HJ
12. Penderi, Llannon, Llanelli, SA14 8HX
13. Gelliwernen Lodge, Llannon, Llanelli, SA14 8HJ
14. Waunadlais, Felinfoel, Llanelli, SA14 8NX
15. Pantycelyn, Llangennech, Llanelli, SA14 8PJ
16. Graig Fach, Llangennech, Llanelli, SA14 8PX
17. Goitre Wen Farm, Hendy, Pontarddulais, Swansea, SA4 0YQ
18. Llettyllwydrew Farm, Llannon, Llanelli, SA14 8JH
19. Lletty'r Wennol Farm, Llannon, Llanelli, SA14 8JH
20. Medelfwy Farm, Felinfoel, Llanelli, SA14 8NX
21. Llyn-derw, Llannon, Llanelli, SA14 8HX

2.8 Distant views of the solar PV development may be perceptible beyond the extent of these residential properties within the study area. However, even with clear visibility, the effects on residential visual amenity and living conditions would not be considered significant or unacceptable beyond this identified scope.

Evaluation of the Baseline Visual Amenity

2.9 The evaluation of baseline visual amenity considers the type, nature, extent and quality of the existing views from the residential properties including building curtilages, private gardens and driveways. Technical Guidance Note 2/19 advises in paragraph 4.11 that:

"When evaluating the baseline, it is recommended that the following aspects are considered:

- *the nature and extent of all potentially available existing views from the property and its garden / domestic curtilage, including the proximity and relationship of the property to surrounding landform, landcover and visual foci. This may include primary / main views from the property or domestic curtilage, as well as secondary / peripheral views; and*
- *views as experienced when arriving at or leaving the property, for example from private driveways / access tracks."*⁴

2.10 In accordance with the principles and processes of GLVIA3, the visual effects have been determined by cross-referencing the sensitivity of the visual receptor with the magnitude of change arising from the proposed solar PV development. Residential properties are generally considered to be of high sensitivity within GLVIA3. However, TGN 2/19 advocates a further detailed review and refined survey of the residential properties in question with regards to the potential sensitivities in relation to the proposed solar PV development.

2.11 Higher sensitivity areas of the residential properties might include:

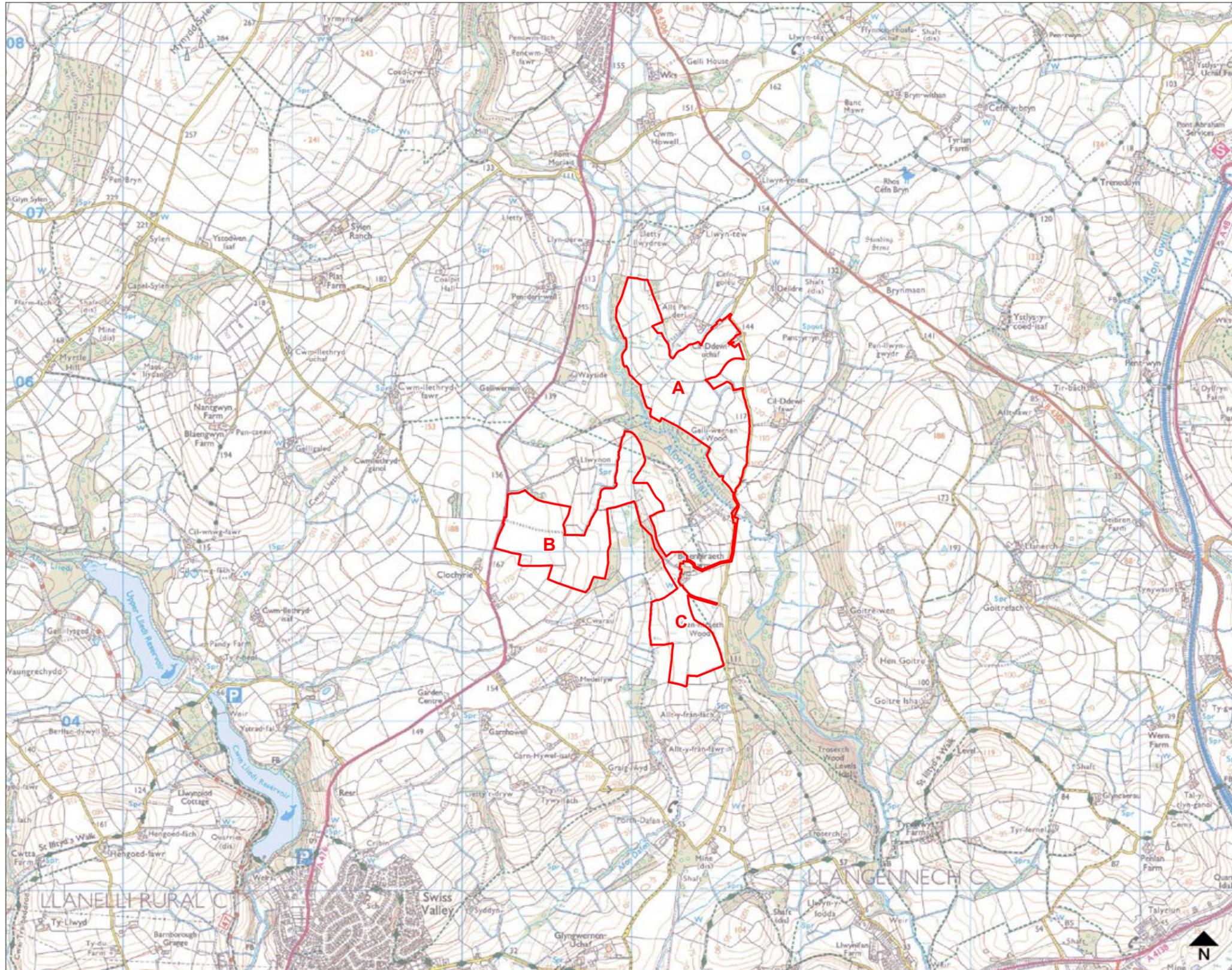
- Views from ground floor windows on principal elevations of the building and are likely to correspond to primary living rooms such as lounge, dining rooms, kitchens or conservatories; and
- Views from rear gardens or heavily frequented parts of a garden where an appreciation of the surrounding landscape is likely to be fundamental to the enjoyment of the space.

2.12 Lower sensitivity areas of the residential properties might include:

- Views from upper floor windows on principal elevations of the building likely to correspond to bedrooms and study / office rooms;
- Views from front gardens or parts of the curtilage to the building where it is likely that the focus of attention is on an activity such as gardening rather than on the surrounding landscape;
- Views from windows on side elevations and from windows likely to correspond to utility rooms, bathrooms, etc; and
- Views from parts of the garden or building curtilage with a purely functional purpose such as a driveway or storage area, etc or land worked as part of a business.

4 Paragraph 4.11, Technical Guidance Note 2/19, Residential Visual Amenity Assessment

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KEY

Site Boundary

FIGURE 1: SITE LOCATION PLAN

SCALE: 1:25,000 @ A3

Assessment of the Magnitude of Change on the Residential Properties

2.13 Visual amenity is defined within GLVIA3 as:

“The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.”⁵

2.14 Visual effects on the surrounding residential properties would potentially arise through the introduction of the solar arrays, security (deer) fencing, CCTV poles, transformer boxes and access tracks and underground cabling located within Sites A, B and C of the proposed solar PV development. The solar arrays are typically of low profile and elevation with the south facing panels fixed at a maximum height of +2.75 metres above ground level (agl) and the security (deer) fencing at +2.0m agl. Visual effects can also arise through the removal of landscape features such as woodlands, hedgerows or trees to expose views of the solar arrays. However, in this case the requirement for tree and hedgerow removal is minimal as the developer has sought to avoid such impacts.

2.15 In general terms, the magnitude of change on the residential properties will decrease with distance from the site and due to the proportion of intervening landform, buildings, woodlands, hedgerows and trees within the view. The magnitude of change arising from the solar PV development also considers the landscape and visual mitigation measures shown on Figure 2 as a residual effect. Other influencing factors affecting the magnitude of change might include:

- Whether the view of the solar arrays is in a direct or oblique angle from the primary orientation or active frontage of the property;
- The extent to which the view is obstructed by vegetation, landform or other built structures; and
- The extent to which the current view is influenced by existing built structures (e.g. buildings, roads, pylons and transmission lines, etc).

2.16 The magnitude of change on the surrounding residential properties is assessed on the following scale:

- **High** – a change in the view that on balance has a defining influence on the overall visual amenity of the residential receptor;
- **Medium** – some change in the view that on balance is clearly visible and forms an important but not a defining influence on the overall visual amenity of the residential receptor;
- **Low** – some change in the view that on balance is visible although has a subservient influence on the overall visual amenity of the residential receptor; and
- **Negligible** – no change or small to imperceptible visual influence on the overall visual amenity of the residential receptor.

2.17 The likely significance of effects is dependent on all of the factors considered in the sensitivity and the magnitude of change upon the residential receptors. These factors are assimilated to assess whether or not the proposed solar PV development will have a likely significant or not significant effect. The variables considered in the evaluation of the sensitivity and the magnitude of change is reviewed holistically to inform the professional judgement of significance.

2.18 A likely significant effect will occur where the combination of the variables results in the proposed development having a definitive effect on the view. A not significant effect will occur where the appearance of the proposed development is not definitive, and the effect continues to be defined principally by its baseline condition.

2.19 The matrix below demonstrates the relationship between sensitivity and magnitude of change based on the specific criteria given. At all times, professional judgement is used to determine the overall significance of visual effects. The major effects highlighted in dark grey are considered to be significant in terms of the EIA Regulations. The moderate effects highlighted in light grey are potentially significant, and a summary justification is provided as to whether the effect in question is significant or not significant. It should be noted that whilst an individual effect may be significant, it does not necessarily follow that the proposed solar PV development would be unacceptable, either in terms of the public interest test or when considering the planning balance in relation to the other benefits arising from the solar PV development.

2.20 The relationship between sensitivity and magnitude of change is indicated within the schedule below:

		Sensitivity		
		HIGH	MEDIUM	LOW
Magnitude of Change	HIGH	Major	Major	Moderate
	MEDIUM	Major	Moderate	Minor
	LOW	Moderate	Minor	Minor
	NEGLIGIBLE	Negligible	Negligible	Negligible

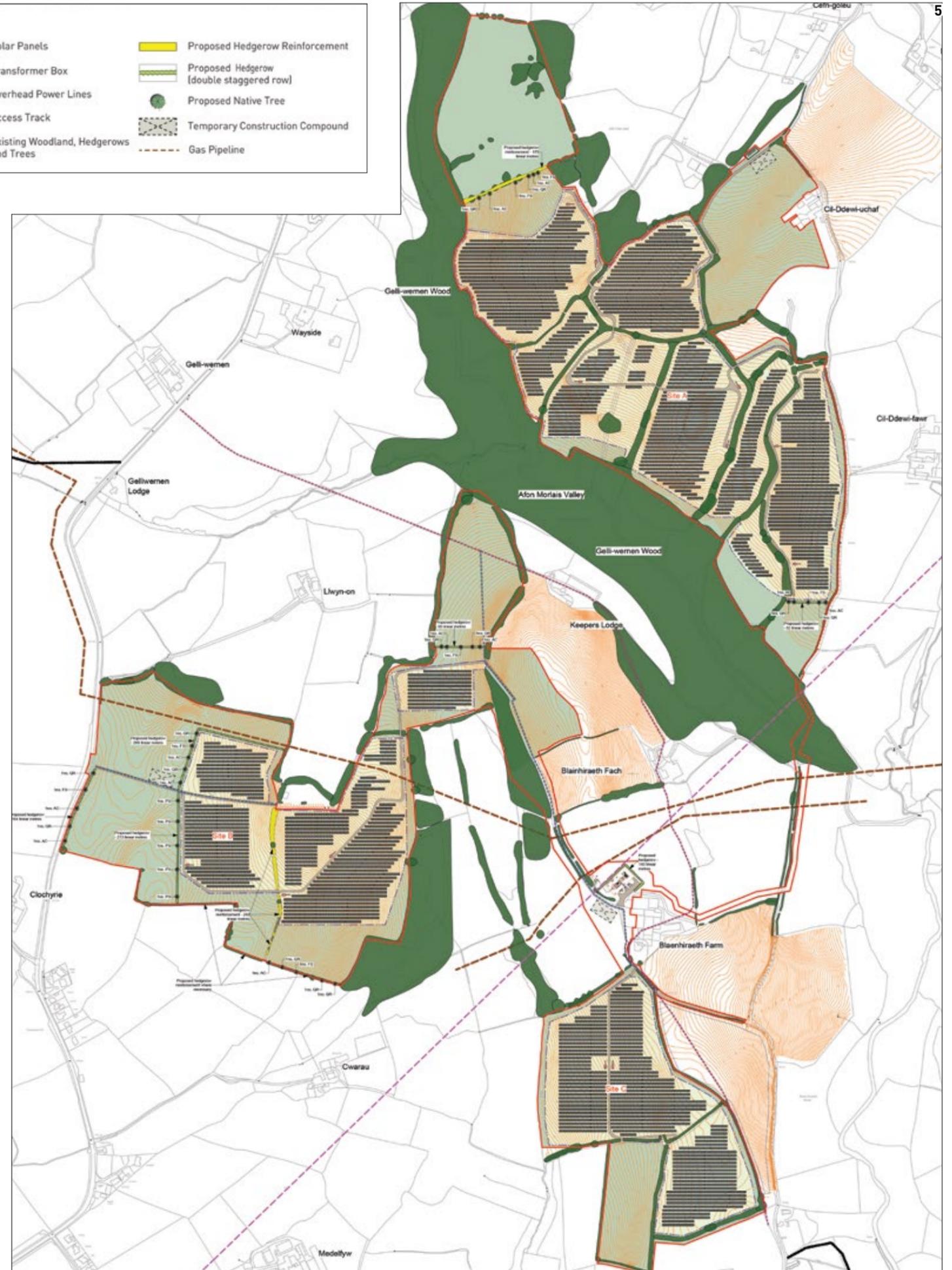
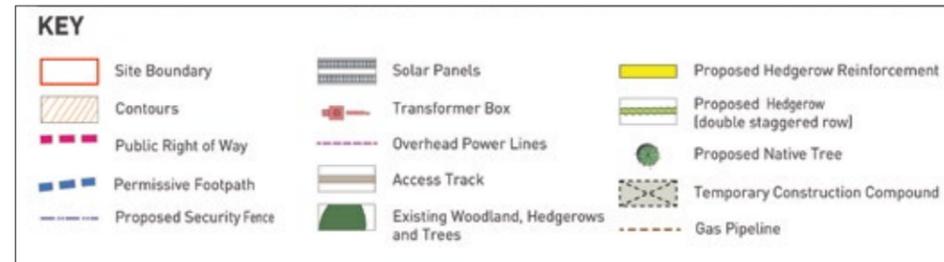
Judgement concerning the acceptable threshold for living conditions and residential visual amenity in the public interest

2.21 In this final stage, and only for those residential properties identified as experiencing a major significant effect in the previous stage, a further judgement is required to determine whether the visual effect in question has exceeded the Residential Amenity Threshold. TGN 2/19 advises that this is a matter for professional judgment explained in narrative with clear, unambiguous and rational conclusions. The visual effects arising from the proposed solar PV development would need to be of such a degree and significance that the residential property would be uninhabitable due to the effects on living conditions.

3. SITE DESCRIPTION

Site Description

- 3.1 The proposed solar PV development is located within Sites A, B and C covering approximately 96.27 hectares of land at Blaenhiraeth Farm, Llanelli as shown on Figures 1 and 2.
- 3.2 Site A is located within 9 no. medium scale geometric and irregular pastoral fields on the eastern slopes of the Afon Morlais Valley between Penderi and Cil Ddewi-uchaf to the north, Cil-Ddewi-fawr to the east, Gelliwernen Wood and Afon Morlais to the south west of the site. Site A roughly measures 1,400 metres from north-to-south with an average width of 300 metres east-to-west. Site A is located on moderate to gently sloping topography between 90m AOD to the south and 145m AOD to the north near Cil Ddewi-uchaf Farm. The contours generally follow the curvature of the stream to the south west and towards the Afon Morlais Valley. Site A is potentially accessible from the rural lane (U2309) near Cil Ddewi-uchaf Farm to the east.
- 3.3 Site B is located within 5 no. medium to large scale geometric pastoral fields to the east of the A476 Llannon Road between Llwynon to the north, Afon Dafen to the east, Cwarau and Medelfyw to the south, and Clochyrie to the south west of the site. Site B is located on gentle to moderately sloping topography between 165m AOD to the west following the A476 Llannon Road and 119m AOD to the north east of the site within the Afon Dafen Valley to the west of Blaenhiraeth Farm. An existing public footpath (33/35) extends along the valley bottom to the north. Site B is potentially accessible from the A476 Llannon Road on higher ground to the west or from the farm track extending to the north west of Blaenhiraeth Farm into the lower valley.
- 3.4 Site C is located within 3 no. medium to small scale geometric pastoral fields within a local north/south valley between Blaenhiraeth Farm to the north, Troserch Wood to the east, Allt-y-frain-fach to the south, and the Afon Dafen Valley to the east of the site. Site C is located on gently sloping topography between 117m AOD near Blaenhiraeth Farm to the north, and 96m AOD within the Afon Dafen Valley to the south west of the site. Site C is accessible from the farm access track directly to the south of Blaenhiraeth Farm.
- 3.5 Sites A, B and C are linked by access tracks and grid connection corridors which generally follow existing farm tracks and the prevailing contours of the site). A substation would be located to the north west of Site C near the existing pylons and agricultural sheds at Blaenhiraeth Farm. This is intended so the substation and grid connection would appear as part of the existing farm building complex and aligned with the existing pylons and transmission lines crossing the site.
- 3.6 Sites A, B and C are not located within any statutory or non-statutory landscape designations following the omission of the Afon Morlais Special Landscape Area (SLA) from the adopted Carmarthenshire LDP.



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FIGURE 2: LANDSCAPE MITIGATION AND ENHANCEMENT PLAN

4. PROPOSED DEVELOPMENT

- 4.1 The main elements of the proposed solar PV development that would potentially give rise to the visual effects includes the installation of the ground mounted solar panels with a maximum design capacity of up to 34.4MWp (megawatts peak). The solar arrays would be located within three distinct land parcels of the scheme's development boundary within Sites A, B and C. The landscape mitigation and enhancement plans are shown on Figure 2.
- 4.2 The ground mounted solar PV panels would be laid out in straight lines set at an angle of 25 degrees from east-to-west across the various field enclosures. The distance between the solar arrays would respond to site topography although would typically range between 3.35 metres to 6 metres. The highest elevation of the solar panels would +2.75 metres above ground level (agl) therefore will be generally screened by the surrounding high sided banks, hedgerows and woodland in many locations. There would be restricted opportunities to observe the entirety of solar PV development from any given viewpoint surrounding the site. The lower edge of the solar panels would be approximately +0.7 metres above ground level. The solar arrays would be static and positioned to respond to physical landscape features such as topography, woodland, hedgerows, ditches, streams and public rights of way (PROW).
- 4.3 The metal framework that houses the solar modules would be fixed into the ground by posts centred approximately 6 metres apart. The solar arrays within Sites A, B and C would be contained within a 2.0m high timber posts and galvanised steel mesh (deer) fencing of rural character and reduced visual profile. The distance between the proposed fencing and existing hedgerows would vary across the site although the minimum distance would be approximately 3 metres which would be set aside for meadow grassland as an ecological benefit.
- 4.4 A single main substation compound would be located to the north west of Blaenhiraeth Farm towards the centre of Sites A, B and C and this will be required for the duration of the development over the 35 year operational lifespan. There will also be electrical connection infrastructure and a substation compound that would be centrally located within the site and positioned adjacent to the overhead pylon and transmission lines to the north west of the Blaenhiraeth Farm outbuildings. The point of connection to the local electricity grid would be directly to the existing overhead pylons crossing the site. The cabling connecting the solar arrays within Sites A, B and C to the substation would be buried underground within trenches aligned with the aggregate maintenance tracks. The proposed cable route between Site A and the substation to the north west of Blaenhiraeth Farm would require the laying of cables through the masonry of the Cilddewi Bridge (grade II listed). Security measures will include 2 metre high timber and galvanised steel mesh (deer) fencing with a number of 3 metre high timber poles for CCTV surveillance which would be set back from the hedgerow boundaries to reduce these visual effects.

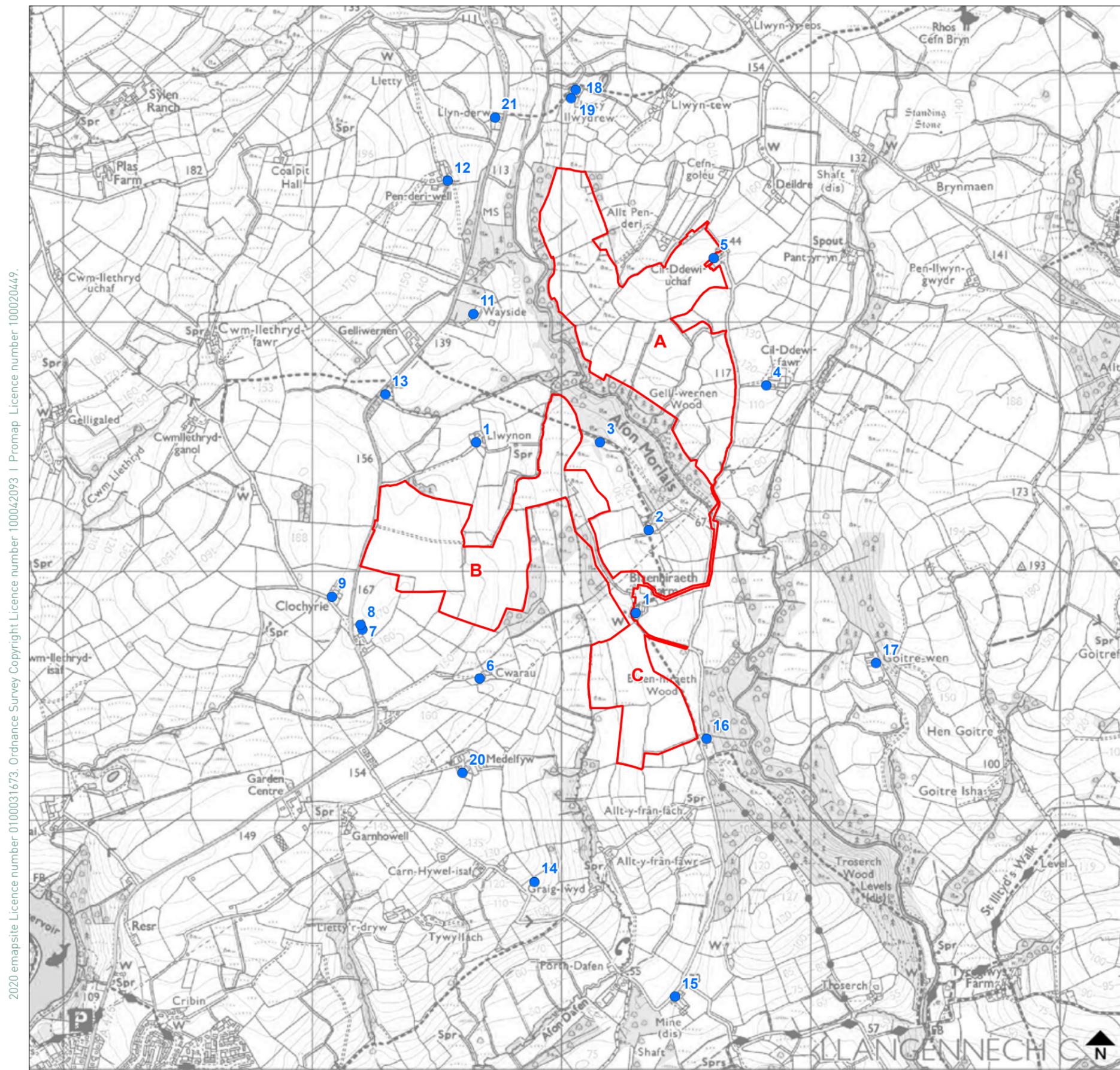
5. EXISTING RESIDENTIAL PROPERTIES

- 5.1 The following residential properties have been included within the scope of this RVAA as shown on Figure 1, Site Location Plan and Residential Receptors:
1. **Blaenhiraeth Farm, Llangennech, Llanelli, SA14 8PX**
 2. **Blaenhiraeth Fach, Llangennech, Llanelli, SA14 8PX**
 3. **Keepers Lodge, Llangennech, Llanelli, SA14 8PX**
 4. **Cilddewi Fawr, Llannon, Llanelli, SA14 8JZ**
 5. **Cilddewi Uchaf, Llannon, Llanelli, SA14 8JZ**
 6. **Cware Farm, Fferm y cware, Felinfoel, SA14 8EZ**
 7. **Ashbury House, Llannon Road, Llanelli, SA14 8EZ**
 8. **Mayfield House, Llannon Road, Llanelli, SA14 8EZ**
 9. **Clochyrie Farm, Felinfoel, Llanelli, SA14 8EZ**
 10. **Llwynon Farm, Llannon, Llanelli, SA14 8HJ**
 11. **Wayside, Llannon, Llanelli, SA14 8HJ**
 12. **Penderi, Llannon, Llanelli, SA14 8HX**
 13. **Gelliwernen Lodge, Llannon, Llanelli, SA14 8HJ**
 14. **Waunadlais, Felinfoel, Llanelli, SA14 8NX**
 15. **Pantycelyn, Llangennech, Llanelli, SA14 8PJ**
 16. **Graig Fach, Llangennech, Llanelli, SA14 8PX**
 17. **Goitre Wen Farm, Hendy, Pontarddulais, Swansea, SA4 0YQ**
 18. **Llettyllwydrew Farm, Llannon, Llanelli, SA14 8JH**
 19. **Lletty'r Wennol Farm, Llannon, Llanelli, SA14 8JH**
 20. **Medelfwy Farm, Felinfoel, Llanelli, SA14 8NX**
 21. **Llyn-derw, Llannon, Llanelli, SA14 8HX**
- 5.2 The following individual properties were visited as part of the RVAA survey following consent from the homeowners:
1. **Blaenhiraeth Farm, Llangennech, Llanelli, SA14 8PX**
 3. **Keepers Lodge, Llangennech, Llanelli, SA14 8PX**
 7. **Ashbury House, Llannon Road, Llanelli, SA14 8EZ**
 10. **Llwynon Farm, Llannon, Llanelli, SA14 8HJ**
 12. **Penderi, Llannon, Llanelli, SA14 8HX**
 14. **Waunadlais, Felinfoel, Llanelli, SA14 8NX**
 15. **Pantycelyn, Llangennech, Llanelli, SA14 8PJ**
 16. **Graig Fach, Llangennech, Llanelli, SA14 8PX**
 17. **Goitre Wen Farm, Hendy, Pontarddulais, Swansea, SA4 0YQ**
 20. **Medelfwy Farm, Felinfoel, Llanelli, SA14 8NX**

- 5.3 The following residential properties did not respond to the letter and/or were not consented by the homeowners. These residential properties have therefore been assessed from 'proxy viewpoints' at publicly accessible locations at close proximity to the property or from within the site itself:
2. **Blaenhiraeth Fach, Llangennech, Llanelli, SA14 8PX**
 4. **Cilddewi Fawr, Llannon, Llanelli, SA14 8JZ**
 5. **Cilddewi Uchaf, Llannon, Llanelli, SA14 8JZ**
 6. **Cware Farm, Fferm y cware, Felinfoel, SA14 8EZ**
 9. **Clochyrie Farm, Felinfoel, Llanelli, SA14 8EZ**
 11. **Wayside, Llannon, Llanelli, SA14 8HJ**
 13. **Gelliwernen Lodge, Llannon, Llanelli, SA14 8HJ**
 18. **Llettyllwydrew Farm, Llannon, Llanelli, SA14 8JH**
 19. **Lletty'r Wennol Farm, Llannon, Llanelli, SA14 8JH**
 21. **Llyn-derw, Llannon, Llanelli, SA14 8HX**

6. EFFECTS ON RESIDENTIAL VISUAL AMENITY

6.1 The individual effects on the residential properties surrounding the site are summarised within the following section.



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FIGURE 3: SITE LOCATION PLAN AND RESIDENTIAL RECEPTORS
SCALE: 1:20,000 @ A3



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Viewpoint Location 

Residential Property 



1. Blaenhiraeth Farm



North elevation



East elevation



South elevation



West elevation



Site Context - View to south of Blaenhiraeth Farm towards Site C (south direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
1	Blaenhiraeth Farm, Llangennech, Llanelli, SA14 8PX	Site C – 30m	South	South	<p>Landowners 'involved property' located approximately 30m to the north of Site C.</p> <p>Two storey detached farmhouse with main frontage and private gardens orientated to the south of the property.</p> <p>Site C would be visible at close proximity to the south of the main frontage and private gardens.</p> <p>Peripheral views of Site B would be visible on the hillside in the distance from the west elevation.</p> <p>Site A not generally visible to the north of the property due to intervening landform and woodland.</p> <p>Visual sensitivity = Low</p>	<p>Solar arrays within Site C would be partially visible at close proximity from the main frontage to the south of the property including the upper floor windows.</p> <p>Solar arrays within Site B would be partially visible on the hillside from the west elevation of the property in the direction of the pylons and transmission lines and the small wind turbines on the higher ground to the west of the A476 Llannon Road.</p> <p>Treecover within the private gardens would partially screen views of the solar arrays within Sites A, B and C.</p> <p>Magnitude of change = High</p>	Moderate (Not Significant)	<p>Acceptable.</p> <p>Property belongs to the landowner in support of the planning application.</p> <p>Although the solar arrays in Site A would be partially visible at close proximity, they would occupy a limited proportion of the view to the south of the main frontage and gardens.</p> <p>Solar arrays within Site B would be visible on the hillside within distant views across the valley to the west of the property.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>





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Proxy Viewpoint 

Residential Property 



2. Blaenhiraeth Fach

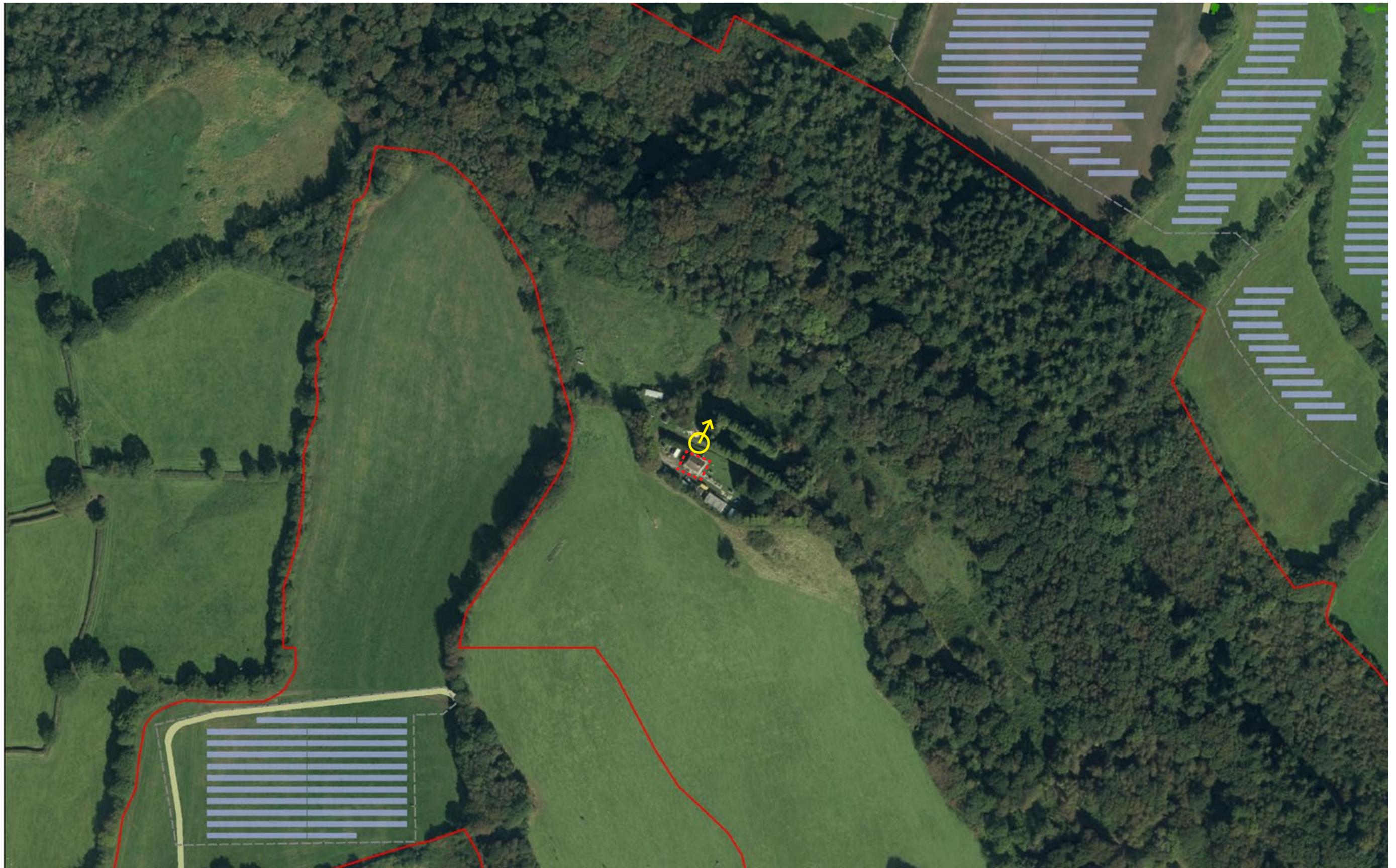


Proxy View 1 - View from Site A to east of Blaenhiraeth Fach (south west direction)



Proxy View 2 - View to the west of Blaenhiraeth Fach (north west direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
2	Blaenhiraeth Fach, Llangennech, Llanelli, SA14 8PX	Site A – 310m	East	North East	<p>Two single storey bungalow properties located on the opposite hillside to the west of Site A and the Afon Morlais Valley.</p> <p>The main frontages and gardens of the bungalows are located to the east of the property overlooking the Afon Morlais Valley. The views extend across the woodland and lower valley towards Site A and higher pastoral farmland further to the east. Pylons and transmission lines are located within the view.</p> <p>Visual sensitivity = High</p>	<p>Solar arrays within Site A would be partially visible from the main frontage and gardens beyond the mixed deciduous and coniferous woodland in the lower valley although framed by the proposed hedgerow to the south of Site A.</p> <p>The majority of Site A would be screened by woodland on the hillside to north of the property and within the lower Afon Morlais Valley. The southern area of solar arrays of Site A would be partially visible beyond the proposed hedgerow to the south of Site A.</p> <p>Sites B and C would not generally be visible due to orientation of views in the north east direction.</p> <p>Views from the main frontage and gardens would generally oversail the solar arrays within the lower valley of Site A towards the pastoral farmland, pylons and transmission lines visible on the higher ground to the east of the property.</p> <p>Views from the main frontage and gardens are partially screened by mixed deciduous and coniferous woodland within the lower valley in both the summer and winter months as well as shrubberys within the private gardens. Views from the property are partially influenced by the pylons in the same direction as the solar arrays within Site A.</p> <p>Magnitude of change = Low</p>	Moderate (Not Significant)	<p>Acceptable.</p> <p>Site A would be partially visible within the middle distance across the valley and not within the immediate surroundings of the property.</p> <p>The solar arrays within Site A would appear nestled on the lower ground within the middle distance beyond the intervening woodland in the lower valley and the proposed native hedgerow and tree planting to south of Site A.</p> <p>Views would oversail the solar arrays on the lower ground towards the pastoral farmland, pylons and transmission lines on the higher ground to the east of Site A.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



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Viewpoint Location 

Residential Property 



3. Keepers Lodge



North east elevation



South east and north east elevations



South east elevation



View to north east of Keeper's Lodge (north east direction)

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Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
3	Keepers Lodge, Llangennech, Llanelli, SA14 8PX	Site A – 257m	North East	North East	<p>Two storey detached farmhouse located on the middle valley slopes of the Afon Morlais Valley to the west of Site A.</p> <p>The main frontage is located to the east of the property with the private gardens enclosed by woodland to the south. Views surrounding the property are heavily enclosed by woodland within the lower valley.</p> <p>Visual sensitivity = Low</p>	<p>The solar arrays within Sites A, B and C would not generally be visible from the main frontage due to the mixed deciduous and coniferous woodland within the lower valley in the summer and winter months.</p> <p>The upper elevations of the property are visible from within Site A although there appears to be no upper floor windows on this frontage of the property.</p> <p>Solar arrays within Site A would be partially visible within the private gardens away from the immediate building curtilage.</p> <p>Magnitude of change = Low</p>	<p>Minor (Not Significant)</p>	<p>Acceptable.</p> <p>Sites A, B and C would not generally be visible from the property frontages due to the surrounding woodland with limited outward views.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



bing

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Proxy Viewpoint 

Residential Property 





Proxy View 1 - View to north of Cilldewi Fawr from south east (north east direction)



Proxy View 2 - View to east of rural lane towards Cilldewi Fawr (east direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
4	Cilddewi Fawr, Llannon, Llanelli, SA14 8JZ	Site A – 117m	South	West	<p>Two storey detached farmhouse located approximately 120 metres to the east of Site A.</p> <p>The main frontage of the farmhouse is orientated to the south with views along the valley towards Gelliwernen Woods.</p> <p>Views of Site A are intervened by the existing high hedgerows and banks enclosing the rural lane to the west of the property.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Site A would not generally be visible from the main frontage due to the orientation of the property to the south and the intervening hedgerows along the rural lane.</p> <p>Distant views of the solar arrays within Sites B and C may be perceptible from the western elevation and building curtilage.</p> <p>Magnitude of change = Low/Negligible</p>	<p>Minor/Negligible (Not Significant)</p>	<p>Acceptable.</p> <p>Site A would not generally be visible due to the orientation of the main frontage and the intervening high hedgerows along the rural lane to the west of the property.</p> <p>Sites B and C may be perceptible within distant views to the south west of the property although would form a minor component of the view.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



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Proxy Viewpoint 

Residential Property 

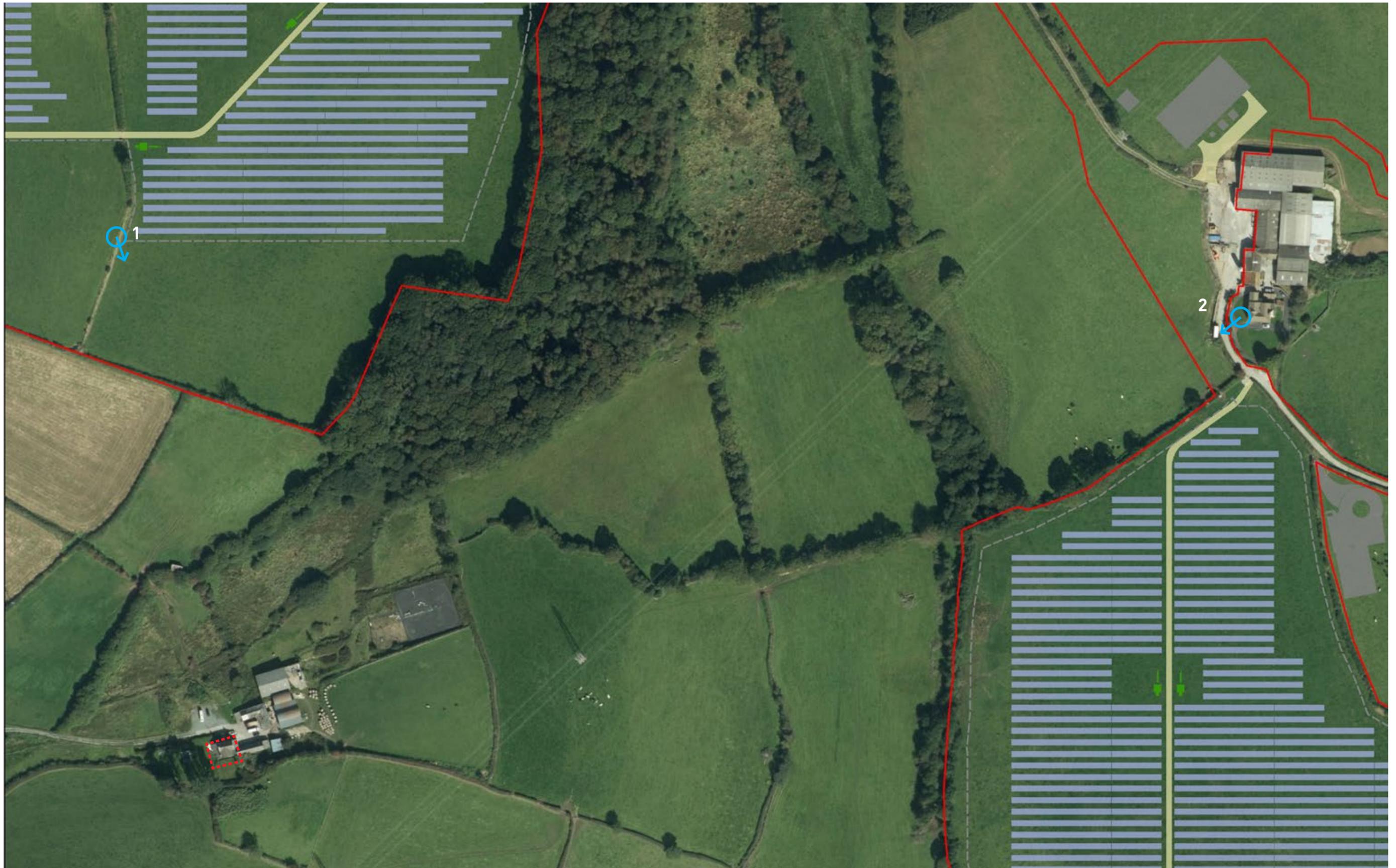


5. Cilldewi Uchaf



Proxy View towards Cilddewi Uchaf from Site B (north east direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
5	Cilddewi Uchaf, Llannon, Llanelli, SA14 8JZ	Site A – 180m	South East	South West	<p>Two storey detached farmhouse located approximately 180 metres to the north east of Site A on higher ground near the rural lane.</p> <p>The main frontage of the property is orientated to the south east although views are partially enclosed by the cluster of farm outbuildings.</p> <p>Views from south west elevation of the property extends across the valley towards Site A although is of higher elevation and intervened by the existing hedgerows and trees.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Site A would not generally be visible from the main frontage due to its orientation to the south east and the surrounding cluster of outbuildings.</p> <p>The solar arrays within Sites A and B may be perceptible within peripheral views from the building curtilage although intervened by existing hedgerows and treecover or visible at distance from the property.</p> <p>The solar arrays within Site C would not generally be less perceptible due to the distance, landform and intervening deciduous and coniferous woodland within the lower valley.</p> <p>Magnitude of change = Low</p>	Minor (Not Significant)	<p>Acceptable.</p> <p>Site A would not generally be perceptible beyond the intervening hedgerows and treecover due to the sloping landform.</p> <p>Site B may be distantly perceptible from the across the valley from the south west elevation although would form a minor component of the view in this direction.</p> <p>Site C would be less perceptible not generally be visible from this property.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place</p>



Proxy Viewpoint 

Residential Property 

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Proxy View 1 - View of Cware Farm from Site B (south direction)



Proxy View 2 - View of Cware Farm from Blaenhiraeth Farm (east direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
6	Cware Farm, Fferm y cware, Felinfof, SA14 8EZ	Site B – 202m	North	North East	<p>Two storey detached farmhouse located approximately 200 metres to the south of Site B and partly enclosed within a local undulation and by other farm outbuildings to the east of the property.</p> <p>The main frontage is orientated to the north across a local undulation towards the middle slopes of Site B descending to the east.</p> <p>Views from the eastern elevations of the farmhouse towards Site C would be visible from the upper elevations although partly intervened by the existing farm outbuildings and cattle sheds on the building curtilage.</p> <p>Visual sensitivity = High</p>	<p>The solar arrays within Site A would be less perceptible due to intervening landform, woodland and distance from the property.</p> <p>The solar arrays within Site B would be partially visible descending the hillside to the north of the main frontage of the farmhouse and building curtilage at a distance of approximately 300 metres.</p> <p>Solar arrays have been removed from the sloping ground to the south of Site B to provide a greater offset distance from Cware Farm (6) and to reduce these visual effects.</p> <p>In addition, native hedgerow reinforcements and tree planting has also been proposed as a mitigation measure to the south of Site B to provide additional visual screening in the long term.</p> <p>Site C would be partially visible to the east of the eastern elevation although viewed in the context of intervening farm outbuildings and cattle sheds.</p> <p>Magnitude of change = Medium</p>	Major (Significant)	<p>Acceptable.</p> <p>Site A would be less perceptible due to the orientation of the property and the intervening landform, woodland and distance from the property.</p> <p>Site B would be partially visible on the middle slopes to the north although further set back from the property by approximately 300 metres.</p> <p>Site C would be partially visible from the upper elevations to the east of the property although partly screened at ground level by the intervening farm outbuildings and cattle sheds.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



Proxy Viewpoint  Viewpoint Location 
 Residential Property 

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7. Ashbury House



North elevation



North elevation



East elevation



West elevation

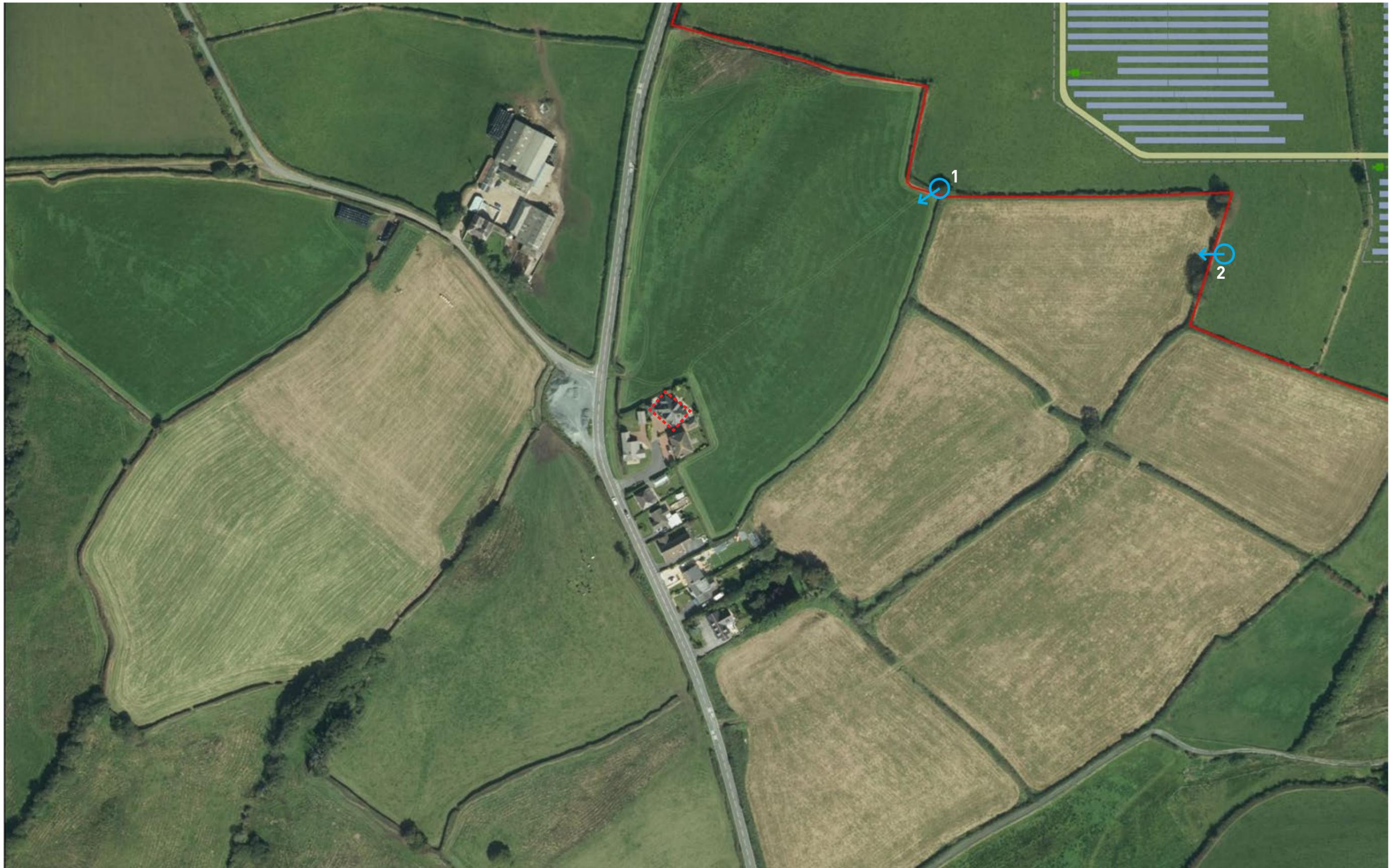


Site Context - View from rear gardens of Ashbury House (north east direction)



Proxy View from Site B towards Ashbury House and Mayfield House (south west direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
7	Ashbury House, Llannon Road, Llanelli, SA14 8EZ	Site B – 208m	West	East	<p>Two storey detached residential property located to the south west of Site B within an enclosed cul-de-sac and private gardens.</p> <p>The main frontage, principal orientation and focus of the views are located to the south west of the property are in the opposite direction to Site B.</p> <p>Visual sensitivity = Low</p>	<p>The solar arrays within Sites A and C would not generally be visible due to the distance, intervening landform and hedgerows.</p> <p>The solar arrays within Site B would be visible from the upper floor windows of the north east elevation of the property over a distance of approximately 208m.</p> <p>The removal of the solar panels to the west of Site B adjacent to the A476 Llannon Road would partly reduce the visual effects on this property.</p> <p>In addition, native hedgerow reinforcements and tree planting has also been proposed as a mitigation measure to the south of Site B to provide additional visual screening in the long term.</p> <p>Magnitude of change = Low</p>	<p>Minor (Not Significant)</p>	<p>Acceptable.</p> <p>The main frontage and focus of the views extends to the south west of the property in the opposite direction of the solar arrays within Site B.</p> <p>Views of the solar arrays within Site B would be partially visible in the middle distance from the upper floor windows to the north east although partially screened by a local undulation and hedgerows.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



Proxy Viewpoint 

Residential Property 

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8. Mayfield House



Proxy View 1 - View from Site B towards Mayfield House and Ashbury House (south west direction)



Proxy View 2 - View from Site B towards Mayfield House and Ashbury House (south west direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
8	Mayfield House, Llannon Road, Llanelli, SA14 8EZ	Site B – 195m	South West	North East	<p>Two storey detached residential property located to the south west of Site B within an enclosed cul-de-sac and private gardens.</p> <p>The main frontage, principal orientation and focus of the views located to the south west of the property are in the opposite direction to Site B.</p> <p>Visual sensitivity = Low</p>	<p>The solar arrays within Sites A and C would not generally be visible due to distance, intervening landform and hedgerows.</p> <p>The solar arrays within Site B would be visible from the upper floor windows of the north east elevation of the property over a distance of approximately 195m.</p> <p>The removal of the solar panels to the west of Site B adjacent to the A476 Llannon Road would partly reduce the visual effects on this property.</p> <p>In addition, native hedgerow reinforcements and tree planting has also been proposed as a mitigation measure to the south of Site B to provide additional visual screening in the long term.</p> <p>Magnitude of change = Low</p>	<p>Minor (Not Significant)</p>	<p>Acceptable.</p> <p>The main frontage and focus of the views extends to the south west of the property in the opposite direction of the solar arrays within Site B.</p> <p>Views of Site B would be partially visible from the upper floor windows to the north east although partly screened by a local undulation and hedgerows.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



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Proxy Viewpoint 

Residential Property 



9. Clochyrie Farm



Proxy View 1 - View towards Clochyrie Farm from Site B (south west direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
9	Clochyrie Farm, Felinfoel, Llanelli, SA14 8EZ	Site B – 195m	South West	East	<p>Two storey detached farmhouse and outbuildings located to the south west of Site B on elevated ground.</p> <p>The main frontage is orientated to the south west with panoramic views from the higher ground extending towards Carmarthen Bay in the distance to the south west.</p> <p>The farmhouse is partially enclosed by outbuildings and cattle sheds to the north east of the property.</p> <p>Visual sensitivity = Low</p>	<p>The solar arrays within Sites A and C would not generally be visible due to distance, intervening landform and hedgerows.</p> <p>The solar arrays within Site B would be visible from the upper windows of the north east elevation although within the context of the existing cluster of farm outbuildings and cattle sheds that encloses the property.</p> <p>The removal of the solar panels to the west of Site B adjacent to the A476 Llannon Road would partly reduce the visual effects on this property.</p> <p>In addition, native hedgerows and tree planting has also been proposed as a mitigation measure to the west of Site B to provide additional visual screening in the long term.</p> <p>Magnitude of change = Low</p>	<p>Minor (Not Significant)</p>	<p>Acceptable.</p> <p>The main frontage and focus of the views extends to the south west of the property in the opposite direction of the solar arrays within Site B.</p> <p>Views of Site B would be partially visible from the upper floor windows to the north east although partly screened by the intervening outbuildings and cattle sheds.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



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Viewpoint Location 

Residential Property 



10. Llywynon Farm



West elevation



West elevation



Site Context - View towards Site A from Llywynon farm (east direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
10	Llywynon Farm, Llannon, Llanelli, SA14 8HJ	Site A – 502m	East	East	<p>Uninhabited two storey detached farmhouse and outbuildings located to the west of Sites A and B within a derelict condition.</p> <p>The property is located to the west of the farm outbuildings and sheds located to the east. The property is partly enclosed by treecover although views do extend towards Site A from the building curtilage.</p> <p>Sites B and C are not generally visible due to the intervening landform, woodland and hedgerows.</p> <p>Visual sensitivity = Low</p>	<p>Property is currently in a derelict condition and not inhabitable with no occupier's present. The property is located to the west and partly enclosed by farm outbuildings to the east.</p> <p>Magnitude of change = Negligible</p>	<p>Negligible (Not Significant)</p>	<p>Acceptable.</p> <p>Property is currently in a derelict condition and not inhabitable with no occupier's present.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property is not habitable in the baseline condition.</p>



Proxy Viewpoint 

Residential Property 

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Proxy View 1 - View from Site A towards Wayside (south west direction)



Proxy View 2 - View from Site A towards Wayside (west direction)



Proxy View 3 - View from Site A to south east of Wayside (west direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
11	Wayside, Llannon, Llanelli, SA14 8HJ	Site A - 300m	South West	East	<p>Large two and a half storey detached property with separate wings, outbuildings and private gardens located approximately 300m to the west of Site A.</p> <p>The main frontage and driveway is located to the south west of the property with the rear elevations and private gardens orientated to the north east.</p> <p>The property is partly enclosed by woodland to the north, east and west of the private gardens.</p> <p>Visual sensitivity = High</p>	<p>The solar arrays within Site A would be partially visible beyond intervening woodland across the lower valley over a distance of approximately 3009 metres.</p> <p>The solar arrays within Sites B and C would not generally be visible due to the intervening landform, woodland and hedgerows.</p> <p>Partial views of the solar arrays within Site A would be perceptible across the valley from the south east elevation, building curtilage and private gardens. The lower areas of Site A would be partly screened by the woodland in the Afon Morlais Valley.</p> <p>The private gardens are partly enclosed by treecover to the east that would provide varying degrees of enclosure between the summer and winter months. The views to the north east of the property would remain unaffected.</p> <p>Magnitude of change = Medium</p>	Major (Significant)	<p>Acceptable.</p> <p>Partial views of the solar arrays within Site A would be visible across the valley. These views are partially screened by mature treecover to the east of the gardens between the summer and winter months.</p> <p>The focus of the view to the north east of the property would remain unaffected by the solar arrays within Site A.</p> <p>The solar arrays within Sites B and C would not generally be visible due to the intervening landform, woodland and hedgerows.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>

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Viewpoint Location 

Residential Property 



12. Penderi Farm



East elevation



South elevation

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
12	Penderi, Llannon, Llanelli, SA14 8HX	Site A – 619m	East	South East	<p>Two storey detached farmhouse located to the north west of Site A. The property includes outbuildings to the north and west.</p> <p>The main frontage and outlook of the property is orientated to the east and not in the direct line of sight as Site A.</p> <p>The property is partly enclosed by woodland extending along the A476 Llannon Road and the lower valley.</p> <p>Sites B and C would not generally be visible due to intervening landform, woodland and distance.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Site A are not located within direct line of sight from the main frontage to the east of the property. This area of the site would not include solar panels to allow for ecological mitigation.</p> <p>Partial views of the solar arrays within Site A would be visible from the south elevation in the south east direction although would be generally screened by the intervening woodland in the lower valley.</p> <p>Views of Site A would be slightly more perceptible in the winter months without full leaf coverage although would be restricted to the northern part of Site A.</p> <p>Magnitude of change = Low</p>	<p>Minor (Not Significant)</p>	<p>Acceptable.</p> <p>The solar arrays within Sites A, B and C would not generally be visible from the property frontages due to the surrounding woodland following the A476 Llannon Road and the lower valley.</p> <p>Limited views of the northern part of Site A would be visible from the south elevation, building curtilage and private gardens although the main frontage to the east would remain unaffected.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



Site Context 1 - View towards the north area of Site A from Penderi (east direction)



Site Context 2 - View towards Site A from Penderi (south east direction)

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Proxy Viewpoint 
 Residential Property 



13. Gelliwernon Lodge

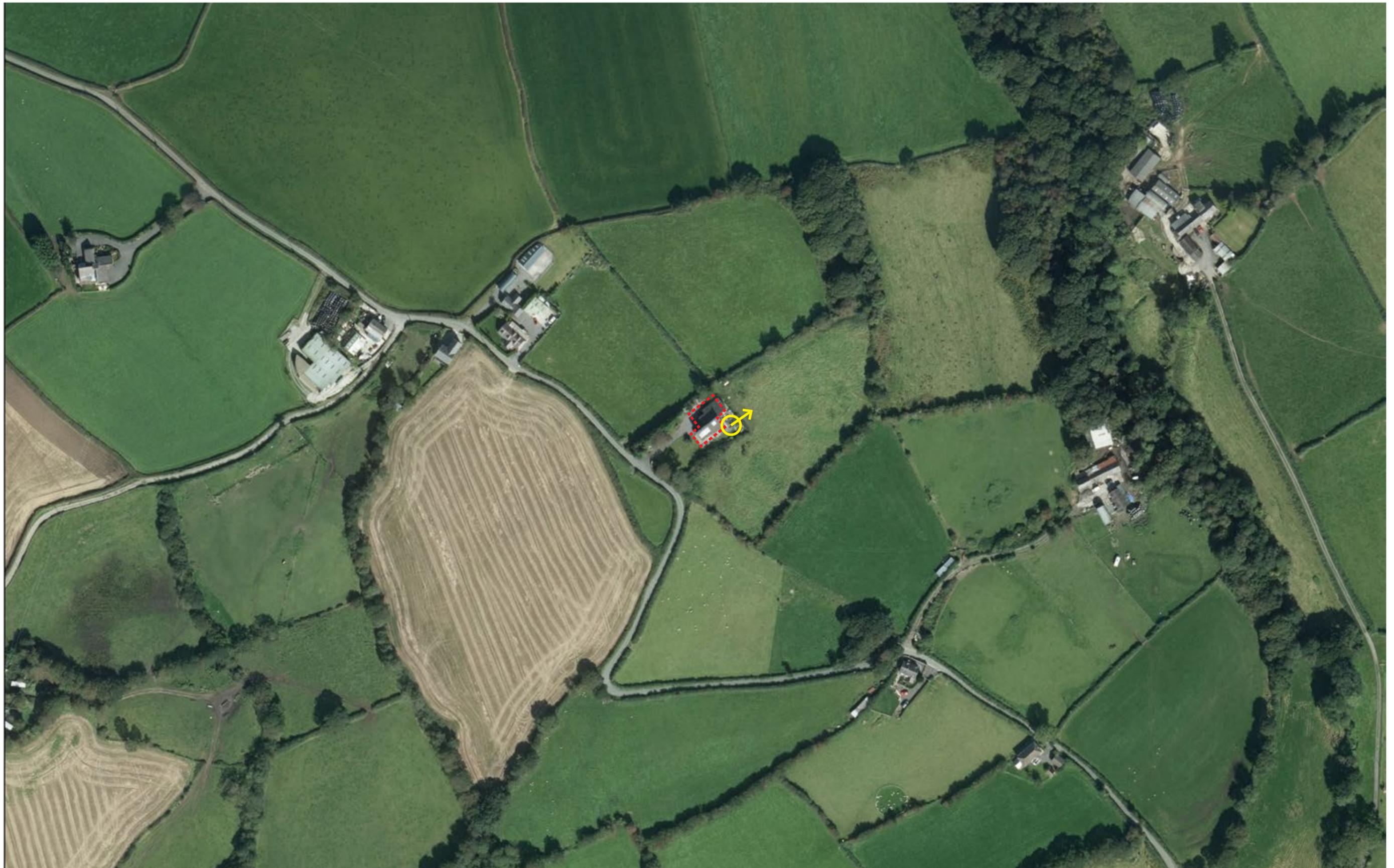


Proxy View 1 - Front gate from A476 Llannon Road



Proxy View 2 - Front door from A476 Llannon Road

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
13	Gelliwernen Lodge, Llannon, Llanelli, SA14 8HJ	Site B – 368m	North West	East	Two storey detached residential property adjacent to the A476 Llannon Road. The property is enclosed within a local undulation by woodland and landform. Visual sensitivity = Low	The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows. Magnitude of change = Low/Negligible	Minor/Negligible (Not Significant)	Acceptable. The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows. The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.



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Viewpoint Location 

Residential Property 





North elevation



North and East elevations



South elevation

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
14	Waunadlais, Felinfoel, Llanelli, SA14 8NX	Site C – 573m	North East	South East	<p>Detached two storey residential property with panoramic views extending towards the River Loughor estuary to the south east.</p> <p>The main frontage and outlook of the property is located to the south east and not in the direction of Sites A, B and C.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows.</p> <p>Partial views of Site C in the distance would potentially be visible from the upper floors of the north east elevation of the property.</p> <p>The main frontage and outlook towards the River Loughor estuary to the south east would remain unaffected.</p> <p>Magnitude of change = Low/Negligible</p>	<p>Minor/Negligible (Not Significant)</p>	<p>Acceptable.</p> <p>The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows. The focus of views towards the River Loughor estuary to the south east would remain unaffected.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



Site Context 1 - View across Afon Morlais Valley from Waunadlais (east direction)



Site Context 2 - View across Afon Morlais from Waundalais (south east direction)





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Viewpoint Location 

Residential Property 





North east elevation



North west elevation



Site Context View 1 - Towards Pantycelyn Site B from Pantycelyn (north west direction)



Site Context View 2 - View towards Site C from Pantycelyn (north direction)



Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
15	Pantycelyn, Llangennech, Llanelli, SA14 8PJ	Site C – 923m	North West	North	<p>Two storey semi-detached property located approximately 923 meters to the south of Site C.</p> <p>The main frontage of the property is located to the north west.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows.</p> <p>Magnitude of change = Negligible</p>	<p>Negligible (Not Significant)</p>	<p>Acceptable.</p> <p>The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



Proxy Viewpoint 

Residential Property 

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Proxy View 1 - View of Craig Fach from gardens (south elevation)



Proxy View 2 - View along unclassified lane to east of Craig Fach (north direction)



Proxy View 3 - View from north of Graig Fach along unclassified lane

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
16	Graig Fach, Llangennech, Llanelli, SA14 8PX	Site C – 237m	South East	West	<p>Detached two storey residential property located at close proximity to Site C and Troserch Woods.</p> <p>The property is enclosed within a local undulation and by woodland following the intervening rural lane and on the boundary of Troserch Woods.</p> <p>The main frontage of the property and the gardens extends to the south in the opposite direction of Site C.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Sites A, B and C would not generally be visible due to orientation of the property to the south and the visual enclosure provided by landform and woodland.</p> <p>Magnitude of change = Negligible</p>	<p>Negligible (Not Significant)</p>	<p>Acceptable.</p> <p>The solar arrays within Sites A, B and C would not generally be visible due to the orientation of the property to the south and the visual enclosure provided by landform and woodland.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>

**Intentionally
left blank**



Viewpoint Location 
Residential Property 

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West elevation



Site Context 1 - View towards Troserch Wood from Goitre Wen Farm (south west direction)



Site Context 2 - View towards Site C from Goitre Wen Farm (west direction)



Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
17	Goitre Wen Farm, Hendy, Pontarddulais, Swansea, SA4 0YQ	Site C – 736m	East	West	Two storey detached farmhouse and outbuildings located on the hillside to the east of Site C and Troserch Wood. The property is elevated although enclosed by surrounding woodland. Visual sensitivity = Medium	The solar arrays within Sites A, B and C would not generally be visible due to the intervening woodland. Magnitude of change = Negligible	Negligible (Not Significant)	Acceptable. The solar arrays within Sites A, B and C would not generally be visible due to the intervening woodland. The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.



Proxy Viewpoint 

Residential Property 

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Proxy View 1 - View towards Llettyllwydrew Farm and Letty'r Wennol Farm from Site A (north direction)



Proxy View 2 - View towards Llettyllwydrew Farm and Letty'r Wennol Farm from the A476 Llannon Road (east direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
18	Llettyllwydrew Farm, Llannon, Llanelli, Carmarthenshire, SA14 8JH	Site A – 614m	West	South	Two storey detached farmhouse and outbuildings located within the valley to the north of Site A. The main frontage of the property is located to the west with an outlook across the valley. Visual sensitivity = Medium	The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows. Magnitude of change = Negligible	Negligible (Not Significant)	Acceptable. The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows. The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.



Proxy Viewpoint 

Residential Property 

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Proxy View 1 - View towards Lletyllwydrew Farm and Letty'r Wennol Farm from Site A (north direction)



Proxy View 2 - View towards Lletyllwydrew Farm and Letty'r Wennol Farm from the A476 Llannon Road (east direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
19	Lletty'r Wennol Farm, Llannon, Llanelli, Carmarthenshire, SA14 8JH	Site A – 595m	West	South	Two storey detached farmhouse and outbuildings located within the valley to the north of Site A. The main frontage of the property is located to the west with an outlook across the valley. Visual sensitivity = Medium	The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows. Magnitude of change = Negligible	Negligible (Not Significant)	Acceptable. The solar arrays within Sites A, B and C would not generally be visible due to the intervening landform, woodland and hedgerows. The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.



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Viewpoint Location 

Residential Property 





North east elevation



South east elevation







Ste Context Photomontage



Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
20	Medelfwy Farm, Felinfoel, Llanelli, SA14 8NX	Site C – 565m	North West	North East	<p>Single storey detached residential property located on elevated ground to the south of Site B and to the west of Site C.</p> <p>The main entrance and principal frontage is located to the north west of the property. Panoramic views extend from the north east and south east elevations towards Blaenhireath Farm within the lower valley.</p> <p>The property is partly enclosed by farm outbuildings and cattle sheds to the north east of the property.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Sites A and B would not generally be visible due to distance and intervening landform and woodland.</p> <p>The solar arrays within Site C would be visible within the direction of Blaenhireath Farm visible in the lower valley to the north east of the property.</p> <p>The solar arrays within Site C would appear nestled in the valley and framed by the existing framework of hedgerows.</p> <p>The solar arrays within Site C would form a relatively minor component of the panoramic views extending to the north east and south east from the elevated property at Medelfwy Farm.</p> <p>The solar arrays within Site C would be visible over a distance of approximately 565 metres in the same direction as the existing farm buildings and cattle sheds.</p> <p>The temporary site compound has been relocated to the north of Site C near Blaenhiraeth Farm to reduce the visual effects on Medelfwy Farm (20) during the construction stages.</p> <p>Magnitude of change = Medium</p>	Moderate (Significant)	<p>Acceptable.</p> <p>The solar arrays within Site C would be visible within the lower valley within the same direction of view as the existing farm buildings to the north east of the property at a distance of approximately 565 metres.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>



Proxy Viewpoint 

Residential Property 

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Proxy View 1 - View towards Llyn Derw from Site A (north west direction)

Property ID	Property Address	Approximate Distance to Site (metres)	Orientation of Main Frontage	Location of Primary Views towards Site	Baseline Visual Amenity / Visual Sensitivity	Magnitude of Change	Significance of Visual Effect	Acceptability Threshold for Residential Visual Amenity and Living Conditions in the Public Interest
21.	Llyn-Derw, Llannon, Llanelli, SA14 8HX	Site A – 565m	East	South East	<p>Two storey detached farmhouse and outbuildings adjacent to the A476 Llannon Road and near Penderi Farm to the north west of Site A.</p> <p>The main frontage of the property is orientated to the east and not in the direct line of sight as Site A. The property is partly enclosed by the surrounding cluster of farm outbuildings.</p> <p>Sites B and C would not generally be visible due to intervening landform, woodland and distance.</p> <p>Visual sensitivity = Medium</p>	<p>The solar arrays within Site A are not located within direct line of sight from the main frontage of the property to the east.</p> <p>Partial views of the solar arrays within Site A would be visible from the upper floors to the east and south of the property although generally screened by the intervening woodland in the lower valley.</p> <p>Views of the solar arrays within Site A may be slightly more perceptible in the winter months without leaf coverage although would be restricted to the northern part of Site A.</p> <p>Magnitude of change = Low/Negligible</p>	<p>Minor/Negligible (Not Significant)</p>	<p>Acceptable.</p> <p>Limited views of the solar arrays within the northern part of Site A would be perceptible from the upper floors to the south east of the property. However, views from the main frontage and building curtilage would generally remain unaffected.</p> <p>The solar PV development would not appear overbearing, overwhelming or oppressive as a matter for the public interest. The residential property would remain habitable with the solar PV development in place.</p>

7. LANDSCAPE PLANNING POLICY

7.1 The relevant landscape planning policies are contained within Planning Policy Wales (Edition 10, December 2018) and the Carmarthenshire Council Local Development Plan (2006 to 2021).

Planning Policy Wales (Edition 10, December 2018)

7.2 This document sets out an overview of the planning policy context for Wales. Planning Policy Wales (PPW) Edition 10 was published in December 2018. Page 10, paragraph 1.17 notes that there is a presumption in favour of sustainable development and includes a photograph (replicated below) showing a solar PV development within close proximity to a number of residential properties.

7.3 This photograph from PPW page 10 simply illustrates a general point that solar PV developments can be considered acceptable within close proximity to residential properties without harm to living conditions.



7.4 Chapter 5, Productive and Enterprising Placemaking and Well-being, paragraph 5.7.3 notes that:

“Climate change is a global challenge, with impacts felt at the local level presenting a significant risk to people, property, infrastructure and natural resources. We need to plan for these impacts, reducing the vulnerability of our natural resources and build an environment which can adapt to climate change. The planning system plays a significant role in managing this risk. Development allowed today will be around for decades to come. The most important decision the planning system makes is to ensure the right developments are built in the right places.”⁶

7.5 Paragraph 5.7.8 notes that:

“The benefits of renewable and low carbon energy, as part of the overall commitment to tackle climate change and increase energy security, is of paramount importance. The continued extraction of fossil fuels will hinder progress towards achieving overall commitments to tackling climate change. The planning system should:

- *integrate development with the provision of additional electricity grid network infrastructure;*
- *optimise energy storage;*
- *facilitate the integration of sustainable building design principles in new development;*
- *optimise the location of new developments to allow for efficient use of resources;*
- *maximise renewable and low carbon energy generation;*
- *maximise the use of local energy sources, such as district heating networks;*
- *minimise the carbon impact of other energy generation; and*
- *move away from the extraction of energy minerals, the burning of which is carbon intensive.”⁷*

7.6 Chapter 6, Recognising the Special Characteristics of Places states within Paragraph 6.3.3 that:

“All the landscape of Wales are valued for intrinsic contribution to a sense of place, and local authorities should protect and enhance their special characteristics, whilst paying due regard to the social, economic and cultural benefits they provide, and to their role in creating valued places.”⁸

7.7 The proposed solar PV development is not located within any statutory or non-statutory landscape designations since the Afon Morlais Valley SLA as shown in Figure 6.5 was omitted from the LDP.

Carmarthenshire Local Development Plan 2006 to 2021

7.8 The Carmarthenshire Local Development Plan 2006 to 2021 (Adopted 10th December 2014) provides the local planning policies for the site and surrounding area. Policy EQ1 Protection of Buildings, Landscapes and Features of Historic Importance states that:

“Proposals for development affecting landscapes, townscapes buildings and sites or features of historic or archaeological interest which by virtue of their historic importance, character or significance within a group of features make an important contribution to the local character and the interests of the area will only be permitted where it preserves or enhances the built and historic environment.”⁹

7.9 Policy RE3 Non-Wind Renewable Energy Installations states that:

“...Proposals for small scale non-wind renewable energy installations outside defined Development Limits are required to satisfactorily justify the need to be sited in such a location. Such proposals should be sited in close proximity to existing buildings and structures and will not cause demonstrable harm to the landscape...

...Large scale schemes located outside defined Development Limits may be permitted in exceptional circumstances, where there is an overriding need for the scheme which can be satisfactorily justified, and the development will not cause demonstrable harm to the landscape...

...Proposals that would cause demonstrable harm to the landscape, visual impact, noise, ecology, or ground and surface water as a result of the cumulative effect of renewable energy installations will not be permitted.”¹⁰

7.10 The supporting text for Policy RE3 also advises that:

“It is anticipated that an increasing number of proposals will come forward for large schemes to be located outside defined development limits, for example solar parks. Such schemes can play an important role in assisting WG achieve its renewable energy generation targets, and for this reason, the need for the scheme will be weighed up against the need to protect the landscape from inappropriate development. Such schemes will be assessed against other policies contained within the Plan primarily relating to the impact on the landscape and biodiversity of the proposal and the cumulative impact of renewable energy installations.”¹¹

7.11 Carmarthenshire County Council have requested within the Local Impact Report (LIR) that as no specific residential visual amenity policy is currently in place that the planning application be reviewed against LDP Policy GP1, Sustainability and High Quality Design, which states that:

“Development proposals will be permitted where they accord with the following:

- *It would not have a significant impact on the amenity of adjacent land uses, properties, residents or the community;...”¹²*

⁶ PPW Edition 10 – Dec 2018 – Chapter 5, Productive and Enterprising Placemaking and Well-being (Page 87)

⁷ PPW Edition 10 – Dec 2018 – Chapter 5, Productive and Enterprising Placemaking and Well-being (Page 88)

⁸ PPW Edition 10 – Dec 2018 – Chapter 6, Recognising the Special Characteristics of Places (Page 131)

⁹ Paragraph 6.6.5 to 6.6.10, Carmarthenshire Local Development Plan 2006 to 2021

¹⁰ Paragraph 6.7.27 to 6.7.32, Carmarthenshire Local Development Plan 2006 to 2021

¹¹ Paragraph 6.7.31, Carmarthenshire Local Development Plan 2006 to 2021

¹² Paragraph 6.1.1, Carmarthenshire Local Development Plan 2006 to 2021

8. CONCLUSIONS

8.1 This Residential Visual Amenity Assessment (Rev A) has been prepared on behalf of Voltalia UK Ltd ('the developer') in support of the proposed 34.4MW solar photovoltaic (PV) development on approximately 96.27 hectares of land at Blaenhiraeth Farm, Llanelli, SA14 8PX.

8.2 This RVAA seeks to determine whether or not the proposed solar PV development would give rise to visual effects on the surrounding residential properties and whether the degree or significance of these visual effect would result in unacceptable consequences to living conditions such that planning permission should be refused in the public interest.

Study Area and Scope

8.3 The scope and study area of the residential properties included within this RVAA has been informed by the findings of the Environmental Statement (ES) Chapter 6, Landscape and Visual Impact Assessment (LVIA), the Zone of Theoretical Visibility (ZTV) mapping, post code data and consultation with Carmarthenshire County Council, and subsequent requests from the public consultation event held on 13th August 2019.

8.4 Given the type and scale of the proposed solar PV development and the dispersed nature of the surrounding residential properties, the likelihood of any significant visual effects is considered to be restricted to those within the immediate surroundings of the site. This was mainly due to the limited vertical height of the proposed solar arrays at a maximum height of +2.75 metres above ground level (agl) and the visual enclosure provided by the surrounding landform, hedgerows and woodlands.

Effects on Residential Visual Amenity

8.5 The findings of both the LVIA and this RVAA demonstrates that the proposed solar PV development within Sites A, B and C would not be visible in entirety from any given viewpoint location. This is due to the pattern of the development located within Sites A, B and C and the prevailing landform, hedgerows and woodland. Opportunities to observe the solar PV development from publicly accessible locations has been further considered within the LVIA.

8.6 This RVAA has identified that the proposed solar PV development would result in moderate to negligible (not significant) visual effects on the following residential properties within the study area including:

- 1. Blaenhiraeth Farm, Llangennech, Llanelli, SA14 8PX
- 2. Blaenhiraeth Fach, Llangennech, Llanelli, SA14 8PX
- 3. Keepers Lodge, Llangennech, Llanelli, SA14 8PX
- 4. Cilddewi Fawr, Llannon, Llanelli, SA14 8JZ
- 5. Cilddewi Uchaf, Llannon, Llanelli, SA14 8JZ
- 7. Ashbury House, Llannon Road, Llanelli, SA14 8EZ
- 8. Mayfield House, Llannon Road, Llanelli, SA14 8EZ
- 9. Clochryrie Farm, Felinfoel, Llanelli, SA14 8EZ
- 10. Llwynon Farm, Llannon, Llanelli, SA14 8HJ
- 12. Penderi, Llannon, Llanelli, SA14 8HX
- 13. Gelliwernen Lodge, Llannon, Llanelli, SA14 8HJ
- 14. Waunadlais, Felinfoel, Llanelli, SA14 8NX
- 15. Pantycelyn, Llangennech, Llanelli, SA14 8PJ

- 16. Graig Fach, Llangennech, Llanelli, SA14 8PX
- 17. Goitre Wen Farm, Hendy, Pontarddulais, Swansea, SA4 0YQ
- 18. Llettyllwydrew Farm, Llannon, Llanelli, Carmarthenshire, SA14 8JH
- 19. Lletty'r Wennol Farm, Llannon, Llanelli, Carmarthenshire, SA14 8JH
- 21. Llyn-Derw, Llannon, Llanelli, SA14 8HX

8.7 The proposed solar PV development would be visible to varying degrees from these residential properties surrounding the site. However, the visual effects on these residential properties would not be significant. Therefore, the proposed solar PV development would also not fail the public interest test in terms of the effects on residential visual amenity experienced from these properties.

8.8 This RVAA has identified that proposed solar PV development would result in major or moderate (significant) visual effects on the following residential properties:

- 6. Cware Farm, Fferm y cware, Felinfoel, SA14 8EZ
- 11. Wayside, Llannon, Llanelli, SA14 8HJ
- 20. Medelfwy Farm, Felinfoel, Llanelli, SA14 8NX

8.9 These residential properties were further assessed regarding the acceptability threshold for residential visual amenity and living conditions.

Acceptability Thresholds for Residential Visual Amenity in the Public Interest

8.10 Cware Farm (6) comprises a two storey detached farmhouse located approximately 200 metres to the south of Site B and partly enclosed within a local undulation and by other outbuildings to the east of the property. The main frontage is orientated to the north with views across a local undulation towards the middle slopes of Site B descending to the east. Views from the eastern elevations of the farmhouse towards Site C would be visible from the upper elevations although partially screened by the existing farm outbuildings and cattle sheds on the building curtilage. Site A would be less perceptible due to the orientation of the property and the intervening landform, woodland and the distance from the property. Site B would be partially visible on the middle slopes to the north although set back from the property by approximately 300 metres. **Solar arrays have been removed from the sloping ground to the south of Site B to provide a greater offset distance from Cware Farm (6) and to reduce these visual effects.** Site C would also be partially visible from the upper elevations to the east of the property although partly screened at ground level by the intervening farm outbuildings. The solar PV development would therefore not appear overbearing, overwhelming or oppressive from Cware Farm (6).

8.11 Wayside (11) comprises a large two and a half storey detached property with separate wings, outbuildings and private gardens located approximately 300 metres to the west of Site A. The main frontage and driveway is located to south west of the property with the rear elevations and private gardens orientated to the north east. The property is partly enclosed by woodland to the north, east and west of the gardens. Partial views of the solar arrays within Site A would be visible across the valley. These views are partially screened by mature treecover to the east of the

gardens between the summer and winter months. The focus of the view to the north east of the property would remain unaffected by the solar arrays within Site A. The solar arrays within Sites B and C would not generally be visible due to the intervening landform, woodland and hedgerows. The solar PV development would not appear overbearing, overwhelming or oppressive from Wayside (11).

8.12 Medelfwy Farm (20) comprises a single storey detached residential property and outbuildings located on elevated ground to the west of Site C. The main entrance and principal frontage is located to the north west of the property with farm outbuildings and cattle sheds positioned to the north east. Panoramic views extend from the north east and south east elevations towards Blaenhiraeth Farm in the lower valley. The solar arrays within Site C would be visible within the lower valley within same direction of view as the existing farm buildings to the north east of the property at a distance of approximately 565 metres. **The temporary site compound has been relocated to the north of Site C near Blaenhiraeth Farm to reduce the visual effects on Medelfwy Farm (20) during the construction stages.** The solar PV development would not appear overbearing, overwhelming or oppressive from Medelfwy Farm (20).

Summary

8.13 It is a long held planning principle that no individual person has a private right to a view. However, there are situations where the effect on the outlook or visual amenity of a residential property and associated living conditions would be so great that it would not be in the public interest to permit such conditions to occur where they did not previously exist.

8.14 Given the scale of the proposed solar PV development, this RVAA demonstrates that there would be a relatively low number of residential properties that would be significantly affected. The proposed solar PV development within Sites A, B and C would not be visible in entirety from any given residential property owing to the landform, hedgerow pattern and woodlands. None of the identified visual effects would be overbearing, overwhelming or oppressive to such a degree that it would affect living conditions within the residential properties as a matter for the public interest.

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APPENDIX 6.5

SUMMARY OF LANDSCAPE AND VISUAL EFFECTS

Appendix 6.5: Summary of Landscape and Visual Effects Schedule (23/12/2020) – Votalia UK Ltd, Penderi / Blaenhiraeth Solar Farm

Representative Viewpoint		Distance (km)	Landscape Character						Visual Amenity					
			LANDMAP Visual and Sensory	Value	Susceptibility	Sensitivity	Magnitude	Effect/Significance	Receptor	Value	Susceptibility	Sensitivity	Magnitude	Effect/Significance
Viewpoints	Viewpoint 1 – Bridleway near Pencwm fawr, Llannon	1.22km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Negligible	Negligible (Not significant)	PROW	High	High	High	Negligible	Negligible (Not significant)
	Viewpoint 2 – B4306 Roman Road near Brynmaen	1.12km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Negligible	Negligible (Not significant)	Public Highway	Medium	Medium	Medium	Negligible	Negligible (Not significant)
	Viewpoint 3 – Rural lane (U2309) near Cil-Ddew-uchaf	0	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	High	Major (Significant)	Public Highway	Medium	Medium	Medium	High	Major (Significant)
	Viewpoint 4 – Rural lane (U2309) near the access to Blaenhiraeth Farm	0.15km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Low	Minor (Not significant)	Public Highway	Medium	Medium	Medium	Low	Minor (Not significant)
	Viewpoint 5 – Public footpath (33/54) at Blaenhiraeth Farm	0	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	High	Major (Significant)	PROW	High	High	High	High	Major (Significant)
	Viewpoint 6 – Rural lane near Pant-y-Celyn and Porth Dafen	0.75km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Negligible	Negligible (Not significant)	PROW	High	High	High	Negligible	Negligible (Not significant)
	Viewpoint 7 – Medelfyw Road between A476 Llannon Road and Carn-Hywel-isaf	0.73km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Negligible	Negligible (Not significant)	PROW	High	High	High	Negligible	Negligible (Not significant)
	Viewpoint 8A/B – A476 Llannon Road near Site B and Clochyrie Farm	0	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	High	Major (Significant)	Public Highway	Medium	Medium	Medium	High	Major (Significant)
	Viewpoint 9 – Public footpath (33/35) between Gelliwernen Farm and Blaenhiraeth Farm	0.56km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Low	Minor (Not Significant)	PROW	High	High	High	Low	Moderate (Not Significant)
	Viewpoint 10 – Rural lane near Plas Farm	1.67km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Negligible	Negligible (Not significant)	Public Highway	Medium	Medium	Medium	Negligible	Negligible (Not significant)

Viewpoint 11 – Mynydd Sylen (Trig Point and Aerial Mast)	2.83km	CRMRTVS905 Mynydd Sylen	High	High	High	Negligible	Negligible (Not significant)	PROW	High	High	High	Negligible	Negligible (Not significant)
Viewpoint 12 – Public footpath (33/54) within the lower valley to the north of Site B	0	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	High	Major (Significant)	PROW	High	High	High	High	Major (Significant)
Viewpoint 13 – St Illtyds Walk to the south east of Troserch Woods	1.47km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Negligible	Negligible (Not Significant)	PROW	High	High	High	Negligible	Negligible (Not significant)
Viewpoint 14 – Rural lane near Troserch Woods	0.68km	CRMRTVS988 Swiss Valley and Morlais Valley	High	High	High	Low	Moderate (Not significant)	Public Highway	Medium	Medium	Medium	Low	Minor (Not significant)
Viewpoint 15 – A476 Llannon Road near Llyn-derw	0.59km	CRMRTVS988 Swiss Valley and Morlais Valley	High	High	High	Low	Moderate (Not significant)	Public Highway	Medium	Medium	Medium	Low	Minor (Not significant)
Viewpoint 16 – Rural lane (U2309) near Cil Ddewi-uchaf	0.25km	CRMRTVS557 Llanelli Hills	Medium	Medium	Medium	Low	Minor (Not significant)	Public Highway	Medium	Medium	Medium	Low	Minor (Not significant)

APPENDIX 6.6

**CARMARTHENSHIRE SOLAR PV DEVELOPMENT – LANDSCAPE
SENSITIVITY AND CAPACITY STUDY (EXTRACTS)**

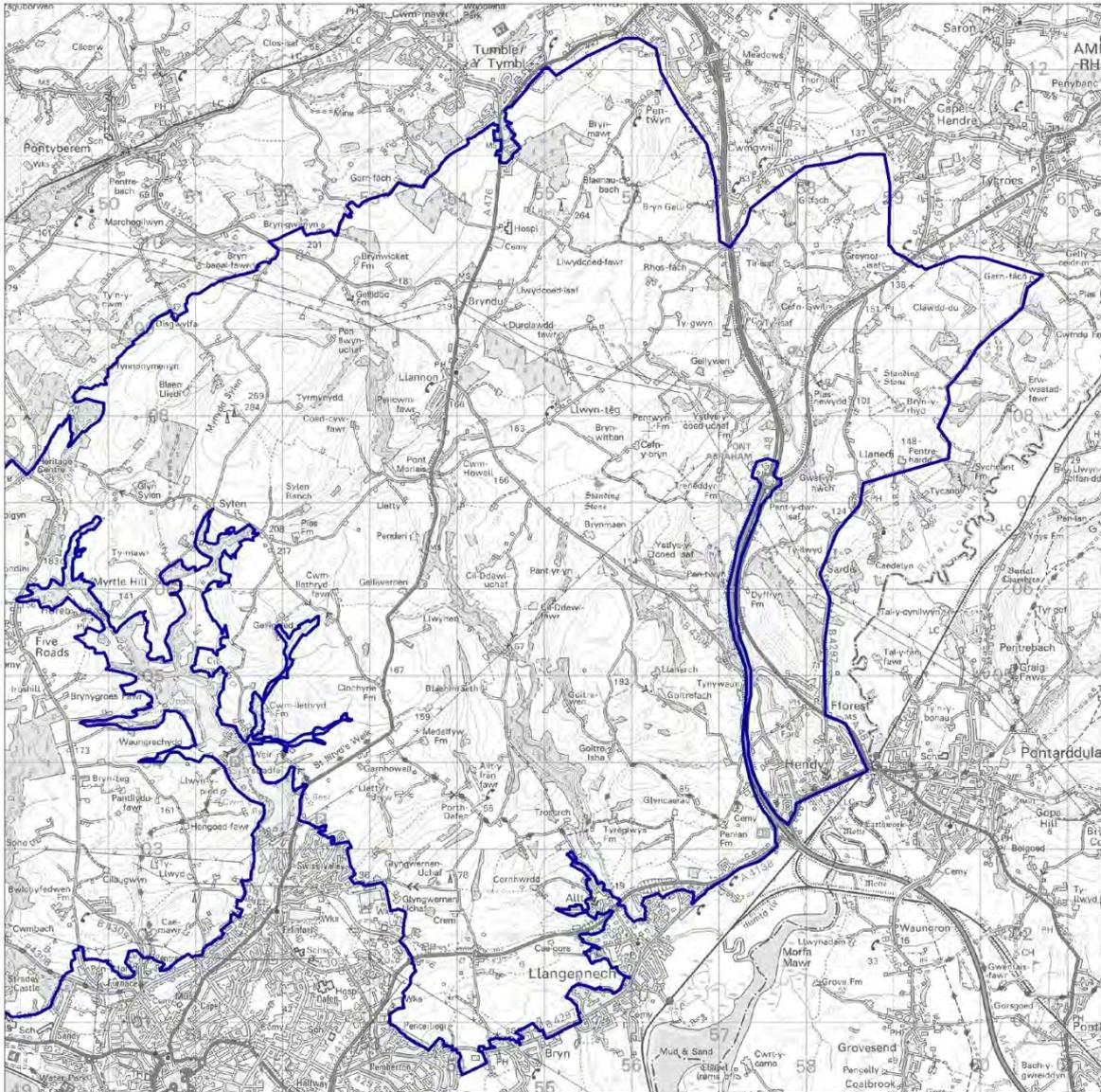
Carmarthenshire Solar PV Development

Landscape Sensitivity and Capacity Study



Prepared by Anthony Jellard Associates LLP

047 - Mynydd Sylen, Llanelli Hills and Pembrey coastal hills - East



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Produced by exeGesis SDM Ltd

LANDSCAPE UNIT 047: Mynydd Sylen, Llanelli Hills and Pembrey Coastal Hills

LANDSCAPE		Assessed Susceptibility		
		Low	Medium	High
Scale	VS8: Scale - Medium (92.8%)			
Landform	Rolling hills and valleys VS4: Topographic Form - Rolling/Undulating (87.4%)			
Land cover pattern	Mosaic pattern provided by strong network of hedge bound fields, with some patches of woodland VS Class: Level 3 - Mosaic Rolling Lowland (92.8%) VS5: Land Cover Pattern - Field Pattern/Mosaic (98.3%) VS16: Pattern - Organised (98.3%) HL Class: Level 3 - Irregular Fieldscapes (81.8%)			
Built environment	VS6: Settlement Pattern - Scattered Rural/Farm (98.3%) VS20: Use of Construction Materials - Generally Inappropriate (92.8%) VS25: Sense of Place - Moderate (87.4%) Mix-small scale residential/farms and medium scale Residential, farm buildings, pylons, turbines,solar PV			

VISUAL		Assessed Susceptibility		
		Low	Medium	High
Skylines and settings	Undulating landscapes Rolling/gently undulating skyline			
Visibility, key views, vistas	VS9: Enclosure - Enclosed (89.0%) Some views into/out of area but these are limited by rolling landform and strong vegetation cover			
Intervisibility, associations with adjacent landscapes	VS22: There are attractive views - ...neither in or out (87.4%) VS23: There are detractive views - ...neither in or out (94.6%) Framed views and intermittent views into and out of the area; coastal views from south western area			
Types of receptors	Residential, place of work, leisure (eg St Illtyd's Walk), transport route			
Views to / from landscape and cultural heritage features	Some inter-visibility with the Carmarthen Bay and Estuary SLA to south and west			

LANDSCAPE UNIT 047: Mynydd Sylen, Llanelli Hills and Pembrey Coastal Hills

AESTHETIC, PERCEPTUAL AND EXPERIENTIAL		Assessed Susceptibility		
		Low	Medium	High
Scenic quality and character	VS46: Scenic Quality - Moderate (92.9%) VS47: Integrity - Moderate (92.8%) VS48: Character - Moderate (92.8%)			
Remoteness and tranquillity	Frequented /busy along A476 but remainder secluded/interrupted VS24: Perceptual and Other Sensory Qualities - Tranquil, Sheltered (87.4%)			

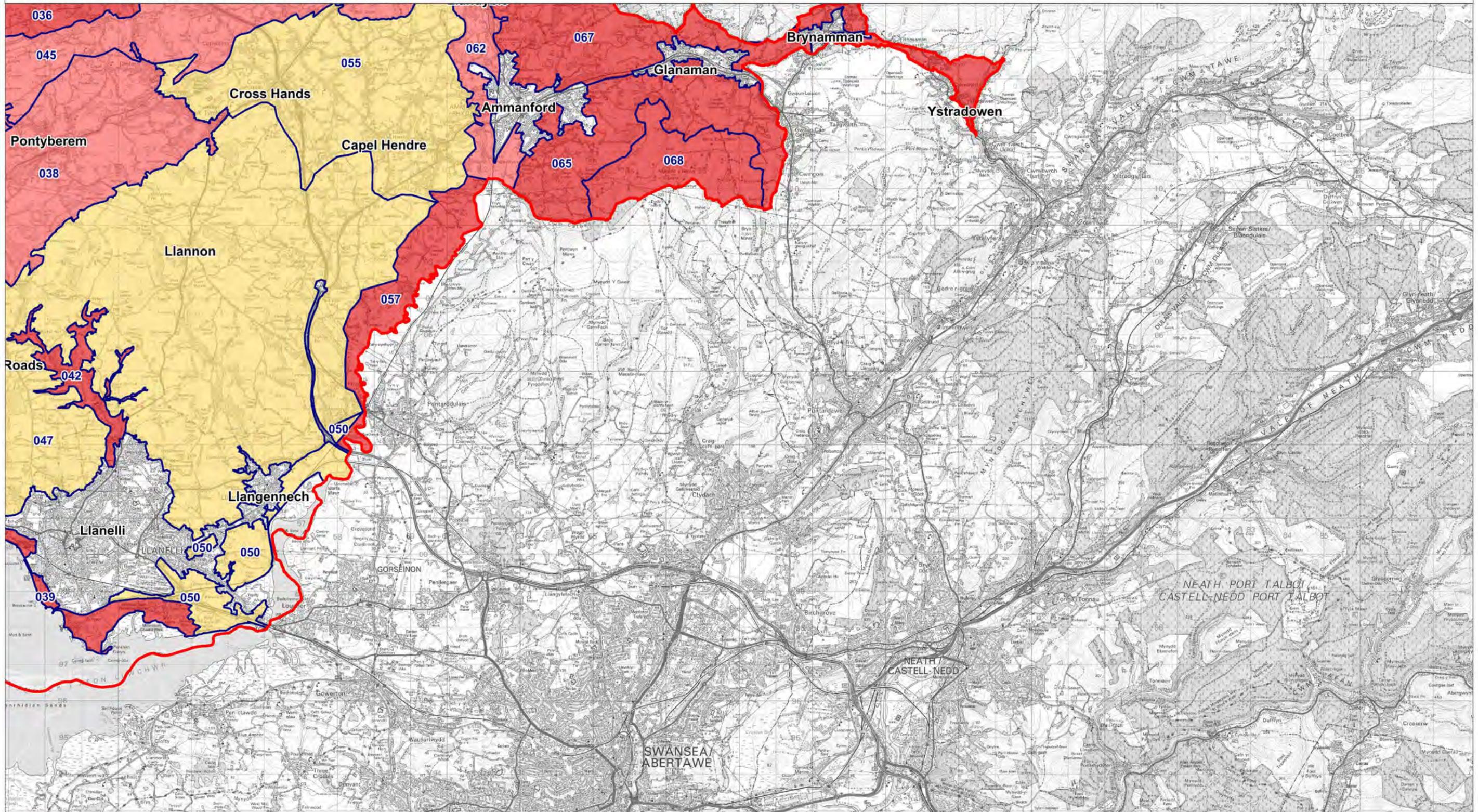
VALUE		Assessed Value		
		Low	Medium	High
Landscape value	Taf and Tywi Estuary (RLHI) Stradey Castle (RPG) 1 Special Landscape Area(s) VS50: Overall Evaluation - Moderate (92.9%) VS49: Rarity - Moderate (94.6%) LH45: Overall Evaluation - High (53.0%); Moderate (46.6%) GL31: Rarity - Moderate (97.2%) GL33 Overall Evaluation - Moderate (97.2%)			
Historic value	Taf and Tywi Estuary (RLHI) Stradey Castle (RPG) 11 Scheduled Ancient Monuments 36 Listed Buildings HL38: Rarity - Moderate (96.0%) HL35: Integrity - Outstanding (83.3%) HL40: Overall Evaluation - High (96.3%)			

SUMMARY OF SENSITIVITY TO SOLAR DEVELOPMENT		Assessed Sensitivity		
		Low	Medium	High
Small	Low sensitivity for small scale in areas with existing built form, where rolling landform, strong field boundaries and scattered coniferous plantations provide enclosure			
Medium	Low to medium sensitivity where landform and strong field boundaries provide some enclosure			
Large	Medium sensitivity to large scale in areas with fewer receptors and where landform and strong field boundaries provide some degree of enclosure			
Additional comments	Small part of south western area lies within SLA and higher sensitivity in this area. Historic landscape integrity and overall evaluations contribute additionally to the level of sensitivity to solar PV development. Landscape character in the north-western area of this unit is significantly influenced by high-voltage electricity lines carried on steel towers, and results in a reduced sensitivity in this locality. Potential for cumulative effects with other solar PV development.			

LANDSCAPE UNIT 047: Mynydd Sylen, Llanelli Hills and Pembrey coastal hills

LANDSCAPE CAPACITY AND GUIDANCE FOR SITING SOLAR DEVELOPMENT	
Landscape objective	Objective 2: Maintain the landscape character
Key landscape, visual and cultural heritage characteristics susceptible to solar development	Designated features within the Landscape Unit: Taf and Tywi Estuary (RLHI) Stradey Castle (RPG) Approx 5% lies within Carmarthen Bay and Estuary Special Landscape Area in the south 11 Scheduled Ancient Monuments 36 Listed Buildings
	Other susceptible landscape, visual and cultural heritage features: St Illtyd's Walk
Baseline solar development (March 2016)	Solar PV development within this landscape unit: Large scale developments near Llanon, south east of Tycroes, and south of Five Roads all consented Small scale development south of Cwmgwili consented
Indicative overall capacity	There is some capacity for small to large scale development in areas where there will be no effect upon the special qualities of the registered historic landscape and the SLAs. Detailed field survey work has identified some areas where enclosure provided by the rolling landform and landcover, particularly in combination with existing infrastructure, may provide opportunities to locate solar PV development
Guidance on siting	<i>Section 5 of this report provides generic guidance on siting.</i> In addition, the following specific issues should be considered: <ul style="list-style-type: none"> • Maintain the integrity of Taf and Tywi Estuary Registered Landscape of Outstanding Historic Interest in Wales adjacent to the south western part of this LU • Safeguard the natural beauty of the Carmarthen Bay and Estuary Special Landscape Area in the south western part of this LU • Protect the setting of SAMs and other important cultural heritage features, including the essential setting to Stradey Castle RPG to the north of Pwll • Consider views from residential receptors and the setting of settlements • Consider the effect on views from St Illtyd's Walk for proposals in this unit • Consider the effects on users of the Wales Coast Path • Consider the cumulative effects with other solar PV development • Potential area of search for small to medium scale development along high-voltage overhead lines corridor crossing the northern section of this unit, especially where forestry plantations can assist in assimilation or screening

Figure 13-6 : Sensitivity to Medium Solar Development



Legend

- | | | |
|--|---|---|
|  Study Area | Sensitivity |  Medium to High |
|  Landscape Units |  Low |  High |
| |  Low to Medium | |
| |  Medium | |



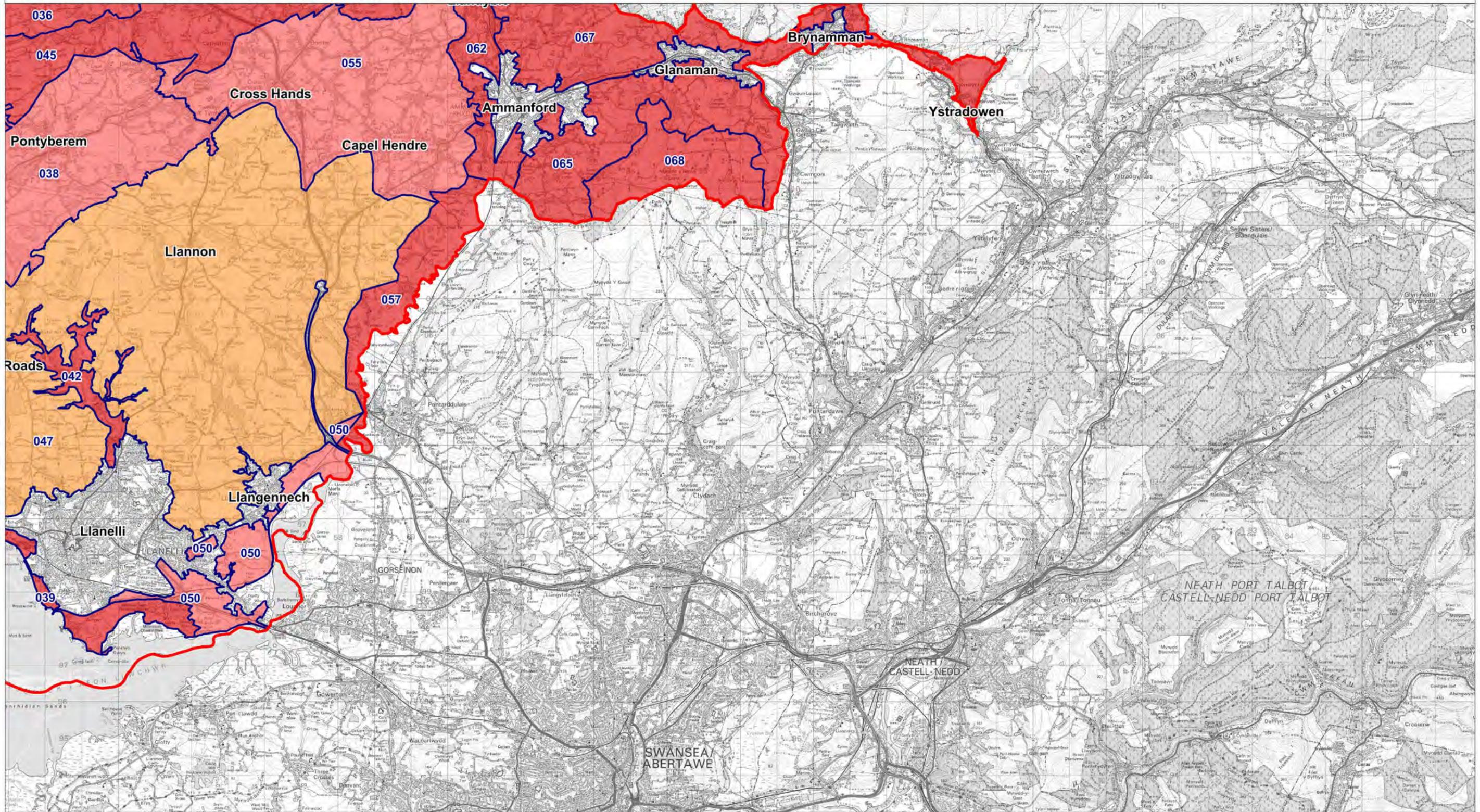
**ANTHONY JELLARD
ASSOCIATES LLP**

Pear Tree Cottage, Grosmont, NP7 8LG

Scale 1:100500



Figure 14-6 : Sensitivity to Large Solar Development



Legend

- | | | |
|--|---|---|
|  Study Area | Sensitivity |  Medium to High |
|  Landscape Units |  Low |  High |
| |  Low to Medium | |
| |  Medium | |



**ANTHONY JELLARD
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APPENDIX 6.7

LANDSCAPE CONSULTATION RESPONSE SUMMARY SCHEDULE

Appendix 6.8: Landscape Consultation Schedule (23/12/2020) – Voltaia UK Ltd, Penderi / Blaenhiraeth Solar Farm

Consultee	Landscape Comments	Response
Carmarthenshire County Council	<p>No landscape objection in principle subject to conditions.</p> <p>CCC have included a number of requests within the Local Impact Report (LIR) including:</p> <ul style="list-style-type: none"> • Para 6.5 – request to remove the two areas of solar panels to the west of Site B adjacent to the A476 Llannon Road and LVIA viewpoint 8A/B; • Para 6.8 – request to revise the location for the temporary site compound to the south of Site C and the inclusion of additional tree planting along hedgerows; and • Para 7.0 – request for further details regarding the management responsibilities within the Landscape and Ecological Management Plan (LEMP). 	<p>The site layout has been updated to remove the two areas of solar panels to the west of Site B near LVIA viewpoint 8A/B on the A476 Llannon Road as requested by CCC.</p> <p>The temporary site compound has been moved from the south of Site C to the north west of Blaenhiraeth Farm near to the existing pylons and grid connection point. Additional tree planting will be proposed on the landscape mitigation plans to reflect the updated site layout in locations that would not cause future overshadowing of the solar arrays.</p> <p>The management responsibilities identified within the Landscape and Ecological Management Plan (LEMP) would be the subject of a planning condition therefore would allow for compliance, monitoring and enforcement by CCC.</p>
Natural Resources Wales	<p>No landscape objection in principle subject to conditions.</p> <p>NRW have expressed significant concerns with regard to the potential effects on ecology including on the Carmarthen Bay and Estuaries Special Area of Conservation (SAC), the Burry Inlet Special Protection Area (SPA), the Burry Inlet Ramsar and the Burry Inlet and Loughor Estuary Site of Special Scientific Interest (SSSI).</p>	<p>Applicant agrees to the inclusion of Conditions 1, 2 and 3 recommended by NRW with regards to securing the implementation of the Construction Environmental Management Plan (CEMP), the Construction Ecological Management Plan (CEcMP), and the Landscape and Ecological Management Plan (LEMP) that would allow for enforcement.</p>

	However, NRW consider that these concerns can be addressed through a pre-commencement condition for submission and approval of a detailed and site specific Construction Environment Management Plan (CEMP).	
Cadw	No heritage or landscape objections in principle although requests further details regarding cable route crossing the Cilddewi Bridge (grade II listed).	Alternative cable laying methodologies are currently being investigated to reduce any potential impacts on the Cilddewi Bridge.
Llanelli Rural Council	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Environmental impact on the countryside; • Visual impact on residents, the local community and road users along the A476 Llannon Road; • Detrimental impact on the aesthetics and natural beauty of the countryside; • Panels cannot be hidden from public view; • Construction impacts and the detrimental effects on local amenity through piling operations; • Brownfield sites should be considered. 	<p>The representations from the community councils, interest groups, and local residents broadly covers the following topics:</p> <ul style="list-style-type: none"> • Adverse impact on the unspoilt, rural and tranquil character of the valley; • The perceived large scale and industrial character of the solar PV development; • The location of the site within the LANDMAP Swiss Valley and Morlais Valley visual and sensory aspect; • Loss of agricultural farmland; • Visual impact on the rural lane (U2309) to the east of Site A; • Visual impact on the A476 to the west of Sites A and B; • Potential damage to the Cilddewi Bridge (grade II listed); and • Impacts on the private views of the surrounding farms and residential properties.
Llannon Community Council	<p>Landscape observations:</p> <ul style="list-style-type: none"> • Visual impact greatest within the Llannon Community Area; • Development is wholly inappropriate with regards to the impact on the local community; • Blight on the landscape over a significant area. 	

Llanelli Ramblers	<p>No specific landscape objection although:</p> <ul style="list-style-type: none"> • Unaware of disused nature of public footpaths at Blaenhiraeth Farm; • Supports the inclusion the additional permissive footpath to the north west of Blaenhiraeth Farm to link with public footpath 33/54. 	<p>The applicant has assessed the effects of the proposed solar PV development on landscape character and visual amenity within the LVIA and RVAA.</p>
David and Sarah Williams	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Extremely large industrial scale that would dominate the landscape; • Would prefer to see them on brownfield sites; • Solar Farm will significantly dominate and spoil the landscape; • Proposal does not offer biodiversity benefits. 	<p>The character and appearance of the site would inevitably change from pastoral farmland to a solar PV development comprising solar arrays, access tracks, temporary compounds, underground cabling, grid connections, sub stations, transformers, security (deer) fencing and CCTV equipment.</p> <p>The applicant does not consider that the proposals would result in significant effects simply by virtue of the development being visible from any particular location.</p>
Brian Rees, Cilddwei Fawr	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Unacceptable visual impact on the landscape; • Unacceptable visual impact on the Afon Morlais Valley and the rural lane; • Unacceptable impact on residential properties at Cilddwei Fawr, Penderi Well Farm, Ciddewi Uchaf, Blaenhiraeth Fach, Keepers Lodge, Llwynon, Gelliwernen Lodge and Gelliwernen Farm; • Potential damage to the Cilddewi Bridge (grade II listed). 	<p>The degree and significance of effect has been determined through assessing the sensitivity of the receiving landscape or visual receptor (person) combined with the magnitude of change arising from the proposed development.</p> <p>The representations refer to the industrial character and the unacceptable landscape and visual effects. Whilst some local objectors would undoubtedly view the proposals in this way, equally, other people would simply view the development as essential infrastructure that should be delivered as a matter of urgency to tackle climate change.</p>

David Rees, Cilddwei Fawr	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Shading from the existing woodlands and trees and not suitable for solar PV development; • Solar panels should be placed on industrial sites and should be more friendly to wildlife. 	<p>Due to the variations in public opinion and attitudes towards renewable energy projects from positive to negative, the LVIA and RVAA adopts a precautionary approach that assumes all the effects will be negative or adverse unless otherwise stated.</p>
Phil Owen	<p>Supports the application:</p> <ul style="list-style-type: none"> • Required to tackle the effects of climate change. 	<p>The LVIA has assessed a number of significant effects including on the character of the site predominately within the LANDMAP Llanelli Hills visual and sensory aspect, on public footpath 33/54 near Blaenhiraeth Farm, the rural lane (U2309) to the east of Site A, and the A476 to the west of Site B.</p>
Liam Davies, The Byre	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Objects to the Byre property on Medlfyw Road not being included within the RVAA; • Development located on or adjacent to a landscape whose visual and sensory qualities have been assessed as high within LANDMAP; • Location within the Swiss Valley and Morlais Valley visual and sensory aspect of high overall evaluation; • Adverse and unacceptable impact on the landscape; • Scale of the development; • Proximity to Llanelli whose population enjoys the value of the landscape; • Impact on views from the private garden of the Byre between Medelfyw Farm and Waundaluis with views towards Area C and Blaenhiraeth Farm; 	<p>The LVIA also identifies a number of other visual effects located between higher topography at Llannon and Pencwm-fach to the north, the B4306 to the north east, Goitre-wen to the east, Trosersch Wood to the south east, Medelfyw Road to the south, the A476 and Mynydd Sylen to the west.</p> <p>The proposed development would be visible to varying degrees although not always to a significant degree. The applicant considers that the majority of this area is located within private farmland and therefore not appreciable to the public. Owing to the sloping landform of the valley, the surrounding woodland and the high sided hedgerows, the visual effects are considered to be</p>

	<ul style="list-style-type: none"> • Not followed hierarchy of landscape designations. • Impact of Site C on those travelling to and from Cilldewi Bridge. 	<p>relatively localised for the scale of development proposed.</p> <p>A separate Residential Visual Amenity Assessment (Rev A) has been undertaken to consider the effects on the private views of the surrounding farms and residential properties. The RVAA has identified a number of significant visual effects in relation to the properties at Cware Farm (6), Wayside (11) and Medelfwy Farm (20).</p>
Helen Davies, The Byre	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Objects to the Byre property on Medfyw Road not being included within the RVAA; • Impact on the green belt around Llanelli; • Location within a landscape whose visual and sensory qualities have been assessed as high within LANDMAP; • Unacceptable adverse effect on the landscape; • Should be located on brownfield sites; • Scale and industrial character of the development and effect on pristine rural landscape; • Blight on the natural beauty and ecological impacts. 	<p>The applicants have responded through a number of design iterations including the removal of solar arrays to the north of Site A, to the south of Site B, and to the south west of Site C to mitigate these effects. Whilst significant visual effects have been identified on these properties, the proposals would not be overbearing, overwhelming or oppressive to such a degree that the living conditions would be unacceptable in the public interest.</p>
Clair Davies	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Objects to property not being included within the RVAA; • Catastrophic impact on the precious green belt around Llanelli; • Location within a landscape whose visual and sensory qualities have been assessed as high within LANDMAP; • Unacceptable effect on the landscape. 	<p>The residents of the Byre and Penderi Farm have noted that their property was not included within the scope of the RVAA. Penderi Farm (12) has been included within the RVAA.</p> <p>The Byre is located approximately 680 metres to the south west of Site C near Waundalais (14) on the Medelfyw Road. The scope of the RVAA was determined through a review of the Zone of Theoretical Visibility (ZTV) mapping for the proposed solar arrays and through consultation</p>

<p>Alun Owens, Penderiwell Farm</p>	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Inappropriate and disproportionate development; • Impact on local residents and the rural character of the currently pristine Morlais Valley; • Disputes land could be grazed by sheep as skillsets not transferable; • Importance of green belt area; • Downgrading agricultural land to industrial land; • Detrimental to the rural character and scar on the local landscape; and • Penderi Farm not included with RVAA. 	<p>with Carmarthenshire County Council. The focus of the RVAA was on those residential properties that would potentially be significantly affected by the proposed development and therefore does not include all properties with a potential view. Given the location of the Byre outside of the ZTV and distance from Site C, the proposed development would not result in unacceptable living conditions within this property.</p> <p>A number of the representations refer to the large scale of the development covering 96.27 hectares or 230 acres of farmland at Blaenhiraeth Farm. To clarify, the 96.27 hectares refers to the site boundary area although the actual area occupied by solar panels within the Sites A, B and C would be less at approximately 50.3 hectares or 125 hectares. There would be gaps of between 3.35m and 7m between the solar arrays to allow for maintenance access therefore it is not a blanket development area. A significant area of the remaining land would be proposed for landscape and ecological enhancements as identified within the CEcMP and the LEMP.</p>
<p>Lionel Jones, Wayside</p>	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Site A will have an unacceptable impact on the character, setting and appearance of the area; • Site A will deface a 1.4 km stretch of this typical Carmarthenshire wooded rural valley running from Pont Morlais in the North to Goitre Wen in the south; • Unacceptable visual impact upon my home and neighbouring properties including Penderiwell Farm, Ciddewi Uchaf, Cilddewi Fawr, Blaenhiraeth Fach, Keepers Lodge, Llwynon, Gelliwernen Lodge and Gelliwernen Farm; • Site A is visible from the A476; • Potential damage to the Cilddewi Bridge (grade II listed); 	<p>A number of the representations refer to the importance of the area as a green belt between Llannelli, Llannon and Llangennech. The site is not located within a designated green belt in planning terms.</p>

	<ul style="list-style-type: none"> • Should relocate Site A closer to Blaenhiraeth Farm; • Should relocate parts of Site B closer to Blaenhiraeth Farm; • Valley provides a natural haven and green belt; • Solar farm should be sited on high, flat areas and not subject to shading; • Brownfield land or unproductive land should be utilised. 	<p>A number of the representations have commented that that the site is located within the LANDMAP Swiss Valley and Morlais Valley visual and sensory aspect of high sensitivity. To clarify, the site is predominantly located within the LANDMAP Llanelli Hills visual and sensory aspect with the exception of a small part of the grid connection route crossing the Cilddewi Bridge (grade II listed) which is within the LANDMAP Swiss Valley and Morlais Valley visual and sensory aspect. Cadw have indicated that subject to conditions regarding the cable connection details, no objection would be raised.</p>
Barnaby Rees-Jones, Wayside	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Site is not ideal for solar development being located on sloping valley sides, they are best located on high and flat land that can be effectively screened; • Change of use from agricultural to industrial; • Desecration of the Welsh farming countryside and well known beauty spot; • Impact on character of the valley; • Un-spoilt, pristine grassland and wooded valley would uncharacteristically be scarred; • The culmination of the effects of a solar development of this size - panels, fencing, inverter stations with electrical buzz and access roads will inevitably change the landscape character of the site and have a simultaneous adverse impact on the natural qualities of the Llannon countryside. 	<p>The overall evaluation for the Llanelli Hills visual and sensory aspect covering the site has been assessed by Natural Resources Wales' as being of moderate overall evaluation – not of high sensitivity or designated value.</p> <p>The medium sensitivity of the site is further supported by the <i>Carmarthenshire Solar PV Development – Landscape Sensitivity and Capacity Study</i>. Within this study, the site is located within Landscape Unit 47 Mynydd Sylen, Llanelli and Pembury Coastal Hills. Figure 14-6 of this study shows that the site is located within an area of medium sensitivity for large scale solar PV development. It is also notable that the site is located within an area of low sensitivity for medium scale solar development.</p>

	<ul style="list-style-type: none"> • Impact on green belt preventing urban sprawl; • Proposal also fails to mention that within 2km of the site is another 5.5MW solar farm – Pentre Solar Farm; • Impact on every single resident of Llannon village; • Detrimental effects on the landscape whose character is changed completely; • Not located on brownfield land; and • Impact on the A476 and distraction to road users. 	<p>The site is also located within a priority area for solar energy as identified by Arup on behalf of the Welsh Government. The <i>Carmarthenshire Solar PV Development – Landscape Sensitivity and Capacity Study</i> shows that the site is located within one of the least sensitive landscape units for large scale solar PV development throughout the county.</p> <p>The majority of the representations do appear to support the requirement for renewable energy development in principle although not at this location.</p>
Carolyn Williams	No specific landscape objection.	<p>The applicants consider that if the Welsh Government is going to achieve the 70% renewable energy generation target by 2030 as outlined in PPW paragraph 5.7.16, then such sites with available grid connections should be deemed acceptable.</p>
Elgan Rees, Medelfyw Farm	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Clear views of proposed development from seven different windows; • Beautiful landscape transformed from rural tranquillity to an industrial monstrosity; • Landscape will be blighted for future generations; and • Not located on brownfield land. 	
Eifion Williams	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Prefer to see grass and not glass. 	
Gwyneth Thomas	<p>Landscape objection:</p> <ul style="list-style-type: none"> • Size of the solar farm, loss of agricultural land and impacts on residential properties. 	

Owners and residents of Blaenhiraeth Fach	Landscape objection submitted by Geraint John Planning and EDP on behalf of the owners and residents of Blaenhiraeth Fach.	Please see landscape response within the letter to PINS from Pegasus on 23 rd November 2020.
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APPENDIX 7.1

EXTENDED PHASE 1 SURVEY

EXTENDED PHASE 1 SURVEY
PENDERI FARM, LLANGENNECH, CARMARTHENSHIRE

carried out by



commissioned by

VOLTALIA UK LIMITED

JULY 2019



EXTENDED PHASE 1 SURVEY

PENDERI FARM, LLANGENNECH, CARMARTHENSHIRE

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The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. (previously Michael Woods Associates) was commissioned by Voltalia UK Ltd to carry out an ecological survey of land at Penderi Farm in Llangennech, Carmarthenshire.
- 1.1.2 An ecological survey was previously carried out (on 20th/21st October 2014), however, the submission of a planning application was delayed. Therefore, an update survey was conducted on the 26th April 2018 with the results augmented from visits later in the year associated with bird survey visits (on the 9th and 31st May 2018).
- 1.1.3 This Extended Phase 1 Report 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.
- 1.1.4 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.

1.2 Site Description Summary

- 1.2.1 The survey area is approximately 143.6 hectares (ha) in size, 92.27ha of which lies within the red line boundary of the development. The approximate centre of the site is at OS Grid Ref. SN 543 048. Figure 1 shows a map of the survey area.
- 1.2.2 The site is located in Carmarthenshire, South Wales, approximately 6 km north of the town of Llanelli and consists of improved/poor semi-improved pasture grassland and wetter rush dominated areas interspersed with native broadleaf woodland, species-rich hedgerows with ditches and streams and the Afon Morlais flows through the site. It is surrounded by farmland and the west of the site is partly bounded by the A476 on the western boundary.





2 SURVEY AND ASSESSMENT METHODOLOGY

2.1 Data Search

- 2.1.1 Statutory designated sites within proximity of the Site were identified using the Natural England/DEFRA web-based MAGIC database (www.MAGIC.gov.uk).
- 2.1.2 Ordnance Survey maps (1:25,000) and aerial images of the Site were examined online (bing.com/maps and maps.google.co.uk).
- 2.1.3 The West Wales Biodiversity Information Centre (WWBIC) was consulted for records of protected and notable species within 1km of the site. The records centre was also asked to provide details of designated sites within 1km of the site. The search for bat records was limited to a 1km buffer as the impacts on this taxon are not thought to be significant, therefore, an extended search was not required.

2.2 Field Survey

Personnel

- 2.2.1 The ecological surveys were undertaken by:
- Gregor Neeve ACIEEM who has 6 years' experience undertaking ecological surveys and has a BSc in a relevant subject.
 - Hannah Montag MCIEEM who has 15 years' experience undertaking ecological surveys and has a BSc and MSc in relevant subjects. Hannah holds a licence for the survey of bats (Natural Resources Wales Licence 61304:OTH:CSAB:2017).
 - Jo Donnelly, MCIEEM who has 17 years' experience undertaking ecological surveys and has a BSc and MSc in relevant subjects. Jo holds a licence for the survey of bats (Natural Resources Wales Licence 78290:OTH:CSAB:2018).
 - Harry Fox, MCIEEM who has 10 years' experience undertaking ecological surveys and has a BSc in Ecology.
- 2.2.2 All above staff have been assessed under the Clarkson and Woods QA processes as competent to complete the survey.

Habitats

- 2.2.3 A habitat survey was carried out based on standard field methodology set out in the *Handbook for Phase 1 Habitat Survey* (2003 edition)¹.
- 2.2.4 Botanical names follow Stace (1997)² for higher plants and Edwards (1999)³ for bryophytes.

¹ Nature Conservancy Council. (1990 - 2003 edition). *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit*, Joint Nature Conservation Committee

² Stace, C. (1997). *New Flora of the British Isles Second Edition*. Cambridge University Press

³ Edwards, S.R. (1999). *English Names for British Bryophytes*. BBS, Cardiff



2.2.5 Habitats are mapped following the codes and conventions described within the Phase 1 Habitat Survey Handbook and Target Notes are used to describe habitats not readily conforming to recognised types and evidence of or suitability for protected species and species of conservation concern.

2.3 Protected and Notable Species

Badgers

2.3.1 A search was made for badger *Meles meles* setts, and sett entrances were checked for signs of use by badgers or other mammals. Setts were classified into the following categories; Main, Subsidiary, Annexe or Outlying. Main setts are typically large structures which constitute the principal shelter and breeding location for a single social group. Subsidiary setts are significant setts which receive regular or sporadic usage but are not the focal sett for a social group. Annexe setts are smaller structures closely associated with Main setts but are not connected by underground tunnels. Outlying setts are located away from other setts and usually comprise no more than two, infrequently used sett entrances.

2.3.2 Sett entrances are counted and mapped to record tunnel direction and their relative level of usage.

2.3.3 Field signs such as 'snuffle holes' (holes dug by badgers when searching for invertebrates), pathways through vegetation, 'latrines' (small pits in which badgers deposit their faeces) and 'day nests' (nests of bedding material made by badgers for sleeping above ground) were also mapped.

Bats

2.3.4 The assessment of the suitability of the site for foraging and roosting bats was based on current guidance set out by the Bat Conservation Trust⁴.

2.3.5 *Buildings*: the exteriors of the buildings were examined through the use of torches and binoculars for features capable of supporting roosting bats or allowing bats entry into potentially suitable roosting spaces beyond. Extra factors taken into consideration included the potential for noise disturbance to the potential roost feature, exposure to the elements, lighting levels, proximity/connectivity of vegetation and water and whether these features/apertures led on to cavities further into the structure.

2.3.6 *Trees*: an inspection of trees on site was carried out from the ground, using binoculars, to record any signs of use of the tree by bat species. Features such as frost cracks, rot cavities, flush cuts, split or decaying limbs (including hazard beams), loose bark and dense plates of ivy were inspected and recorded. Any signs of staining (from urine or fur rubbing) and scratch marks below potential access points were noted, and a search was made for droppings underneath these features.

2.3.7 *Habitat*: the habitats within the site were appraised for their suitability for use by foraging and commuting bats. In particular, the connectivity of the habitats on site to those lying beyond was taken into account. Vegetated linear features are typically important for many species to navigate around the landscape, while the presence of woodland, scrub, gardens, grassland and wetland features increases a site's foraging resource value to bats. The potential for noise or lighting disturbance which may affect commuting links was also recorded.

⁴ Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.



Dormice

- 2.3.8 Two dormouse nut searches were carried out on 13th and 28th January 2015. The first was undertaken by Harry Fox BSc MCIEEM and Mark Baker BSc MCIEEM and the second by Mark Baker BSc MCIEEM.
- 2.3.9 Surveys followed guidelines set out in the Dormouse Conservation Handbook (2006)⁵ where an area of woodland with fruiting hazel was selected and five grid squares of 10m by 10m were searched for 20 minutes each. This method was used in different areas during both visits. Nuts were identified in the field where possible, but nuts were also collected and verified by other dormouse experts in the Clarkson and Woods office including Andrew Ross MSc MCIEEM (holder of Natural Resources Wales dormouse class licence number 45679:OTH:SA:2013).

Water Vole and Otter

- 2.3.10 A search was made along the banks of water courses and water bodies and their adjacent habitats for otter *Lutra lutra* signs including spraints, tracks, castling, and rolling. The banks of any water courses were searched for the presence or potential for holts or other sheltering areas.
- 2.3.11 The banks of the water course were also searched for water vole *Arvicola amphibius* signs including latrines, burrow entrances, feeding stations, 'runways' and footprints.

Great Crested Newts

- 2.3.12 Consultation with Lindsey Rendle of Carmarthenshire County Council established that "There are currently no known records for GCN in Carmarthenshire [and] in the absence of any known populations and the considered absence from the county, we do not specify surveys to inform planning applications." Great-crested newts have therefore been scoped out of this assessment.

Reptiles

- 2.3.13 Features on site were assessed for their potential to provide suitable habitats for use by reptile species. These include rough, tussocky grassland, scrub, disturbed land or refugia such as wood piles, rubble or compost heaps. Where present, suitable existing refugia were inspected for sheltering reptiles, and the ground was scanned whilst walking to look for basking species.

Birds

- 2.3.14 Breeding and wintering bird surveys have been conducted within the site, the details of which are outlined in a separate Appendix.

Invasive Species

- 2.3.15 Invasive species, such as Japanese knotweed *Fallopia japonica* and Himalayan Balsam *Impatiens glandulifera* were searched for and recorded.

Other Notable Species and Species of Conservation Concern

- 2.3.16 Field signs indicating the presence of other species of conservation concern, such as hares *Lepus europaeus*, harvest mice *Micromys minutus* and hedgehogs *Erinaceus europaeus* (Species of Principal

⁵ Bright, P., Morris, P., and Mitchell-Jones, T. 2006. *Dormouse Conservation Handbook: Second Edition*. English Nature.



Importance under the NERC Act (2006)) were recorded. Habitats were also assessed for their potential to support such species.

2.4 Quality Assurance

- 2.4.1 All ecologists employed by Clarkson and Woods are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct⁶ when undertaking ecological work.
- 2.4.2 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)⁷.
- 2.4.3 This report has been prepared in accordance with the relevant British Standard: BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development⁸.

3 SURVEY LIMITATIONS

3.1 Desk Study

- 3.1.1 The data presented within the report should not be seen as exhaustive. Data obtained from within the search area is highly unlikely to constitute a complete record of habitats and species present within the search area. It is therefore possible that protected species may occur within the vicinity of the proposed development site that have not been identified within the desk study.
- 3.1.2 The data presented within the desk study section of this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

3.2 Badgers

- 3.2.1 Areas with dense ground cover (hedges, scrub, woodland etc. were examined closely. If impenetrable vegetation prevented entry then the perimeter was examined in order to detect badger paths suggesting a hidden sett within the area. It cannot be guaranteed that all the entrances have been located, especially if a small sett is currently inactive or used seasonally and concealed in an area of thick scrub. Badgers may dig new holes and create new setts in a very short space of time.

3.3 Bats

- 3.3.1 Bats are very small creatures, capable of accessing small spaces and it is possible that these animals, or their signs, might have been missed during the survey if they are normally present opportunistically or in small numbers for a short period of time each year.
- 3.3.2 Not all features in trees or buildings suitable for use by bats are visible from the ground and there may be no external evidence of use of features by bats; consequently it is only possible to make a best effort when carrying out such a survey.

⁶ CIEEM (2013). *Code of Professional Conduct*. www.cieem.net/professional-conduct.

⁷ CIEEM (2013). *Competencies for Species Survey (CSS)*. www.cieem.net/competencies-for-species-survey-css

⁸ The British Standards Institution (2013). *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*. BSI Standards Ltd.



3.4 General

- 3.4.1 This survey offers only a single 'snapshot' of the Site and takes no account of seasonal differences, or of any species which might choose to take up residence subsequently. At the same time a lack of signs of any particular species does not confirm its absence, merely that there was no indication of its presence during this survey.
- 3.4.2 If no action or development of this land takes place within twelve months of the date of this report, then the findings of this survey should be reviewed and may need to be updated. After three years the findings will be out of date and the full survey should be repeated.

4 RESULTS

4.1 Data Search – Designated Sites

International Designations within 5km of the Site

- 4.1.1 The Burry Inlet Special Protection Area (SPA) is located 3.2km south of the site. The site is designated due to internationally important numbers of overwintering Northern shoveler *Anas clypeata*, Eurasian teal *Anas crecca*, Eurasian wigeon *Anas penelope*, dunlin *Calidris alpina alpina*, red knot *Calidris canutus*, Eurasian oystercatcher *Haematopus ostralegus*, Eurasian curlew *Numenius arquata*, grey plover *Pluvialis squatarola*, common shelduck *Tadorna tadorna* and common redshank *Tringa tetanus*. The site also supports an internationally important assemblage of wintering birds with a 5 year mean peak of 34,962 waterfowl.
- 4.1.2 The Carmarthen Bay and Estuaries SAC is located 3.2km south west of the proposed development. The SAC was formally designated in December 2004 for having excellent European examples of six of the habitat and five of the species conservation features of interest listed in the Habitats Directive. The listed habitats are: Estuaries, Large shallow inlets and bays, Atlantic salt meadows, *Salicornia* and other annuals colonising mud and sand, Mudflats and sandflats not covered by seawater at low tide, and Sandbanks which are slightly covered by sea water all the time. Twaite Shad *Alosa fallax* are identified as an Annex II species forming a primary reason for selection. This species migrates through the estuary to access spawning areas on the Afon Tywi. Other Annex II species listed within the citation (but not identified as primary reasons for qualification are: Allis shad *Alosa alosa*; river lamprey *Lampetra fluviatilis*; sea lamprey *Petromyzon marinus*; and European otter.

National Designations within 2km of the Site

- 4.1.3 No nationally designated sites were identified within 2km of the site

Local Designations within 1km of the Site

- 4.1.4 Rhos Cefn Bryn Wildlife Trust Reserve was situated approximately 1km north east of the site, encompassing 6ha and consisting of unimproved acid grassland. This type of grassland is generally confined to west Wales and is a feature associated with Carmarthenshire and south Ceredigion. The reserve supports a population of the endangered and declining Marsh Fritillary butterfly *Euphydryas aurinia*, dormice, adders *Vipera berus*, common lizards *Zootoca vivipara* and supports a range of ground nesting birds such as meadow pipit *Anthus pratensis* and snipe *Gallinago gallinago*.



4.2 Data Search – Protected and Notable Species

4.2.1 Data was obtained from West Wales Biodiversity Information Centre on all notable species within 1km of the site boundary.

Badger

4.2.2 Five records of badgers were obtained from the data search within 1km of the site, the closest being within the site boundary. A single record of a sett within the south of the site was provided, dated 1993.

Bats

4.2.3 One undated record of a greater horseshoe bat *Rhinolophus ferrumequinum* was provided occurring 720m to the east of site. This was recorded as a bat hibernaculum and discovered as part of assessment of old mine adits for potential as bat roosts. A further record of an unidentified bat was made in 2008, also 720m east of the site.

Dormouse

4.2.4 Four records of dormice made since 2000 were obtained, the closest being approximately 300m south west of the site in Troserch Wood (found within a nestbox).

Reptiles

4.2.5 Adder *Vipera berus* has been recorded 1km east of the site in 2008 and 2009.

Birds

4.2.6 The bird species shown in Table 1 below have been recorded within 1km of the site boundary since 2000 and are listed under the Local Biodiversity Action Plan (LBAP), Species of Principal Importance (SPI)⁹ or BTO Birds of Conservation Concern red/amber lists¹⁰. Birds protected from disturbance during nesting (Schedule 1 under the Wildlife and Countryside Act 1981) are also included.

Table 1: Bird species recorded within 1km since 2000, arranged in order to proximity to the Site.

Common Name	Species Name	Designation	Distance and Direction from the Site (m)	Date
Starling	<i>Sturnus vulgaris</i>	SPI, BTO Red-list	300 southwest	28/01/2011
Lapwing	<i>Vanellus vanellus</i>	SPI, LBAP	900m northeast	07/06/2014
Red Kite	<i>Milvus milvus</i>	Schedule 1	200 west	07/09/2005
			500 southeast	22/01/2009
Goshawk	<i>Accipiter gentilis</i>	Schedule 1	500 southeast	22/01/2009
Redwing	<i>Turdus iliacus</i>	BTO Red-list	500 southeast	22/01/2009

⁹ Species of Principal Importance (SPI) are listed under the Environment (Wales) Act 2016 as Section 7 Priority Species

¹⁰ Red list species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. >50% in 25 years), or which have declined historically and not recovered. Amber list species are those whose population or range has declined moderately in recent years (>25% but <50% in 25 years) declined historically but recovered recently, rare breeders (fewer than 300 pairs), internationally important populations in the UK, localised populations and those with an unfavourable conservation status in Europe.



Common Name	Species Name	Designation	Distance and Direction from the Site (m)	Date
Willow Tit	Poecile montana	SPI, BTO Red-list	500 southeast	22/01/2009
Yellowhammer	Emberiza citrinella	SPI, LBAP, BTO Red-list	500 southeast	22/01/2009
Woodcock	Scolopax rusticola	BTO Amber-list	500 southeast	22/01/2009

Offer

4.2.7 Since 2000 there have been 159 records of spraint identified as that of the European otter within 1km of the site concentrated on the Afon Morlais river running through the site.

Other Notable Species

4.2.8 Several moth species which are listed under the Local Biodiversity Action Plan have been recorded within 1km of the site. The majority of the records are from Trosarch Wood, located to the south east of the site, the closest records include; beaded chestnut *Agrochola lychnidis*, autumnal rustic *Eugnorisma glareosa*, waved carpet *Hydrelia sylvata*, dot moth *Melanchra persicariae*, dusky thorn *Ennomos fuscantaria*, flounced chestnut *Agrochola helvola* and latticed heath *Chiasmia clathrata*. Small phoenix *Ecliptopera silaceata* has been recorded close to the Afon Morlais river where it bisects the site.

4.2.9 Meadow thistle *Cirsium dissectum*, a Local BAP species, was recorded within the site boundary in 1987, but no more recent records are available. All other species were associated with the woodlands at Trosarch Wood and adjacent to the Afon Morlais river.

4.2.10 Lemon slug *Malacolimax tenellus*, a Local BAP species, has been recorded within Trosarch Wood adjacent to the site.

4.3 Field Survey Results

4.3.1 The site consisted of farmland encompassing 31 fields bounded by hedgerows, ditches and woodland. A small number of farm buildings were located throughout the site and the Afon Morlais river ran from the north-west to the south-east and dissected the site.

4.3.2 The results of the ecological survey are shown on Figure 4 at the end of this section.

4.4 Habitats

Semi-Improved Grassland

4.4.1 A total of seventeen fields were classified as semi-improved grassland, meaning they had not been artificially fertilised for a time and so contained a higher diversity of species, particularly forbs. These had been previously recorded in 2014 as improved grassland which may have been partly due to the fact that the survey was undertaken in the winter and partly that the fields have been less intensively managed for the last four years.

4.4.2 Species recorded within the semi improved grassland included crested dogstail *Cynosurus cristatus*, meadow foxtail *Alopecurus pratensis*, sweet vernal grass *Anthoxanthum odoratum*, Yorksire fog *Holcus lanatus*, soft rush *Juncus effusus*, ragged robin *Lychnis flos-cuculi*, ribwort plantain *Plantago lanceolata*, creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, creeping buttercup *Ranunculus repens*,



meadow buttercup *Ranunculus acris*, cuckoo flower *Cardamine pratensis*, red clover *Trifolium pratense*, broad-leaved dock *Rumex obtusifolius* and silverweed *Argentina anserina*.

4.4.3 A photograph showing the semi-improved grassland habitat is shown below.



Photograph 1: Showing Semi Improved Grassland in Field F20 (June 2018)

Poor Semi-Improved Grassland

4.4.4 Four fields were classified as poor semi improved grassland where the sward was dominated by perennial ryegrass *Lolium perene* but some of the forbs listed above were starting to colonise. Over time, this grassland will revert back to semi-improved but it appears that it has been heavily grazed or fertilised more recently.

Improved Grassland

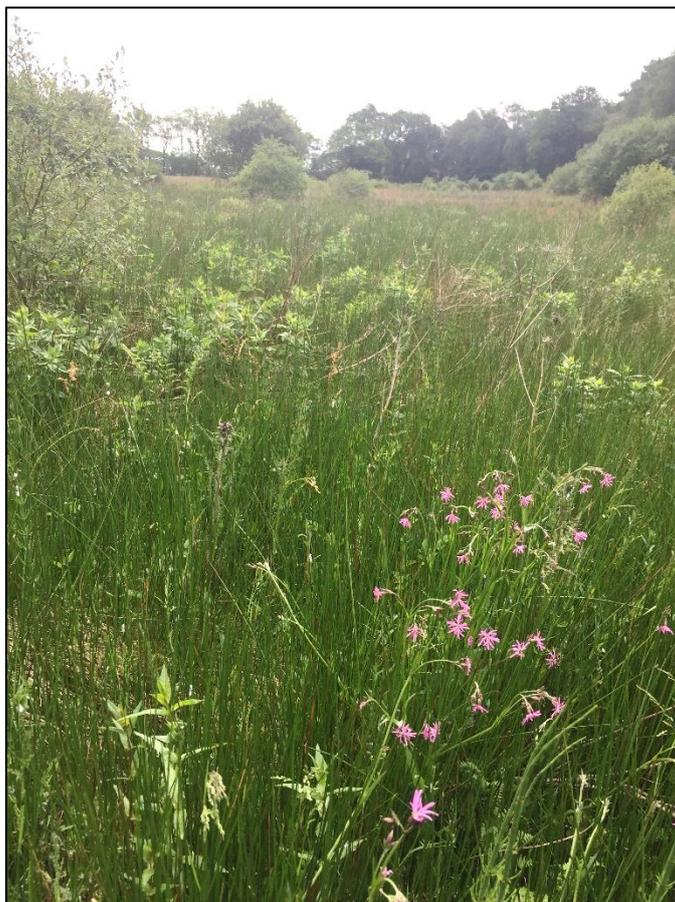
4.4.5 A total of seven fields were identified as improved grassland with evidence of heavy fertilisation through slurry spreading, which was more evident in 2014 but had possibly ceased in 2018. Sward species present included perennial rye-grass, creeping bent *Agrostis stolonifera*, Yorkshire-fog, crested dogstail, meadow buttercup, red clover, white clover *Trifolium repens*, broad-leaved plantain *Plantago major*, mouse-ear *Cerastium fontanum* and broad-leaved dock.

Fen

4.4.6 Field 12a was very wet with large amounts of Sphagnum moss present and dominated by dense soft rush with creeping bent, Yorkshire-fog, common sorrel *Rumex acetosa*, ragged robin, water mint *Mentha citrate*, marsh bedstraw *Galium palustre*, marsh forget-me-not *Myosotis scorpioides*, lesser spearwort *Ranunculus flammula*, red clover, hogweed *Heracleum sphondylium*, willow herb *Epilobium* sp., meadowsweet *Filipendula ulmaria* and marsh thistle *Cirsium palustre*. A photograph of this habitat is shown below.



- 4.4.7 In 2014, parts of Field 12a (approximately 40%) had been cut with the arisings left *in-situ*. During the update surveys there was no sign of management.



Photograph 2: Showing the Fen Habitat within Field 12a (June 2018)

Marshy grassland

- 4.4.8 Field F14 was comprised of dense soft rush during the update surveys, as well as more discreet low-lying patches within some of the other fields (as mapped in Figure 4). The marshy grassland areas comprised soft rush, ragged robin, bog pimpernel *Anagallis tenella*, greater birdsfoot trefoil *Lotus pedunculatus*, marsh forget-me-not, creeping Jenny *Lysimachia nummularia*, marsh thistle, marsh bedstraw and cuckoo flower.

Scrub

- 4.4.9 Field 12b had evidence of being cleared of scrub in some areas in both the 2014 and 2018 surveys but the remnant vegetation on the ground suggested it had recently been dominated by bramble *Rubus fruticosus agg.* and gorse *Ulex europaeus* scrub.
- 4.4.10 The northern end of Field 13 was dominated by a mosaic of gorse scrub and grassland. This habitat mosaic was considered to provide suitable habitat for basking and foraging reptiles (described further below).
- 4.4.11 Field 16 had a dense area of bramble and gorse scrub at its central, southern boundary.

Ditches

4.4.12 Ditches were present along a majority of the site boundaries, some of which were wet with flowing water, particularly during the winter months, as shown in the photograph below. These larger ditches were mainly present in the north of the site, where they fed into the larger watercourses.



Photograph 3: Showing Wet Ditch (June 2018)

4.4.13 Smaller ditches were also present at the field boundaries which were smaller, shallower and only likely to hold water during periods of very heavy rainfall, as shown in Photograph 4.



Photograph 4: Dry Ditch at Field Boundary (October 2014)



Rivers/Streams

- 4.4.14 The Afon Molais river flowed through the site and the redline boundary crosses this river at the location of a small bridge. The river is rocky and water depth varies throughout the year. The stream is located within an area of woodland.
- 4.4.15 A tributary of the Afon Dafen river flows adjacent to the site and is a small rocky stream with a low water depth in the summer months. The stream lies within a line of trees on the western boundary of Field F1 (Figure 4).

Ponds

- 4.4.16 Pond 1 (TN29 in Figure 3) was located to the north of the site and was a deep sink hole approximately 20m² and with steep vertical banks around 5m deep which were covered in dense bramble.
- 4.4.17 Pond 2 (TN34 in Figure 3) appeared to be man-made and comprised a large pond (approximately 250m²) with an island in the middle. It was surrounded by scrub comprising gorse, willow, bramble and birch.

Hedgerows

- 4.4.18 Seventy seven hedgerows were mapped during the survey, including a majority of species-rich hedgerows with fewer species-poor hedgerows, illustrated in Figure 4 and described in Tables 2 and 3.

Table 2: Species Rich Hedgerow Descriptions

Hedgerow No.	Description
H1, H7, H11, H12, H14, H16, H17, H18, H24, H26, H27, H31, H36, H38, H40, H41, H44, H45, H48, H52, H55, H56, H57, H58, H59, H60, H62, H67, H73, H74, H76	Species-rich hedgerow with trees - species include hawthorn <i>Crataegus monogyna</i> , ash <i>Fraxinus excelsior</i> , hazel <i>Corylus avellana</i> , holly <i>Ilex aquifolium</i> , pedunculate oak <i>Quercus robur</i> , blackthorn <i>Prunus spinosa</i> , willow <i>Salix</i> sp., and sycamore <i>Acer pseudoplatanus</i> . Ground flora include rush, bramble, common nettle <i>Urtica dioica</i> , red campion <i>Silene dioica</i> and herb Robert <i>Geranium robertianum</i>
H3, H5, H6, H8, H9, H10, H13, H19, H28, H29, H30, H32, H35, H42, H43, H53, H54, H61, H63, H68, H70, H71, H72, H75	Species-rich hedgerow without trees – includes similar species to those described above
H2, H4, H50, H51, H64	Defunct species-rich hedgerow with trees - containing some of the following: oak, gorse, birch <i>Betula</i> sp., holly and hazel, willow, hawthorn and dog rose <i>Rosa canina</i> Ground flora include rush, bramble, common nettle, red campion and herb Robert

Table 3: Species Poor Hedgerow Descriptions

Hedgerow Number	Description
H20, H21, H22, H23, H25, H39, H46, H49, H77, H78	Species-poor hedgerow with trees - containing some (not all) of the following: hazel, hawthorn, blackthorn, oak, willow, sycamore and ash



Hedgerow Number	Description
H37, H69	Species-poor hedgerow without trees - containing a combination of the following: hazel, hawthorn, blackthorn, oak, wych-elm <i>Ulmus glabra</i> , sycamore, beech <i>Fagus sylvatica</i> , holly, <i>Rhododendron</i> sp., willow and ash.
H15, H33, H34, H47, H65, H66	Defunct species-poor hedgerow - with hawthorn and bramble

4.4.19 A number of the hedgerows had been recently flailed in 2014 and had continued to be well managed in 2018 and a majority were established on earth and rock hedge banks.

Woodland

4.4.20 Native broadleaved and plantation conifer woodland was present within the site and formed a number of the site boundaries (Figure 4). Both woodland types were mature and the broadleaved woodland contained a wide variety of species including oak, ash, hazel, holly, sycamore and occasional beech. The conifer woodland comprised either larch *Larix* sp. and Scot's pine *Pinus sylvestris* (TN14 in Figure 4) or fir *Abies* sp. and spruce *Picea* sp.

4.4.21 During the 2018 update survey, additional ground flora species were recorded within the woodland and some of the hedgerows including bluebell *Hyacinthoides non-scripta*, wood anemone *Anemone nemorosa*, creeping Jenny, enchanters nightshade *Circaea lutetiana*, pignut *Conopodium majus*, red campion *Silene dioica* and foxglove *Digitalis purpurea*.

4.4.22 The Natural Resources Wales Ancient Woodland Inventory has identified the majority of the woodland within and adjacent to the site as Restored Ancient Woodland Sites (RAWS), which are likely to have continuously wooded for over 400 years but had previously been planted with non-native conifer species (but are now composed of more than 50% broadleaved).

Buildings

4.4.23 A number of buildings were recorded on site during the survey (B1 to B4, Figure 4).

Buildings 1 and 2

4.4.24 Buildings 1 and 2 were large steel-framed buildings used for housing cattle and animal feed but were largely empty at the time of survey.

4.4.25 Both buildings were constructed of concrete block walls approximately 1.8m high with slatted wood or corrugated metal sheets extending from the top of the walls to the roof line (approximately 6m high at the tallest point). The fronts of the buildings were open with a series of gates and wooden wind-breaks. The roofs were clad with corrugated metal roof sheets with east-west oriented roof pitches.

Building 3

4.4.26 Building 3 was a group of attached structures comprising the agricultural dairy buildings associated with Blaenhiraeth Farm. These were an assemblage of traditional stone buildings with modern concrete, asbestos and sheet metal structures used to house livestock, store animal feed and machinery and included a milking parlour and associated milk storage.



Building 4

- 4.4.27 This building was Blaenhiraeth Farmhouse and was inhabited at the time of survey. It comprised a rendered, two-storey building with modern-style concrete roof tiles covering a U-shaped pitched roof layout. The building and roof appeared to be in good condition with no obvious cracks or gaps, although the U-shaped roof obscured a large portion of the structure.

Building 5

- 4.4.28 This was a derelict stone building (TN32, Figure 4) in ruin with no roof, doors or windows and with only part of the walls remaining. The walls were heavily weathered with many deep mortar gaps.

4.5 Protected Species and Species of Conservation Concern

Badgers

- 4.5.1 Confidential information on badgers is provided in a separate addendum report.

Bats

- 4.5.2 The data search comprised just a single record of a greater horseshoe bat within 1km of the site, however, this low number of bat records is likely due to a lack of recorders within the area.

Roosting Bats

Buildings 1 and 2

- 4.5.3 An inspection of the interior and exterior of the buildings found no potential roost features and no signs of bat activity. Buildings 1 and 2 were therefore considered to be of negligible bat roost potential according to the BCT guidelines.

Building 3

- 4.5.4 Buildings B3 and B4 were considered to have low to moderate potential to support roosting bats, although a detailed internal inspection of these buildings could not be carried out as Building 4 was locked and Building 3 was in use at the time of survey, with heavy machinery in constant use throughout the buildings preventing a detailed survey being completed safely.
- 4.5.5 No evidence of bat activity was found associated with this group of structures although they may contain features suitable for crevice-dwelling bats in timber roof joints and under tiles. In addition the second storey of the traditional two storey stone barn to the south-west could potentially be accessed by bats through a disused hayloft door and the dark nature of the internal space was considered to be suitable as a feeding perch or roost for species including horseshoe and long-eared bats. This group of buildings was considered to have low to moderate potential to support roosting bats according to the BCT Guidelines.

Building 4

- 4.5.6 No evidence of bat activity was noted, however the complex roof-structure of the building may provide suitable roosting potential for species such as brown long-eared. Although no obvious potential roost access points were noted, the design of the roof meant that much of the structure could not be inspected from the ground and any potential roost features may not have been visible. The building was considered to have low to moderate potential to support roosting bats according to the BCT Guidelines.



Building 5

- 4.5.7 The remnant stone walls of this building contained many deep mortar gaps potentially suitable for crevice roosting bats, although no signs of bats, such as droppings or grease marks, were found. The building was considered to have low potential to support roosting bats according to the BCT Guidelines.

Bridge

- 4.5.8 A stone bridge provided a road crossing point over the river Afon Morlais (TN45, Figure 4). The bridge contained a large number of crevices which may be suitable for roosting bats, particularly species such as Daubenton's *Myotis daubentonii*, which are associated with riparian habitats. This structure was considered to be of moderate potential for roosting bats according to the BCT guidelines.
- 4.5.9 The bridge was subject to a more detailed fibre-scope survey on 5th July 2018 by licenced bat workers. The bridge is divided into two arches. The northernmost is approximately 6m long, 3m wide and 2.5m high. Numerous (approximately 9) extensive holes were identified in the interior walls extending between 15 and 40+cm into the structure. Most of these crevices were of either moderate or high suitability for hibernation, moderate suitability for day roosting and low suitability for maternity. Approximately 90% of these crevices were inspected using an endoscope and high powered torch. No evidence of bats was found.
- 4.5.10 The southernmost arch was approximately 6m long, 5m wide and 3.5m high. Again, numerous slots and cavities were identified and were of a similar depth and suitability for bats as the northern arch, but only about 50% investigable due to grey wagtail *Motacilla cinerea* chicks in a nest in one cavity. No evidence of bats was found.



Photograph 5: Stone Bridge Crossing River Afon Morlais with Crevices Suitable for Roosting Bats



Woodland and Trees

4.5.11 A number of trees with potential bat roost features were noted throughout the site including:

- A semi-mature pedunculate oak tree (TN12 in Figure 4) was situated in Field 8 but outside of the site boundary. Potential roost features included a tear-out and knot holes on the north-west and northern face of the trunk and branches, approximately 2m from the ground. The tree was assessed as having moderate roosting suitability according to the BCT guidelines.
- A mature beech tree (TN13 in Figure 4) was located in the Hedgerow 20 and had a tear-out on the southern face of the trunk with a cavity extending upwards into the trunk approximately 1.7m from the ground. The tree was assessed as having moderate roosting suitability according to the BCT guidelines.
- A silver birch *Betula pendula* tree (TN26 in Figure 4) contained a cavity offering a potential roost feature on the south-west side of the trunk, approximately 1.8m high and as such was assessed as having moderate roosting suitability according to the BCT guidelines.
- Mature oak, chestnut *Castanea sativa* and sycamore woodland (TN30 in Figure 4) with many trees with potential roost features in various cavities. The woodland as a whole was assessed as having high roosting suitability according to the BCT guidelines.
- A mature ash tree (TN32 in Figure 4), located adjacent to and east of a derelict stone building, was completely hollow with many other cavities and holes in the trunk and branches providing suitable roost features all around the tree. The tree was assessed as having high roosting suitability according to the BCT guidelines.
- The site contained and was surrounded by large tracts of mature woodland and it is highly likely that these woodlands contained a number of potential roost features. The extent of the woodland on site meant an inspection of every tree was not practicable as a part of this survey.

Foraging and Commuting Bats

4.5.12 The site consisted of a range of habitats likely to support foraging and commuting bats, including tall species-rich hedgerows, scrub, tree-lined river valleys and ditches, native and non-native woodland, open pasture grassland, fen and marshy grassland. Given the range of habitat types on site and linear connectivity to the wider landscape, it is considered that the site as a whole has high potential value for commuting and foraging bats according to the BCT guidelines.

Dormice

4.5.13 The site contained many dense, species-rich, native hedgerows connected to broadleaved native woodland, with both hedgerows and woodland containing species, including hazel, commonly associated with dormice.

4.5.14 The presence of dormice has been confirmed by the discovery of four hazel nuts within Gelli-wernen Wood (TN42 in Figure 4) in 2014 which had been gnawed by this species. The abundant suitable habitat and good connectivity to the woodland throughout the site indicate that hedgerows are likely to support dormice dispersing from the woodland. This woodland is also connected to Troserch Wood, where a dormouse was found within a box approximately 300m from the site.



Water Vole and Otter

- 4.5.15 No signs of otters or water voles were recorded during the survey however the ditches and rivers running through the site were considered to be suitable for otters to navigate through the landscape and the dense hedgerows and woodland provided opportunities for otters to rest and shelter. The data search confirmed that otters regularly use the Afon Morlais river running through the site.
- 4.5.16 No records of water vole were identified within the data search. Water voles tend to prefer slow-flowing, un-shaded, deeper water habitats. The ditches and rivers on site were all fast flowing and mostly shaded by thick hedgerows, scrub and woodland and were largely considered unsuitable. It was noted during the 2018 surveys that during the summer many of the ditches were dry during the survey, indicating that they are ephemeral in nature and so would be sub-optimal for water vole. The deepest ditches held 10cm or less of water and flowed on very rocky substrates (a more detailed survey of the ditches was conducted on 4th July 2018). Photographs 3 and 4 in the *Ditches* section above show the typical ditches on the site; the majority were small ditches which are ephemeral in nature and so likely to only hold water during very heavy rainfall. There were a small number of larger ditches in the north of the site, however, as Photograph 4 shows, the ditches were rocky, which water voles tend to avoid¹¹. In addition, water voles prefer deeper water and the ditches were shallow with water levels which fluctuate greatly. It is considered that the small number of wet ditches on the site offer unsuitable habitat for water voles.
- 4.5.17 The stream running through the site (Afon Dafen tributary, as shown in Figure 4) flows under the ground when it reaches the site through fields F14 and F12a, so no open water is visible, making it unsuitable for water vole and otter.
- 4.5.18 The Afon Morlais river (shown in Photograph 6) crosses the site under a bridge (as shown in TN45, Figure 4). The river at this point is fast flowing and very shallow during the summer months, with very little bankside vegetation. It is considered unsuitable for water voles at this point but may be more suitable up or down stream. This river is considered to be most suitable for otters, although no spraints have been recorded at the bridge, where there are suitable marking substrates which otters are known to favour. A photograph of this river habitat is shown overleaf.

¹¹ Strachan, R. , Moorhouse, T. , Gelling, M. 2011. Water Vole Conservation Handbook, Third Ed. WildCRU, University of Oxford



Photograph 6: River Afon Morlais (February 2015)

Birds

- 4.5.19 The site was considered to be suitable for both wintering and breeding birds, some of which may be notable species. Further surveys have been carried out, the results of which are given in separate reports.

Reptiles

- 4.5.20 Reptiles are known to use mosaics of habitat where they can shelter and forage in dense vegetation cover but emerge to bask in areas of less dense vegetation. The site contained a number of habitats considered suitable for more widespread species of reptiles including slow worm, common lizard, adder and grass snake to forage, bask, breed and shelter. Adders have been recorded 1km from the site.
- 4.5.21 Areas of particular suitability for reptiles included within marshy grassland (F12a) as well as an area of scattered scrub (Field 13, TN4 in Figure 4). Wet flush areas of tussocky grassland at the field boundaries were considered suitable for foraging but not for resting or hibernating reptiles due to the high levels of grazing and agricultural management. Grass snakes are particularly associated with wet habitat and, given the presence of wet habitats on site, particularly the marshy grassland in Field 12a, this species in particular was considered likely to be present.
- 4.5.22 Reptiles are known to be dissuaded from short vegetation (for example close mown or grazed grass) due to the risks of predation. The sward in the improved grassland fields on site was short at the time of survey and it was considered unlikely that reptiles were present within main bodies of the fields. Reptile suitability within the fields was therefore limited to wet, tussocky margins with and at the edge of hedgerows and woodland.



Invertebrates

- 4.5.23 The site contained a range of habitats, including woodland and hedgerows with dead wood and leaf-litter, grassland fields, marshy grassland, wet ditches and rivers that are likely to support a diversity of terrestrial and aquatic invertebrate species.
- 4.5.24 During the surveys, several common and widespread species of butterfly were observed, however, no notable species were recorded. The data search revealed a number of notable moth species close to the site, however, nocturnal invertebrate species would not have been identified during the survey.
- 4.5.25 The marshy grassland/ fen habitat was considered to have potential to support marsh fritillary butterfly and this species is known to be present approximately 1km north of the site in Rhos Cefn Bryn Wildlife Trust Reserve. To a lesser extent, wet, tussocky grassland areas at the field margins were also potentially suitable dependent on the presence of devil's-bit scabious *Succisa pratensis* which caterpillars of this species are usually reliant upon. This plant species has not been recorded during any of the site visits, both in 2014 and 2018, however, this species flowers late in the summer and so it is acknowledged that the site visits did not coincide with the main flowering period when this plant is most visible.
- 4.5.26 A follow up walkover of the site was conducted on 28/08/2018 in order to search for devil's-bit scabious (during the main flowering period) and the most diverse wetter areas were checked. This species was not identified, although some of the rush had been cut at the time of the survey. Additionally, a site meeting was conducted on 01/05/2019 with Amanda Evans, Conservation Project Officer for Parc Coetir Mynydd Mawr, the nearby marsh fritillary site. She confirmed that the habitat within the proposed development boundary was not suitable for marsh fritillary and that they are unlikely to be present.

Other Protected Species, Species of Conservation Concern and Invasive Species

- 4.5.27 The hedgerows and woodland on site were potentially suitable for foraging and hibernating hedgehogs, however, the wet nature of much of the site may deter them from using it. Urban and suburban areas are strongholds for hedgehogs and the site lies within a very rural area with no settlements closeby. Also, given the notable presence of badgers with active setts and foraging signs throughout the site, they may be further deterred given that badgers are a significant predator of this species. It is therefore considered that they are unlikely to be present.
- 4.5.28 The mosaic of grassland and woodland habitats were suitable for brown hare, however, this species was not identified during any of the numerous visits to the site and no records were identified within the data search. It is therefore considered to be absent.
- 4.5.29 The habitat was considered suitable for polecats, which have a historical stronghold in mid-Wales. Polecats are associated with farmland and the farm buildings as well as the mosaic of grassland, woodland and hedgerow would be suitable for this species. There was some evidence of the presence of rabbits within the site; polecats predate this species and use their burrows.
- 4.5.30 Several deep ponds were identified within and adjacent to the site which may be suitable for common toad *Bufo bufo*.
- 4.5.31 No Japanese knotweed or Himalayan balsam was noted within the site during the survey. Rhododendron was recorded within the hedgerows at Field F9. This is a non-native species which can be very invasive.

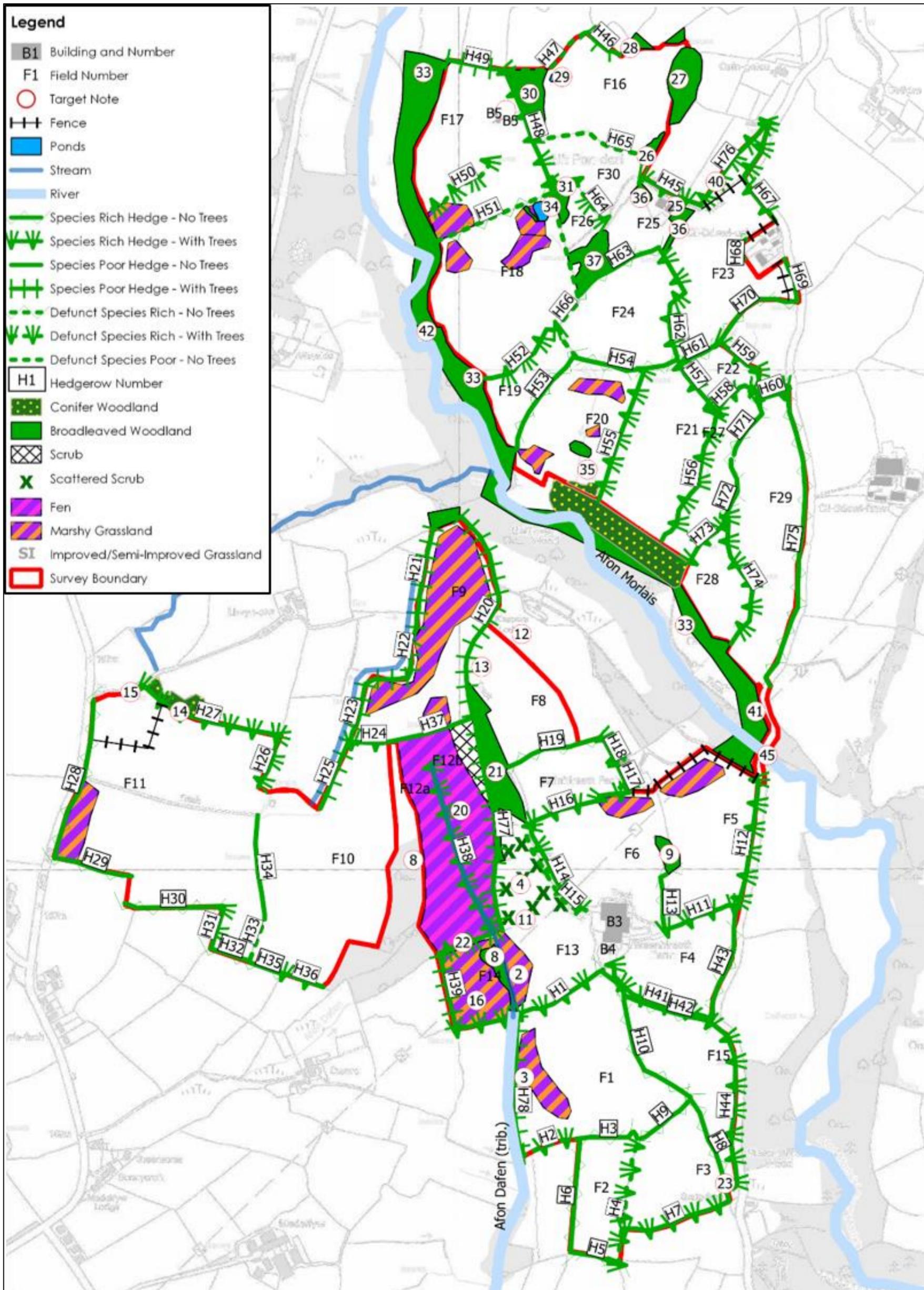


Figure 4: Phase 1 Map of Site (Target Notes Overleaf)



Table 4: Target Notes

No.	Description
TN1	<i>Not shown on map - Information provided in addendum report.</i>
TN2	Native broadleaved woodland. Species include alder <i>Alnus glutinosa</i> , birch, willow, sycamore, holly and oak.
TN3	Treeline comprising alder, approximately 5m tall. The river behind (tributary of Afon Dafen) was fast flowing and shaded.
TN4	Scattered gorse scrub within a grassland field providing a habitat mosaic suitable for foraging and basking reptiles.
TN5	<i>Not shown on map - Information provided in addendum report.</i>
TN6	<i>Not shown on map - Information provided in addendum report.</i>
TN7	<i>Not shown on map - Information provided in addendum report.</i>
TN8	Willow carr with mature willow, alder, oak and birch.
TN9	Copse of oak and beech with holly and hawthorn
TN10	<i>Not shown on map - Information provided in addendum report.</i>
TN11	Mature oak tree in a field - no potential roost features for bats were found.
TN12	Semi-mature oak - potential roost features included a tear-out and knot holes on the north-west and northern face of the trunk and branches, approximately 2m from the ground. Moderate suitability for roosting bats.
TN13	Tree line approximately 10m high comprising oak, beech and hazel with a bramble understory. Potential bat roost feature in a beech tree near the centre with a tear-out on the southern face of the trunk with a cavity extending upwards into the trunk approximately 1.7m from the ground. Moderate suitability.
TN14	Pine copse including larch and Scot's pine.
TN15	Tree line of willow and oak along a track.
TN16	Field F14 had become dominated by soft rush – the spread was far greater than in 2014.
TN17	<i>Not shown on map - Information provided in addendum report.</i>
TN18	Mature native oak woodland with ash, hazel, holly and hawthorn.
TN19	<i>Not shown on map - Information provided in addendum report.</i>
TN20	Field 12a comprised fen habitat associated with the Afon Dafen (trib.) stream. It was dominated by soft rush and Sphagnum moss.
TN21	Mature native broadleaved woodland including sycamore, hazel, ash and oak.
TN22	Treeline – 10m tall comprising oak and willow.
TN23	Open copse of oak with native bluebell understory.
TN24	<i>Not shown on map - Information provided in addendum report.</i>
TN25	Two steel-framed agricultural barns with corrugated metal roofs, open sided (Buildings 1 and 2).
TN26	Scattered trees including oak, ash and birch along the field boundary. One birch tree had a potential bat roost feature in the south-west side of the trunk, approximately 1.8m high. Moderate suitability for roosting bats.
TN27	Mature native woodland, very wet with birch, oak and hazel.
TN28	Mature native woodland, very wet with birch, oak and hazel as well as some conifer species (spruce and larch).



TN29	Pond 1. Approximately 5m deep sink hole adjacent to woodland with a pond at the bottom. Banks very steep and covered with bramble.
TN30	Mature ash, chestnut and sycamore woodland with many potential bat roost features in tree cavities.
TN31	Mature oak, ash, and sycamore woodland.
TN32	Old derelict remains of stone buildings (Building 5). Low bat roost potential in mortar gaps in walls. Large dying ash adjacent with potential roost feature in a hollow trunk with many other cavities and holes in the trunk and branches providing suitable roost features all around the tree. High bat roost potential.
TN33	Mature native woodland with species including oak, hazel, willow, birch, holly and ash.
TN34	Pond 2. Appears to be man-made with a small island. Surrounding Vegetation consisted of gorse, willow, bramble and birch.
TN35	Mature stand of oak woodland in Field 20 with a stream running through the middle. Limited reptile basking, foraging and sheltering potential within woodland and around a rubble pile at the south-east edge.
TN36	Copse of native, mature woodland including oak, birch, hazel and willow.
TN37	Mature, native, wet woodland. Oak and birch with bramble understory.
TN38	<i>Not shown on map - Information provided in addendum report.</i>
TN39	<i>Not shown on map - Information provided in addendum report.</i>
TN40	H76 leads into a willow carr at the south west end. Mammal paths running in and out of hedge were noted.
TN41	Pond 3. In woodland on the edge of site boundary. Large, mature poplar trees growing at centre.
TN42	Dormouse nut search carried out in 2015; four nuts found which showed characteristic signs of being opened by dormice
TN43	<i>Not shown on map - Information provided in addendum report.</i>
TN44	<i>Not shown on map - Information provided in addendum report.</i>
TN45	Stone bridge where road crosses Afon Morlais river. Lots of crevices – suitable for roosting bats and nesting birds (see Photograph 4)
TN46	<i>Not shown on map - Information provided in addendum report.</i>



5 SUMMARY

5.1.1 The survey revealed a mosaic of habitats within the site:

- Semi-improved grassland
- Poor semi-improved grassland
- Improved grassland
- Fen
- Marshy grassland
- Scrub (very small areas)
- Watercourses
- Hedgerows
- Woodland
- Buildings (will not be affected by the proposals)

5.1.2 Of these, the semi-improved grassland and fen habitats were particularly diverse. The woodland and hedgerows supported a range of species, and several hedgerows were also species rich and 'Important' under the Hedgerow Regulations.

5.1.3 The presence of several notable species were also confirmed or assumed:

- Badger (confirmed)
- Bats (assumed)
- Dormice (confirmed)
- Otter (confirmed)
- Birds (see separate report)
- Reptiles (assumed)
- Polecats (assumed)
- Common toad (assumed)

5.1.4 Evidence of badger was observed throughout the site and several active setts were recorded.

5.1.5 Bats are assumed to forage within the site and several trees have been identified as suitable to support roosting bats. They may also roost in buildings close to the site. Further surveys for bats have not been carried out and their presence remains assumed; this is due to the fact that the development is not likely to have a significant impact on foraging or roosting habitats. This approach has been agreed with the LPA ecologist.

5.1.6 Dormouse has been confirmed as using the woodland on the site and is likely to be present within the hedgerow network.



- 5.1.7 Otters are confirmed as using the river Afon Morlais, but may use ditches on the site for foraging and commuting. Specific otter survey were not considered necessary given the number of records identified within the data search.
- 5.1.8 Discrete areas of reptile habitat was observed including rock outcrops, marshy grassland, fen and field boundaries. The majority of this habitat lies outside the development footprint, therefore, specific surveys for reptiles have not been undertaken and their presence is assumed.
- 5.1.9 Polecats and toads are also assumed to be present within the site and no specific survey have been carried out.

APPENDIX 7.2

WINTERING BIRDS SURVEY

WINTERING BIRD SURVEYS

PENDRI FARM, LLANGENNECH, CARMARTHENSHIRE

carried out by



commissioned by

VOLTALIA UK LTD.

JULY 2018



WINTERING BIRD SURVEYS

PENDERI FARM, LLANGENNECH, CARMARTHENSHIRE

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Author	Mike Hockey			
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The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. (previously Michael Woods Associates) was commissioned by Voltalia UK Ltd to carry out wintering bird surveys of land at Penderi Farm in Llangennech, Carmarthenshire.
- 1.1.2 Surveys were previously carried out in 2015, however, the submission of a planning application was delayed. Therefore, update surveys have been undertaken.
- 1.1.3 This Wintering Bird Survey Report 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.
- 1.1.4 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.

2 SURVEY AND ASSESSMENT METHODOLOGY

Personnel

- 2.1.1 All surveyors have been assessed under the Clarkson and Woods QA processes as competent to complete the surveys. The bird surveys were conducted by the following ecologists:
- Harry Fox MCIEEM. Harry has 10 years' experience undertaking ecological surveys and has a BSc in Ecology.
 - Mark Baker MCIEEM. Mark has over 11 years' experience undertaking ecological surveys and has a BSc in relevant subjects.
 - Steve Miller (affiliate member of CIEEM). Steve has over 20 years' experience conducting ecological surveys.

Survey Area

- 2.1.2 The survey area covered over 30 fields, small woodlands and agricultural plots and many hedgerows amounting to several kilometres. To ensure that any data analysis was meaningful and robust, a number of neighbouring fields were aggregated into survey zones for the purpose of data processing. The aggregated survey zones where possible included fields of a similar habitat character. Each of the three blocks of land designated for proposed arrays was classified into separate zones. The neighbouring land which was within the survey area, but not designated for solar development, was classified into four further zones. This was to enable comparisons to be made between the areas to be developed and the adjacent non-developed areas. These seven survey zones are set out on the map in Figure 1 overleaf. Descriptions of the survey zones are set out in Table 1 below.



2.1.3 Each survey zone contained largely grassland but also some small woodlands; several hedges and other features. The locations of birds recorded were categorised by which zone they occurred in and also whether they occurred in open grassland or woodland, on boundaries or in gorse (in Zone 6 only). This allows patterns in the relative usage of the site's habitats, both by the overall bird assemblage and by notable species, to be detected.

Table 1: Description of survey zones

Survey Zone	Habitat
1	<p>5 semi-improved and improved grassland fields in the northern-most part of the overall survey area. These were smaller fields with large hedgerows and were on top of the valley. Includes 4 small broad leaved woodlands. The zone includes a modern cattle housing unit.</p> <p>None of the proposed array falls within this zone.</p>
2	<p>8 semi-improved and improved grassland fields in the north of the site. These fields were larger and sloped down to towards the Afon Morlais river. The south-western edge of the zone is almost entirely woodland edge of which the majority is broadleaved woodland. A medium sized pond has been constructed in the zone within the last 10 years.</p> <p>The majority of this zone is proposed for construction of the array, apart from the northernmost field and a buffer along the south-western woodland edge.</p>
3	<p>7 semi-improved and improved grassland fields in the southern part of the site. These fields were fairly large and on a slope towards the Afon Morlais river, but did not contain the woodland edge as Zone 2. Contains semi- natural broadleaved one copse. Bounded to the east side by a road with a low cut species rich hedge. Blaenhiraeth Farm is situated in the centre of this zone.</p> <p>Only a small part of the westernmost section of this zone is proposed for construction of the array.</p>
4	<p>2 fields of semi-improved and poor semi-improved grassland, which are large and open.</p> <p>The majority of this zone is proposed for construction of the array.</p>
5	<p>Fen habitat within a single field dominated by Sphagnum moss and rush. A stream, which is lined with birch (<i>Betula pendula</i>) trees, runs though the centre of the field. Part of the western boundary is broadleaved woodland.</p> <p>No construction is proposed within this zone.</p>
6	<p>One marshy grassland field dominated by rush and one poor semi-improved field with gorse dominated scrub and a small copse.</p> <p>No construction is proposed within this zone.</p>
7	<p>Three large, open fields of semi-improved and improved pasture typified by species poor hedgerow with or without trees. Part of the eastern boundary of the zone is broadleaved woodland and the western boundary borders a road.</p> <p>The majority of this zone is proposed for construction of the array.</p>

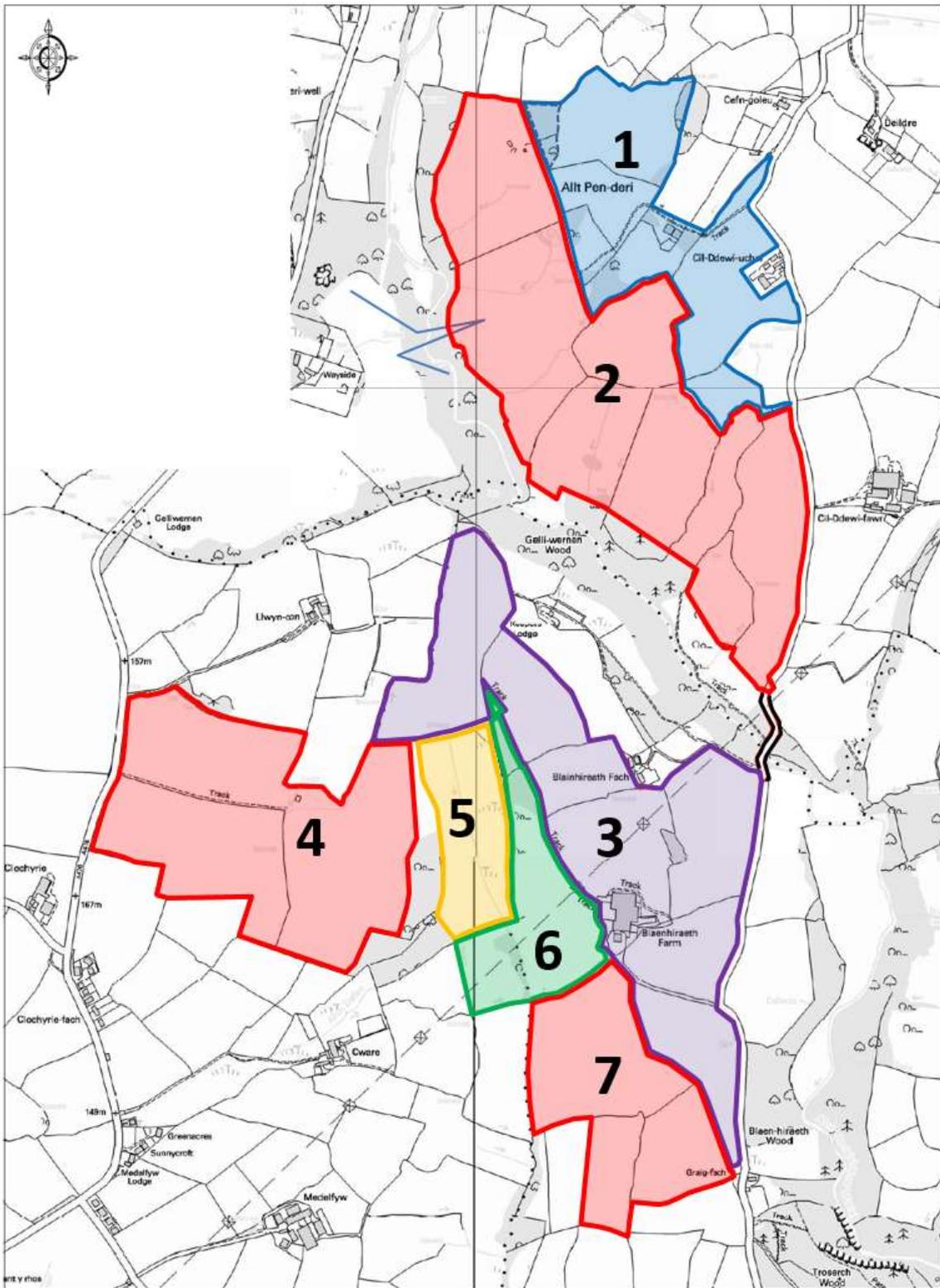


Figure 1: Survey Zones (The majority of the Red zones fall within the footprint of the development)



Survey Timings and Protocol

2.1.4 The site was surveyed for wintering birds four times from November 2017 to February 2018, to identify which bird species were using the site during the winter and which habitats appeared to be of greatest value in terms of shelter and foraging.

2.1.5 The surveys were carried out on the following days, under the weather conditions described in Table 2 below.

Table 2: Dates and Weather Conditions during Wintering Bird Surveys

Survey Number	Date	Description of weather (Precipitation; Cloud (Oktas); Wind [Beaufort Scale])	Temperature (°C)
1	28/11/17	Light showers, sunny with cloud 4–8/8, wind 2/12	6
2	18/12/17	Dry, cloud 4/8, wind 2/12	4 to 10
3	16/01/18	Dry, cloud 7/8, wind 2–6/12	2 to 6
4	27/02/18	Occasional light snow flurries, cloud 3–6/8, wind 2/12	-2 to 4

2.1.6 The survey followed BTO guidelines, where the observer systematically walked through the site, ensuring that all points on site were visited to within 50m. The location and behaviour of all birds and flocks of birds seen was noted on large-scale survey maps which were later collated onto master maps for interpretation.



3 SURVEY LIMITATIONS

3.1 Survey

3.1.1 Nocturnal bird surveys were not undertaken and as such the activity on site of birds such as owls cannot be determined. In lieu of survey data, a judgement has been made based on the results of the data search and the presumed value of the habitats on site to such species.

3.1.2 The surveys offer only 'snapshots' of the Site and whilst trying to account for seasonal differences, may miss certain species which attend the site infrequently or which might choose to take up residence subsequent to completion of the surveys. At the same time a lack of signs of any particular species does not confirm its absence, merely that there was no indication of its presence during this survey.

3.2 General

3.2.1 If no action or development of this land takes place within twelve months of the date of this report, then the findings of this survey should be reviewed and may need to be updated. After three years the findings will be out of date and the full survey should be repeated.



4 RESULTS

4.1.1 The desk study, presented within the Extended Phase 1 report, identified only a low number of bird species within 1km of the site including starling, lapwing, red kite, goshawk, redwing, willow tit, yellowhammer and woodcock. All records, apart from the lapwing, were recorded during the winter months.

4.2 Field Survey

4.2.1 In total, 51 bird species (including woodpigeon which were not enumerated) were recorded during the survey visits. 22 of these were BTO Birds of Conservation Concern red/amber lists¹ or Species of Principal Importance (SPI)², comprising 12 'red listed' birds and 10 'amber listed' birds. 10 species were listed as being SPI for nature conservation and as such are capable of being material considerations within the planning process. The patterns of abundance and distribution of each of these species is discussed later in this section, with greatest detail given to birds of conservation concern and SPI.

4.2.2 Table 3 overleaf shows the numbers of species encountered across each survey visit with the peak count of sightings highlighted. This enables patterns in changing abundance of each species to be observed over the course of the winter period as well as the general level of association between the site and the species concerned. Table 4 shows the peak counts of species encountered across all the survey visits within each survey zone, subdivided by broad habitat type. In both tables an indication is given of the level of protection each species receives according to the above criteria (red, amber, SPI in bold).

¹ Red list species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. >50% in 25 years), or which have declined historically and not recovered. Amber list species are those whose population or range has declined moderately in recent years (>25% but <50% in 25 years) declined historically but recovered recently, rare breeders (fewer than 300 pairs), internationally important populations in the UK, localised populations and those with an unfavourable conservation status in Europe.

² Species of Principal Importance (SPI) are listed in section 7 of the Environment (Wales) Act



Table 3: Numbers of Each Species Recorded During Each Survey Visit

Species	Visit 1	Visit 2	Visit 3	Visit 4	Total
Canada goose	0	0	0	3	3
Mallard	3	0	0	4	7
Pheasant	3	2	1	1	7
Red Kite	0	1	0	0	1
Buzzard	3	1	1	3	8
Sparrowhawk	0	0	0	2	2
Kestrel	0	0	0	2	2
Snipe	2	50	70	85	207
Woodcock	2	0	2	5	9
Grey Plover	0	0	0	14	14
Lapwing	0	0	0	29	29
Herring gull	0	0	0	2	2
Lesser Black-backed Gull	4	0	0	0	4
Black-headed Gull	5	0	0	0	5
Great spotted woodpecker	3	4	3	2	12
Green woodpecker	1	0	0	0	1
Skylark	3	4	25	0	32
Meadow pipit	36	47	45	13	141
Pied wagtail	2	0	0	0	2
Grey Wagtail	0	2	0	0	2
Dunnock	5	16	2	11	34
Robin	23	56	10	35	124
Stonechat	0	1	0	0	1
Blackbird	25	70	13	29	137
Song thrush	2	2	0	1	5
Mistle thrush	12	6	9	6	33
Fieldfare	30	16	67	115	228
Redwing	153	72	5	501	731



Species	Visit 1	Visit 2	Visit 3	Visit 4	Total
Goldcrest	10	4	0	5	19
Wren	21	18	14	19	72
Nuthatch	4	5	3	5	17
Treecreeper	1	2	1	4	8
House sparrow	4	6	3	21	34
Blue tit	8	38	14	33	93
Great tit	8	15	5	13	41
Coal Tit	1	0	1	0	2
Long-tailed tit	8	12	0	6	26
Chaffinch	10	15	6	11	42
Bullfinch	7	3	2	11	23
Goldfinch	0	0	4	0	4
Linnet	0	0	3	0	3
Siskin	0	0	10	6	16
Starling	114	119	163	29	425
Jay	3	4	0	3	10
Jackdaw	20	14	15	4	53
Carrion crow	2	9	26	5	42
Raven	3	3	5	2	13
Rook	1	0	0	33	34
Magpie	0	3	2	1	6
Reed Bunting	0	2	0	0	2
Total Individuals	542	622	529	1074	2767
Number of Species	36	33	30	38	50

Note that wood pigeon were excluded from the survey. They were recorded as present on all visits but counts were not made.



Table 5: Results of the Wintering Bird Survey (Peak Counts of Birds within Each Habitat Type)

Species	ZONE 1			ZONE 2			ZONE 3			ZONE 4		ZONE 5		ZONE 6				ZONE 7	
	Open	Woodland	Boundaries	Open	Woodland	Boundaries	Open	Woodland	Boundaries	Open	Boundaries	Fen	Boundaries	Open	Woodland	Gorse	Boundaries	Open	Boundaries
Canada goose	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mallard	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pheasant	2	0	2	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Red Kite	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buzzard	1	0	0	2	0	0	3	0	0	1	0	0	0	0	0	0	0	1	0
Sparrowhawk	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kestrel	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Snipe	6	0	0	23	4	1	5	0	0	54	0	2	0	3	4	0	0	10	0
Woodcock	0	1	0	2	1	1	0	0	0	0	0	0	0	0	1	0	1	0	1
Grey Plover	0	0	0	12	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Lapwing	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0
Herring gull	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Lesser Black-backed Gull	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-headed Gull	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great spotted woodpecker	1	1	0	0	2	1	1	0	0	0	0	0	1	0	1	0	0	0	1
Green woodpecker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Skylark	1	0	0	3	0	0	0	0	0	25	0	0	0	0	0	0	0	2	0



Species	ZONE 1			ZONE 2			ZONE 3			ZONE 4		ZONE 5		ZONE 6				ZONE 7	
	Open	Woodland	Boundaries	Open	Woodland	Boundaries	Open	Woodland	Boundaries	Open	Boundaries	Fen	Boundaries	Open	Woodland	Gorse	Boundaries	Open	Boundaries
Meadow pipit	1	0	2	40	3	1	20	1	3	7	0	0	0	0	0	0	0	1	0
Pied wagtail	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grey Wagtail	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Dunnock	1	1	2	0	2	2	1	1	4	1	0	2	2	0	1	0	2	2	4
Robin	1	5	2	4	2	8	0	1	17	1	13	3	3	1	0	3	1	4	9
Stonechat	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blackbird	6	6	2	2	4	9	14	0	9	4	6	2	2	1	2	1	2	2	10
Song thrush	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	1
Mistle thrush	0	2	1	5	1	0	6	0	2	2	1	0	0	0	0	2	0	1	0
Fieldfare	95	2	6	20	4	5	12	0	0	45	1	0	0	1	0	6	0	2	0
Redwing	220	36	4	100	0	12	30	3	5	152	6	6	2	4	1	7	1	15	6
Goldcrest	0	2	0	0	9	0	1	0	1	0	2	1	0	0	0	0	0	0	0
Wren	1	3	1	1	3	2	1	1	6	0	3	2	3	1	6	0	2	0	3
Nuthatch	0	2	0	1	2	2	0	0	2	0	1	0	1	0	1	0	0	0	0
Treecreeper	0	1	0	1	0	0	0	1	1	0	0	0	0	0	1	1	0	0	0
House sparrow	0	4	3	0	0	0	0	0	19	0	0	0	0	0	0	0	3	0	0
Blue tit	0	1	2	0	2	5	0	2	11	0	8	3	1	0	2	1	1	0	6
Great tit	0	3	1	0	3	2	0	1	7	0	3	2	3	0	2	0	0	0	1



Species	ZONE 1			ZONE 2			ZONE 3			ZONE 4		ZONE 5		ZONE 6				ZONE 7	
	Open	Woodland	Boundaries	Open	Woodland	Boundaries	Open	Woodland	Boundaries	Open	Boundaries	Fen	Boundaries	Open	Woodland	Gorse	Boundaries	Open	Boundaries
Coal Tit	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-tailed tit	1	5	1	0	7	5	0	0	6	0	0	1	0	0	0	0	0	0	0
Chaffinch	2	3	0	1	6	0	1	2	6	1	3	1	1	0	1	0	1	1	1
Bullfinch	4	2	1	2	0	2	0	0	4	1	1	2	0	0	1	2	0	0	0
Goldfinch	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Linnet	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Siskin	0	0	0	0	6	0	0	0	0	0	0	6	0	0	0	0	0	0	4
Starling	8	25	1	80	2	0	34	0	52	59	0	0	0	1	0	7	0	29	0
Jay	0	1	2	0	1	1	1	0	1	0	0	0	0	1	0	0	0	0	0
Jackdaw	20	0	0	15	4	0	0	0	0	0	0	0	0	4	0	0	0	0	0
Carrion crow	0	2	1	13	0	2	3	0	0	3	0	0	0	12	0	0	0	2	3
Raven	2	0	0	2	0	0	2	0	0	1	1	0	0	1	0	0	0	2	0
Rook	0	0	1	0	0	0	0	0	0	0	0	0	0	32	1	0	0	0	0
Magpie	0	0	0	0	0	0	1	1	1	0	2	0	0	0	1	0	0	0	0
Reed Bunting	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Individuals	384	112	36	344	69	65	183	15	159	359	52	33	19	65	26	30	13	75	49
Number of Species	22	22	19	26	21	20	21	11	21	16	15	13	10	14	15	9	8	15	12



Overall Assemblage

4.2.3 The wintering bird assemblage was diverse: comprising typical species of woodland and hedgerows, as well as species characteristic of wetland and farmland. Fieldfare and redwing, winter visitors, were recorded in large numbers, and another winter visitor, grey plover, was recorded during Visit 4 only. Other species were residents, though numbers may be swelled by an influx of European birds.

Temporal Changes (within season)

4.2.4 Over the course of the four surveys, the level of usage of the site by certain species varied. During Visits 2 and 3, peak counts were recorded for 18 and 21 species respectively. This contrasts to the early and late winter surveys (Visits 1 and 4) where 14 and 13 peak counts were recorded. This suggests that for the majority of species, the site was most critical in the mid-winter period. However it must be noted that certain notable species were most abundant during Visit 4, towards the tail end of the winter period. The patterns for individual notable species are discussed below.

Temporal Changes (between years)

4.2.5 Surveys were previously carried out during 2015. A larger number of species were recorded in 2018, with the addition of the following red/amber species:

- Black headed gull
- Grey plover
- Lapwing
- Lesser black backed gull
- Reed bunting

4.2.6 The only notable bird recorded in 2015 and not in 2018 was marsh tit. A total of 46 species and 1,964 individuals were recorded in 2015, whereas 50 species and 2,767 individuals were recorded in 2018.

4.2.7 There was a general increase in both number of species and numbers of individuals in the various zones of the site, apart from the following decreases:

- Lower numbers of individual birds within the boundaries of Zone 2 (28 less)
- Lower numbers of individual birds within the open areas of Zone 3 (39 less)
- Lower numbers of both individual birds (12 less) and diversity of species (2 less) within the boundaries of Zone 5
- Lower numbers of individual birds within the boundaries of Zone 6 (4 less)

4.2.8 These changes are relatively insignificant and may be attributed to weather conditions.



Red-listed Species

Woodcock

- 4.2.9 Woodcock are a cryptic wading bird associated with woodland, where they shelter and nest. They will forage in pasture and arable fields for worms and insect larvae. They have declined sharply in recent years which may be due to the reduced availability of extensive areas of woodland.
- 4.2.10 Woodcock were recorded in low numbers on the edges of the woodland habitats, but occasionally in the more open areas of the site, adjacent to woodland. The site offers highly suitable habitat for woodcock and is likely to support greater numbers than indicated by the surveys as woodcock are more active at dawn and dusk; and therefore may have been missed.
- 4.2.11 Numbers recorded broadly corroborate the findings of the wintering bird surveys conducted in 2015 by Clarkson & Woods.

Lapwing

- 4.2.12 Lapwing are a wader found in wet pasture, arable habitats and around coasts. They typically require damp ground and pools to probe for invertebrates. They have declined in the last 50 years, mainly due to agricultural intensification. The lapwing is also a Species of Principal Importance under section 7 of the Environment (Wales) Act 2016.
- 4.2.13 Lapwing were recorded on one occasion only, in open habitats of Zone 3. This indicates that they are not likely to be present all year round but may use the site at certain times of year, either opportunistically or as conditions become suitable later in the winter.
- 4.2.14 Lapwing were not previously recorded on the site in winter of 2015.

Skylark

- 4.2.15 The skylark is a species mainly associated with arable habitats, grassland and moorland in the UK. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and range contraction thanks to habitat loss and changing farming practises. It is also a Species of Principal Importance under section 7 of the Environment (Wales) Act 2016.
- 4.2.16 Between 3 and 25 skylark were recorded on the first three visits with peak numbers in open habitats of Zone 4 during Visit 3. Large areas of the site are suitable for wintering skylark though it appears that only certain areas, likely those which are highest in elevation, are preferred for foraging. The site supports a moderate population of skylark which appear to move around in loose groups using the site's habitats and those of neighbouring land according to daily conditions and topography. Therefore the site can be considered a regularly used component of the local foraging resource for these birds.
- 4.2.17 Skylark numbers were slightly higher than the numbers recorded by the wintering bird surveys conducted in 2015.



Song thrush

- 4.2.18 The song thrush is associated with thick hedgerows, native woodland, damp ground, and grazed pasture. The bulk of the song thrush diet is earthworms and snails, particularly when insect larvae and berry crops are not available. Therefore, damp ground where these food sources are readily found is essential.
- 4.2.19 The UK song thrush population fell by 50% between 1970 and 2003. Loss of damp food-rich habitats, particularly in the summer, is thought to be the main cause of the decline on farmland. Song thrush is a Species of Principal Importance under section 7 of the Environment (Wales) Act 2016.
- 4.2.20 Song thrush were recorded in low numbers during each visit except Visit 3 in boundaries and woodland. This species holds large territories and it is likely that the site supports relatively low numbers over the winter.
- 4.2.21 Song thrush numbers were slightly lower than the numbers recorded by the wintering bird surveys conducted in 2015, which may be indicative of their continued decline.

Mistle thrush

- 4.2.22 Mistle thrush are associated with hedgerow and woodland, though will forage in open grassland too. They eat invertebrates but supplement their diet with berries in the autumn and winter. Their numbers and range have fallen in recent years.
- 4.2.23 They were recorded during each visit in moderate numbers, with a peak in open habitats of Zone 2. They were also recorded in each habitat type which reflects their broad ecology. The site appears to support a moderate wintering population.
- 4.2.24 Mistle thrush numbers were slightly higher than those recorded by the wintering bird surveys conducted in 2015.

Fieldfare

- 4.2.25 The fieldfare is a winter migrant associated with woodland, orchards and hedgerows, feeding on fruit and berries over the winter. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and range contraction.
- 4.2.26 Fieldfare were recorded in moderate numbers (16-67) on each survey visit, with a peak in Visit 4. They were found in boundary habitats and woodland but the largest flocks were recorded in open habitats of Zone 1. The site appears to support a moderate population of fieldfare and is a focus for foraging by these birds over the winter period.
- 4.2.27 Numbers recorded broadly corroborate the findings of the wintering bird surveys conducted in 2015.



Redwing

- 4.2.28 The redwing is associated with woodland, orchards, hedgerows and scrub; feeding on fruit and berries over the winter. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and wintering range contraction.
- 4.2.29 Redwing were recorded in high numbers (72-501) on each visit except Visit 3 when only 5 individuals were observed, indicating some movement across other valued habitat in the local area over time. The greatest numbers were observed on Visit 5. Open habitats contained the largest flocks, though redwing were also recorded in boundaries and woodland. The site appears to support a large population of redwing for which the site forms a key foraging resource.
- 4.2.30 Numbers were slightly higher than those recorded by the wintering bird surveys conducted in 2015.

House sparrow

- 4.2.31 House sparrow are a familiar species closely associate with urban habitats. They are red-listed due to significant recent decline, however the cause is unclear.
- 4.2.32 House sparrow were recorded in low numbers during each visit and were associated with boundary habitats primarily in Zones 1 and 3. The wider site does not support significant numbers of house sparrow but the farm buildings and surrounding hedgerows support a small to moderate population.
- 4.2.33 Numbers recorded broadly corroborate the findings of the wintering bird surveys conducted in 2015.

Starling

- 4.2.34 The starling is a familiar species often found in towns, gardens, farmland and woodland. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and range contraction. It is also a Species of Principal Importance under section 7 of the Environment (Wales) Act 2016.
- 4.2.35 Starling were present in moderate numbers during Visits 1 to 3, and low numbers during Visit 4. They were observed in greatest numbers in open habitats of Zone 2, though were also seen in woodland and boundaries. The site supports modest numbers of starling and is considered to be a component of the overall foraging resource in the local area during the winter months.
- 4.2.36 Smaller flocks of starling were observed than in 2015.

Amber-listed Species

Snipe

- 4.2.37 Snipe are found mainly in wet grassland, marsh and reedbeds. They are known for their characteristic zig-zag escape flight. This species is amber listed due to recent breeding and wintering population decline and range contraction.



4.2.38 High numbers (50 to 85) of snipe were observed on Visits 2 to 4, with low numbers in Visit 1, suggesting that winter populations of snipe were relatively late to accumulate or had congregated elsewhere early in the season. The fact that they remained throughout the season in good numbers provides evidence that the site is important to the population encountered. Snipe were mainly associated with open habitats; particularly in Zone 4. The site supports a reasonably large population of snipe.

4.2.39 Snipe numbers were substantially higher than in 2015.

Grey plover

4.2.40 Grey plovers are a wading species associated mainly with coastal habitats, though they will forage in pasture on migration. They are amber-listed due to recent breeding and wintering population decline, recent reduction in breeding and wintering range and for having an important non-breeding population. They are also a species associated with the Burry Inlet Special Protection Area (SPA) and Ramsar.

4.2.41 Grey plovers were observed on a single occasion using open habitats in Zones 2 and 6. The site is likely to represent an opportunistic foraging site for small numbers of migrating birds. Grey plovers were not previously recorded in 2015.

4.2.42 The location of the grey plover identified is shown in Figure 2 below.

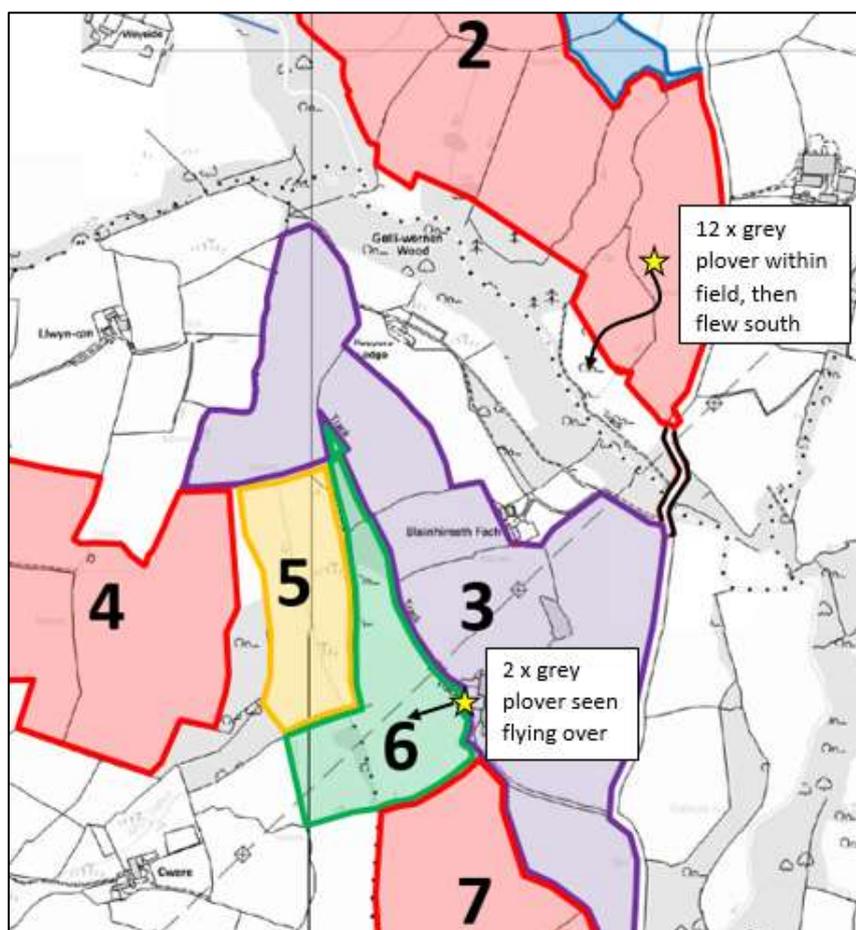


Figure 2: Location of Grey Plovers Recorded During Visit 4



4.2.43 The grey plover were recorded on 27/02/18 between 12-13:00 (the flock of 12) and the two individuals between 9-10:00. High tide was 16:18 and low tide at 11:24, therefore, the birds were observed at around the low tide mark. This shows that the birds are not likely to be using the site during times when the SPA to the south is under water and rather are using it opportunistically.

Meadow pipit

4.2.44 Like skylarks, meadow pipits are associated with open arable, grassland and heathland habitats, are ground dwelling birds and have undergone declines in recent years, hence their amber status.

4.2.45 Moderate numbers of these birds were consistently encountered in each visit; primarily in open habitats in Zone 2. The site appears to support a medium population of meadow pipit during the winter.

4.2.46 Numbers recorded broadly corroborate the findings of the wintering bird surveys conducted in 2015.

Dunnock

4.2.47 Dunnock inhabit any well vegetated areas with scrub, brambles and hedges, including field edges, earning their moniker "hedge sparrow". They spend large amounts of time on the ground in amongst grassland but also remain close to shrubby vegetation cover. Dunnock abundance fell substantially between the mid-1970s and mid-1980s, after a period of population stability. Some recovery has occurred throughout the UK since the late 1990s. Dunnock is an amber listed Species of Conservation Concern and a Species of Principal Importance under section 7 of the Environment (Wales) Act.

4.2.48 Dunnock were recorded in relatively low numbers in each survey zone and during each survey visit. This species is present all year round and the site does not appear to support high numbers over the winter.

4.2.49 Numbers recorded broadly corroborate the findings of the wintering bird surveys conducted in 2015.

Bullfinch

4.2.50 Bullfinch are found mainly in woodland and farmland, feeding primarily on fleshy seeds and buds. Bullfinch are amber listed as a Species of Conservation Concern due to recent breeding and wintering population decline and reduction in breeding and wintering range. It is also a Species of Principal Importance under section 7 of the Environment (Wales) Act.

4.2.51 This species was observed in relatively low numbers spread across the site, during each survey visit. The site appears to support a small to medium population of bullfinch.

4.2.52 Bullfinch numbers were slightly higher than in 2015, which may be indicative of their population recovery.



Other Birds of Conservation Concern

4.2.53 Individuals or small numbers of each of herring gull, grey wagtail and linnet (red-listed species) and mallard, kestrel, lesser black-backed gull, black-headed gull and reed bunting (amber-listed species) were recorded on one or two occasions and did not show a persistent association with the site. It is therefore likely that they are not present within the site throughout the winter but may use the site opportunistically.

Habitat Usage

All Species

4.2.54 The greatest number of individuals and species were recorded in open habitats. Similar numbers of species were recorded in the boundaries, though almost double the number of individuals were recorded in boundaries than woodland.

4.2.55 The highest numbers of individual birds were observed in the open areas of Zones 1, 2 and 4 (numbers in these Zones were boosted by very large flocks of redwing). The most diverse area was identified within the open areas of Zone 2, where a total of 26 species were recorded. This is unsurprising, as it represents a large area.

Birds of Conservation Concern

4.2.56 A map showing the number of red-listed species in each broad habitat type (Open, Woodland, Gorse and Boundaries) within each survey zone is displayed in Figure 2 below. Please note that data within each zone are amalgamated (so it does not show diversity on a field by field or hedgerow by hedgerow basis). This allows some degree of judgement to be made as to the areas of the site which support the greatest diversity of the most threatened bird species.

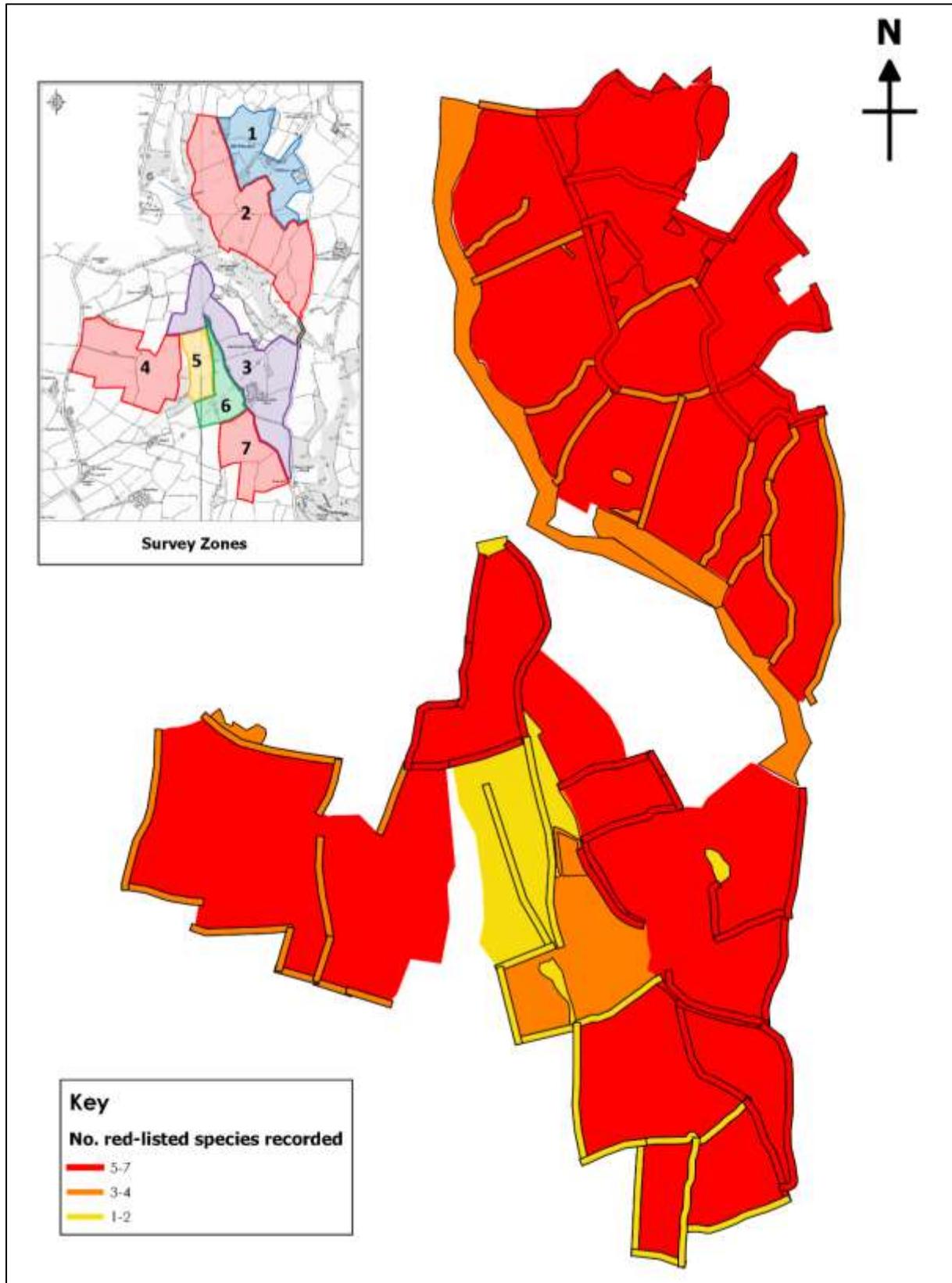


Figure 2: Diversity of red-listed species in different survey zones of the site, subdivided by broad habitat type

4.2.57 Figure 2 shows that high numbers of species were found throughout the site, with Zone 5 and the hedgerows in Zones 5, 6 and 7 having lower numbers.



4.2.58 The hedgerows in the southern part of the site tended to be flailed to a low height and so it is not surprising that lower numbers of birds were identified in this area. The fen habitat within Zone 5 may be more likely to support fewer numbers of more specialist birds and the dense rush would be unsuitable for many of the red listed species recorded, which are more likely to be found in open arable or pasture or in hedgerows.

5 SUMMARY

5.1.1 The wintering bird surveys carried out in 2018 identified a greater number of birds and a greater diversity of species, possibly due to changes in management of the site, however, these differences were small and so may simply be a result of weather conditions or temporal variations. Overall, the findings corroborate those of the 2015 survey.

5.1.2 A total of 51 species were identified; comprising 12 red listed birds and 10 amber listed birds. 10 of these 22 birds of conservation concern are also Species of Principal Importance under the Environment (Wales) Act and so are a material consideration for planning.

5.1.3 The greatest number of birds were found within the open habitats on the site, with slightly lower numbers in boundary features and very few in the woodland. The open habitats of Zones 1 and 4 were important in terms of numbers of birds and the open habitat within Zone 2 for both numbers and diversity. Of this area, Zones 2 and 4 lie within the development footprint. The table below shows the key species recorded on site for which the site is likely to represent a significant proportion of the foraging and/or sheltering habitat found within the local area. Were these habitats to be lost, the conservation status of the population of these species is likely to be adversely affected.

5.1.4 The notable birds utilising the site can be split into two distinct categories; those which were recorded foraging predominantly within open habitats and those recorded foraging predominantly in boundary habitats such as woodland and hedgerows. The birds within open habitat are more likely to be directly impacted by the installation of the array.

5.1.5 Herring gull, grey wagtail and linnet (red-listed species) and mallard, kestrel, lesser black-backed gull, black-headed gull and reed bunting (amber-listed species) were recorded only on one or two occasions in very low numbers and so did not show any persistent association with the site. They have therefore been excluded from the table below.

Birds Recorded within Open Habitats		Birds Recorded within Boundary Habitats
Snipe	Mistle thrush	Song thrush
Starling	Skylark	Dunnock
Grey plover	Fieldfare	House sparrow
Lapwing	Redwing	Bullfinch
Meadow pipit		Woodcock

APPENDIX 7.3

BREEDING BIRDS SURVEY

BREEDING BIRD SURVEYS

PENDERI FARM, LLANGENNECH, CARMARTHENSHIRE

carried out by



commissioned by

VOLTALIA UK LTD.

JULY 2018



BREEDING BIRD SURVEYS

PENDERI FARM, LLANGENNECH, CARMARTHENSHIRE

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1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. (previously Michael Woods Associates) was commissioned by Voltalia UK Ltd to carry out breeding bird surveys of land at Penderi Farm in Llangennech, Carmarthenshire.
- 1.1.2 Surveys were previously carried out in 2015, however, the submission of a planning application was delayed. Therefore, update surveys have been undertaken.
- 1.1.3 This Breeding Bird Survey Report 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.
- 1.1.4 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.

2 SURVEY AND ASSESSMENT METHODOLOGY

Personnel

- 2.1.1 All surveyors have been assessed under the Clarkson and Woods QA processes as competent to complete the surveys. The bird surveys were conducted by the following ecologists:
- Harry Fox MCIEEM. Harry has 10 years' experience undertaking ecological surveys and has a BSc in Ecology.
 - Mark Baker MCIEEM. Mark has over 11 years' experience undertaking ecological surveys and has a BSc in relevant subjects.
 - Jo Donnelly MCIEEM. Jo has 17 years' experience undertaking ecological surveys and a BSc and MSc in relevant subjects.
 - Hannah Montag MCIEEM. Hannah has 15 years' experience undertaking ecological surveys and a BSc and MSc in relevant subjects.
 - Mike Hockey GradCIEEM. Mike has 4 years' experience undertaking ecological surveys and a BSc in Natural Sciences.

Survey Area

- 2.1.2 The site covered over 30 fields, small woodlands and agricultural plots and many hedgerows amounting to several kilometres. The survey area was larger than the redline boundary and so included several adjacent fields.



Survey Timings and Protocol

- 2.1.3 The site was surveyed for breeding birds four times between April 2018 and July 2018, to identify which bird species were using the site for breeding or exhibited territorial behaviour and which habitats appeared to be of greatest value in terms of shelter and foraging.
- 2.1.4 The surveys were carried out on the following days, under the weather conditions described in Table 1 below.

Table 1: Dates and Weather Conditions during Breeding Bird Surveys

Survey Number	Date	Description of weather (Precipitation; Cloud (Oktas); Wind [Beaufort Scale])	Temperature (°C)	Times
1	26/04/18	Dry, Cloud 6, Wind 3-5	10-12	09:30-14:00
2	09/05/18	Dry, Cloud 7-8, Wind 1-2	11-13	08:30-12:45
3	31/05/18	Dry, Cloud 8-6, Wind 0-2	16-22	08:00-13:10
4	04/07/18	Light rain showers, Cloud 5-6, Wind 1-3	16-24	08:15-12:30

- 2.1.5 The survey followed BTO guidelines, where the observer systematically walked through the site, ensuring that all points on site were visited to within 50m. The location and behaviour of all birds and flocks of birds seen was noted on large-scale survey maps which were later collated onto master maps for interpretation. Particular attention was paid to bird exhibiting breeding behaviour, for instance birds in full song, exhibiting antagonistic behaviour/calling, carrying nest material, carrying food, and returning to nesting sites. Standard BTO Common Birds Census symbology and species codes were used to create a survey map of each individual visit.
- 2.1.6 Bird sightings were separated into different habitat "Zones" as follows:
- Open Habitats*
- 2.1.7 Birds which were recorded within the open fields, either foraging within the grass or scrub within the field, or flying overhead. Note that birds flying overhead (and not foraging) are later excluded from the analysis as these species were not considered to be using the site for anything other than commuting over.
- Hedgerow Habitats*
- 2.1.8 Birds recorded within the hedgerows bordering the fields. These species may forage within the margins of the field, but are primarily associated with the hedgerows on site.
- Woodland Habitats*
- 2.1.9 Those species recorded within the woodland habitats which border the site. It should be noted that only the edges of this woodland was surveyed, as surveyors did not enter the woodland. Therefore, the numbers of birds encountered are not representative of the woodland as a whole.



3 SURVEY LIMITATIONS

3.1 Survey

- 3.1.1 Nocturnal bird surveys were not undertaken and as such the activity on site of birds such as owls cannot be determined. In lieu of survey data, a judgement has been made based on the results of the data search and the presumed value of the habitats on site to such species.
- 3.1.2 The surveys offer only 'snapshots' of the Site and whilst trying to account for seasonal differences, may miss certain species which attend the site infrequently or which might choose to take up residence subsequent to completion of the surveys. At the same time a lack of signs of any particular species does not confirm its absence, merely that there was no indication of its presence during this survey.

3.2 General

- 3.2.1 If no action or development of this land takes place within twelve months of the date of this report, then the findings of this survey should be reviewed and may need to be updated. After three years the findings will be out of date and the full survey should be repeated.



4 RESULTS

4.1 Desk Study

4.1.1 The desk study, presented within the Extended Phase 1 report, identified only a record of lapwing which was observed within 1km of the site during the summer months.

4.2 Field Survey

4.2.1 In total, 61 bird species (including woodpigeon which were not enumerated) were recorded during the survey visits. 23 of these were BTO Birds of Conservation Concern red/amber lists¹ or Species of Principal Importance (SPI)², comprising 12 'red listed' birds and 11 'amber listed' birds. 13 species were listed as being SPI for nature conservation and as such are capable of being material considerations within the planning process. The patterns of abundance and distribution of each of these species is discussed later in this section, with greatest detail given to birds of conservation concern and SPIs.

4.2.2 Table 2 overleaf shows the numbers of species encountered across each survey visit with the peak count of sightings highlighted. This enables patterns in changing abundance of each species to be observed over the course of the breeding period as well as the general level of association between the site and the species concerned. Table 3 shows the peak counts of species encountered across all the survey visits subdivided by broad habitat type. In both tables an indication is given of the level of protection each species receives according to the above criteria.

4.2.3 In the tables, the bird species are colour coded to indicate their conservation status and their likely breeding status on-site is indicated by abbreviations as outlined below:

Bold text	Species of Principal Importance under Environment (Wales) Act 2016 / UKBAP Species
Red fill	'Red listed' species according to BTO/RSPB Bird of Conservation Concern
Orange fill	'Amber listed' species according to BTO/RSPB Bird of Conservation Concern
Yellow fill	Peak Count of Survey for each species
Y	Breeding confirmed (nests located or adults with food/nest material, or fledglings seen)
Pr	Breeding probable
Po	Breeding possible
N	Not likely to breed on site

¹ Red list species are those that are globally threatened, whose population or range has declined rapidly in recent years (i.e. >50% in 25 years), or which have declined historically and not recovered. Amber list species are those whose population or range has declined moderately in recent years (>25% but <50% in 25 years) declined historically but recovered recently, rare breeders (fewer than 300 pairs), internationally important populations in the UK, localised populations and those with an unfavourable conservation status in Europe.

² Species of Principal Importance (SPI) are listed in section 7 of the Environment (Wales) Act



Table 2: Numbers of Each Species Recorded During Each Survey Visit

Species	Visit 1	Visit 2	Visit 3	Visit 4	Total	Likely Breeding?
Canada Goose	0	17	1	1	19	N
Shelduck	0	0	1	0	1	N
Pheasant	2	2	3	0	7	Y
Grey heron	0	2	1	0	3	N
Red Kite	0	7	3	2	12	Y
Buzzard	10	5	7	3	25	Y
Sparrowhawk	0	1	0	1	2	Y
Kestrel	0	1	0	0	1	Y
Moorhen	0	1	0	0	1	Y
Snipe	0	2	1	0	3	Y
Black-headed Gull	0	6	3	0	9	N
Lesser black backed gull	0	1	1	0	2	N
Herring gull	2	1	0	1	4	N
Collared Dove	0	1	0	1	2	Y
Cuckoo	0	0	0	1	1	N
Swift	4	0	0	7	11	Y
Green woodpecker	1	0	0	0	1	Y
Great spotted woodpecker	1	1	2	3	7	Y
Skylark	12	6	9	3	30	Y
Swallow	28	29	24	26	107	Y
House martin	1	16	3	4	24	Y
Meadow pipit	5	4	0	4	13	Y
Tree pipit	1	0	2	1	4	Y
Pied wagtail	0	1	2	0	3	Y
Grey Wagtail	2	1	0	0	3	Y
Duncock	13	12	10	17	52	Y
Robin	39	46	35	4	124	Y
Stonechat	0	2	1	0	3	Y
Song thrush	6	12	7	6	31	Y
Mistle thrush	6	13	7	9	35	Y
Blackbird	35	55	30	23	143	Y
Blackcap	7	20	15	4	46	Y



Species	Visit 1	Visit 2	Visit 3	Visit 4	Total	Likely Breeding?
Chiffchaff	19	16	16	7	58	Y
Garden warbler	0	0	2	0	2	Y
Willow warbler	9	9	5	0	23	Y
Common whitethroat	3	4	5	3	15	Y
Goldcrest	3	4	2	4	13	Y
Wren	43	46	59	28	176	Y
Spotted flycatcher	0	0	3	1	4	Y
Blue tit	36	32	13	28	109	Y
Great tit	17	17	5	8	47	Y
Coal Tit	1	1	1	5	8	Y
Long-tailed tit	1	4	2	0	7	Y
Nuthatch	8	8	0	6	22	Y
Treecreeper	1	0	1	1	3	Y
Jay	5	2	3	1	11	Y
Jackdaw	0	0	0	6	6	Y
Carrion crow	9	18	5	16	48	Y
Raven	6	5	6	4	21	Y
Rook	1	0	3	2	6	Y
Magpie	0	2	6	7	15	Y
Starling	2	2	5	5	14	Y
House sparrow	10	18	21	6	55	Y
Chaffinch	29	21	21	6	77	Y
Greenfinch	0	2	0	0	2	Y
Bullfinch	0	2	4	6	12	Y
Goldfinch	20	13	15	29	77	Y
Linnet	9	11	10	4	34	Y
Reed bunting	1	1	2	1	5	Y
Total Individuals	415	505	386	305	1611	
Number of Species	40	50	47	43	60	

Note that wood pigeon were excluded from the survey. They were recorded as present on all visits but counts were not made.



Table 3: Results of the Breeding Bird Survey (Peak Counts of Birds within Each Habitat Type)

Species	Open Habitats	Hedgerow Habitats	Woodland Habitats
Canada Goose	16	2	0
Shelduck	1	0	0
Pheasant	1	1	3
Grey heron	1	1	0
Red Kite	9	0	0
Buzzard	12	2	0
Sparrowhawk	2	0	0
Kestrel	1	0	0
Moorhen	1	0	0
Snipe	3	0	0
Black-headed Gull	9	0	0
Lesser black backed gull	1	0	0
Herring gull	4	0	0
Collared Dove	2	0	0
Cuckoo	0	1	0
Swift	11	0	0
Green woodpecker	1	0	0
Great spotted woodpecker	3	1	1
Skylark	11	4	0
Swallow	53	0	4
House martin	20	0	0
Meadow pipit	7	2	0
Tree pipit	1	2	0
Pied wagtail	1	1	1
Grey Wagtail	1	2	0
Duncock	7	21	1
Robin	7	41	8
Stonechat	1	1	0
Song thrush	7	9	2
Mistle thrush	8	18	1
Blackbird	19	50	5
Blackcap	3	17	2
Chiffchaff	6	16	4
Garden warbler	0	2	0



Species	Open Habitats	Hedgerow Habitats	Woodland Habitats
Willow warbler	3	12	1
Common whitethroat	3	6	1
Goldcrest	2	5	2
Wren	7	51	9
Spotted flycatcher	1	2	1
Blue tit	9	39	13
Great tit	7	19	2
Coal Tit	0	4	2
Long-tailed tit	0	1	4
Nuthatch	1	7	7
Treecreeper	0	0	2
Jay	1	8	0
Jackdaw	2	4	0
Carrion crow	27	7	0
Raven	13	2	0
Rook	3	0	2
Magpie	4	8	3
Starling	6	6	0
House sparrow	4	25	6
Chaffinch	6	28	5
Greenfinch	0	1	1
Bullfinch	0	7	4
Goldfinch	31	20	6
Linnet	4	13	6
Reed bunting	1	2	1
Total Individuals	376	471	110
Number of Species	52	43	31



4.3 Overall Assemblage

4.3.1 The breeding bird assemblage was diverse: comprising typical species of woodland and hedgerows, as well as species characteristic of wetland and farmland. Numerous summer visitors were recorded, including cuckoo, swift, swallow, house martin, tree pipit, willow warbler, chiffchaff, blackcap, and spotted flycatcher. Other species were residents, though numbers may be swelled by an influx of migrant birds.

4.4 Temporal Changes (within season)

4.4.1 Over the course of the four surveys, the level of usage of the site by certain species varied a little. The peak number of individuals and species was recorded during Visit 2 at the beginning of May.

4.5 Temporal Changes (between years)

4.5.1 Surveys were previously carried out during 2015. A slightly lower number of species were recorded in 2018 (A total of 64 species were recorded in 2015, compared with 61 in 2018), with the following red/amber species (as currently listed by the BTO) recorded in 2015, but not 2018:

- Mallard
- Lesser spotted woodpecker
- Grasshopper warbler
- Redstart

4.5.2 In 2015, the mallard, lesser spotted woodpecker and grasshopper warbler were only recorded on one occasion and so may not have been breeding on the site. The redstart was recorded on two occasions and so was more likely to be breeding within the site.

4.6 Red-listed Species

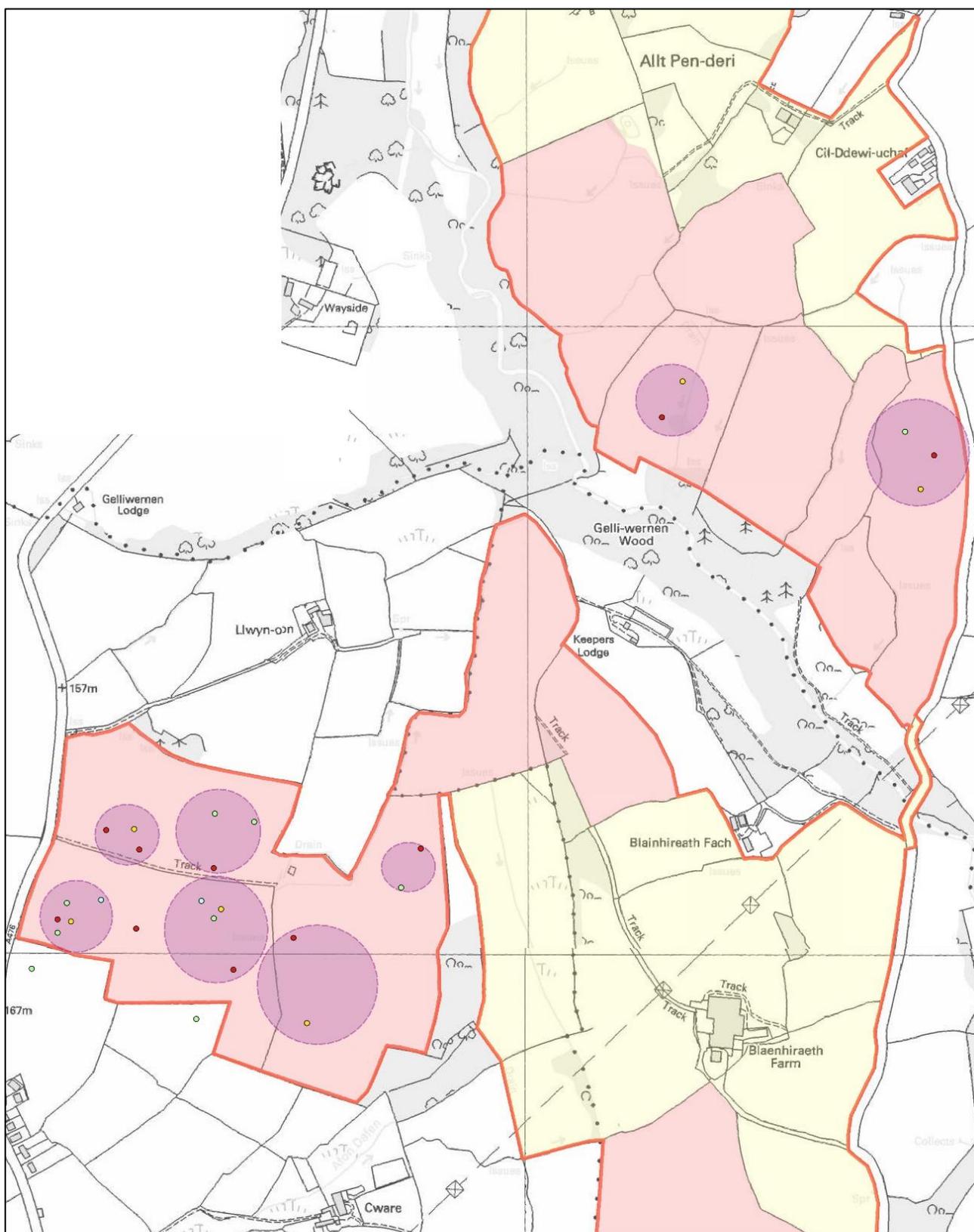
Skylark

4.6.1 The skylark is a species mainly associated with arable habitats, grassland and moorland in the UK. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and range contraction. It is also a Species of Principal Importance under section 41 of the NERC Act (2006).

4.6.2 Skylark were recorded on each visit with peak numbers in open habitats during Visit 1. The fields to the west of the site are more suitable for breeding skylark as they are large, open and at a slightly higher elevation. The site supports a small population of skylark and surveys indicate this is around 8 territories.

4.6.3 Skylark numbers were higher than the numbers recorded by the breeding bird surveys conducted in 2015.

4.6.4 A map showing the locations of sightings of skylarks and estimated territories is shown in Figure 1.



Key: Array Fields Non-Array Fields Probable Territories		Project Penderi Solar Farm, Llanelli, Carmarthenshire		
 Survey 1 (26.04.18) Tally: 12	 Survey 2 (09.05.18) Tally: 6	 Survey 3 (31.05.18) Tally: 9	 Survey 4 (04.07.18) Tally: 3 TOTAL: 30	Title Breeding Bird Survey Results
Project Number 5684		Figure Number 1		
Scale See Scale Bar		Date 05/07/2018		





Tree pipit

4.6.5 Tree pipit is a summer visitor; their breeding habitat typically includes grassland or heathland with scattered trees or scrub. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and range contraction. It is also a Species of Principal Importance under section 41 of the NERC Act (2006).

4.6.6 Tree pipit were recorded on three occasions across the breeding season in a small number of locations within the site; with a maximum of two individuals recorded on Visit 3. The site appears to support a single breeding pair.

4.6.7 These findings are broadly similar to the findings from 2015.

Grey wagtail

4.6.8 Grey wagtail are common birds of fast flowing rivers. They are badly affected by harsh winters, and because of recent moderate declines it is a Red-listed species.

4.6.9 Grey wagtail were recorded breeding alongside the Afon Morlais river close to the road bridge that crosses this river separating the north and south sites. The nest was located in a position that could be vulnerable to disturbance by any development works close to the bridge. In addition, individual grey wagtail were recorded elsewhere in the site.

4.6.10 Grey wagtail numbers were slightly higher than the 2015 surveys recorded.

Song thrush

4.6.11 The song thrush is associated with thick hedgerows, native woodland, damp ground, and grazed pasture. The bulk of the song thrush diet is earthworms and snails, particularly when insect larvae and berry crops are not available. Therefore, damp ground where these food sources are readily found is essential.

4.6.12 The UK song thrush population fell by 50% between 1970 and 2003. Loss of damp food-rich habitats, particularly in the summer, is thought to be the main cause of the decline on farmland. Song thrush is a red listed bird of conservation concern and a Species of Principal Importance.

4.6.13 Song thrush were recorded in low to modest numbers during each visit in boundaries, woodland and open habitats; primarily in the northern part of the site. This species holds large territories and it is likely that the site supports a small breeding population.

4.6.14 Song thrush numbers were slightly lower than the numbers recorded by the breeding bird surveys conducted in 2015, which may be indicative of their continued decline.

Mistle thrush

4.6.15 Mistle thrush are associated with hedgerow and woodland, though will forage in open grassland too. They eat invertebrates but supplement their diet with berries in the autumn and winter. Their numbers and range have fallen in recent years.

4.6.16 They were recorded during each visit in moderate numbers across the site, foraging in open habitats and settled in boundaries; often in small flocks. The site appears to support a medium breeding population.



4.6.17 Mistle thrush numbers were slightly higher than those recorded by the breeding bird surveys conducted in 2015.

Spotted flycatcher

4.6.18 Spotted flycatcher is a summer visitor that catches flying insects from perches in trees and shrubs. It is found in farmland where there are woodlands, hedgerows or scrub. It benefits from habitat that supports high numbers of its food prey, flying insects. The species has significantly declined in recent decades and as a result is a red listed species.

4.6.19 It was recorded on two occasions across the site and the site appears to support a small breeding population.

4.6.20 Numbers were slightly higher than the 2015 survey recorded.

Starling

4.6.21 The starling is a familiar species often found in towns, gardens, farmland and woodland. This species is red listed as a Species of Conservation Concern due to recent breeding and wintering population decline and range contraction. It is also a Species of Principal Importance under section 41 of the NERC Act (2006).

4.6.22 Starling were present in low numbers during each survey visit. They were observed in greatest numbers in boundaries in the south-eastern area of the site, though were also seen in open habitats. The site supports low numbers of breeding starling.

4.6.23 Slightly larger numbers of starling were observed than in 2015.

House sparrow

4.6.24 House sparrow are a familiar species closely associate with urban habitats. They are red-listed due to significant recent decline, however the cause is unclear.

4.6.25 House sparrow were recorded in modest numbers during each visit and were associated with boundary habitats near the Penderi and Blaenhiraeth Farm buildings. The wider site does not support significant numbers of house sparrow but the farm buildings and surrounding hedgerows support a small to moderate breeding population.

4.6.26 Numbers recorded were notably higher than in 2015.

Linnet

4.6.27 Linnets are found on farmland wherever there is a plentiful supply of seeds throughout the year. Mixed farmland is particularly valuable. They nest in dense hedgerows, gorse, bramble or other types of scrub.

4.6.28 Linnet numbers have dropped substantially over the past few decades, with the UK population estimated to have declined by 57 per cent between 1970 and 2008. This is largely the result of a lack of food sources in modern farming. Linnet is a red listed bird of conservation concern and a Species of Principal Importance.

4.6.29 Linnet were recorded on each survey visit in low to modest numbers and the site appears to support a medium population.

4.6.30 Linnet numbers were slightly lower than in 2015, though more consistent across the survey visits.



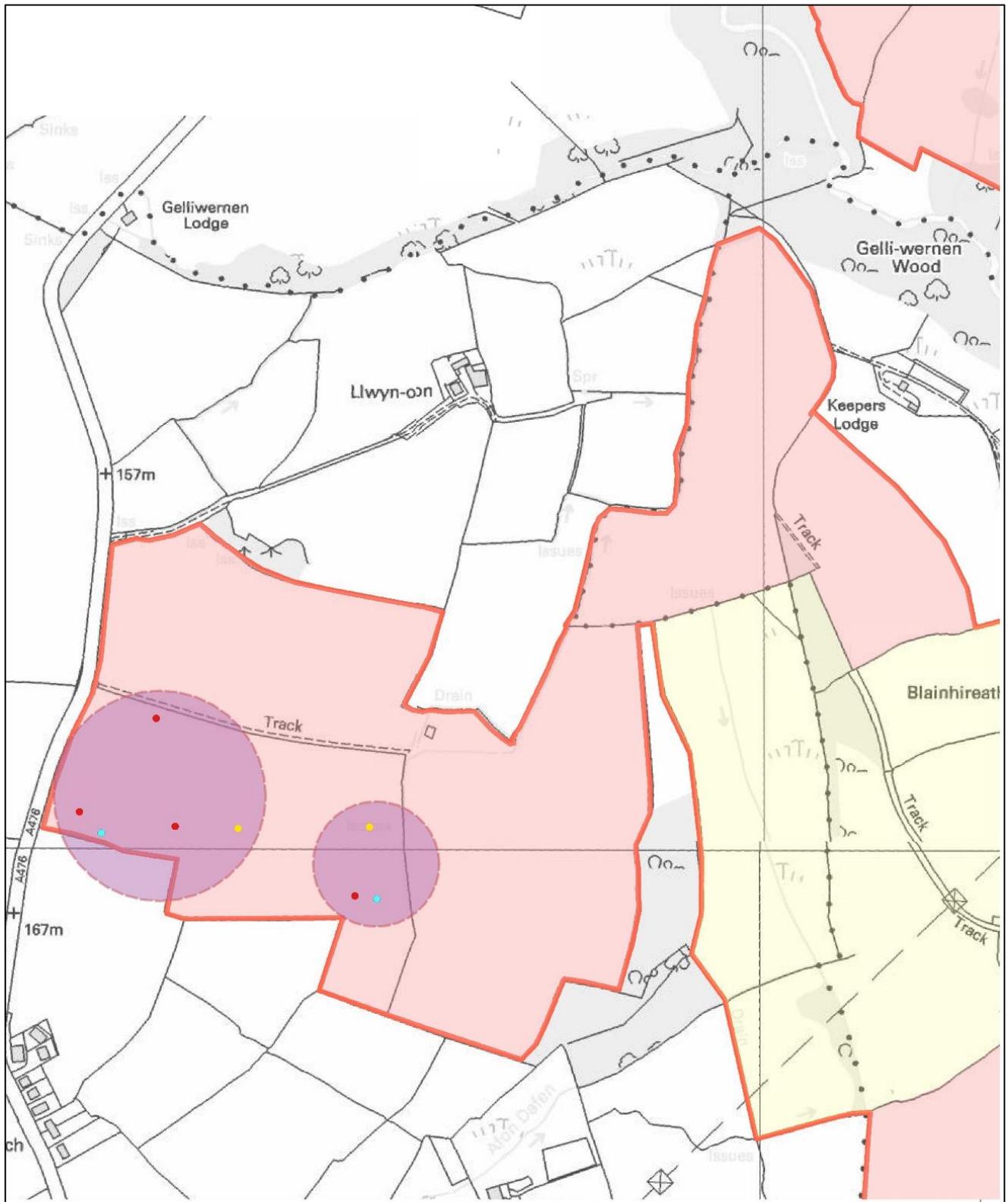
4.7 Amber-listed Species

Swift and House martin

- 4.7.1 These species arrive from Africa in the spring and leave in late summer. They eat insects on the wing and nest in buildings. Both species are amber listed due to recent breeding and wintering population decline and reduction in breeding and wintering range.
- 4.7.2 These species were recorded across the survey period but not on each visit. This is indicative of their use of the site as a periodic foraging resource within their much larger range. The buildings within the site, notably Blaenhiraeth Farm, support roosting house martins.
- 4.7.3 Numbers recorded for these species were broadly in accordance with the survey results of 2015.

Meadow pipit

- 4.7.4 Like skylarks, meadow pipits are associated with open arable, grassland and heathland habitats, are ground dwelling birds and have undergone declines in recent years, hence their amber status.
- 4.7.5 Relatively low numbers of these birds were encountered in each visit; primarily in open habitats to the west of the site, as for skylarks. The site appears to support a small breeding population of meadow pipit.
- 4.7.6 Numbers recorded were slightly lower than those recorded by the breeding bird surveys conducted in 2015.
- 4.7.7 A map showing the locations of sightings of meadow pipits and estimated territories is shown in Figure 2.



Key: Array Fields Non-Array Fields Probable Territories	Project Penderi Solar Farm, Llaneli, Carmarthenshire	
	Title Breeding Bird Survey Results - Meadow Pipit	
● Survey 1 (26.04.18) ● Survey 2 (09.05.18) ● Survey 3 (31.05.18) ● Survey 4 (04.07.18)	Project Number 5684	Figure Number Figure 2
Scale See Scale Bar	Date 12/07/2018	





Dunnock

- 4.7.8 Dunnock inhabit any well vegetated areas with scrub, brambles and hedges, including field edges, earning their moniker "hedge sparrow". They spend large amounts of time on the ground in amongst grassland but also remain close to shrubby vegetation cover. Dunnock abundance fell substantially between the mid-1970s and mid-1980s, after a period of population stability. Some recovery has occurred throughout the UK since the late 1990s. Dunnock is an amber listed Species of Conservation Concern and a Species of Principal Importance.
- 4.7.9 Dunnock were recorded in moderate numbers in each survey zone and during each survey visit. This species is present all year round and the site appears to support a moderate breeding population.
- 4.7.10 Numbers recorded broadly corroborate the findings of the breeding bird surveys conducted in 2015.

Willow warbler

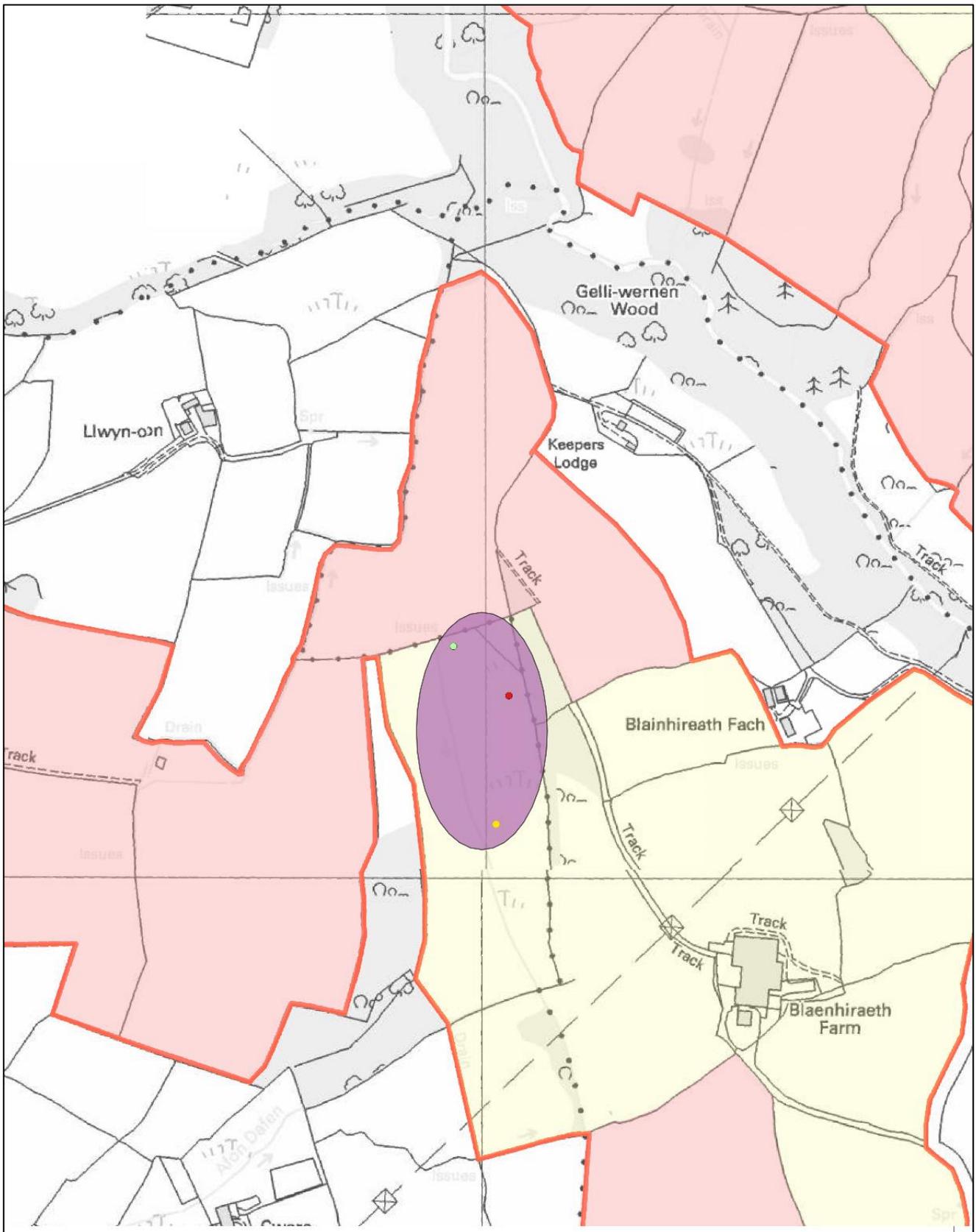
- 4.7.11 Willow warbler are associated with scrub and open woodland and are amber listed due to recent breeding and wintering population decline and reduction in breeding and wintering range.
- 4.7.12 This species were recorded in modest numbers across the site during Visits 1 to 3 and the site appears to support a moderate breeding population.
- 4.7.13 Numbers recorded broadly corroborate the findings of the breeding bird surveys conducted in 2015.

Bullfinch

- 4.7.14 Bullfinch are a charismatic species found mainly in woodland and farmland, feeding primarily on fleshy seeds and buds. Bullfinch are amber listed as a Species of Conservation Concern due to recent breeding and wintering population decline and reduction in breeding and wintering range. It is also a Species of Principal Importance under section 41 of the NERC Act (2006).
- 4.7.15 This species was observed in relatively low numbers spread across the site during two survey visits. The site appears to support a small population of breeding bullfinch.
- 4.7.16 Bullfinch numbers were similar to those recorded in 2015.

Reed bunting

- 4.7.17 Reed bunting is a resident species that is typically found in wet vegetation, but has more recently spread into farmland. It nests close to the ground amongst dense vegetation including ditch banks. They feed on the ground and in ditches and banks and favour damp or marshy grassland and swamps.
- 4.7.18 Reed bunting numbers in the UK have been declining since the mid-1970s, due to habitat loss. Reed bunting is an amber listed Species of Conservation Concern and a Species of Principal Importance.
- 4.7.19 This species occurred on site within the fen habitat where there was dense rush and scrub.
- 4.7.20 Reed bunting numbers were slightly higher than in 2015.
- 4.7.21 A map showing the locations of sightings of reed buntings and estimated territories is shown in Figure 3.



Key: Array Fields Non-Array Fields Probable Territories			Project Penderi Solar Farm, Llanelli, Carmarthenshire
	● Survey 1 (26.04.18) ● Survey 2 (09.05.18) ● Survey 3 (31.05.18) ● Survey 4 (04.07.18)			Title Breeding Bird Survey Results - Reed bunting
		Project Number 5684	
		Figure Number Figure 3	
		Scale See Scale Bar	Date 12/07/2018



Kestrel

- 4.7.22 Kestrels are found in a variety of habitats and are widespread, predated small mammals and birds as well as invertebrates and worms. They have declined since the 1970s and it is thought that this decline is related to changes in farming practices.
- 4.7.23 This species was only observed once, however, suitable habitat was present for breeding.
- 4.7.24 Two individuals were observed in 2015, therefore, results are broadly the same for this species.

Snipe

- 4.7.25 Snipe are wading birds which breed in wet habitats and are shy and elusive, only flushing when the surveyor is very close. They predominately feed on invertebrates and worms as well as some plants. They have undergone a decline in the last 25 years, particularly within areas of lowland grassland.
- 4.7.26 Only 3 individuals were recorded on two visits, however, it is likely that this species was underrecorded given its elusiveness and it is considered highly likely that at least one breeding pair is present.
- 4.7.27 5 individuals were recorded in 2015 during a single visit in two areas on the site and it was concluded that they were unlikely to be breeding, however, a likely pair were recorded on the second visit in 2018 indicating that there may be one breeding pair.

4.8 Other Birds of Conservation Concern

- 4.8.1 Individuals or small numbers of each of herring gull and cuckoo (red-listed species) and shelduck, lesser black-backed gull and black-headed gull (amber-listed species) were recorded on one or two occasions. It is considered likely that they are not breeding within or adjacent to the site.

Habitat Usage

All Species

- 4.8.2 The greatest number of species were recorded in open habitats (52), followed by hedgerows (43) and woodland (31). The greatest number of individuals were found within the hedgerows on the site (471), with slightly lower numbers in open habitats (376), then lower numbers still in woodland (110).
- 4.8.3 The above results are skewed by the extent of the habitats within the survey site as open habitats made up the largest proportion in terms of area within the site. Given that a larger number of individuals were found within hedgerows and that only 9 less species occurred, hedgerows are likely to be extremely important for birds on the site, as the extent of this habitat was lower.

Birds of Conservation Concern

- 4.8.4 The habitat type which supported the most species of conservation concern (both Red and Amber-listed species) was open habitats with 16 species, closely followed by hedgerow habitats with 15 species. Woodland supported 9 species. These counts exclude those species of conservation concern which were flying overhead and not actually using the site (such as gulls).
- 4.8.5 Again, the results above will be skewed as the extent of open habitat, hedgerows and woodland are different within the survey area. Given the small difference between the number of species within the open habitat and the hedgerows and the lesser extent of hedgerows on the site, the importance of this habitat should be elevated.



5 SUMMARY

- 5.1.1 The breeding bird surveys carried out in 2018 identified a higher number of birds and a slightly higher diversity of species when compared with 2015, possibly due to changes in management of the site, however, these differences were small and so may just be a result of weather conditions or temporal variations.
- 5.1.2 A total of 60 species were identified; of which 11 were red listed birds and 11 were amber listed birds. 12 of these 22 birds of conservation concern are also Species of Principal Importance under the Environment (Wales) Act and so are a material consideration for planning.
- 5.1.3 The greatest number of individuals were found within the hedgerows on the site, with slightly lower numbers in open habitats, then lower numbers still in woodland. The greatest number of species were found in open habitats (52), though boundary habitats (woodland and hedgerows combined) supported only slightly fewer (46) species. Given the fact that woodland and hedgerows covered a smaller area on the site than the open habitats, the importance of these habitats should be elevated.
- 5.1.4 The notable birds utilising the site can be split into two distinct categories; those which were recorded foraging predominantly within open habitats and those recorded foraging pronominally in boundary habitats such as woodland and hedgerows. The birds within open habitat are more likely to be directly impacted by the installation of the array.
- 5.1.5 Shelduck, black headed gull, lesser black-backed gull, herring gull, swift, house martin and house sparrow have not been included within the table below as they are likely to be nesting outside the site boundary.
- 5.1.6 Grey wagtail has been confirmed as nesting under the bridge.
- 5.1.7 Although kestrel was recorded within the open habitats, it will be nesting within boundary features and so has been included within this category.

Birds Recorded within Open Habitats	Birds Recorded within Boundary Habitats
Snipe	Kestrel
Skylark	Cuckoo
Meadow pipit	Tree pipit
Reed bunting	Grey wagtail
	Dunnock
	Song thrush
	Mistle thrush
	Willow warbler
	Spotted flycatcher
	Starling
	Bullfinch
	Linnet

APPENDIX 7.4

HRA SCREENING MATRIX

HABITATS REGULATION ASSESSMENT: TEST TO INFORM LIKELY SIGNIFICANCE

PART A: The Proposal

National Grid Reference	SN 543 048
Name of Site	Penderi Farm in Llangennech, Carmarthenshire
Development Proposals for the Site	
Description	Installation of a ground mounted photovoltaic solar array
Size and scale	Approximately 70ha of land with a capacity of 40MW
Land-take	The array is approximately 70ha in size, but a large amount of this land would lie outside of the security fencing or between strings of panels
Resource requirements <i>(from the European Site or from areas in proximity to the site)</i>	None
Emissions <i>(e.g. polluted surface water runoff, atmospheric pollution)</i>	None (CEMP in place to prevent accidental pollution/sediment runoff)
Excavation requirements <i>(e.g. impacts of local hydrogeology)</i>	Excavation required to lay electrical cables between strings and also to join parcels of land
Transportation requirements	Occasional access once operational
Duration of construction, operation, etc	Summer build
Artificial Lighting	No artificial lighting required for construction or operation
Other	None
Description of any avoidance or mitigation measures that have been incorporated into the project	Security fencing surrounding the site at least 4.5m from field boundaries
European Site(s) that could be affected by the proposals	Distance of the proposed development from the European Site
Carmarthen Bay and Estuaries Special Area of Conservation (SAC)	Approximately 3.2km south and the Afon Morlais and Afon Dafen (tributary) which run through the site discharge directly into the SAC where they reach the coast south of the site.
Burry Inlet Special Protected Area (SPA) and Ramsar	Approximately 6km south east at its closest point. The tributary which runs through the site discharges into the above SAC, then into the SPA/Ramsar (as shown in the Figure at the end of this document).
List of European Site Interest Features (i.e. Species & Habitats)	
<p>Burry Inlet Special Protected Area (SPA) and Ramsar The site is designated due to internationally important numbers of overwintering Northern shoveler <i>Anas clypeata</i>, Eurasian teal <i>Anas crecca</i>, Eurasian wigeon <i>Anas penelope</i>, dunlin <i>Calidris alpina alpina</i>, red knot <i>Calidris canutus</i>, Eurasian oystercatcher <i>Haematopus ostralegus</i>, Eurasian curlew <i>Numenius arquata</i>, grey plover <i>Pluvialis squatarola</i>, common shelduck <i>Tadorna tadorna</i> and common redshank <i>Tringa tetanus</i>. The site also supports an internationally important assemblage of birds with a 5 year mean peak of 34,962 waterfowl.</p>	
<p>Carmarthen Bay and Estuaries Special Area of Conservation (SAC) The SAC is designated for excellent European examples of six of the habitat and five of the species conservation features of interest listed in the Habitats Directive. The listed habitats are: Estuaries, Large shallow inlets and bays, Atlantic salt meadows, Salicornia and other annuals colonising mud and sand, Mudflats and sandflats not covered by seawater at low tide, and Sandbanks which are slightly covered by sea water all the time. Twaitie Shad <i>Alosa fallax</i> are identified as an Annex II species forming a primary reason for selection. This species</p>	

migrates through the estuary to access spawning areas on the Afon Tywi. Other Annex II species listed within the citation (but not identified as primary reasons for qualification are: Allis shad *Alosa alosa*; river lamprey *Lampetra fluviatilis*; sea lamprey *Petromyzon marinus*; and European otter *Lutra lutra*.

Threats to Site and Conservation Objectives

Burry Inlet Special Protected Area (SPA) and Ramsar

The main threats to the site and the severity (Low/Medium/High) have been taken from the Natura 2000 data form and are as follows:

- Air pollution, air-borne pollutants (Low)
- Marine water pollution (Medium)
- Changes in abiotic conditions (High)
- Outdoor sports and leisure activities, recreational activities (Medium)
- Military use and civil unrest (Medium)
- Fishing and harvesting aquatic resources (Medium)

The conservation objectives for the site include:

The numbers of SPA bird species are stable or increasing

The abundance and distribution of suitable prey are sufficient and appropriate to support the numbers of all SPA bird species

All SPA birds are allowed to inhabit their feeding grounds and resting areas with minimum disturbance, and are allowed to move unhindered between them.

All states of the Conservation Objectives for the supporting habitats and species, subject to natural processes, are fulfilled and maintained in the long-term. Supporting habitats for bird species of the Burry Inlet SPA include:

- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Atlantic salt meadows
- Salicornia and other annuals colonising mud and sand
- 'Large shallow inlets and bays' are the supporting habitat for the common scoter of the Carmarthen Bay SPA.

The management and control of activities or operations likely to be of significant effect to the oystercatchers, is appropriate for maintaining the feature at FCS and is secure in the long-term.

Carmarthen Bay and Estuaries Special Area of Conservation (SAC)

The main threats to the site and the severity (Low/Medium/High) have been taken from the Natura 2000 data form and are as follows:

- Fishing and harvesting aquatic resources (Medium)
- Pollution to surface waters (limnic, terrestrial, marine & brackish) (High)
- Human induced changes in hydraulic conditions (High)
- Marine and Freshwater Aquaculture (Medium)
- Invasive non-native species (Medium)
- Hunting, fishing or collecting activities (Medium)
- Soil pollution and solid waste (excluding discharges) (Low)
- Changes in abiotic conditions (Medium)
- Marine water pollution (Medium)
- Outdoor sports and leisure activities, recreational activities (Medium)
- Air pollution, air-borne pollutants (Low)
- Shipping lanes, ports, marine constructions (Medium)
- Other urbanisation, industrial and similar activities (High)
- Grazing (High)

Conservation objectives include:

Contaminant levels in the water column and sediments derived from human activity to be:

- at or below existing statutory guideline concentrations
- below levels that would potentially result in increase in contaminant concentrations within sediments or biota
- below levels potentially detrimental to the long-term maintenance of the features species populations, their abundance or range.

And for the fauna present in the SAC:

- Contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression

Specifically for otters:

- For otter there are sufficient sources within the SAC and beyond of high quality freshwater for drinking and bathing.

Importance of habitats within Development site for European Site Integrity and Continued Favourable Conservation Status of Annex II species.

The habitats within the site are not directly associated with the SAC or SPA/Ramsar, however, the streams which lie adjacent to the site feed into the Carmarthen Bay and Estuaries SAC approximately 5.1km downstream. This then feeds into the Burry Inlet SPA/Ramsar approximately 10.4km downstream.

It is also possible that species within the SPA use habitats within the development site for foraging (in particular, and so it may be functionally linked.

PART B: Assessment of Likely Significant Effects

Ecological Surveys undertaken to Inform Assessment.

Extended Phase 1 habitats survey conducted on the 20th October 2014, updated on the 26th April 2018 with the results augmented from visits later in the year associated with bird surveys (on the 9th and 31st May 2018)

Four wintering bird surveys carried out on 13th January, 28th January, 3rd February and 12th February 2015, updated with additional surveys carried out on 28th November, 18th December 2017 and 16th January, 27th February 2018

Four breeding bird surveys carried out on 16th April, 24th April, 19th May and 5th June 2015, which were updated on 26th April, 9th May, 31st May and 4th July 2018

What are the potential hazards likely to affect the interest features

Impact	Description	Likely to have significant effect on interest feature?
Habitat Loss	<p>None of the habitats found within the SAC/SPA/Ramsar are present within the proposed development site.</p> <p>Wintering bird surveys conducted within the development site identified a peak count of 14 grey plover, which comprises 2% of the SPA population. These are likely to be displaced from some areas of the site, however, other areas will be retained and enhanced for this species, therefore, habitat loss will be minimal and not detrimental to the SPA population.</p> <p>Additionally, the grey plover recorded within the proposed development site where present at low tide, when the SPA would be most optimal for foraging; therefore, these birds are likely to be using the site opportunistically rather than as a necessity when the SPA may be underwater and so not accessible for foraging.</p>	No.
Habitat Fragmentation	None. The development will not result in any removal or fragmentation of suitable habitat	No.
Habitat Degradation	No direct habitat degradation will occur given the distance of the site	No.
Artificial Lighting	No artificial lighting to be used during or post construction	No.
Disturbance	No disturbance given the distance of the site	No.
Pollution	The watercourses adjacent to the site feed into the SAC and the SPA/Ramsar further downstream. A detailed analysis of the watercourses linking the Development Site to the designated sites show that the River Afon Morlais is the most direct link between the two areas, and this stretch of river measures 5.1km (as shown in Figure 1). Given this distance, in the unlikely event that accidental pollution or sediment runoff does end up in any watercourses adjacent to the site, this would be deposited before it reaches the SAC over 5km downstream.	No.
Climate Change	No effects on climate change anticipated.	No.

PART C: Conclusion

Is the potential scale or magnitude of any effect likely to be significant?

a) Alone

No effects anticipated.

b) In combination with other plans or projects?

No effects anticipated. No similar developments have been identified which may result in cumulative effects.

Conclusion: Is the proposal likely to have a significant effect on a European Site?

Not likely to be significant.



Location of Proposed Development Site and SAC/SPA/Ramsar with Afon Morlais Tributary Connecting

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APPENDIX 7.5

CONSTRUCTION ECOLOGICAL MANAGEMENT PLAN

CONSTRUCTION ECOLOGICAL MANAGEMENT PLAN

**PENDRI / BLAENHIRAETH SOLAR FARM,
LLANGENNECH, CARMARTHENSHIRE**

Prepared by



and



commissioned by

VOLTALIA UK LTD

23 / 12 / 2020



CONSTRUCTION ECOLOGICAL MANAGEMENT PLAN

PENDRI / BLAENHIRAETH SOLAR FARM, LLANGENNECH, CARMARTHENSHIRE

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4	CONSTRUCTION PHASE PRESCRIPTIONS	7
5	TIMETABLE	20

Project title	Penderi / Blaenhiraeth Solar Farm, Llangennech, Carmarthenshire			
Document title	Construction Ecological Management Plan			
Client	Volitalia UK Limited			
Author	Gregor Neeve, Hannah Montag and Rob French			
Status	Checked (C&W)	Date	Checked (Pegasus)	Date
V1.0	Mark Baker	26/07/2018	Rob French	08/08/2018
V2.0	Polly Luscombe	31/07/2019	Rob French	31/07/2019
V3.0	Hannah Montag	28/01/2020	Rob French	09/01/2019
V4.0	Hannah Montag	16/12/2020	Rob French	23/12/2020

Surveys are undertaken on the understanding that nothing in the final report will be omitted, amended or misrepresented by the client or any other interested party. This report and its contents remain the property of Clarkson and Woods and Pegasus Group until payment has been made in full.



1 INTRODUCTION

1.1.1 This Construction and Ecological Management Plan (CEcMP) has been prepared on behalf of Voltalia UK Ltd in support of the proposed 34.4 MW solar photovoltaic (PV) development on approximately 96.27 hectares of land at Blaenhiraeth Farm, Llanelli, SA14 8PX. Due to the generating capacity, the planning application constitutes a Development of National Significance (DNS) and will be determined by the Welsh Government on the recommendation of the Planning Inspectorate Wales (PINS). This CEcMP has been jointly prepared by Clarkson and Woods Ecologists and Pegasus Group Landscape Architects.

1.1.2 The CEcMP specifically deals with the protection of habitats and species during the construction phase. Information relating to the management of other environmental issues such as traffic movements, construction methods, compound location, site welfare, working hours, services and noise is being provided separately within the Construction Environmental Management Plan (CEMP). This biodiversity-focussed CEcMP should be read alongside:

- Any other CEMP documents;
- Arboricultural Survey, Impact Assessment and Protection Plan. Barton Hyett Associates, December 2020;
- Landscape and Ecological Management Plan, December 2020; and
- Flood Risk Assessment, January 2020.

1.1.3 A Construction Environmental Management Plan (CEMP) ~~will also be~~ **has been** prepared which ~~will~~ covers the environmental protection of the site. The CEcMP and CEMP should be read in conjunction. The CEMP ~~will~~ **addresses** specific issues raised by Natural Resources Wales (NRW) in their ~~scoping~~ **consultation** response (dated ~~12/04/2019~~ **09/10/20**) including:

- ~~• Construction Methods – details of materials, waste, contaminated land;~~
- ~~• General Site Management – construction programme, site clearance requirements, construction drainage, site set-up plan detailing sensitive receptors and buffers zones, relevant protection measures e.g. fencing;~~
- ~~• Control of Nuisances – restrictions on timing/duration/frequency of works, dust control measures, control of light spill and conservation of dark skies;~~



- ~~Resource Management~~ fuel and chemical storage, waste management, water consumption, energy consumption;
- ~~Traffic Management~~ deliveries, plant on site, wheel washing facilities; and
- ~~Pollution Prevention~~ demonstrate compliance with relevant Guidelines for Pollution Prevention, incident response plan, site drainage plan.
- A monitoring programme for all watercourses on site. As a minimum, they should be checked daily or more frequently dependent on the nature/location of works.
- Details on any water features on the site and how they will be protected.
- Any sources of pollution (including silt), potential pathways for that pollution to enter any watercourses within the vicinity of the site and appropriate pollution control measures to be implemented on site.
- Details of the nature, type and quantity of materials to be imported on to the site.
- Details of emergency contacts, for example Natural Resources Wales' Pollution hotline 0300 065 3000.
- Pollution Prevention: demonstrate how relevant Guidelines for Pollution Prevention and best practice will be implemented, including details of emergency spill procedures and incident response plan.
- Details of the persons and bodies responsible for activities associated with the CEMP and emergency contact details.

1.1.4 Ecological surveys have revealed the following protected/notable habitats/species as occurring or potentially occurring within the site:

- Rivers/Streams adjacent to the site, which are hydrologically linked to the Carmarthen Bay and Estuaries Special Area of Conservation (SAC);
- Hedgerows, some of which are species rich and 'Important' under the Hedgerow Regulations 1997 and woodland at the field boundaries;
- Diverse, semi-improved grassland within the site;
- Diverse fen habitat adjacent to the site;



- Badger setts within and adjacent to the site;
- Bats which may roost within trees and forage in hedgerows and grassland;
- Dormice have been confirmed as present within the woodland and hedgerow network;
- Otters have been confirmed as present in the river adjacent to the site;
- Breeding birds within hedgerows and grassland habitats; and
- Reptiles may be present in tussocky, marshy grassland.

1.1.5 This report should be available at the site office(s) during the construction stages. The Ecological Constraints Plan at the end of this report should be displayed within the site office(s) at a location visible to all site operatives.



2 OBJECTIVES

2.1.1 This CEcMP sets out management prescriptions to safeguard the landscape and ecological features within the site during the construction phase; as well as installation of habitat features for **the** future benefit of the biodiversity within the site.

2.1.2 The following objectives have been identified:

Objective 1: To protect retained habitats within and surrounding the site from damage and unnecessary disturbance during construction

2.1.3 A variety of habitats were identified within/adjacent to the construction area including hedgerows, woodlands, fen and watercourses. These habitats are to be retained and protective measures will be put in place to ensure no direct or indirect impacts on landscape/habitat features during the construction stages.

2.1.4 The grassland habitat within the development footprint will be protected through careful timing of works.

Objective 2: To ensure protected and notable species are adequately safeguarded during construction

2.1.5 Appropriate precautions will be required to ensure any adverse effects are avoided to a number of protected and notable species which may be using the field and boundary habitats. These include badgers, bats, dormice, otters, nesting birds and reptiles.

Objective 3: To enhance the site for local wildlife

2.1.6 A number of enhancements have been proposed which will need to be carried out during the construction phase of works. This includes restoration of grassland, planting of hedgerows, installation of bat, bird and dormouse boxes, creation of wet scrapes for birds and creation of hibernacula/grass piles for reptiles and other animals. Full details of these enhancements are also provided in the supporting Landscape and Ecological Management Plan (LEMP).



3 RESPONSIBLE PERSONNEL & LINES OF COMMUNICATION

3.1 Client/Developer (Voltalia UK Ltd)

3.1.1 Voltalia UK Ltd shall be responsible for the implementation of this CEcMP through the construction phase of the development and shall liaise with the Ecological Clerk of Works (ECoW) to commission and arrange an Ecologist's input or site attendance. They will also liaise with the Site Manager(s) to notify them of any works affecting ecology. Should management of the site change, new personnel will be made aware of and action the objectives of this CEcMP.

3.2 Site Manager

3.2.1 The Site Manager (to be assigned by Voltalia UK Ltd) shall be responsible for the implementation of the prescriptions detailed in this CEcMP during the construction phase. The Site Manager will be provided with a copy of this CEcMP and liaise with Voltalia UK Ltd and the ECoW throughout the construction phase of the development to ensure that the stipulated measures are being implemented correctly. Should site personnel change, new personnel will be made aware of and action the objectives of this CEcMP.

3.3 Ecological Clerk of Works (ECoW)

3.3.1 The ECoW shall be a suitably qualified Ecologist with at least two years' experience and suitable training in how the responsibilities of the ECoW will be discharged. Clarkson & Woods (01934 712500) should be contacted prior to appointing the ECoW to ensure a suitably qualified Ecologist is instructed to fulfil this role.

3.3.2 The ECoW will be responsible for delivering the prescriptions and objectives requiring ecological expertise during the construction stages. They shall assist and advise the developer (Voltalia UK Ltd) and the site manager, as required, in their adherence to the requirements of this CEcMP.

3.4 Contact Details

	Company Name	Primary Contact	Address	Email & telephone Contact Details
Main Contractor	Voltalia UK Ltd	Kelly Clutterbuck / Rosie Vetter	26 – 28 Hammersmith Grove, London, W6 7BA	k.clutterbuck@voltalia.com r.vetter@voltalia.com T.+44 (0) 7809 714 718
ECoW	Clarkson & Woods	Primary Contact: Hannah Montag	Overbrook Business Centre, Poolbridge Road, Blackford, Somerset, BS28 4PA	Contact Email: hannah.Montag@clarksonwoods.co.uk Jo.robinason@clarksonwoods.co.uk Contact Telephone: 01934 712500



		Secondary Contact: Jo Robinson		
Wildlife Rescue Centre	Gower Bird Hospital		Sandy Southgate, Swansea SA3 2EW	01792 371630
Pollution Incident Contact	Natural Resources Wales			0300 065 3000 (24 hour phone line)

4 CONSTRUCTION PHASE PRESCRIPTIONS

PR1: Protection of Retained Habitats

Contributes to Objective 1 and 2

Woodlands, Hedgerows and Trees

- 4.1.1 These are valuable ecological habitats which are known to support dormice, foraging/commuting bats, nesting birds and potentially reptiles.
- 4.1.2 These habitats will be protected by installing tree protection fencing or the perimeter deer fencing in accordance with the Arboricultural Impact Assessment (AIA) undertaken by Barton Hyett Associates (December 2020).
- 4.1.3 Security (deer) fencing posts will be driven into the ground utilising a small piling machine.
- 4.1.4 The piling machine will be positioned on the inside of the security (deer) fencing, not within the hedgerow buffer zone or the Root Protection Areas (RPAs) of trees which are to be retained.
- 4.1.5 For internal hedgerows and woodland, where security (deer)fencing is not required, this habitat will be protected by:
- Trees: installation of tree protection fencing such as Heras fencing to protect the Root Protection Areas (RPAs) in accordance with BS 5837:2012 *Trees in Relation to Design, Demolition and Construction*; and
 - Hedgerows: stock proof fencing to be installed at least 4m from boundary features.
- 4.1.6 The tree and hedgerow protection fencing will be installed prior to any construction works commencing. The fencing will be inspected by the Site Manager at appropriate intervals during the construction stages.



- 4.1.7 No construction vehicles will be driven within the buffer between the fencing and the hedgerows/woodland. No materials are to be stored within the Root Protection Areas (RPA) of woodland and trees.
- 4.1.8 Signage will be fitted on the installed fencing to make clear that the fencing delineated Ecological Protection Zones (EPZ) or the Root Protection Areas (RPA) to show that no vehicular access or storage is permitted. The proposed signage is to be weather resistant.
- 4.1.9 Where the access track and cable route runs through or adjacent to woodland and hedgerows to be removed the remaining sections will be protected through the installation of Heras fencing.
- 4.1.10 Minor crown lifting is required within several areas within the site in order to install the access tracks, as shown in the Arboricultural Impact Assessment. These works will follow *BS3998:2010 – Tree Work – Recommendations* and will be carried out under the supervision of an ECoW to ensure that no roosting birds or bats would be affected.
- 4.1.11 Any wood removed from the crown lifting operations will be piled within the hedgerow or woodland habitat and be maintained as deadwood to provide hibernaculum and habitat for wildlife.
- 4.1.12 All cable connection (including those within the highway) will be laid following the methodology set out within a detailed Arboricultural Method Statement undertaken by Barton Hyett Associates. An arboricultural watching brief may also be required in sensitive areas (e.g. through Gelli-wernen Wood) to ensure the retained trees are suitably protected.

Watercourses

- 4.1.13 Watercourses adjacent to the site are important habitats and support otters. They also are hydrologically linked to internationally designated wildlife sites downstream.

Buffer Zones

- 4.1.14 Smaller ditches within the hedgerow network which only occasionally hold water will be protected via a buffer of at least 4 metres between the edge of the ditch and the protective fencing.



- 4.1.15 Larger (main) ditches which hold water year-round and feed into the streams/rivers adjacent to the site will be protected via a buffer of at least 7 metres between the edge of the ditch and the protective fencing as shown on the Ecological Constraints Plan at the end of the report.
- 4.1.16 A buffer zone of at least 15 metres will be established between the Afon Morlais and Afon Dafen tributaries and the proposed solar panels, which will be protected through the installation of the security (deer) fencing, as shown within the Ecological Constraints Plan.
- 4.1.17 No construction vehicles will enter these buffer zones and no construction materials will be stored within these areas.
- 4.1.18 In some areas, security (deer) fencing is required close to main ditches (highlighted in 6 locations in the Ecological Constraints Plan). Where fencing posts are required within 2 metres of the watercourse, these will be installed by hand rather than machine in order to protect the ditch from damage.

Pollution Prevention (Safe Storage of Fuel & Chemicals)

- 4.1.19 The risk of pollutant (e.g. fuel/chemical) spillages is considered to be minimal and mainly associated with:
- Diesel (used for site vehicles and generators during construction);
 - Concrete/cement (for substation foundations); and
 - Sewage and chemicals from welfare facilities.
- 4.1.20 A detailed pollution/spill response plan will be prepared and kept within the site offices, the contents of which will be included within site inductions.
- 4.1.21 Diesel will be stored within the site compound in a designated area, in secure labelled bowsers.
- 4.1.22 The site compound will be situated more than 50 metres from any ponds or ditches.
- 4.1.23 Refuelling will take place in situ at the site compound. When refuelling the following measures will be implemented:
- Supervise all refuelling and bulk deliveries of fuel to ensure there are no spillages;



- Check the available capacity in the tank before refuelling;
- Don't jam open a delivery valve;
- Check hoses and valves regularly for signs of wear;
- Turn off valves after refuelling and lock them when not in use;
- Position drip trays under pumps to catch minor spills;
- Keep a spill kit with sand, earth or commercial products for containment of spillages; and
- Provide incident response training to staff and contractors.

4.1.24 Machinery will be inspected regularly to ensure there are no fuel leaks.

4.1.25 Spill kits with sand, earth or commercial products that are approved for stored materials will be located at the site. Staff will be trained on the use of these kits and will be made aware of where the kits are stored.

4.1.26 In the event of any incidents including spillages (diesel), contaminated run-off, damage to underground services or poor waste disposal the procedure will be as follows:

- Contact and inform the construction manager, and use the appropriate spill kit; and
- The construction manager will be responsible for immediately contacting National Resources Wales and recording the incident.

4.1.27 Concrete will be delivered to the site ready mixed and poured directly at the point of use (the substation). No mixing or storage of concrete will occur within the site.

4.1.28 Sewage and chemicals from the welfare units will be emptied regularly using specialised vehicles and removed from the site immediately.

Silt

4.1.29 Detailed measures to prevent silt runoff into watercourses will be set out within the CEMP.

4.1.30 A previously culverted section of ditch will be opened up and diverted in the west of the site, as shown in the Ecological Constraints Plan and detailed within the



Flood Risk Assessment. This will reduce runoff within this area of potential surface water flooding.

4.1.31 Although prevention of silt/runoff will be covered within the CEMP, the general principles for control are set out below:

- Minimise the amount of exposed ground and soil stockpiles and the length of time these are exposed;
- Only removing vegetation from the area that needs to be exposed in the near future;
- Cover any stockpiles;
- Use of geotextile silt fences or haybales if required to buffer runoff; and
- Restriction of works during periods of heavy rainfall.

4.1.32 Works will be timed to avoid the winter months, when the ground conditions are most saturated. A detailed timing plan for works will be set out within the CEMP.

4.1.33 The majority of the site is situated on free-draining soil or away from any watercourses, however, there are some key areas which have been identified as Critical Stream/Drainage areas as shown in the Ecological Constraints Plan. A full Method Statement for works within these areas will be set out within the CEMP.

Semi-Improved/Marshy grassland within the Solar Arrays

4.1.34 The majority of the site comprises diverse semi-improved grassland with patches of marshy grassland. Construction works will be restricted to drier periods, where possible, to prevent damage to the wet grassland habitats. The main construction period will be timed to the summer months when the ground conditions are likely to be drier. Some, less damaging activities will be conducted outside the summer months, details of which will be included in the Construction Environmental Management Plan.

PR2: Specific Safeguarding of Protected and Notable Species

Contributes to Objective 2



General

Toolbox Talk

4.1.35 A toolbox talk will be conducted by an experienced ECoW to the site manager in advance of the construction stages. An information pack for the site office outlining the presence of protected species will be provided with steps to take should they be encountered during the construction stages. The sensitive areas are shown on the Ecological Constraints Plan at the end of this report. This will be displayed within the site office and will be used as part of the induction for new contractors visiting the site.

Badgers

4.1.36 A 30 metre buffer area around the existing badger setts will be incorporated into the site layout plans. This buffer will be delineated with the proposed security (deer) fencing and this buffer area must be kept free from construction activities.

4.1.37 Prior to works commencing on the site, a pre-construction badger survey will be conducted by an experienced ECoW to ensure no new setts have been excavated within the construction area. This inspection will be undertaken during July to October prior to the construction stages.

4.1.38 Where active badger setts are identified, a 30m buffer will be delineated around the sett. Should the sett lie within 30m of a working area, the sett may require closure under a Natural Resources Wales (NRW) licence. Works at close proximity to the badger setts would be restricted to July to November inclusive. Careful timing will be required in terms of a pre-construction inspection, applications for any licences, and the closure of badger setts, if required.

4.1.39 Gaps will be incorporated into the security (deer) fencing in order to allow badgers access across the site. These gaps are shown on the Ecological Constraints Plan and are located close to the existing badger setts or mammal paths. Gaps will measure 100mm high and at least 1000mm in width. It is not advisable to utilise badger gates as these are known to be ineffective.

Otters

4.1.40 All watercourses will be protected through the installation of security or stock-proof fencing prior to the onset of construction. Appropriate buffers have been set out in the *Watercourses* section above.



-
- 4.1.41 Excavations will be infilled at the end of the day. Where this is not possible, ramps will be provided at regular intervals, such as a plank at a 45° angle. This will also benefit badgers and other mammals.
 - 4.1.42 A 10mph speed limit will be set during construction which will reduce the risk of accidental collision.
 - 4.1.43 Construction materials will be stored at least 50 metres from watercourses and any open material (such as pipes) which may be accessed by otters or other animals will be capped or covered during storage.
 - 4.1.44 Any tools or materials which may be hazardous to otters and other animals will be removed from the site or stored securely overnight.
 - 4.1.45 No lighting will be utilised during construction works. If night working is unexpectedly required, the Ecologist will be contacted for advice.

Bats

- 4.1.46 No artificial lighting is to be used during construction activities. Should any form of artificial lighting be required, a Lighting Plan will be required which will include a strategy for lighting type and placement to ensure that hedgerows, woodland and watercourses remain unlit at key times. The Lighting Plan will be created with input from an Ecologist and will be issued to the LPA for approval prior to any artificial lighting being used on the site.
- 4.1.47 A cable is to be laid across (or directionally drilled beneath) Ciddewi Bridge as shown on the Ecological Constraints Plan. This structure contains several potential roosting features for bats.
- 4.1.48 Bat emergence/re-entry surveys will be carried out prior to the commencement of construction between May and August in order to ascertain whether bats utilise the bridge for roosting.
- 4.1.49 Should any bats, or evidence of bats be found, a licence from Natural Resources Wales (NRW) will be required prior to the work commencing.
- 4.1.50 Cabling work will be carried out during the active bat season (between April to September inclusive) when dusk temperatures are above 8°C and so conducive to bat activity.



4.1.51 The following Method Statement will be adhered to **should the cable be laid over the bridge**, which has been prepared to protect the historical monument, but will also protect roosting/nesting features provided by the bridge:

Proposed methodology for laying of 3no. 11kV cables over masonry arch bridge at Cilddewi Bridge – Grid reference: SN 54619 05254

Date: 06/06/2013

Summary of outline proposal

It is proposed to route 3no. 11kV triplex cables over the masonry arch bridge.

It will be a contractual requirement that the method below is followed by the contractor, to ensure that the fabric of the listed structure is not damaged by the construction work. Any changes are to be approved by the Local Authorities prior to work taking place. The contractor will be responsible for briefing and supervising all operatives.

Any invasive work is limited to the concrete saddle, fill material and tarmac road surface. The protected masonry arch and parapet structure will not be touched.

Plant and tools will be selected to minimise vibration levels and any vibration created by the works will be considerably less than that caused by vehicle loading in normal use.

Detailed H&S risk assessments are the responsibility of the contractor and are not covered here.

Methodology

Cutting

1. Close the road and divert all traffic as agreed with the local Highways Authority.
2. Carry out a conditional survey of the bridge structure including all masonry and parapets, and prepare a full photographic record for submission to Carmarthenshire County Council.
3. Carefully drill a series of 16mm pilot holes to confirm the depth of the road makeup at the crown, measured from the top surface of the tarmac to the top of the masonry arch. A depth of approximately 350mm is estimated at the crown.
4. Using a diesel powered self propelled floorsaw, make a series of parallel cuts along the line of the trench at 75 - 100mm (maximum) centres. Blade cutting depth to be carefully set to keep at least 50mm clear from the masonry arch crown below. Any final material to be removed over the stone arch to be carefully de-laminated and removed using hand tools.
5. Break out the road surface and existing concrete using a small handheld 110V electric breaker, proceeding very carefully and slowly to ensure no interference with or damage to the masonry structure beneath.



6. Outside of the area of the new steel coverplate, breaking is to be done using a handheld pneumatic jack hammer to a depth of 350 - 400mm depending on findings in item 3 above. Arisings to be removed by a 1t excavator. (No other vehicle traffic will be allowed onto the bridge).
7. Lay pre-formed galvanised mild steel trunking for electric cables in trench, bedded on 50mm lean mix sand and cement blinding and separation membrane over the masonry crown.
8. Backfill the trench with concrete to the specification agreed with the County Engineer.
9. Place galvanised mild steel coverplate in position using a HIAB lorry which will be parked on the bridge approach but will not drive over the arch structure. The steel coverplate is to be set to finish flush with top of existing concrete bridge saddle.
10. Road to remain closed for approved curing period.
11. Lay 100mm tarmac wearing course and make good.
12. Clear site of any debris or waste.
13. Carry out a post construction conditional survey of bridge structure including all masonry and parapets, and keep a full photographic record. All records to be submitted to Carmarthenshire County Council.

Environmental Impact Assessment

Impact	Source	Control Measures
Pollution of watercourse.	Dust generated by floorsaw.	Run off containing dust from cut tarmac and concrete will be collected and pumped into a settlement tank for disposal offsite.
Pollution of watercourse.	Concrete wash out.	Bunded area to be created for wash out. Water contaminated with cement will be collected and pumped into a settlement tank for disposal offsite.
Diesel spillage/leaks	Floorsaw, generator, excavator.	Plant to be filled prior to delivery to site. If refuelling is necessary, it is to be done using a funnel and over a drip tray. A spill kit is to be kept on site in case of any leaks.
Air pollution	Dust generated by floorsaw.	Wet cutting only.
Air pollution	Exhaust fumes	Turn off all plant when not in use. Plant to be well maintained and to have up to date service records.
Noise	Floorsaw, excavator	No out of hours working. Only use plant in good working order. Non residential area.

Proposed methodology for laying of 3no. 11kV cables over masonry arch bridge at Cilddewi Bridge. 06/06/13. Appendix 4 - Heritage Assessment (Cotswold Archaeology)



Dormice

- 4.1.52 A limited number of hedgerow breaches would be required to install the access tracks and cabling routes. Dormice have been identified as being hedgerows within some of the hedgerows within the site. It is considered highly unlikely that a dormouse nest would be encountered during clearance due to the very small length that would require removal. However, a dormouse European Protected Species Development Licence will need to be obtained from NRW prior to construction. The NRW licence will be required to permit the disturbance of the dormice within the site and any removal of habitat.
- 4.1.53 The removal of the hedgerows would take place between October to May inclusive in order to avoid impacts on dormice with any dependant young and any nesting birds (see *Birds* section below).
- 4.1.54 Initially, above ground vegetation will be removed during the winter months between November to March inclusive. Clearance will be carried out using handtools and care will be taken not to disturb the ground. The clearance will be carried out in the presence of a suitably qualified Ecologist with a NRW dormouse licence/accredited ECoW.
- 4.1.55 During the following May, the ground will be cleared using a toothed excavator again under the supervision of a licenced ECoW. The Ecologist will make a check of the ground prior to removing any roosts found within the hedgerow.

Reptiles

- 4.1.56 The marshy grassland habitat (dominated by rushes), will be cut in order to displace reptiles. These areas as shown in the Ecological Constraints Plan will be topped using a tractor mounted topper to approximately 100mm in April/May as soon as the air temperature is above 9°C and so reptiles are unlikely to be in hibernation. Arisings will be removed from site. Prior to topping, an ECoW will check the area for nesting birds.
- 4.1.57 Vegetation clearance will be undertaken directionally, from the outer parts of the rush areas and towards the field boundaries, in order to displace any reptiles into this retained habitat.
- 4.1.58 Machinery will be driven slowly to give reptiles time to disperse. It is considered likely that only grass snakes will be present in this habitat and so will disperse readily.



Birds

- 4.1.59 All grassland within the site will be cut as short as possible (approximately 100mm) prior to 1st March before construction commences (with the exception of the rush areas as described above). The grass will then be cut regularly until the onset of construction to ensure a length of no more than 150mm. This will prevent the site being used by ground nesting birds.
- 4.1.60 Prior to the cutting of the rush dominated marshy grassland habitat, a nesting bird check by an experienced Ecologist will be undertaken. This will be carried out no more than 48hrs prior to the clearance of the habitat.
- 4.1.61 Should any birds be identified as nesting within the habitat to be cleared, works will be postponed until the nest fledges.
- 4.1.62 The Ciddewi Bridge will be affected by a cable being laid across (or beneath) this structure (Method Statement above) and grey wagtail *Motacilla cinerea* have been confirmed as nesting within this structure. The nesting site will be temporarily blocked prior to March 1st by a licenced bat Ecologist who will check the area for roosting bats prior to blocking the crevice.
- 4.1.63 Alternative nesting locations will be installed by an experienced Ecologist as early as possible, but at least prior to the crevices being blocked. These will comprise a total of 4 no. Schwegler 2HW nest boxes which will need to be added to banks or structures up or downstream of the bridge. It will be left to the Ecologists discretion as to where these boxes would be most suitably installed.

PR3: Monitoring

Contributes to Objective 1 & 2

- ~~4.1.64 The EcOW will conduct monitoring visits every two weeks during the construction phase. The first visit will be undertaken prior to construction commencing and once the fencing has been installed. The purpose of this visit will be to:~~
- ~~• Check the fencing is installed with the required buffers;~~
 - ~~• Check the grassland has been managed to a length not suitable for ground nesting birds;~~
 - ~~• Check the marshy grassland has been cleared to displace reptiles;~~
 - ~~• Conduct a toolbox talk to the Site Manager; and~~



- ~~Ensure the Ecological Mitigation Plan is on display at the site office and that a toolbox talk pamphlet is available to all site operatives.~~

~~4.1.65 Subsequent monthly visits will focus on:~~

- ~~Checking that the fencing (security fencing and temporary fencing) is in place and undamaged;~~
- ~~Check buffer areas are free from machinery and materials; and~~
- ~~Ensure no issues with pollution incidents or silt runoff.~~

4.1.66 The ECoW will also be available on an “on call” basis during construction should any unforeseen issues arise. **Monitoring**

4.1.67 The monitoring program will comprise:

- Initial check of site by ECoW prior to construction commencing and once the protective fencing has been installed to ensure that all buffers have been appropriately demarcated;
- Daily site checks, to include visual inspection of the watercourses, by the Site Environmental Manager or appointed staff (who have been briefed on this document). This will include a check of any protective measures (silt fencing, hay bales) as well as a check of water quality to record discolouration, odour, oily sheen or litter. A log will be kept on site of these checks and any problems identified as well as remedial measures implemented;
- A site visit by an ecologist every two weeks during the construction period to check the water courses and that the mitigation measures outlined in this document are in place and functioning appropriately. Water samples will also be taken.

4.1.68 Water samples will be taken at 4 points both upstream and downstream of the development on the Afon Morlais and Afon Dafen (approximate locations of points are shown in Appendix 1) in order to assess water quality. Likely parameters will be pH, electrical conductivity, temperature, dissolved oxygen and total suspended solids.

4.1.69 Where there are significant differences in water quality between the two sample points, the causes will be investigated. This may require a walk of the length of



the watercourse and any adjoining ditches in order to identify sources of pollution or silt runoff. Remedial measures will be implemented as required.

4.1.70 The ECoW will also be available on an “on call” basis during the construction period.

Reporting

4.1.71 A quarterly report will be issued by the ECoW to Lindsey Rendle, the Local Planning Authority Ecologist. The report will include a detailed log of monitoring activities by the Site Environmental Manager and ecologist. It will detail and breaches of the CEMP and the remedial steps taken. It will also include results of the water samples taken.

PR4: Installation of Habitat Enhancements

4.1.72 A number of habitat enhancements will be installed within the site including:

- Scrapes for breeding/wintering birds;
- Seeding of any bare ground created during construction with a diverse native seed mix;
- Plug planting of species to benefit notable butterflies;
- Planting and reinforcement of new hedgerows;
- Installation of bat, bird and dormouse boxes; and
- Creation of hibernacula, brush and grass piles.

4.1.73 The specification and locations of these features are fully detailed within the LEMP. The majority of new habitats will be created once construction has been completed. Some of the above may require use of excavators including the creation of swales and hibernacula. These may be installed during the construction phase whilst the plant and machinery is already on site.



5 TIMETABLE

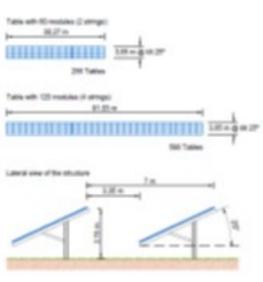
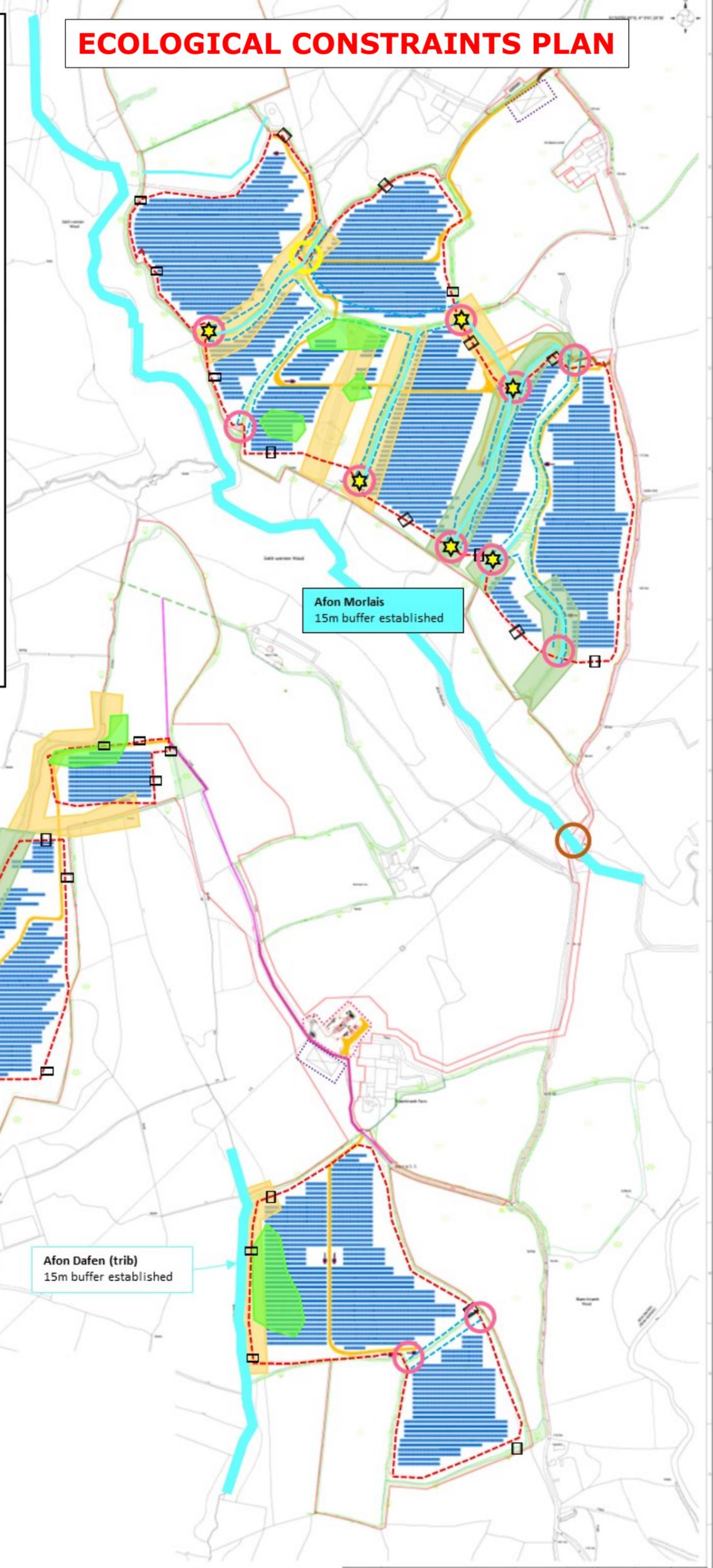
Prescriptions						MAIN CONSTRUCTION PHASE				
		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
PR1	Installation of security/temporary fencing (including gaps for badgers) <i>Prior to onset of construction</i>				Prior to construction					
PR2	Pre-construction badger check <i>Carried out by an ecologist to update locations of active setts Undertaken July to October prior to construction to allow time to carry out licenced activities, if required.</i>									
PR2	Cutting of grassland within the site (approximately 100mm). Subsequent re-cutting to ensure height of no more than 150mm until the onset of construction	Cutting of grassland to 50mm	Management up until onset of construction							
PR2	Directional clearance of marshy grassland/rush habitat <i>April/May when temperature above 9°C. Nesting bird check by ecologist prior to removal</i>			Clearance of grassland	Nesting bird check					
PR2	Dormice/Birds/Reptiles <i>Supervision of removal of hedgerow</i>					Prior to construction				



Prescriptions		Feb	Mar	Apr	May	MAIN CONSTRUCTION PHASE			Oct
						Jun	Jul	Aug		Sep
PR2	Laying of cable over Ciddewi Bridge using Method Statement <i>Pre-works inspection of bridge by licenced ecologist and emergence survey if necessary</i>							Laying of cable Pre works survey	
PR3	Monitoring <i>Initial visit by EcOW prior to works commencing, then two-weekly monitoring visits during construction</i>				Toolbox talk and pre-construction check	Two-Weekly visit	Two-Weekly visit	Two-Weekly visit	
PR4	Installation of habitat enhancements <i>These may be installed during or after construction is complete. Details are included within the LEMP.</i>							Habitat enhancements requiring use of excavator	Remaining enhancements installed

ECOLOGICAL CONSTRAINTS PLAN

- Location of security fencing (deer fencing) at least 4m from field boundary
- Location of sheep-proof fencing at least 4m from field boundaries
- Marshy grassland area to be cleared to displace any reptiles present prior to construction
- Security fencing installed hard up to hedgerow – may require some pruning under supervision.
- Security fencing posts within 2m of watercourse to be installed by hand
- Gap under security fencing to allow badger access (approx. 100mm high and at least 1000mm wide)
- Cable trenching over bridge
- Supervision required to clear gap in hedgerow
- Main river with at least 15m buffer
- Main ditch with at least 7m buffer
- Critical stream/drainage – requires measures to prevent overland flow/compaction
- Critical stream/drainage – requires measures to prevent soil damage/siltation
- Heras-type fencing around construction compounds
- Permanent fencing around substation



REVISION	DATE	BY	CHKD	APPD
1	10/10/2023	...	...	...
2	...	...	...	...

NO	DESCRIPTION	DATE	BY	CHKD	APPD
01	Issue for approval	10/10/2023	...	...	...
02	Issue for construction	10/10/2023	...	...	...

APPENDIX 7.6

LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

**PENDRI / BLAENHIRAETH SOLAR FARM,
LLANGENNECH, CARMARTHENSHIRE**

Prepared by



and



commissioned by

VOLTALIA UK LTD

23 / 12/ 2020



LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

PENDERI / BLAENHIRAETH SOLAR FARM, LLANGENNECH, CARMARTHENSHIRE

CONTENTS

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2	AIMS & OBJECTIVES.....	4
3	RESPONSIBLE PERSONNEL & LINES OF COMMUNICATION	7
4	OPERATIONAL PHASE PRESCRIPTIONS	8
5	MANAGEMENT PLAN DIARY	24

Project	Blaenhiraeth Solar Farm, Llangennech, Carmarthenshire			
Document	Landscape and Ecological Management Plan (LEMP)			
Client	Voltalia UK Limited			
Author	Gregor Neeve, Hannah Montag and Rob French			
Status	Checked (C&W)	Date	Checked (Pegasus)	Date
V1	PT & MB	19/07/18	RF	08/08/2018
V2	TC	23/07/19	RF	23/07/2019
V3	HM	02/01/20	RF	09/01/2020
V4	HM	16/12/20	RF	23/12/2020

Surveys are undertaken on the understanding that nothing in the final report will be omitted, amended or misrepresented by the client or any other interested party. This report and its contents remain the property of Clarkson and Woods and Pegasus Group until payment has been made in full.



1 INTRODUCTION

1.1.1 This Landscape and Ecological Management Plan (LEMP) has been prepared on behalf of Voltalia UK Ltd in support of the proposed 34.4 MW solar photovoltaic (PV) development on approximately 96.27 hectares of land at Blaenhiraeth Farm, Llanelli, SA14 8PX. Due to the generating capacity, the planning application constitutes a Development of National Significance (DNS) and will be determined by the Welsh Government on the recommendation of the Planning Inspectorate Wales (PINS). The LEMP has been jointly prepared by Clarkson and Woods Ecologists and Pegasus Group Landscape Architects.

1.1.2 Ecology surveys have revealed the following notable habitats/species within the site:

- Rivers/Streams adjacent to the site, which are hydrologically linked to the Carmarthen Bay and Estuaries Special Area of Conservation (SAC);
- Hedgerows, some of which are species rich and 'Important' under the Hedgerow Regulations (1997) and woodland at the field boundaries;
- Diverse, semi-improved grassland within the development footprint;
- Diverse fen habitat adjacent to the development;
- Badger setts within and adjacent to the site;
- Bats which may roost within trees and forage within the hedgerows or grassland;
- Dormice have been confirmed as present within the woodlands and hedgerows;
- Otters have been confirmed as present within the river adjacent to the site;
- Birds breeding in hedgerows and grassland habitats; and
- Reptiles may be present in tussocky, marshy grassland.

1.1.3 A separate Landscape and Visual Impact Assessment (LVIA, Rev A) was carried out by Pegasus Group in December 2020, the findings of which are outlined within Chapter 6 of the Environmental Statement (ES).

1.1.4 The Welsh Government's Technical Advice Note 5 (TAN 5) on Nature Conservation and Planning (2009) provides guidance on consideration of biodiversity in the planning process and states that the planning system should "*look for development to provide a net benefit for biodiversity conservation*". This LEMP seeks to promote the delivery of suitable ecology mitigation measures through the proposed solar PV development.



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- 1.1.5 An EIA screening opinion from Lindsey Rendle, the Carmarthenshire Council Ecologist, dated 27th October 2014 states that “...an appropriate landscape and biodiversity mitigation/enhancement plan” should be included as part of the scheme. The purpose of the plan will be to “...deliver some landscape and biodiversity enhancement...through the management or creation of wildlife habitats elsewhere on the land holding”. This document therefore aims to satisfy TAN5 and the relevant screening opinion requests from Carmarthenshire County Council.
- 1.1.6 A site meeting has been carried out where the prescriptions within this LEMP were discussed and agreed with the Local Planning Authority ecologists. This LEMP has been subsequently revised in order to reflect these discussions with the LPA.
- 1.1.7 Established guidance¹ sets out a series of opportunities to enhance solar farms for local wildlife and contribute to national biodiversity targets. This LEMP reflects the recommendations set out within this guidance document.
- 1.1.8 This report sets out the aims and objectives, followed by detailed management prescriptions. A timetable of works is given in Section 5 and a plan at the end of this report shows the locations for the proposed enhancements. The Site Layout and Landscape Framework Plan is provided within Figure 6.2 of the ES.

¹ BRE (2014) Biodiversity Guidance for Solar Developments. Eds G E Parker and L Greene

2 AIMS & OBJECTIVES

2.1.1 The proposed solar PV development at Blaenhireath Farm presents a considerable opportunity for landscape and biodiversity mitigation and enhancement. This LEMP has been prepared to ensure that these opportunities are realised and could be suitably conditioned by PINS or the LPA as part of a planning consent.

2.1.2 The aim of this LEMP is to:

- Set out the agreed objectives for landscape management of the site;
- Set clear standards for the performance of landscape maintenance work;
- Assist in the development of work programmes for landscape maintenance staff;
- Establish landscape maintenance responsibilities; and
- Help monitor success and progress against these aims and objectives.

2.1.3 The following objectives have been identified which, when implemented, will ensure the overarching aims of the LEMP are achieved.

Objective 1: To create new habitats through planting of locally appropriate native species

2.1.4 Areas of bare ground created during the construction stage will be reseeded as soon as possible post construction to ensure injurious or ruderal weeds do not establish. A wildflower seed mix appropriate to the local area, including yellow rattle *Rhinanthus minor*, will be used in order to increase the diversity of the grassland.

2.1.5 Species will be added to the wildflower seed mix to attract species such as the forester moth *Adscita staites*, latticed heath moth *Chiasmia clathrate*, and grass rivulet *Perizoma albulata*. These are all Species of Principal Concern under the Environment (Wales) Act.

2.1.6 Approximately 1309 linear metres of native double staggered hedgerows and reinforcements are proposed as shown on the Site Layout and Landscape Framework Plan within Figure 6.2 of the Environmental Statement. The proposed hedgerows and reinforcements are intended to mitigate for the losses. In addition, the proposed hedgerow planting will assist with the visual screening of the proposed solar PV development. There would be a number of standard native trees located within the native hedgerow species mixes at locations that do not



overshadow the proposed solar panels. Care would need to be taken to avoid the standard native trees when trimming the existing hedgerows.

Objective 2: To provide sheltering features around the site for nearby populations of bats, birds and other notable faunal species

- 2.1.7 A variety of bird boxes will be installed on mature trees throughout the site for species such as barn owl *Tyto alba* (a Carmarthenshire BAP priority species), tawny owl *Strix aluco*, kestrel *Falco tinnunculus*, tree creeper *Certhia familiaris*, nuthatch *Sitta europaea* and general nest boxes for small passerines, including house sparrow *Passer domesticus* and tree sparrow *Passer montanus* (a Carmarthenshire BAP priority species). Willow tit *Poecile montanus* and marsh tit *Poecile palustris* nesting boxes will be installed in suitable wet woodland.
- 2.1.8 Four scrapes will be created to provide ephemeral wet areas for snipe, which have been recorded breeding and over wintering on the site.
- 2.1.9 Bat boxes will be installed on the mature trees and woodland within the site. These will include boxes within the wetland areas which would be particularly suitable for bat species which forage in wetlands (such as soprano pipistrelles *Pipistrellus pygmaeus* and Nathusius pipistrelle *Pipistrellus nathusii*) other boxes will be installed within the woodland habitats which would be particularly suitable for woodland species (such as brown long-eared bats *Plecotus auritus* and Natterers bats *Myotis nattereri*). All bats species are included within the Carmarthenshire BAP.
- 2.1.10 Dormouse boxes will be installed in suitable habitat across the site to enhance the nesting habitat for this Carmarthenshire BAP priority species.
- 2.1.11 Partially buried hibernacula, as well as log and brash piles, will be installed around the site in order to provide habitat for invertebrates, amphibians and reptiles. Grass piles will also be established within the field margins, which are suitable for reptiles, particularly for egg laying slow worms *Anguis fragilis* and grass snakes *Natrix natrix*. Reptiles and amphibians are included as a group plan within the Carmarthenshire BAP.

Objective 3: To manage the grassland to establish a diverse sward beneath the solar arrays

- 2.1.12 Part of the site within the array areas will be managed to create a diverse grassland habitat, which will benefit a wide range of wildlife. Within these areas,



grazing and cutting will be restricted during the summer months to allow plants to flower and set seed. The remaining fields on site will be used for grazing sheep beneath the solar panels during the summer months, to allow rotational grazing throughout the year.

Objective 4: To manage grassland outside of the solar arrays for wildlife

2.1.13 The grassland within the field margins will be managed as rough tussocky grassland that will benefit a range of species including birds, bats, small mammals, invertebrates, reptiles and amphibians.

2.1.14 Areas have been targeted for management to provide suitable habitat for ground nesting birds.

Objective 5: To manage hedgerows and trees to provide habitat for a range of species and ensure visual screening of the solar arrays

2.1.15 Existing hedgerows would be managed on a three year rotational cutting cycle to encourage a vertical height of 3 metres above ground level (agl) to promote visual screening and biodiversity. This will also benefit species such as brown hairstreak *Thecla betulae*, a Carmarthenshire BAP priority species as well as dormice, birds and bats.

2.1.16 Dead wood within the hedgerow and woodland habitats will be retained.

Objective 6: To monitor the site and assess the success of management

2.1.17 In order to deliver the proposed landscape and ecological objectives, monitoring of the effects of management prescriptions will be required to ensure that these are effective, and to inform any necessary refinement of the site management.



3 RESPONSIBLE PERSONNEL & LINES OF COMMUNICATION

3.1 Voltalia UK Ltd

3.1.1 Voltalia UK Ltd shall be responsible for the implementation of this LEMP and will appoint a land manager to carry out the objectives of this document. Should the site be sold, the responsibility for actioning the management objectives of the LEMP would be passed on to the new site owner.

3.2 Land Manager

3.2.1 The land manager would be responsible for the implementation of the LEMP during the operational phase. The land manager will be provided with a copy of this LEMP and liaise with Voltalia UK Ltd and the consultant ecologist, where required, to ensure that the stipulated measures are being correctly implemented.

3.3 Ecologist

3.3.1 The Ecologist shall be suitably qualified with at least two years' experience and suitable training and a member of the Chartered Institute of Ecology and Environmental Management (CIEEM). When undertaking monitoring, a Natural Resources Wales (NRW) bat and dormouse licence will be required. Additionally, a licence is required should the barn owl box require opening. Clarkson & Woods (01934 712500) should be contacted prior to undertaking further ecological monitoring or surveys within the site.

3.3.2 The Ecologist will be appointed to carry out the monitoring as set out within this LEMP. They will also be required to provide advice on positioning of habitat boxes and potentially advise on other aspects of habitat creation and management.

4 OPERATIONAL PHASE PRESCRIPTIONS

PR1: Sowing of Native Seed Mix

Contributes to Objective 1

- 4.1.1 Areas of bare ground created during construction will be seeded with a native wildflower and grassland seed mix which will be of UK provenance.
- 4.1.2 Prior to seeding, the bare ground areas will be harrowed and rolled, using a tine harrow in order to avoid any potential damage to underground electrical and grid connections. However, if there are any areas which have suffered high soil compaction, for instance due to heavy machinery being deployed, these will be harrowed using a disc harrow to ensure the soil structure is suitable for sowing. If such a requirement arises to harrow with discs, caution should be exercised to ensure newly installed underground services are not damaged.
- 4.1.3 If there is an abundance of annual or perennial weeds, these areas may be treated with a glyphosate non-residual herbicide prior to seeding.
- 4.1.4 Seeding will take place in autumn (September/October) following completion of the construction phase. Seeds will be broadcast by machine (fertiliser spreader, grass seed box) and rolled where possible. The gaps between strings of solar arrays are to be wide enough to accommodate a tractor travelling between them for harrowing, sowing and rolling purposes. In areas where a machine is unable to access, such as far underneath panels, seeding in these areas will be broadcast by hand and trodden in.
- 4.1.5 The seed mixture will contain yellow rattle *Rhinanthus minor* as well as a variety of native flower and grass species to reflect the species typically found within the locality. The seed mix used will be agreed with the Council's ecologist and landscape officer prior to seeding.
- 4.1.6 The following species will be included within the native wildflower seed mix in order to attract specific moths:

Common Name	Latin Name	Larval Foodplant
Common sorrel	<i>Rumex acetosa</i>	The Forester
Clover	<i>Trifolium sp.</i>	Latticed heath, shaded broad-bar
Yellow rattle	<i>Rhinanthus minor</i>	Grass rivulet
Vetch	<i>Vicia sp.</i>	Shaded broad-bar



PR2: Improvement of Hedgerows

Contributes to Objective C3

4.1.7 Approximately 1309 linear metres of proposed native double staggered hedgerows and reinforcements are shown on the Site Layout and Landscape Framework Plan within Figure 6.2 of the Environmental Statement. The proposed hedgerows and reinforcements are intended to mitigate for the losses required for the site access, maintenance tracks and cabling routes. In addition, the proposed hedgerow planting sourced of local provenance will assist with the visual screening of the proposed solar PV development. There would be a limited number of standard native trees located within the native hedgerow species mixes at locations that do not overshadow the proposed solar panels. Care would need to be taken to avoid the standard native trees when trimming the hedgerows. Standard trees are to be marked on site with high double staking to prevent removal within hedgerow trimming operations.

4.1.8 The new native hedgerows and reinforcements will include the following species as shown on ES Figure 6.2:

Species	Common Name	Height/Spread	Percentage
Acer campestre	Field Maple	100-125cm	5%
Crataegus monogyna	Common Hawthorn	100-125cm	40%
Cornus sanguinea	Dogwood	100-125cm	5%
Corylus avellana	Hazel	100-125cm	10%
Fagus sylvatica	Common Beech	100-125cm	20%
Ilex aquifolium	Holly	80-100cm	5%
Prunus spinosa	Blackthorn	100-125cm	5%
Quercus robur	Pedunculate Oak	100-125cm	10%

4.1.9 The proposed native standard trees will include the following species as shown on ES Figure 6.2:

Species	Common Name	Form	Girth	Height cm	Root Condition
Acer Campestre	Field Maple	Standard	12-14cm	300-350	RB
Fagus sylvatica	Beech	Standard	12-14cm	300-350	RB
Quercus robur	Pedunculate Oak	Standard	12-14cm	300-350	RB
Pinus sylvestris	Scots Pine	Standard	12-14cm	300-350	RB



4.1.10 A detailed hedgerow planting species mix and specification will be agreed with the Council's ecologist and landscape officer.

4.1.11 The new native hedgerows and reinforcements will accord with the following requirements/specifications:

- Hedgerow planting to undertaken between 1st November and 31st March inclusive;
- Prepare the ground along a 1.5m wide strip to provide good soil conditions and as little competition from other vegetation as possible;
- Apply non-residual herbicide to the 1.5m strip in the August or September prior to planting only;
- Hedgerow plants must be:
 - 2-year-old transplants;
 - At least 450mm to 600mm high;
 - Native species, with no one species making up more than 70% of the total;
 - Planted in a staggered double row 40cm apart with a minimum of 6 plants per metre; and
 - Kept clear of weeds until they are established.
- Remove individual guards and tree shelters once the plants are established;
- Replace all failures in the following planting season;
- Trim the newly planted hedge in at least the first 2 years to encourage dense and bushy growth, allowing the hedge to become taller and wider at each cut;
- Care should be taken to avoid the standard native trees when trimming hedgerows; and
- Prevent livestock and grazing animals from damaging the hedge by setting fencing at least 1.2m from the centre of the hedge, or, if there is a bank, as close to the base of the bank as possible.

4.1.12 Any dead wood within the hedgerows and woodland will be retained on site and potentially assist with the construction of the hibernacula.

PR3: Installation of Habitat Boxes

Contributes to Objective 2

4.1.13 The following 22 no. bird boxes will be installed onto the mature trees, hedgerows and woodland within the site, in approximate locations shown on the Ecology

Enhancement Plan at the end of this document. Exact locations for these boxes will be determined on site by the consultant Ecologist.

#	Description and Image	Positioning
2	Barn Owl Trust Barn Owl Box 	To be purchased from Barn Owl Trust or handmade using specifications as shown at: http://www.barnowltrust.org.uk/infopage.html?Id=42 The Barn Owl Box is to be placed on a large mature tree in the open, with unobstructed access to the entrance.
2	Schwegler No. 5 Owl Box 	To be installed 4-6m above ground on a mature tree with unobstructed access to the box. To encourage use, a thick layer of sawdust or wood shavings should be spread in the base of the box.
2	Schwegler Kestrel Nest Box 28 	To be installed at least 3m (preferably 6-8m) above ground on a mature solitary tree. To be placed on a south-eastern orientation away from prevailing wind. Ensure unobstructed access to the box.
2	Schwegler 2B Treecreeper Nest Box 	To be placed on a mature tree with rough bark (such as oak or pine) on a trunk with a diameter of 25-30cm. Should be placed at least 3m off the ground. Best placed on a north or easterly aspect.
2	Schwegler 5KL Nuthatch Box 	To be placed close to the No. 5 Owl boxes in order to encourage nuthatches from utilising the owl boxes. Should be placed at least 3m off the ground. Best placed on a north or easterly aspect. Ensure the boxes are covered from the rain by facing the entrance down slightly in order to prevent rain seeping in and so encourage use and increase the longevity of the box. Ensure there is clear access to the box entrance at all times.



#	Description and Image	Positioning
2	<p>Schwegler 1B Bird Box (32mm entrance)</p> 	<p>To be placed at least 2m above the ground in a quiet and sheltered area of site on mature trees.</p> <p>Ensure the boxes are covered from the rain by facing the entrance down slightly in order to prevent rain seeping in and so encourage use and increase the longevity of the box. Ensure there is clear access to the box entrance at all times. Best placed on a north or easterly aspect.</p>
8	<p>Schwegler 1B Bird Box (28mm entrance)</p> 	<p>Two groups of 4 boxes placed in clusters to be suitable for tree sparrow (which nests colonially).</p> <p>To be placed at least 2m above the ground in a quiet and sheltered area of site on mature trees.</p> <p>Ensure the boxes are covered from the rain by facing the entrance down slightly in order to prevent rain seeping in and so encourage use and increase the longevity of the box. Ensure there is clear access to the box entrance at all times. Best placed on a north or easterly aspect.</p>
2	<p>Marsh and Willow Tit Box</p> 	<p>To be placed within damp woodland.</p> <p>Sawdust should be left within the box to allow the bird to excavate a nest hole.</p> <p>Box to be placed 1-2m from the ground.</p>

4.1.14 The following 15 no. bat boxes will be installed onto mature trees/hedgerows within the site, in approximate locations shown on the Ecology Enhancement Plan. Appropriate locations for these boxes will be determined on site by the consultant Ecologist.

#	Description and Image	Positioning
5	<p>Schwegler 2F with double front panel</p> 	<p>Nail onto the main trunk of mature trees 4 to 5m high, on south, south west or south eastern aspects, ideally in a sunny location. Suitable for smaller species of bats and the internal panels dissuade birds from nesting within this box.</p>
3	<p>Schwegler 1FF Bat Box</p>	<p>Nail onto the main trunk of mature trees 4 to 5m high, on south, south west or south eastern aspects, ideally in a sunny location.</p>

		Suitable for crevice dwelling species such as pipistrelle bats.
5	Schwegler 1FD 	Nail onto the main trunk of mature trees 4 to 5m high, on south, south west or south eastern aspects, ideally in a sunny location. Suitable for a variety of bats.
2	Schwegler 3FS 	Nail onto the main trunk of mature trees 4 to 5m high, on south, south west or south eastern aspects, ideally in a sunny location. Suitable for larger colonies of small bats such as pipistrelles.

4.1.15 Additionally, 50 no. dormouse nest boxes will be installed throughout the site in suitable hedgerows and woodland habitat. The boxes will be placed at a height of between 1.5 - 4m on a suitably mature trees or shrubs. The following dormouse nest box design will be installed:

- *Mammal Society Dormouse Box – Sliding Roof* available from Wildcare
<http://www.wildcareshop.com/dormouse-box-sliding-roof-1.html>

4.1.16 These dormouse boxes will be passed on to a local wildlife group for monitoring as part of the National Dormouse Monitoring Scheme.

PR4: Creation of Scrapes

Contributes to Objective 2

4.1.17 Four scrapes will be created, providing habitat for wintering and nesting birds. The locations of these scrapes are shown on the Ecology Enhancement Plan.

4.1.18 The scrape will comprise a shallow depression approximately 500mm deep in the centre. It will not be uniformly dug, so shallow and deep areas will be present.

4.1.19 Spoil generated during the creation of scrapes will be removed away from the area to ensure a raised ridge is not created at the perimeter of the scrape, which may dissuade certain bird species.

4.1.20 The scrape will be approximately 100m² in size and where space permits, several can be created to form a cluster.

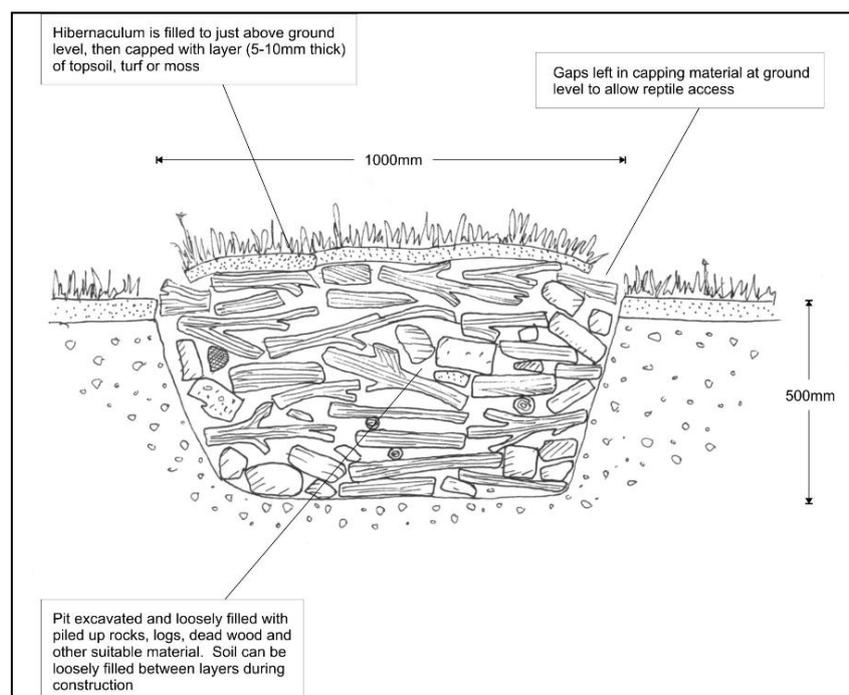
4.1.21 Scrapes will be managed to ensure they do not become choked with vegetation. Should more than 25% of the scrape become covered in rush or tall vegetation, this area will be cut using hand tools. The arisings can be left in situ.

PR5: Creation of Habitat Piles

Contributes to Objective 2

4.1.22 Two wildlife hibernacula will be created, comprising partially buried logs and rubble, to provide shelter and an over-wintering refuge for reptiles, amphibians and invertebrates. Appropriate locations for the hibernacula are shown on the Ecology Enhancement Plan.

4.1.23 The creation of the refuges will take place at the end of the construction stage and will ideally utilise existing wood and stone generated during site preparation, ground excavation and hedgerow removal works. However, should this not exist, materials necessary to create the refuges will be brought onto site. A diagram showing the construction of a hibernaculum is shown overleaf:





4.1.24 In addition, four above ground log and brash piles will be created around the site comprising any branches or cuttings created during works. An additional four grass cuttings piles will be created using arisings created during works on the site. The above structures can be added to with arisings created during management works on the site post construction.

PR6: Management of Grassland Beneath Solar Panels

Contributes to Objective 3

4.1.25 The proposed solar PV development has been divided into fields targeted for conservation grazing and those which may be grazed during the summer months as shown on the Ecological Enhancement Plan.

Areas Grazed During the Winter (Conservation Grazing)

4.1.26 The grassland within these fields will be subject to regular cutting as appropriate during the first year (at least three times within the year) in order to prevent the spread of annual weeds and reduce the nutrient levels in the soil.

4.1.27 Arisings will be collected with a baler or rake to remove nutrients and thereby promote the establishment of a biodiverse sward.

4.1.28 The frequency of cutting will be dependent on the establishment of the sward and will be more regular should annual weeds establish or if arisings cannot be removed from the site.

4.1.29 In subsequent years, this area will be managed through low intensity grazing using sheep and mowing. Both the combined approach of mowing and grazing and the approach of management through mowing alone are presented below.

Mowing and Grazing:

January-February	Light grazing on any new growth (optional).
Early March	Remove grazing; this allows plants to grow and creates good habitat for ground nesting birds. A cut may be taken prior to this should the sward height cause shading problems. Consideration should be given to cutting the grass along the front edge of the panels only.



End August/September	Cut hay once the wildflowers have seeded; cut meadow slowly and allow opportunities for animals and birds to escape.
Late September to end of December	Main grazing period if sheep are used with light grazing down to a short sward height; a mosaic of plant heights helps encourage insects.

4.1.1 The intensity and timings of grazing and mowing may be modified in order to create a sward which does not shade the solar panels, however, the site should not be cut between early March and the end of August to ensure plants can flower and set seed. Should shading of the panels become a problem, a strip directly in front of the panels may be cut which will resolve the shading problems, but allow plants within the rest of the site to establish.

Areas Grazed During the Summer (Agricultural Grazing)

4.1.2 This area will not have any restrictions on grazing and it is assumed that the sheep moved from the conservation area in early March would be relocated into this area until late September when they can be moved back.

4.1.3 Caution is advised when grazing ewes with small lambs due to the presence of small gaps beneath the security (deer) fencing at certain locations. These gaps are provided to enable badgers and other wildlife access through the site.

PR7: Management of Ground Nesting Bird Areas

Contributes to Objective O4

4.1.4 The areas to be managed for ground nesting birds are shown within the Ecological Enhancement Plan.

Field 1 & 2 and Areas A & B

4.1.5 These fields are outside the footprint of the array and outside the security (deer) fencing and will be subject to restrictions in farming practices. This includes:

- No cutting or grazing between early April and the end of August.
- No spraying of herbicide within the above period.

4.1.6 The aim of the management will be to create a sward height of 20-50cm during March to August inclusive.



Area C

4.1.7 Area C is within the security (deer) fencing and so will be subject to grazing/cutting as per the rest of the site.

4.1.8 The aim of the management will be to create a sward height of 20-50cm during March to August inclusive and to promote tussocky grassland to establish. A haycut of this area may not be required, so may be excluded from the management of these areas in order to achieve this sward structure and height.

PR8: Management of Field Margins

Contributes to Objective 4

4.1.9 Coarse, tussocky grassland will be created between the security (deer) fencing and the field boundary hedgerows.

4.1.10 In order to prevent the encroachment of scrub, rotational cutting will be applied. Half of the site will be cut per year to approximately 15cm, allowing two years growth to establish before cutting.

4.1.11 Mowing will take place outside of the bird nesting season (March to August inclusive) during periods of dry weather to ensure that waterlogged ground is not damaged by machinery.

4.1.12 Due to the potentially tall grass/scrub and amount of arisings that would need to be collected, two options are available:

- A flail mower and collector is utilised and arisings are removed to be composted or baled for silage; or
- A disk-cutter is utilised and arisings are left in situ, turned, then collected and baled for use as hay.

4.1.13 Sheep grazing may also be utilised in combination with the above to reduce the amount of arisings to be collected. Sheep will only be utilised between September and February inclusive at a stocking density of around 5 – 10 animals per hectare.

PR9: Management of Injurious Weeds

Contributes to Objective 3

4.1.14 The land will be managed to ensure that any of the five injurious weeds (Weeds Act 1959) do not proliferate or spread on the site. The five species include:

- Common ragwort *Senecio jacobaea*



- Spear thistle *Cirsium vulgare*
- Creeping or field thistle *Cirsium arvense*
- Broad-leaved dock *Rumex obtusifolius*
- Curled dock *Rumex crispus*

4.1.15 Should any of these species become problematic (i.e. a spread to more than 10% of the total field), management prescriptions may need to be altered.

4.1.16 Firstly, the weeds will be cut to ground level prior to flowering and the stocking density within that field will be reduced to lessen disturbance to the sward. Ragwort may need to be hand pulled rather than cut.

4.1.17 Should the spread of weeds remain at >10% after two years of cutting/reduction in stocking density, weeds will either be:

- Spot treated with a broad spectrum, non-persistent herbicide; or
- Treated with a selective weed killer through weed wiping.

4.1.18 Any use of herbicides will first be discussed with the Ecologist.

4.1.19 The spread of undesirable plants will be monitored by the site operator and through monitoring visits by an Ecologist as set out in PR12.

4.1.20 Given the wet nature of the site, it is likely that rush will spread across the wetter areas which are being conservation managed. Although not an injurious weed, rush may form very dense areas and outcompete other wildflower species. Should rush become a problem, a winter cut during a hard frost can be carried out.

4.1.21 Cutting during a hard frost can help to kill cut stems. Should this approach be taken, the areas of dense rush will be targeted with the vegetation cut by hand or using a quad mounted mower; larger machinery may damage the soil structure and cause ruts. In some cases it may be possible to utilise larger machinery, if the ground is well frozen.

PR10: Hedgerow and Tree Management

Contributes to Objective 5

4.1.22 Existing hedgerows would be managed on a three year rotational cutting cycle to encourage a vertical height of +3 metres above ground level to promote visual screening and biodiversity value.



4.1.23 Standard trees will be retained and encouraged within the hedgerow network. Standard trees will be marked on site with high double staking to prevent falling during hedgerow trimming.

4.1.24 Hedgerows will be cut outside of the bird nesting season (March to August inclusive). Care should be taken to avoid the standard native trees when trimming hedgerows.

4.1.25 Dead wood will be retained within the hedgerow and woodland habitat as this forms important habitat for a variety of species. Fallen dead wood will be retained within the hedgerow or woodland network. Standing deadwood will also be retained, however, this may require some pruning to prevent any damage to the solar panels. Where pruning occurs, an Ecologist will be contacted prior to works as roosting bats and nesting birds may have to be considered.

PR11: Monitoring

Contributes to Objective 6

4.1.26 A monitoring strategy is set out below.

Botany

4.1.27 Botanical surveys will be undertaken in years 1, 5, 10, 15 and 20.

4.1.28 The surveys will be carried out within Botanical Monitoring Fields 1 & 2, as shown on the Ecological Enhancement Plan.

4.1.29 Quadrats (2 x 2m) will be used with each species cover within the quadrat assessed using the Domin scale. A total of 15 no. quadrats within each of the fields will be recorded (so 30 no. in total) with 5 no. quadrats recorded from directly beneath the panels, 5 between the arrays of solar panels and 5 within the edges of the fields, where no solar panels have been installed.

4.1.30 The quadrats will be fixed to ensure that the same area is monitored each visit. Fixed quadrats will be marked either physically on the site (if markers will not impede access by maintenance vehicles) or via GPS and mapping (each string of panels has a row number, so mapping locations of quadrats is possible).

4.1.31 The botanical monitoring will be conducted in June/July.

4.1.32 In addition to the above methodology, a visit will be made to those areas which are seeded; these are likely to be discreet areas where caballing is laid or where



ground is damaged during construction. A general walkover will be made of these areas, with the presence of those species included within the seed mix noted.

4.1.33 The results of the botanical monitoring will aim to show:

- Changes in grassland composition;
- Reduction in the spread of agricultural grasses such as ryegrass;
- Establishment of species included within the seed mix; and
- Eventually, it may be possible to assess the NVC community which has established within the site.

Breeding Birds

4.1.34 Bird surveys will be carried out in years 2, 5 and 20.

4.1.35 The wintering bird surveys will be conducted during the same months as the baseline survey (April, May and July).

4.1.36 The survey will follow BTO guidelines, where the observer systematically walked through the site, ensuring that all points on site were visited to within 50m. The location and behaviour of all birds and flocks of birds seen are noted on large-scale survey maps which are later collated onto master maps for interpretation. Particular attention is paid to bird exhibiting breeding behaviour, for instance birds in full song, exhibiting antagonistic behaviour/calling, carrying nest material, carrying food, and returning to nesting sites. Standard BTO Common Birds Census symbology and species codes are used to create a survey map of each individual visit.

4.1.37 Bird sightings will be separated into different habitat "zones" as follows:

Open Habitats

4.1.38 Birds which were recorded within the open fields, either foraging within the grass or scrub within the field, or flying overhead.

Hedgerow (Boundary) Habitats

4.1.39 Birds recorded within the hedgerows bordering the fields. These species may forage within the margins of the field, but are primarily associated with the hedgerows on site.

Woodland Habitats



4.1.40 Those species recorded within the woodland habitats which border the site. It should be noted that only the edges of this woodland are surveyed, therefore, the numbers of birds encountered are not representative of the woodland as a whole.

Wintering Birds

4.1.41 Bird surveys will be carried out in years 2, 5 and 20.

4.1.42 The wintering bird surveys will be conducted during the same months as the baseline survey (November, December, January and February).

4.1.43 The wintering bird surveys will follow BTO guidelines, where the observer systematically walked through the site, ensuring that all points on site are visited to within 50m. The location and behaviour of all birds and flocks of birds seen are noted on large-scale survey maps which are later collated onto master maps for interpretation.

4.1.44 The site will be split into 7 “zones” to aid with analysis of results and make it comparable to the baseline surveys. The zones are as follows:



-
- 4.1.49 A local dormouse group will be contacted in order to monitor the dormouse boxes as part of the National Dormouse Monitoring Program. The aim of this scheme is to monitor local dormouse populations in order to get a national picture and highlight any areas where this species may be declining.
- 4.1.50 Biological monitoring will ensure the habitat is establishing as intended and will track the development of the sward which should increase in diversity over time. Monitoring will also give an early-warning of any injurious weeds or vegetation failure that may occur. Over time the monitoring information will build up a picture of the ecological benefits of the site to a broad range of species.
- 4.1.51 Recommendations may be made to amend the management prescriptions to promote a more diverse grassland sward. Recommendation may include a change in management or supply of additional seed.
- 4.1.52 A monitoring report will be supplied to the Local Planning Authority subsequent to each monitoring visit.
- 4.1.53 An annual steering group meeting will be held in order to review the LEMP and change any management measures or monitoring as required.



5 MANAGEMENT PLAN DIARY

Prescriptions		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PR1	Seeding of Bare Areas <i>Bare areas created during construction to be reseeded once construction is complete</i>												
PR2	Improvement of Hedgerows Planting of new native hedgerow												
PR3	Installation of Bird, Bat and Dormouse Boxes Locations to be agreed by an ecologist while on site.												
PR4	Creation of Scrapes Four scrapes created during or immediately after construction						<i>During or post-construction</i>						
PR5	Creation of Habitat Piles Hibernacula to utilise materials generated from construction where possible.						<i>During or post-construction</i>						

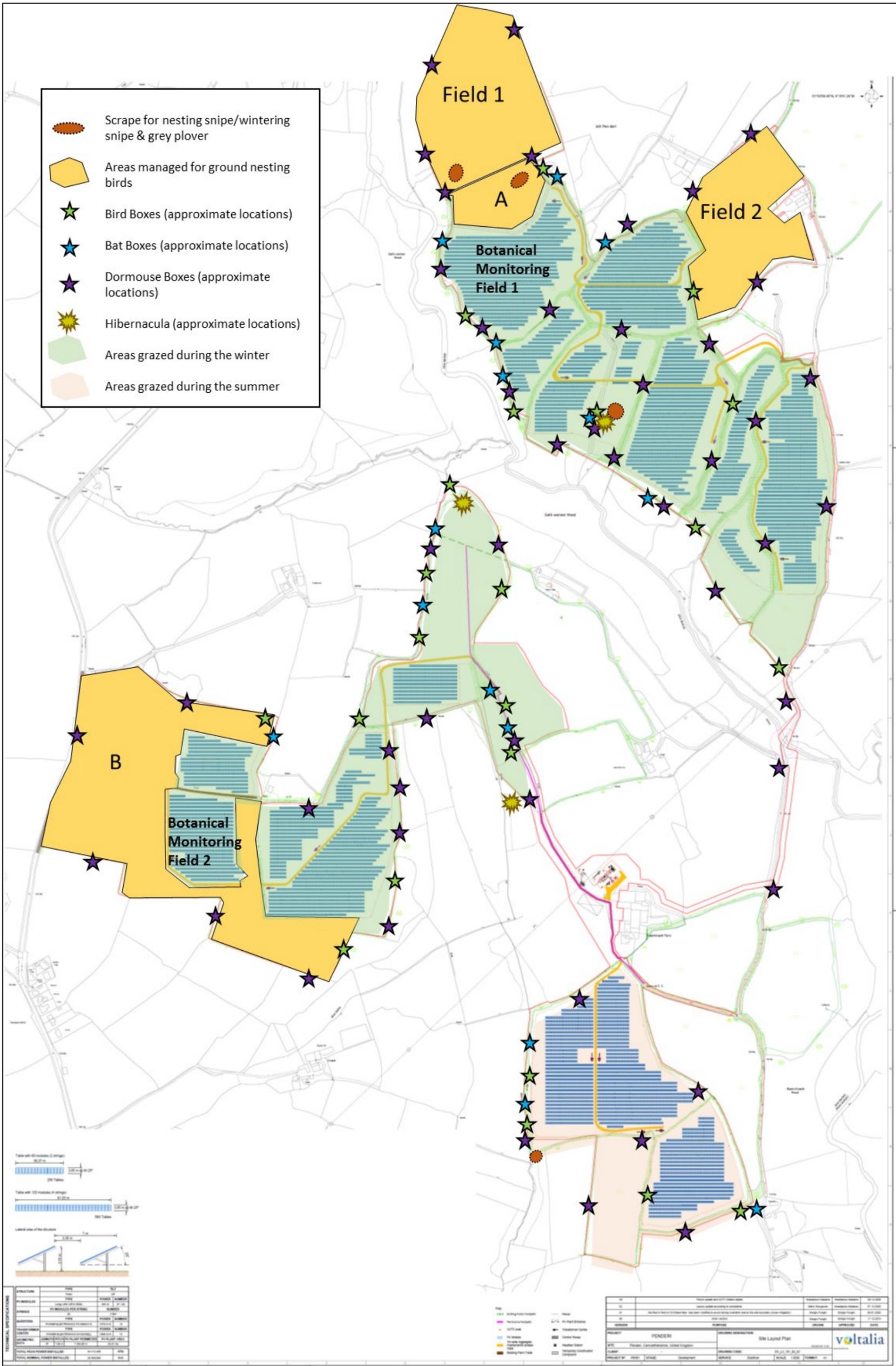


Prescriptions		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PR6	Management of Grassland Beneath Array – Winter/Conservation Grazed Regular cutting during first year with arisings removed												
PR6	Management of Grassland Beneath Array – Winter/Conservation Grazed Management over subsequent years	<i>Light grazing on any new growth</i>							<i>Hay cut</i>	<i>Main grazing period</i>			
PR6	Management of Grassland Beneath Array – Summer/Agricultural Grazing			<i>Main grazing period</i>									
PR7	Management of Ground Nesting Bird Areas – Area A								<i>Topped to 13cm</i>				
PR7	Management of Ground Nesting Bird Areas – Area B & C	<i>Light grazing on any new growth</i>								<i>Main grazing period</i>			
PR8	Management of Field Margins Cut/ grazed on 2 year rotation												
PR9	Management of Injurious Weeds Weeds to be cut and/ or weed-killed where necessary												



Prescriptions		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PR10	Hedgerow and Tree Management Hedgerows to be cut on a three year rotation												
PR11	Monitoring To be carried out in years 1,2,3,5 and 10	<i>Wintering birds</i>	<i>Breeding birds</i>										
					<i>Botany</i>								

ECOLOGICAL ENHANCEMENT PLAN



APPENDIX 7.6

HRA INFORMATION

**INFORMATION TO SUPPORT HABITAT REGULATIONS
ASSESSMENT**

PENDERI FARM, LLANGENNECH, CARMARTHENSHIRE

carried out by



commissioned by

VOLTALIA UK LIMITED

DECEMBER 2020



INFORMATION TO SUPPORT HABITAT REGULATIONS ASSESSMENT

PENDERI FARM, LLANGENNECH, CARMARTHENSHIRE

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Project title:	Penderi Farm		
Document title:	Information to Support HRA	Project number:	7273
Client:	Voltalia UK Ltd	Author:	Hannah Montag
Quality Assurance	Approved by:		
	Tom Clarkson MCIEEM		
			

The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



1 INTRODUCTION

- 1.1.1 The Habitat Regulations Assessment (HRA) process is set out within Part 6 (Assessment of Plans and Projects) of the Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations'). It is required where a plan or project is deemed to have possible impacts on a European designated site, which encompass Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. Candidate Sacs and proposed SPAs are also included within the assessment.
- 1.1.2 The first stage of the HRA process is a screening test to identify whether the plan or project is likely to have any significant impacts on a European designated site. In this case, Clarkson & Woods conducted a likely significant impacts test and concluded that given the distance of the proposed development from the designated sites, no impact was likely. However, given the direct hydrological link between the proposed development and the designated sites downstream, Natural Resources Wales (NRW) have requested that mitigation is put in place in order to ensure that watercourses are adequately protected in order to fully safeguard the European designated sites. Due to recent case law (People over Wind, 2018), any development which incorporates mitigation measures from its initial stages in order to prevent likely significant impacts on European designated sites, should be subject to a full Appropriate Assessment.
- 1.1.3 Given the request from NRW to incorporate mitigation measures and the above case law, a full Appropriate Assessment will be required for this project and this document sets out relevant information to support that process.

1.1 Existing Site Description

- 1.1.1 The site is located in Carmarthenshire, South Wales, approximately 6 km north of the town of Llanelli and consists of improved/poor semi-improved pasture grassland and wetter rush dominated areas interspersed with native broadleaf woodland, species-rich hedgerows with ditches and streams and the Afon Morlais river which flows through the site. It is surrounded by farmland and the west of the site is partly bounded by the A476.
- 1.1.2 A map showing the red line boundary of the site is given in Figure 1.



Figure 1: Red Line Boundary of Site (@Google LLC)



1.2 Proposed Development

- 1.2.1 The development proposed by this application is for the construction, operation, maintenance and decommissioning of a ground mounted solar park with an intended design capacity of 34MWp (megawatts peak).
- 1.2.2 The proposed development is described in detail within Chapter 4 of the Environmental Statement.
- 1.2.3 The proposals constitute a Development of National Significance (DNS) under the criteria provided by the Planning (Wales) Act 2015.
- 1.2.4 The design of the project includes several measures to protect ecological features including:
- A buffer of at least 15m between the Afon Morlais and Afon Dafen tributaries and proposed solar panels, delineated with permanent deer proof fencing.
 - A buffer of 7m between main ditches (which hold water year-round) and protective fencing.
 - A buffer of 4m between smaller ephemeral ditches and protective fencing
- 1.2.5 A Construction Ecological Management Plan and draft Construction Environmental Management Plan have been prepared which set out measures to protect the watercourses adjacent to the site.
- 1.2.6 Post construction, any bare areas within the grassland will be seeded with a more diverse wildflower mix and a large proportion of the site will be subject to conservation grazing in order to increase the botanical diversity within the area. In addition to this, ground nesting bird areas have been incorporated into the design which are outside the footprint of the array and will be managed through restrictions in cutting/grazing during the spring and summer months. This is set out within the Landscape and Ecological Management Plan.

1.3 Consultation

- 1.3.1 Various consultation have been undertaken with NRW and the Local Planning Authority (LPA), both formal and informal.
- 1.3.2 NRW have raised concerns about impacts on designated sites downstream from the proposed development and have requested that a CEMP is prepared. In their consultation response they advised that the CEMP should include:
- A monitoring programme for all watercourses on site. As a minimum, they should be checked daily or more frequently dependent on the nature/location of works.
 - Details on any water features on the site and how they will be protected.
 - Any sources of pollution (including silt), potential pathways for that pollution to enter any watercourses within the vicinity of the site and appropriate pollution control measures to be implemented on site.
 - Details of the nature, type and quantity of materials to be imported on to the site.
 - Details of emergency contacts, for example Natural Resources Wales' Pollution hotline 0300 065 3000.
 - Pollution Prevention: demonstrate how relevant Guidelines for Pollution Prevention and best practice will be implemented, including details of emergency spill procedures and incident response plan.
 - Details of the persons and bodies responsible for activities associated with the CEMP and emergency contact details.

- 1.3.3 Subsequent contact with NRW confirmed that:

There is a hydrological link to the protected sites so the competent authority will have to carry out a test of likely significant effect which may then go to appropriate assessment. An agreed CEMP implemented on site during construction could safeguard the water quality of the watercourses in the vicinity and therefore not be an issue for the protected sites. We are happy for the CEMP to be conditioned and agreed in writing before commencement. If the competent authority goes to appropriate assessment the level of detail required is case specific. In this case, from our perspective, an agreed CEMP would cover the issue. It would be worth agreeing with the competent authority as they can also request it as a condition of the mitigation.

- 1.3.4 The LPA ecologist was also contacted, and she confirmed that HRA is not within Carmarthenshire County Councils remit and that it would be the Planning Inspectorate that conducts the screening and subsequent Appropriate Assessment, if one is required.

1.3.5 Given the requirement for mitigation (as specified above), it is assumed that an Appropriate Assessment is required and so this document is aimed at supporting the Planning Inspectorate to carry out the Appropriate Assessment.

1.4 European Designated Sites – Desk Study

1.4.1 A total of 4 European designated sites lie within 10km of the proposed development. These are: Burry Inlet SPA and Ramsar (6km south at its closest point), Caeau Mynydd Mawr SAC (6km north east at its closest point), Cernydd Carmel SPA (8.8km north east at its closest point) and Carmarthen Bay and Estuaries SPA (3.2km south east at its closest point).

1.4.2 A map showing the above designated sites is given in Figure 2 below.

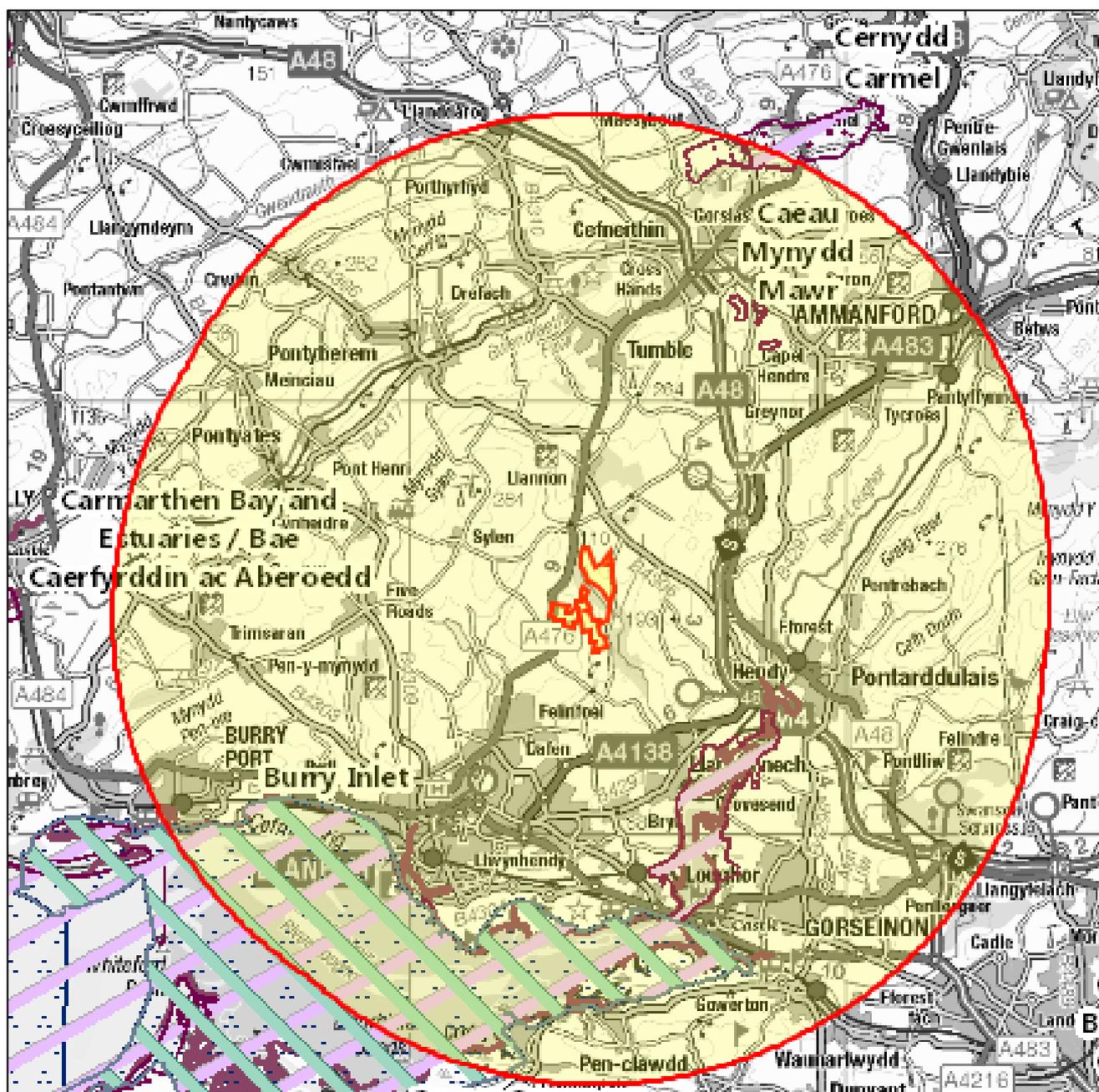


Figure 2: European Designated Sites within 10km of the Proposed Development (Proposed Development outlined in red with 10km buffer shaded yellow). MAGIC Map, Defra

1.4.3 Cernydd Carmel SAC is designated for its Annex 1 habitats (primarily Turloughs, but also wet heathland, dry heathland, raised bog and woodland). Given the distance of this site and the fact that there are no links in terms of habitat to the proposed development, it has been scoped out of this assessment.



- 1.4.4 Caeau Mynydd Mawr SAC is designated for its wet grassland habitat and presence of breeding marsh fritillary butterfly *Euphydryas aurinia*. This species has been considered within the Extended Phase 1 Report (Appendix to the Ecology Chapter for the Environmental Statement) and a meeting was conducted with the Conservation Project Officer for Parc Coetir Mynydd Mawr and it was confirmed that the proposed development site was not suitable for marsh fritillary butterfly. This designated site has also, therefore, been scoped out of this assessment given the absence of suitable habitat and the distance of the protected site from the proposed development.
- 1.4.5 Burry Inlet SPA and Ramsar and Carmarthen Bay and Estuaries SPA are therefore the focus of this assessment. A description of these sites is given below:

Burry Inlet Special Protected Area (SPA) and Ramsar

- 1.4.6 The site is designated due to internationally important numbers of overwintering Northern shoveler *Anas clypeata*, Eurasian teal *Anas crecca*, Eurasian wigeon *Anas penelope*, dunlin *Calidris alpina alpina*, red knot *Calidris canutus*, Eurasian oystercatcher *Haematopus ostralegus*, Eurasian curlew *Numenius arquata*, grey plover *Pluvialis squatarola*, common shelduck *Tadorna tadorna* and common redshank *Tringa tetanus*. The site also supports an internationally important assemblage of birds with a 5 year mean peak of 34,962 waterfowl.
- 1.4.7 The main threats to the site and the severity (Low/Medium/High) have been taken from the Natura 2000 data form and are as follows:
- Air pollution, air-borne pollutants (Low)
 - Marine water pollution (Medium)
 - Changes in abiotic conditions (High)
 - Outdoor sports and leisure activities, recreational activities (Medium)
 - Military use and civil unrest (Medium)
 - Fishing and harvesting aquatic resources (Medium)
- 1.4.8 The conservation objectives for the site include:
- The numbers of SPA bird species are stable or increasing
 - The abundance and distribution of suitable prey are sufficient and appropriate to support the numbers of all SPA bird species
 - All SPA birds are allowed to inhabit their feeding grounds and resting areas with minimum disturbance, and are allowed to move unhindered between them.
 - All states of the Conservation Objectives for the supporting habitats and species, subject to natural processes, are fulfilled and maintained in the long-term. Supporting habitats for bird species of the Burry Inlet SPA include:
 - Estuaries
 - Mudflats and sandflats not covered by seawater at low tide
 - Atlantic salt meadows
 - Salicornia and other annuals colonising mud and sand
 - 'Large shallow inlets and bays' are the supporting habitat for the common scoter of the Carmarthen Bay SPA.
 - The management and control of activities or operations likely to be of significant effect to the oystercatchers, is appropriate for maintaining the feature at FCS and is secure in the long-term.

Carmarthen Bay and Estuaries Special Area of Conservation (SAC)

- 1.4.1 The SAC is designated for excellent European examples of six of the habitat and five of the species conservation features of interest listed in the Habitats Directive. The listed habitats are: Estuaries, Large shallow inlets and bays, Atlantic salt meadows, Salicornia and other annuals colonising mud and sand, Mudflats and sandflats not covered by seawater at low tide, and Sandbanks which are slightly covered by sea water all the time. Twaite Shad *Alosa fallax* are identified as an Annex II species forming a primary reason for selection. This species migrates through the estuary to access spawning areas on the Afon Tywi. Other Annex II species listed within the citation (but not identified as primary reasons for qualification are: Allis shad *Alosa alosa*; river lamprey *Lampetra fluviatilis*; sea lamprey *Petromyzon marinus*; and European otter *Lutra lutra*).



1.4.2 The main threats to the site and the severity (Low/Medium/High) have been taken from the Natura 2000 data form and are as follows:

- Fishing and harvesting aquatic resources (Medium)
- Pollution to surface waters (limnic, terrestrial, marine & brackish) (High)
- Human induced changes in hydraulic conditions (High)
- Marine and Freshwater Aquaculture (Medium)
- Invasive non-native species (Medium)
- Hunting, fishing or collecting activities (Medium)
- Soil pollution and solid waste (excluding discharges) (Low)
- Changes in abiotic conditions (Medium)
- Marine water pollution (Medium)
- Outdoor sports and leisure activities, recreational activities (Medium)
- Air pollution, air-borne pollutants (Low)
- Shipping lanes, ports, marine constructions (Medium)
- Other urbanisation, industrial and similar activities (High)
- Grazing (High)

1.4.3 Conservation objectives include:

- The aim that contaminant levels in the water column and sediments derived from human activity are to be:
 - at or below existing statutory guideline concentrations
 - below levels that would potentially result in increase in contaminant concentrations within sediments or biota
 - below levels potentially detrimental to the long-term maintenance of the features species populations, their abundance or range.
- And the aim that the fauna present in the SAC will be protected through:
 - Contaminant burdens derived from human activity being below levels that may cause physiological damage, or immune or reproductive suppression
 - For otters specifically, that there are sufficient sources within the SAC and beyond of high quality freshwater for drinking and bathing.

2 IDENTIFICATION OF LIKELY SIGNIFICANT EFFECTS

2.1.1 The habitats within the site are not directly associated with the SAC or SPA/Ramsar, however, the streams which lie adjacent to the site feed into the Carmarthen Bay and Estuaries SAC approximately 5.1km downstream. This then feeds into the Burry Inlet SPA/Ramsar approximately 10.4km downstream, as shown in Figure 3 overleaf.



Figure 3: Location of Proposed Development Site and SAC/SPA/Ramsar with Afon Morlais Tributary Connecting



- 2.1.2 NRW have highlighted possible impacts to watercourses during construction which may then affect these designated sites further downstream. This relates to pollution incidents in the form of spills (from vehicles or other chemicals used on the site) and silt pollution.
- 2.1.3 There is also the potential for species which utilise the designated sites to be found within the development area. In order to assess this, the following surveys have been conducted:
- Extended Phase 1 habitats survey conducted on the 20th October 2014, updated on the 26th April 2018 with the results augmented from visits later in the year associated with bird surveys (on the 9th and 31st May 2018)
 - Four wintering bird surveys carried out on 13th January, 28th January, 3rd February and 12th February 2015, updated with additional surveys carried out on 28th November, 18th December 2017 and 16th January, 27th February 2018
 - Four breeding bird surveys carried out on 16th April, 24th April, 19th May and 5th June 2015, which were updated on 26th April, 9th May, 31st May and 4th July 2018

Habitats

- 2.1.4 None of the habitats found within the SAC/SPA/Ramsar are present within the proposed development site.

Birds

- 2.1.5 Wintering bird surveys conducted within the development site identified a peak count of 14 grey plover. The population of grey plover at Bury Inlet SPA is estimated to be 660 individuals and they are classed as "common" within the SPA. The grey plover recorded within the development site could, therefore, represent up to 2% of the SPA population. These birds were only recorded during a single visit, late in the season (27/02/18), so may have been more mobile due to the commencement of migration.
- 2.1.6 The grey plover recorded within the proposed development site where present at low tide, when the SPA would be most optimal for foraging; therefore, these birds are likely to be using the site opportunistically rather than as a necessity when the SPA may be underwater and so not accessible for foraging.
- 2.1.7 Although it is unlikely that the site is functionally linked to the SPA through the movement of the grey plover, they do use the site on an opportunistic basis. These birds are likely to be displaced from some areas of the site, however, other areas will be retained and enhanced for this species, therefore, habitat loss will be minimal and unlikely to affect the integrity of the SPA population.

Otters

- 2.1.8 Otters are known to be present within the Carmarthen Bay and Estuaries SAC and there are also records of otter within the Afon Morlais river adjacent to the site. One of the SACs conservation objectives states that there should be "sufficient sources within the SAC and beyond of high quality freshwater for drinking and bathing" for otters. Therefore, any pollution events as set out above which occur during construction of the solar farm have the potential to impact on otters associated with the designated site. There is also the potential for otters be affected through noise and vibration during construction, particularly if they are laying up close to the site during the day.

3 ASSESSMENT

- 3.1.1 It has been identified above that Carmarthen Bay and Estuaries SAC and Bury Inlet SPA/Ramsar could be impacted through the release of pollution (from plant or silt) during construction which may directly impact the sites further downstream, or impact otters which may be associated with the sites.
- 3.1.2 Additionally, otters may be impacted by noise or vibration during construction.

3.2 Pollution Release

Construction Phase

- 3.2.1 The installation of panels will require the movement of vehicles across the site as well as excavation of trenches to lay cables to join strings of panels. This has the potential to churn up the ground, particularly if



undertaken during wet weather. Disturbance of the soil may lead to release of silt which may be deposited downhill from the construction area either directly into the main rivers or into smaller ditches which are linked to the main tributaries.

3.2.2 Any stockpiling of soil, for example during the excavations for the cables or when installing the foundations for the transformer centres or control house may also lead to silt runoff during heavy rain.

3.2.3 Chemical spills may occur when vehicles are being refuelled, or through damage of machinery.

Operational Phase

3.2.4 No likely impacts have been identified during the operation of the plant and the cessation of intensive agriculture is likely to result in benefits to the watercourses.

Mitigation Measures

Pollution (Silt and Chemical)

3.2.5 A draft CEMP has been prepared which will be finalised prior to construction commencing (and agreed with the LPA). This sets out measures such as:

- Construction schedule (with the main part of construction occurring outside the winter months)
- Management of sediment and surface waters
- Foul drainage
- Construction compound management
- Dust and emission mitigation
- Management and movement of concrete
- Hydrocarbon contamination precautions
- A soil management plan
- Regular construction phase monitoring of sensitive receptors (daily by site manager or appointed party and every two weeks by ecological clerk of works)

3.2.6 More detail will be added to the CEMP once planning permission has been obtained and more information is known about contractors and construction start dates.

3.2.7 However, the principals set out above will ensure that watercourses are protected from pollution incidents and therefore, impacts on the designated sites can be avoided.

3.3 Noise/Vibration

3.3.1 Potential for noise/vibration impacts on otters associated with the designated sites was identified.

Construction Phase

3.3.2 A Construction Ecological Management Plan has been prepared which sets out measures to protect otters during construction. This includes:

- Establishment of buffer zones adjacent to watercourses, with installation of security or stock-proof fencing prior to construction commencing
- Infilling of excavations at the end of the day or, where this is not possible, provision of ramps to enable animals to escape excavated areas
- A 10mph speed limit during the construction period
- Construction materials stored at least 50m from watercourses
- Any tools or materials which may be hazardous to otters removed or stored securely overnight
- No lighting during construction works. If lighting is required, an ecologist will be contacted for advice

Operational Phase

3.3.3 No mitigation is required during operation of the development and it is possible that the European designated sites may benefit from the reduction in fertilizers applied to the land and the creation of diverse grassland/planting of hedgerows and trees which may help to alleviate flooding.



3.4 Decommissioning

- 3.4.1 Prior to decommissioning, updated ecological surveys will be conducted as the site is likely to have changed considerably.
- 3.4.2 The same impacts are likely to apply during removal of the panels and associated structures and so a CEMP will be prepared to support that stage of development to ensure that the watercourses and otters are duly considered and protected.

4 CONCLUSIONS

- 4.1.1 Four European designated sites were identified within 10km of the proposed development area, although only two have the potential to be impacted by the construction works given that they are directly hydrologically linked to the watercourses adjacent to the site. There were:
- Burry Inlet Special Protected Area (SPA) and Ramsar
 - Carmarthen Bay and Estuaries Special Area of Conservation (SAC)
- 4.1.2 Potential impacts identified were pollution events (from chemical spillage or silt/sediment events during construction) or through noise/vibration affecting otters which are associated with the designated sites but are likely to utilise watercourses further away.
- 4.1.3 Mitigation measures have been put in place which are detailed within a Construction Environmental Management Plan and a Construction Ecological Management Plan. Both these plans set out precautions to ensure that the watercourses are protected from pollution during construction and also to ensure that otters are not injured.
- 4.1.4 Appropriate monitoring will be conducted throughout the construction phase to ensure that the CEMP is adhered to and that the specified measures are effective at controlling pollution of the Afon Morlais and connected on site waterbodies.
- 4.1.5 During operation of the site no adverse effects were identified and it may be that the European designated sites benefit from the reduction in fertilizer use and creation of more diverse habitats. In addition, solar farms are known to offer other ecosystem services such as improving soil quality (including stability), carbon sequestration and supporting pollinators which can offer benefits to surrounding land.
- 4.1.6 Similar plans will be put in place during decommissioning of the site as similar impacts are likely to occur as during the construction phase.
- 4.1.7 With the above measures in place, no significant effect is anticipated on the European designated sites.



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APPENDIX 8.1

FLOOD CONSEQUENCE ASSESSMENT

Voltalia UK Limited

Solar Farm at Blaenhiraeth, Llangennech, Llanelli, Carmarthenshire, SA14 8PX

Flood Consequence Assessment

21st December 2020

V9

This report is based on the instructions given by our client. It is not intended for use by a third party, and no responsibility will be given to any third party.

The consultant has followed accepted procedure in providing the services, but given the residual risk associated with any prediction and the variability which can be experienced in flood conditions, the consultant takes no liability for and gives no warranty against actual flooding of any property (client's or third party) or the consequences of flooding in relation to the performance of the services.

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Contents

- 1 Introduction
- 2 Site Location and Setting
- 3 Existing Development and Ground Conditions
- 4 Proposed Development
- 5 Existing Hydrology and Flood Risk
- 6 Policy
- 7 Surface Water Drainage
- 8 Construction Process
- 9 Maintenance
- 10 Conclusions and Recommendations

Appendix

- 1 Council response to SAB pre-application

Report prepared by Amy Jefferies – BSc (Hons), MA

Report approved by Clive Onions – BSc CEng FICE FCIWEM MStructE MCIHT

Version history

Version	Date	Prepared by	Approved by	Comment
V1	17.02.15	AJ	CO	Issued for approval
V2	25.03.15	CO	CO	Minor adjustments
V3	27.06.18	CO	CO	Site layout amended
V4	17.08.18	CO	CO	Final layout incorporated
V5	07.09.18	LJ	LJ	MWp amended
V6	31.07.19	CO	CO	Updated
V7	17.01.20	LJ	CO	Revised arrays layout
V8	15.12.20	LJ	CO	Revised layout
V9	21.12.20	LJ	CO	Minor Clarifications

Issue history

Version	Date	Issued to	Method
V1	17.02.15	Pegasus Group	Email pdf
V2	25.03.15	Ditto	Ditto
V3	27.06.18	Ditto	Ditto
V4	17.08.18	Ditto	Ditto
V5	07.09.18	Ditto	Ditto
V6	31.07.19	Ditto	Ditto
V7	17.01.20	Ditto	Ditto
V8	15.12.20	Ditto	Ditto
V9	21.12.20	Ditto	Ditto

1. Introduction

Volitalia UK Limited, the Client, is proposing to form a Solar Farm to generate up to 38MWp (megawatts peak) of renewable energy on a site formed in 3 parts on land 6km to the northeast of Llanelli, South Wales.

Carmarthenshire County Council has been Consulted as Lead Local Flood Authority, and subsequently as SuDS Advisory Board (SAB). It has also been determined that the proposal is assessed through the Development of National Significance (DNS) process.

A DNS EIA Scoping Direction (3213164 – Penderi Solar Park), in section 7.5, ‘Scopes-In’ Hydrology and Ground Conditions, due to the presence of downstream designated sites. An Environmental Statement chapter on Hydrology and Ground Conditions has therefore been prepared, which refers to the content of this Flood Consequence Assessment and a report Phase 1 Ground Conditions Desk Study by Integrale Ltd (Geotechnical Consultants).

This Flood Consequence Assessment (FCA) highlights the presence of watercourses in the vicinity, the importance of the ecology especially along hedgerows, and the need to provide buffer zones from watercourses.

This Flood Consequence Assessment has been prepared to consider the impact of the solar farm on the hydrology and to ensure that flood risk is not increased as a result of the development. It also shows that the development respects the buffer zones to watercourses and hedgerows.

The site and surroundings have been visited by the author of this report.

2. Site Location and Setting

The site is located on land northwest of Llangennech, approximately 6km northeast of Llanelli, and 3.5km southeast of Pont Abraham, at postcode SA14 8PX. The area is predominantly rural, with occasional areas of woodland, and bisected by the River Morlais (Afon Morlais).

The solar farm proposal is in three parts; A, B, and C – in a triangular configuration, with a total pv plant area of 54.91ha.

The overall site is in the following setting:

- North of the site the land undulates randomly with minor valleys containing watercourses, with the land devoted to farming, mainly pasture. The River Morlais forms a key valley from the north and leads through the site. The A476 and B4306 join at the north of the site, and form the east and west boundaries of the site.
- East of the site the rural undulating countryside continues, before the M4 cuts north-south 2.5km to the east. Central to the site, east of parts B and C, is the River Morlais, running north-south. A large power line supported by pylons stretches southwest-northeast between parts B and C, and just south of part A.
- South of the site the land undulates gently with pasture fields and occasional areas of woodland, with the River Morlais in a valley leading through Llangennech and into the tidal River Loughor estuary, some 4km southeast of the site.

- Southwest of the site is Swiss Valley Garden Centre, within the rural area, beyond which is Llanelli the closest and largest conurbation to the site. Afon Dafen leads south from the western part of the site, through Llanelli, and joins the River Loughor about 6.7km southwest of the site.
- West of the site is the A476 running north-south, beyond which lie the Upper and Lower Lliedi reservoirs within a farmland setting.

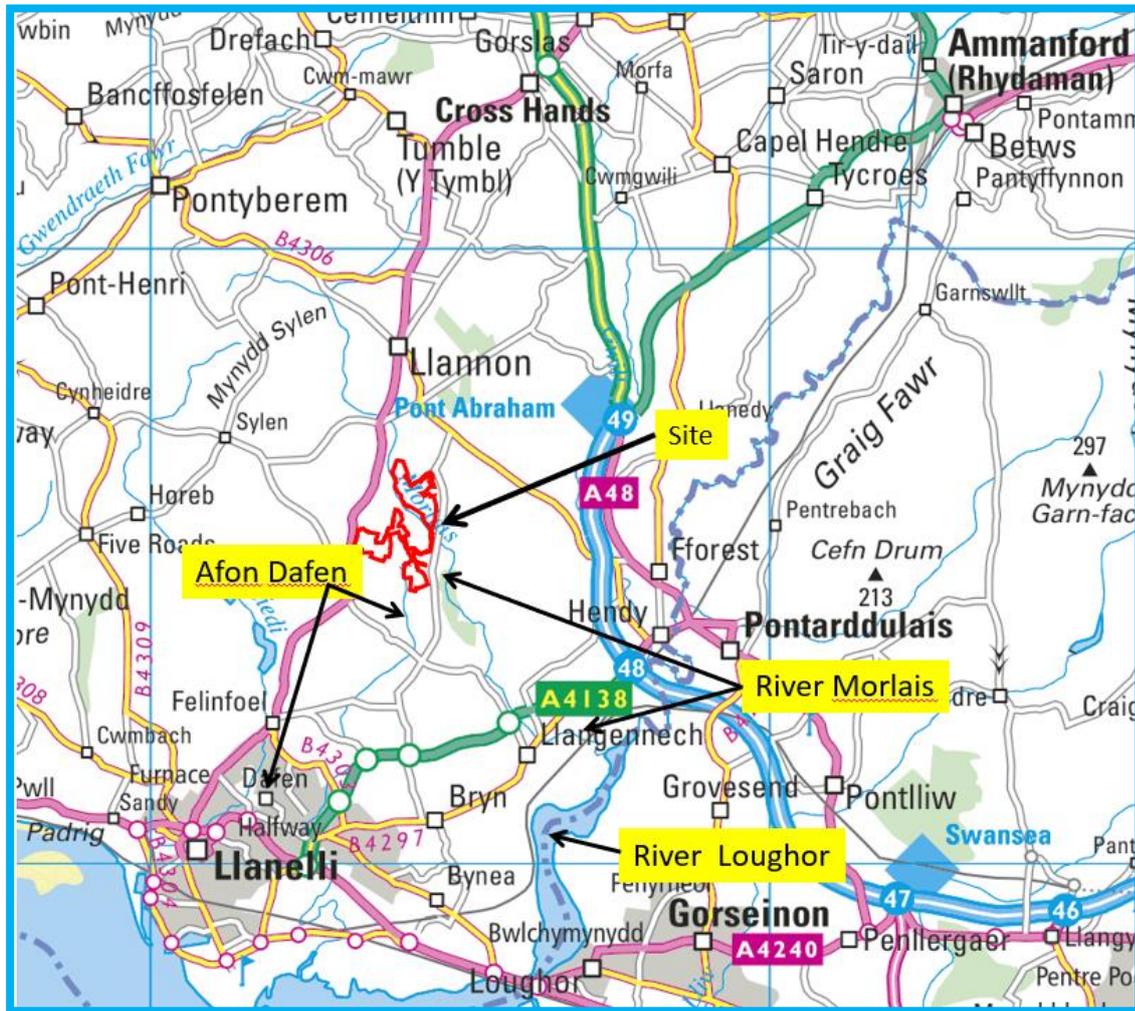


Fig 1 Site location outlined in red– note 3 parts, and Pont Abraham, end of the M4, to the northeast (Streetmap).

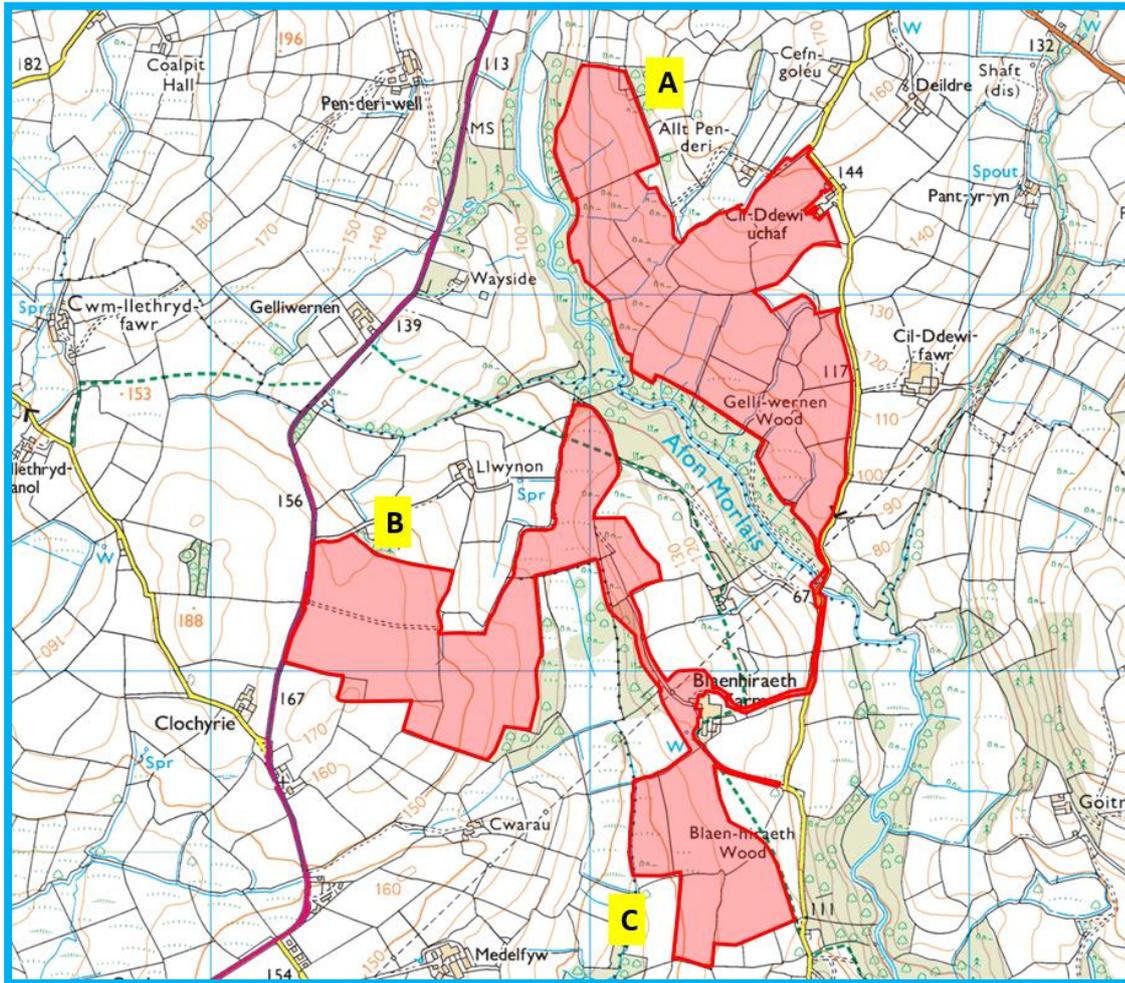


Fig 2 Site location identifying the 3 parts A, B and C. Note interlinking routes for access and cables between B and C, but along the existing lane for connection to A (Streetmap).

3. Existing Site and Ground Conditions

The 3 parts occupy a large number of fields in a very rural area, and with fields dedicated to pasture for grazing and arable crops. Some of the fields appear to have been left barren occasionally, and the gateways display bare earth where traffic access has damaged the grassland, confirmed by site inspection. The site is accessible from the adjacent public highways.

The land forming Part A generally falls south-westwards towards the River Morlais, which is in a wooded incised valley and divides Part A from Parts B and C.

Parts B and C fall east and west respectively into another valley which is drained by the River Dafern (with the northeast part of B falling westwards). The site gradients vary, but are at 1 in 11 or shallower, although there are localised steeper areas.

The fields contain watercourses, but many of these are straight, and are either positively within the central part of a field, or following the hedgelines. They appear to be part of the management of the field system to suit agricultural uses – to drain fields during the seasonal activities and to provide drinking water for cattle.

There are no buildings within the fields devoted to the solar farm. An overhead pylon mounted cable runs northeast-southwest through the connection point between the three parts. The planning Red Line includes a section of the eastern lane, which runs north-south, and includes the River Morlais bridge.

Referring to each of the Parts in turn:

Part A is elongated north-south and follows contours of a hill falling westwards to the River Morlais. It comprises about 8 fields with a total length of roughly 1,100m north-south and average width of roughly 300m east-west. The contours follow the curvature of the river along the southwest of the site, with a lowest elevation of 81m AOD in the south-east, to 144m AOD on the northern boundary. The southwest edge of the site is bordered by a forest buffer to the river which varies from 25m to over 100m wide. There are occasional pockets of forest to the north of the site, and hedgerows tend to include occasional trees, but otherwise the land is dedicated to farming.

Part B has maximum dimensions of roughly 900m east-west by 900m north-south, but is irregular in shape. It comprises 2 main large fields; it is southwest of the River Morlais and the land drains to the Afon Dafen. The site's elevation is between 99m AOD in the northeast, 168m AOD along a ridge in the southwest to 119m AOD in the east. The terrain generally slopes downward, west-east, with steeper terrain in the east close to the Afon Dafen, and the closest point to the river is over 100m. The north-west boundary is indicated by hedgerows, trees and a small woodland; the eastern border is also characterised by a large belt of woodland. The land is mainly dedicated to pasture. To the north of the site is an overhead power line supported by pylons.

Part C is irregular in shape and consists of three fields. Its maximum length is 586m north-south, and maximum width is 350m east-west. The site's elevation rises from the Afon Dafen in the west, up to a ridge, so falls into a completely separate catchment to the River Morlais in the east, from 117m AOD in the northeast to 89m AOD in the southwest. A number of field boundaries are lined with trees in the west and south, but those in the north and east tend to be without trees or hedgerows. The land is mainly dedicated to pasture.

Part C has the closest arrays to the rivers, which are 15m away from the Afon Dafen.

The central area immediately north of Blaenhiraeth Farm forms a plateau at 130m AOD, remote from the watercourses, and is the location of the substation and connection point to the electricity grid.

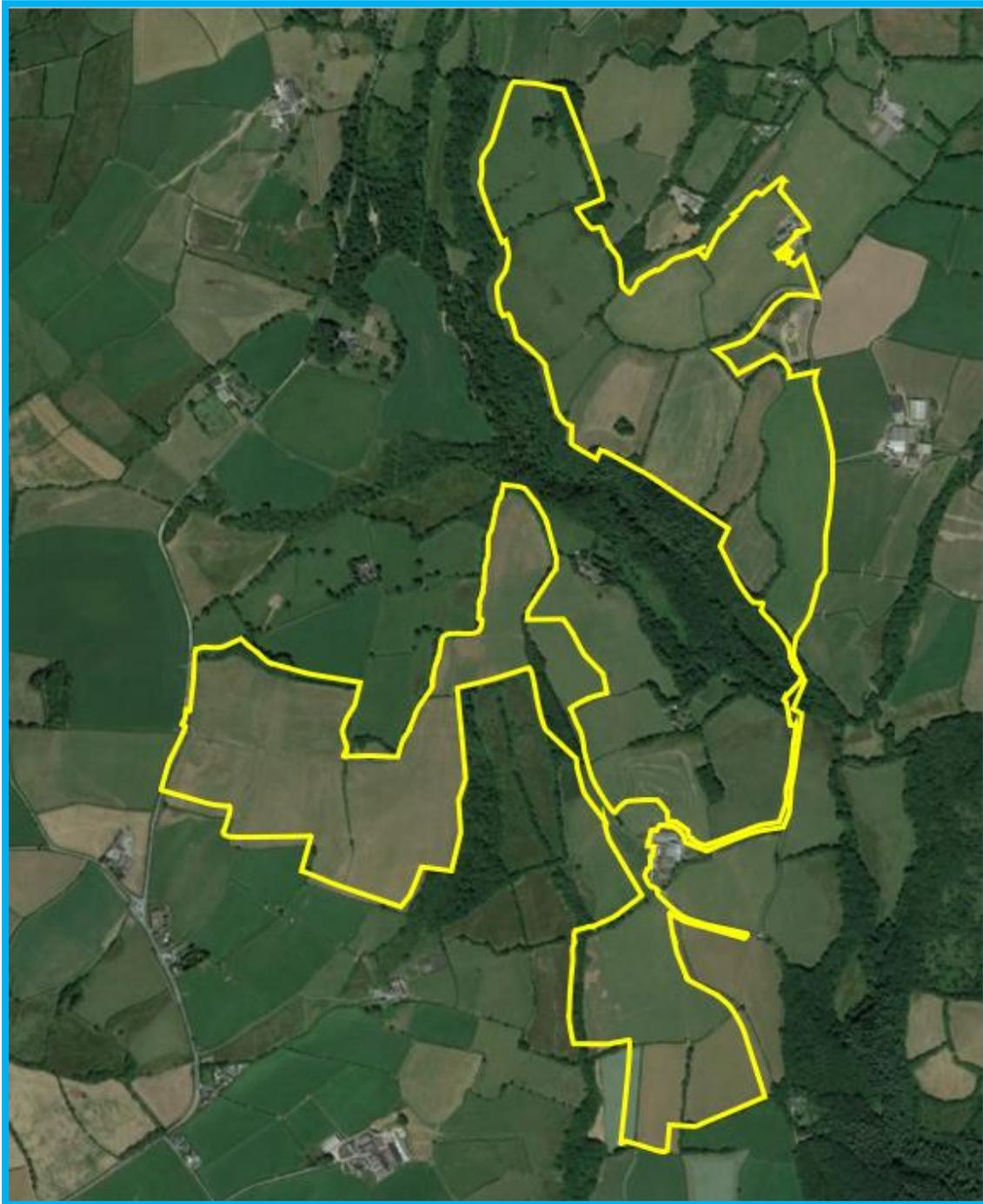


Fig 3 Site located on satellite view, showing rural area. Note outline is approximate to field boundaries due to distortions of background image (2019 Google image).

The Cranfield University Soilscales viewer shows the soil to be a combination of soil which is free draining and soil with impeded drainage, although the slopes of the site will reduce the natural infiltration characteristics. This explains the presence of natural watercourses and man-made field boundary ditches introduced by the farmers to aid drainage of the soil and limit mud/soil erosion from trampling cattle on the slopes.

The underlying geology varies, but is mainly till, over sandstone with mudstone bands.

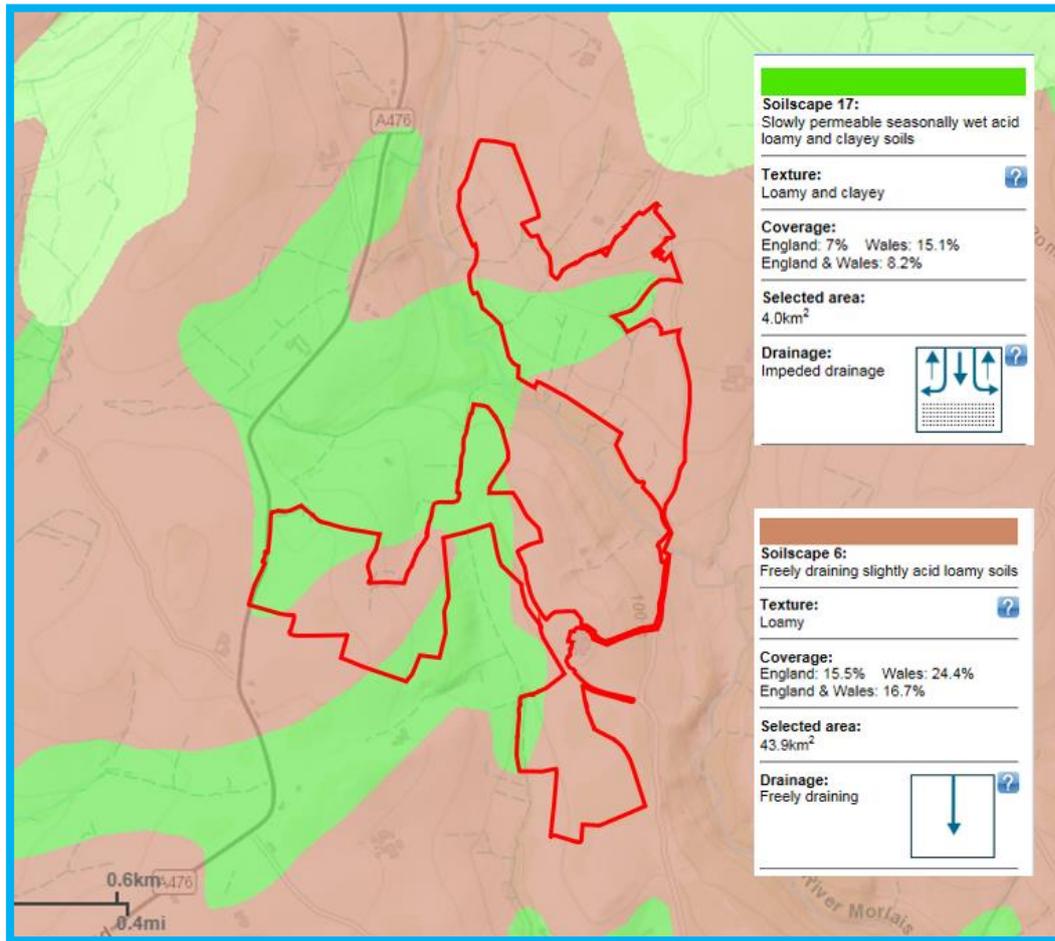


Fig 4 Site located on Soilscales viewer, showing the area to be mainly free draining (brown), with some localised areas of impeded drainage (green), which are likely to be marshy where shallow gradients occur.

4. Proposed Development

The proposed development comprises pressed steel post mounted solar panel arrays in an east-west alignment. The arrays would be up to 3m in height, with the lower edge approx. 700mm above ground, which varies with local undulations in the ground surface.

Within Part A, the containerised transformer units will be supported on metal legs supported on concrete pads within a 300mm thick permeable gravel area. The units will be connected to cables in backfilled trenches leading to the substation which will be in a compound with equipment on concrete pad foundations. The compound area will be formed in 300mm deep permeable gravel to encourage infiltration into the soil below. The compound will be located on a regraded area where required to give a safe maintenance area.

Part B and Part C will also have containerised transformer units on legs on concrete pads within a 300mm thick permeable gravel.

All other units in the feed-in area etc will be formed similarly with beds of permeable gravel.



Fig 5 Typical transformer installation on raised legs with permeable gravel base area (Merthyr Tydfil).

North of Blaenhiraeth Farm will be the location of the substation which feeds the energy into the overhead grid line. This comprises a unit 9.94m long and 2.1m wide on a concrete slab. A perimeter French drain will be formed around the slab to collect runoff, and the slab will be constructed on a permeable gravel subbase to re-feed rainwater into the underlying ground. The site is on a plateau with permeable ground, as shown on the above plans.

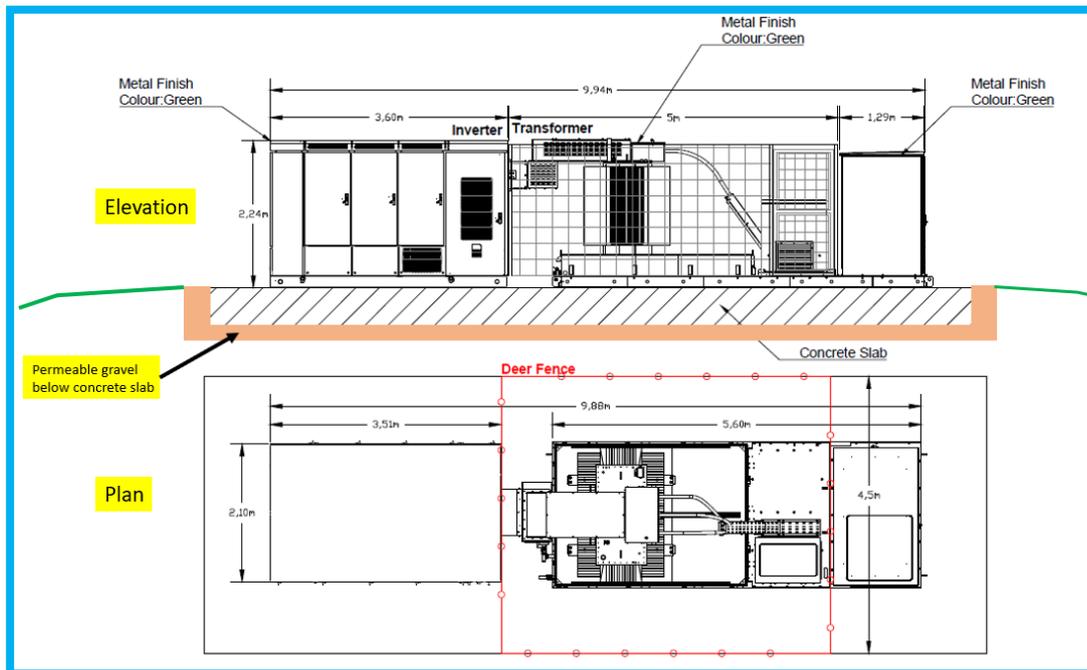


Fig 6 Section and plan of substation with permeable gravel underlayer extending over the full area of the compound.

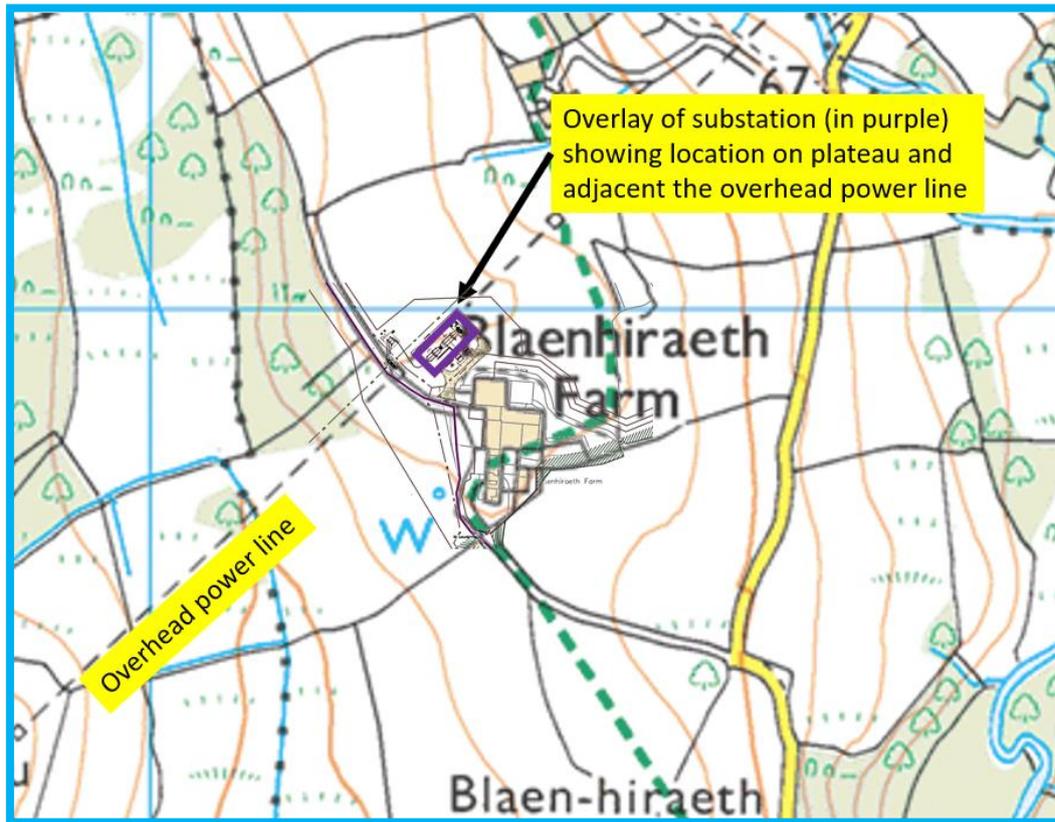


Fig 7 Location of substation on high ground adjacent the overhead cables for feed-in (Streetmap background). Note: Substation layout overlaid on OS Map.

An open mesh deer fence with a large grid (approx. 100mm x 200mm) will be installed to exclude large animals such as deer and will surround the sites, which will allow localised movement of surface water and invertebrates, small mammals etc to move freely. The bottom of the fence will be approx. 100mm above ground to allow natural localised surface water paths to continue. The fences will avoid crossing watercourses and where they do, they will be above the channel and adjacent banks (ie 100mm above banks).

The fence will be set within the boundary, providing a maintenance area outside the solar farm for managing hedges, watercourses and for safety reasons.

The prevailing vegetation in the solar farm areas will be retained, but prepared and seeded where affected by the construction activity, to allow it to flourish with mixed native species of grass and wildflowers. The areas within the fence will become a haven for invertebrates, reptiles, amphibians, small mammals and birds.

The sites will be trimmed about 2-5 times per year (depending on weather conditions) to prevent tall plants shading the panels. The sites will be grazed by sheep at low density for parts of the year. The site will be inspected routinely, and any bare areas of earth will be prepared, seeded and protected to encourage growth.

Vehicular access will be gained from existing farm accesses from nearby roads, and then will extend through the site to give access to the transformers as shown on the plan.

New tracks will be formed in permeable material which will green over due to low usage, thus maintaining permeability and providing a habitat.

It is important to note from the plan that the solar arrays are kept some distance from the watercourses. The usual offset dimension is 4m, but this will be a 'pinchpoint' minimum and exceeded in many areas due to the orthogonal alignment of the arrays and the modular dimensions of the arrays. This distance allows for inspection and maintenance of the ditches/watercourses.

The link between the three Parts of the site provides a route to the central control area and all-important supply link to the overhead pylon line cables. It is noted that Part A relies on a link along the existing public road, avoiding the need for a new bridge crossing of the River Morlais.

Where the permeable tracks cross watercourses, large culverts (eg 1m dia.) will be installed, to provide excess capacity, reduce the risk of blockage and make maintenance easy. They will generally be laid with soft inverts, to allow ecological linkage and allow light into the area.

Cables will generally be taken under the watercourses, about 1m below the bed. These are likely to be installed by no-dig techniques, but if open trenches are proposed applications will be made for Land Drainage Consent/Flood Defence Consent as required.

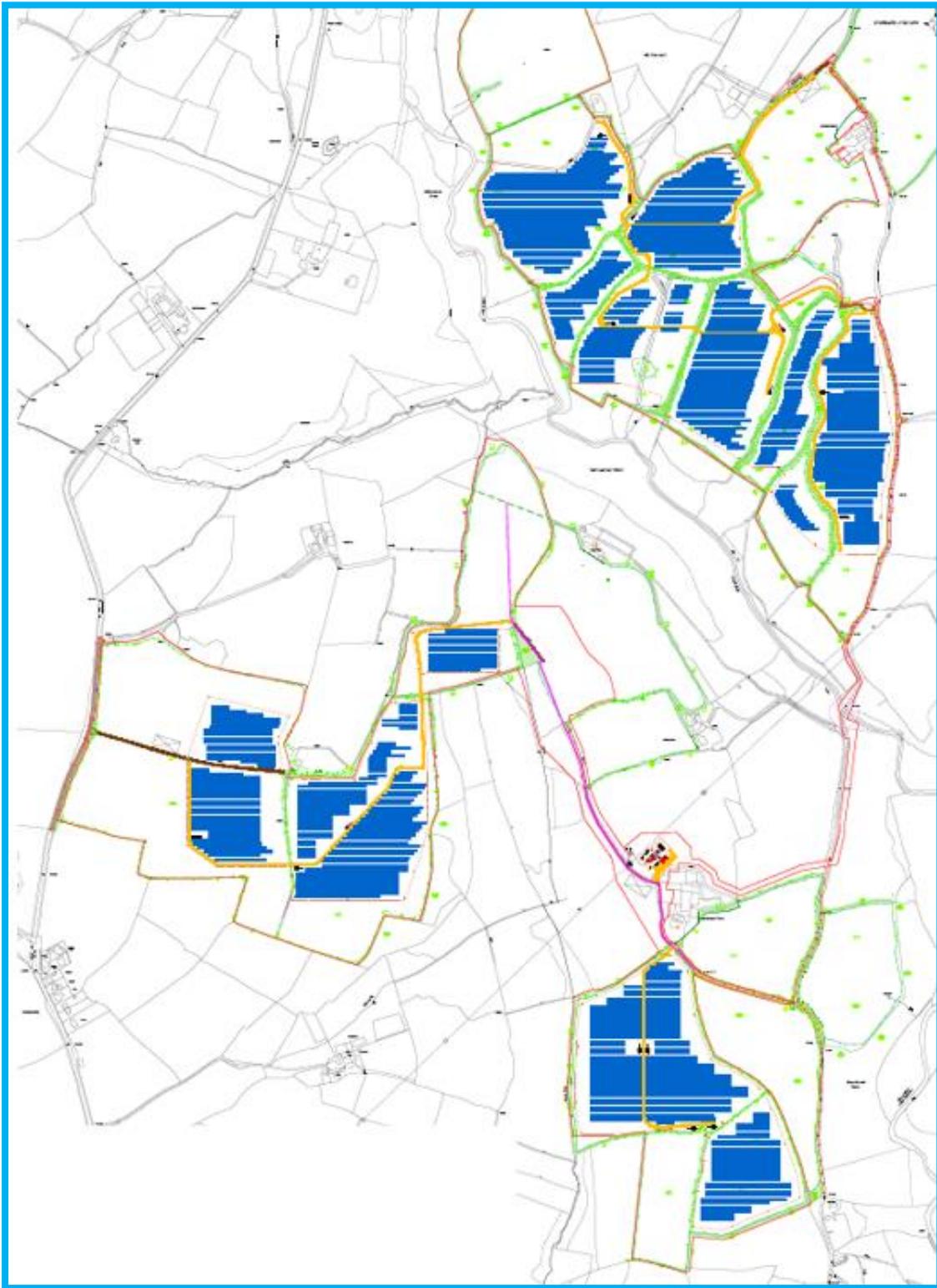


Fig 8 Solar farm layout – blue lines represent solar arrays in east-west direction. The orange lines are access tracks (reaching the transformers), the magenta represents the deer fences, within red boundary lines. Note solar arrays are kept away from hedges, boundary ditches and watercourses.

5. Existing Hydrology and Flood Risk

The site is all located in Flood Zone A, at little or no risk of flooding, according to the TAN 15 Development Advice Map (DAM).

Part A of the site drains to the River Morlais, which flows through a mostly wooded valley into the town of Llangennech, and then into the River Laughor estuary. Although there is flooding predicted by the map in Llangennech, this is attributed to tidal effects, not fluvial effects. The river can therefore be categorised as not sensitive.

Runoff from Parts B and C naturally flows to the River Dafen, which flows through open countryside, through Llanelli and also into the River Laughor estuary. The River Dafen floods as it passes through Llanelli, which is some 2.5km along the river downstream of the site.

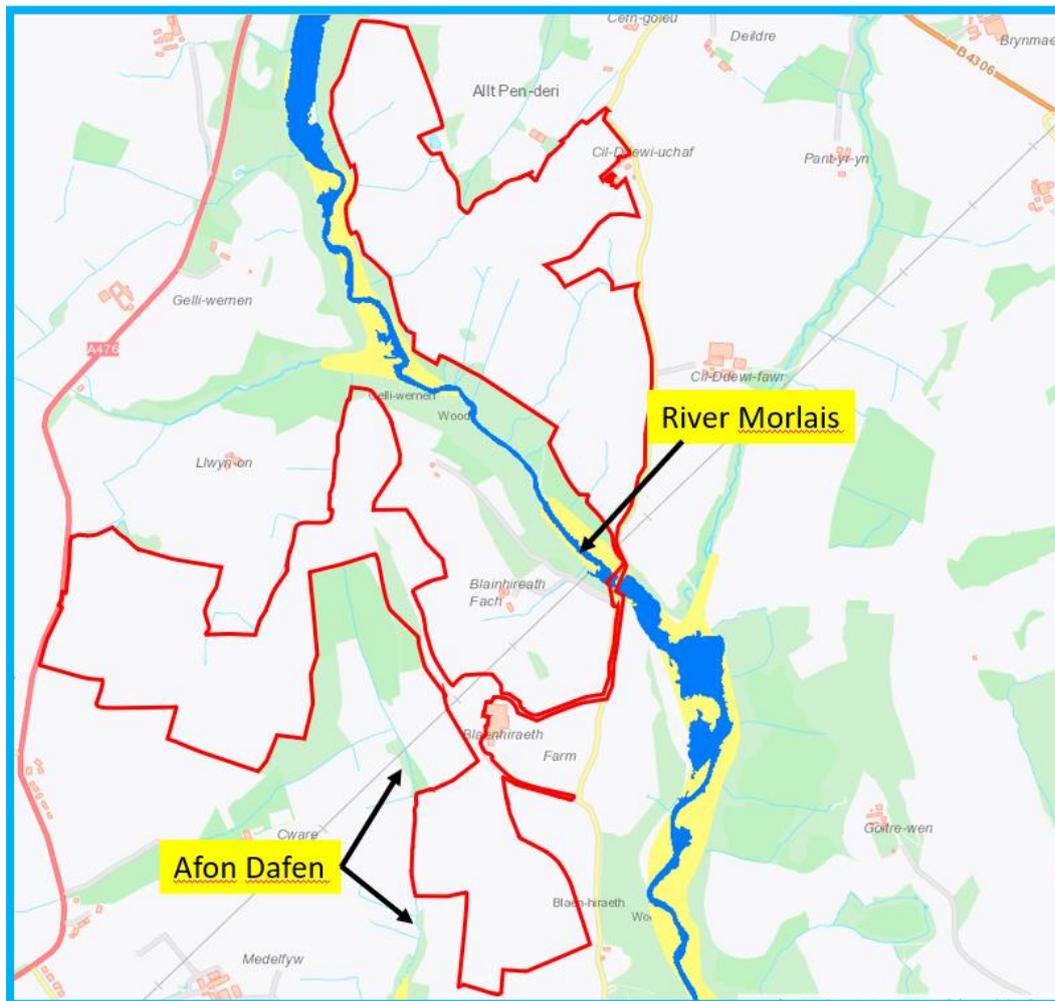


Fig 9 Site boundary superimposed on TAN 15 DAM, showing all of site within Flood Zone A, at low risk of flooding.

Where the lane crosses the River Morlais to the southeast of Part A, there is a small area of flooding, but this is on the existing public highway and not part of the site. The valley is quite incised in this area with land to the north of the bridge parapets available for flood flows, from inspection of the area.

It is important therefore that the solar farm does not increase runoff into the rivers, and make flooding at the bridge worse.

The solar farm equipment is located mainly on free draining land, but some of the areas are on land with impaired permeability land (see Fig 4) which have shallow gradients.

The Drainage Consent Engineer with Carmarthenshire County Council has confirmed in response to consultations that provided the proposal does not adversely affect the drainage characteristics within the site, then the strategy is acceptable.

The layout has therefore been overlaid on the NRW Surface Water Flood Risk Map, which shows the extreme surface water flow routes and shows that all the main flow routes are along wide corridors which have been created between panels.

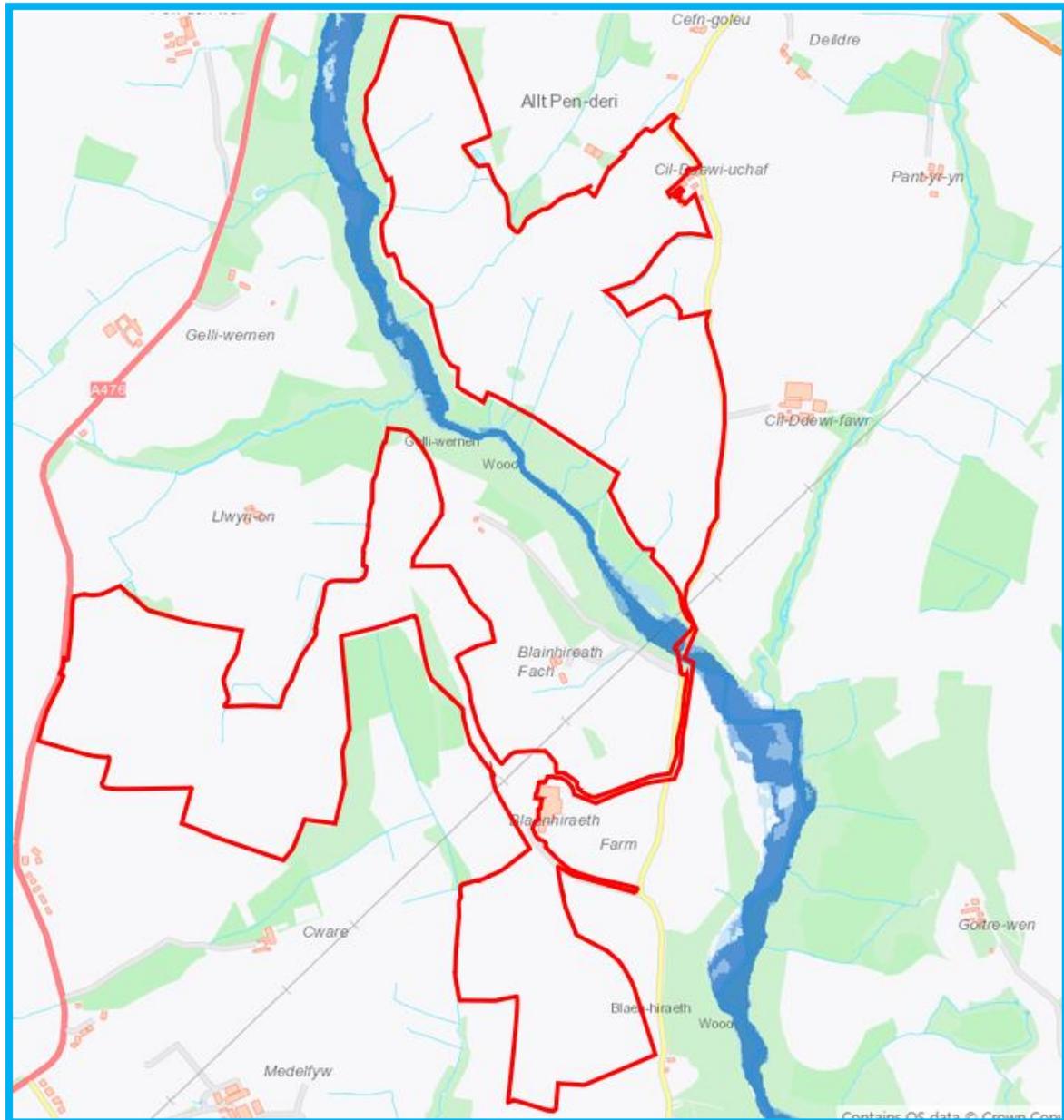


Fig 10 Welsh Government's TAN 15 Development and Flood Risk map, with site superimposed in red.

From the above and below images it can be seen that the natural flow routes are all within generous gaps between the arrays.

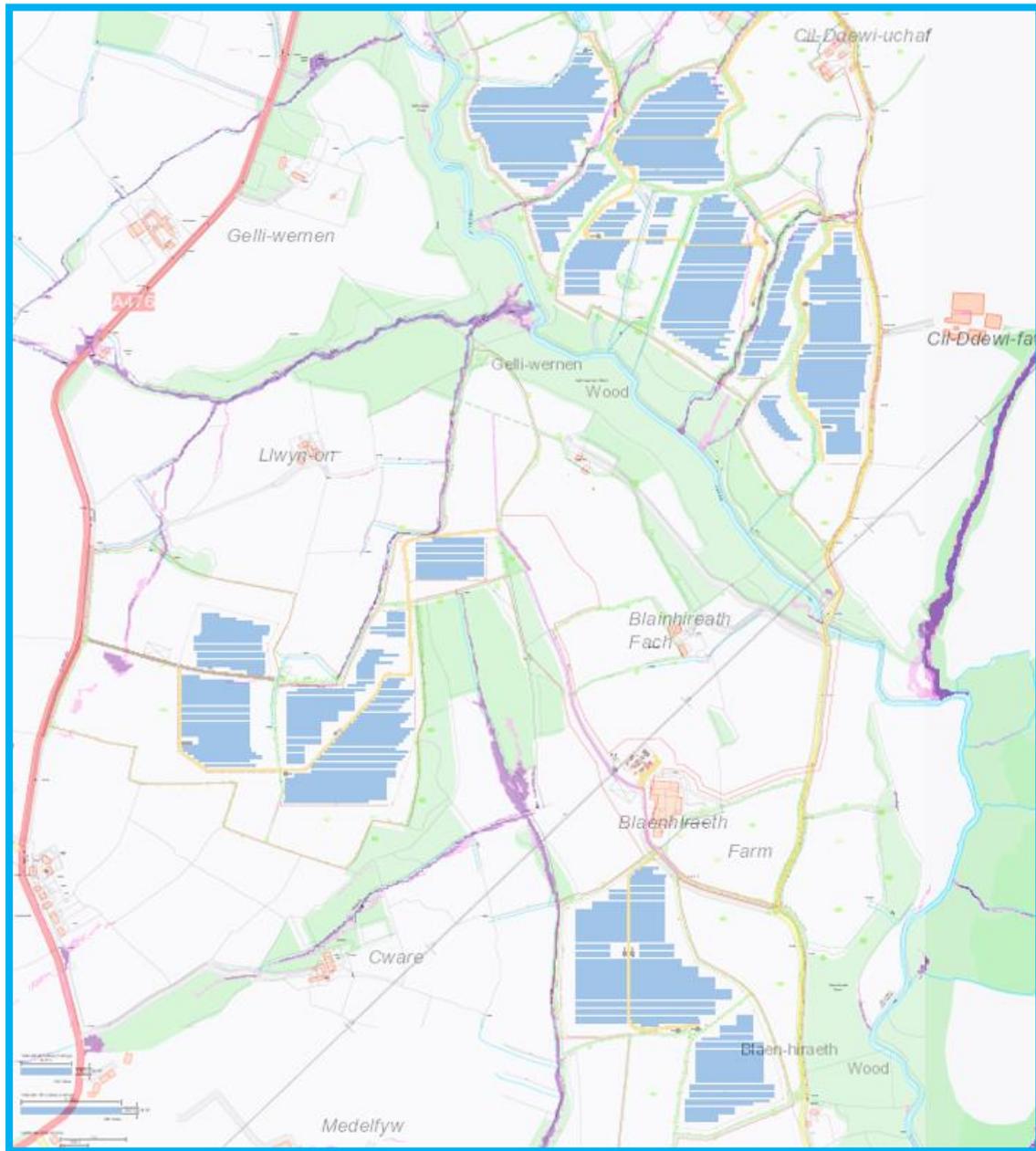


Fig 11 NRW Surface Water Flooding Map with Solar Farm superimposed. The surface water flow routes (purple) have been interrogated to inform the array and equipment layout to ensure that the arrays and equipment are outside all the natural flow routes.

The summary of the above exercise is that the water paths, whether ditches or overland, are all through open areas, with ample space for inspection and maintenance.

6. Policy

Flood Policy relates to the protection of people and property. The Welsh Government has produced Technical Advice Note 15 (TAN 15), and subsequent related Memoranda which give guidance on flood risk and design criteria, and steers development away from areas at risk of flooding.

The development is within Natural Resources Wales Zone A. In this context, according to TAN 15, justification tests are not applicable and there is no need to consider flood risk further.

This development is durable and resilient, and can withstand being in all weathers. The supporting structure and cabling is all resilient to water. No pollution will be caused. The site will be routinely inspected to monitor the solar farm and undertake essential maintenance. It is unlikely that people will visit the site during intense storms because the conditions would not be conducive or safe for inspections and maintenance. The risk of flooding to the River Morlais Bridge is therefore not a risk to the solar farm Operator.

The deer fence will be raised 100mm above the ground generally and has a large grid, to allow movement of localised surface water and smaller mammals to pass through.

The farming activities will cease on the fields (apart from light seasonal grazing by sheep), thus reducing impact from animal waste and silt etc from the water arriving in the receiving waters or groundwater, therefore improving runoff quality. The low density grazing will reduce the risk of mud from trampling and the consequent silt runoff.

All surface water routes are in wide corridors with suitable space for maintenance. The vegetation in the solar farm will be maintained by the Operator to allow ready access and inspection of the arrays and equipment, and to confirm security. The Operator of the Solar Farm would be responsible for maintenance.

The species rich grassland, improving soil quality and reduced trafficking (ie bare earth at gateways and from trampling) will bring real benefits by improving runoff quality, reducing the rate of runoff and reducing the frequency of runoff.

The proposal therefore complies with the objectives of TAN 15 because it will reduce the rate of runoff and improve water quality due to the improved soil conditions and characteristics of the vegetation. The elimination of autumn harvesting and the risk of silt runoff will also be eliminated.

It is noted that Blaenhiraeth Farm is an organic farm, so the use of pesticides and fertilizers is avoided.

7. Surface Water Drainage

Following installation of the arrays and associated equipment, the site will be prepared and seeded to allow a mixture of grasses to flourish. This will be undertaken on a phased basis as soon as is practical after the installation works, and in appropriate weather.

Within the fence will be grazed seasonally by sheep at low density, and tall plants will be strimmed 2-5 times per year to avoid shading over the solar panels, if required. The solar farm area would therefore be categorised as encouraging species-rich grassland, providing a high level of natural surface water attenuation, and better than with current farming practices. Bare areas will be prepared, seeded and protected. No specific drainage channels or pathways will be introduced apart from the diversion of the culverted ditch in the west of the site, as described above.

It has been recognised that solar farms do not increase runoff; indeed, as the vegetation establishes and improves soil properties, the runoff is reduced from previous farming levels and the natural catchment characteristics are restored.



Fig 11 Solar arrays on 1 in 8 slope showing flourishing vegetation (Merthyr Tydfil).

A real benefit of the solar farm is that it will allow the soil structure to improve. The improved soil structure enhances biodiversity and improves absorption capabilities of rainfall – the rate of runoff is more a function of the soil and vegetation than the underlying geology.

The occasions when runoff occurs will therefore be reduced, and the rate of runoff will be reduced.

The fields will not be intensively trodden by cattle or traversed by heavy machinery. Bare areas will be seeded.

The BRE Planning Guidance for the development of large scale ground mounted solar PV systems includes the following extract;

n) Drainage, Surface Water Run-off and Flooding

The Environment Agency has advised that, due to the size of solar PV farms, planning applications will be expected to be accompanied by a Flood Risk Assessment. This will need to consider the impact of drainage. As solar PV panels will drain to the existing ground, the impact will not in general be significant and therefore this should not be an onerous requirement.

Where access tracks need to be provided, permeable tracks should be used, and localised SUDS, such as swales and infiltration trenches, should be used to control any run-off where recommended.

Given the temporary nature of solar PV farms, sites should be configured or selected to avoid the need to impact on existing drainage systems and watercourses. Culverting existing watercourses/drainage ditches should be avoided. Where culverting for access is unavoidable, it should be demonstrated that no reasonable alternatives exist and where necessary only temporarily for the construction period.

This guidance recognises that the runoff from panels is distributed across the whole site and recognises that managing runoff should not be an onerous requirement.

The Government's Countryside Stewardship Grant guidance 'S7: Arable reversion to grassland with low fertiliser input' also recognises the consequent reduction in runoff (and flood risk) from the dense sward of grassland delivered by the solar farm.

How this option will benefit the environment

A dense grass sward in arable fields at risk of soil erosion or surface runoff will stabilise the soil, reduce nutrient losses, and buffer sensitive habitats, such as designated aquatic habitats. It will also reduce surface runoff, which may help to reduce the risk of flooding.

The access tracks and internal tracks will be permeable and designed to allow rainfall to infiltrate into the soil. The tracks tend to green over due to low usage, which adds to biodiversity.

This character of land use is advocated in the Carmarthenshire County Council Biodiversity Action Plan. In particular the solar farm will contribute to the Plan's target to improve biodiversity in the 'patchwork and woodlands and fields, bounded by hedgebanks'.

This arrangement will provide a very positive improvement for infiltration and evapotranspiration and as a biodiverse habitat.

8. Construction Process

The work on a site of this scale will be phased and each area restored as the work is completed. The work programme should be adjusted in wet weather to priorities areas remote from watercourses, to reduce the risk of silt transport into the watercourses. If a potential risk of silt pollution in a watercourse arises, the Contractor should implement the plans within the CEMP and install geofabric fences or straw bales to attenuate the runoff and settle/filter the silt out of the runoff.

Machinery used within the solar farm should be low earth pressure vehicles, such as is typical with farm machinery, to minimise compaction of the ground.

Steelwork supports and framework are made from pressed steel, and can be readily manhandled or with light equipment.

A delivery sequence by vehicles should be devised which minimises repeated journeys over the pasture to reduce rutting and damage to the pasture and soil structure.

On completion of the works the pasture should be restored using light farming machines and prepared appropriately for seeding and protected to encourage early growth, restoration of the soil structure and natural creation of meadow grass.

If the activity creates localised areas of bare earth which increases the risk of runoff, the runoff should be treated by hay bales or geofabric fences as described above such that the runoff leaving the site is suitable for the receiving waters.

9. Maintenance

The solar farm will be managed by the Operator of the solar farm.

It is controlled remotely, so the farm will be visited routinely when conditions are appropriate for safe inspection and maintenance activities to be undertaken.

The arrays are located at a safe distance from existing hedges to allow maintenance of the hedges and to provide sight lines for security.

Maintenance will take the form of the following:

- The site should be inspected on completion followed by annual formal inspections of the site, recommended in autumn when the vegetation has died back.
- Inspections of the watercourses should also be made after an extreme event, to ensure that the water management is safe and continues to drain as appropriate.
- Tree growth or animal activity which could adversely affect runoff should be rectified.
- Ground vegetation (ie grassland) should be inspected to ensure that it is flourishing. Bare earth areas should be treated, seeded, protected and vegetation re-established.
- Tracks should be inspected to ensure they remain permeable; the cause of ponding should be investigated and rectified.
- New channelling or streaming is unlikely to be a problem given the flourishing vegetation, given that solar farms at 1 in 8 slopes on other sites are performing well with no sign of streaming.
- Animal activity in watercourses should be monitored and if this begins to affect the performance of the watercourse, appropriate advice should be obtained to inform and remedial measures.

10. Conclusions & Recommendations

The change in use of these fields from grazing and arable uses to solar farm achieves the following:

- Introduces a major source of renewable energy to the community.
- The site is within Zone A according to TAN 15, and therefore appropriate use in terms of flood risk.
- The related points made within the Scoping Direction have been respected within this FCA.
- The proposed fence and structures will not adversely affect surface water flow characteristics due to the large grid and raised bottom wire.
- There is no risk to visitors from flooding or excessive surface water or flood flows.
- The equipment and associated infrastructure is durable, robust, and resilient to wet weather and will not cause pollution.
- The creation of a species rich grass meadow comprising long grass with native species will bring major improvements to soil quality, and therefore to infiltration and evapotranspiration.
- This improvement will reduce the risk of downstream flooding.
- The resulting ecology will be a haven for a range of insects, invertebrates, reptiles, amphibians, small mammals, and birds.

- The proposal will be in harmony with the targets of the Carmarthenshire County Council Biodiversity Action Plan.
- Permeable tracks will green over through low use and remain permeable and enhance further biodiversity.
- Gravel areas under and around transformers will reduce runoff and infiltrate runoff into the soil.
- A maintenance regime is described which will maintain the virtues of the proposed solar farm.
- The heavy machinery associated with farming will be eliminated, and only light vans will be used after completion, thus preventing further compaction of the soil.
- The animal waste and muddy areas associated with intense farming will be eliminated and so result in beneficial natural runoff characteristics and infiltration water quality.
- Silt-borne runoff following harvest for the months until the vegetation of the new crop establishes will no longer be a risk.
- The SAB has been consulted and exchanged emails confirming that the strategy is appropriate and that full details will be required for their consideration and approval prior to construction start (see Appendix 1). The SAB agreed that this can be done after planning consent. Land Drainage Consent will be applied for where appropriate, such as for track crossings of watercourses.

In conclusion, the proposed change of use will provide a real contribution to soil improvement and biodiversity, will improve runoff/infiltration water quality and result in a significant reduction in runoff rate and volume, bringing significant overall benefits to the local environment and downstream. It will also deliver an important supply of renewable energy to the community. The site will be safe and durable and is not at risk of flooding and therefore is appropriate in terms of the TAN15 advice on flood risk.

Appendix 1 Council response to SAB pre-application

FW: Update: PA/16279 - Proposed solar farm at Penderi/Blaenhiraeth - SAB Pre-application


 Catherine L Abbott <CLAbbott@carmarthenshire.gov.uk>
 To Clive Onions

Reply

Reply All

Forward



Thu 12/03/2020 14:07

You replied to this message on 25/03/2020 11:41.

Hello again Clive,

I have now had a chance to look through the information submitted for the SAB pre-application for the proposed solar farm at Penderi/Blaenhiraeth and can offer the following initial advice:

- It looks like SAB approval for the development will be relatively straightforward, as you are proposing a solution based on infiltration drainage, with no likely increase in surface water discharge to water courses. A major rethink is thus not required.
- The SAB process will also need to assess rainfall runoff management from the new access roads/tracks and the sub-station (plus any other areas/buildings that are part of the development) so details of this will also be required.
- You will need to do some infiltration testing around the site (to BRE365 standards) to confirm the suitability for infiltration drainage.
- For the full application we will require quite a lot more information – design details of the drainage – for the solar arrays, tracks, diverted ditch etc. Confirmation that no runoff will leave the site.
- Maintenance plans, biodiversity plan, construction phasing plan will also be required.
- For the flood defence consent information you are advised to contact Iestyn Jones on IestynJones@carmarthenshire.gov.uk.
- Based on the site area of 96ha the fee for the SAB full application will be £7500.

Is this information sufficient in terms of what you need to go forward with your planning application? Happy to discuss or if you'd like to come in to Parc Myrddyn for a discussion that can be arranged.

Thanks and regards

Cath

Cath Abbott BSc.(Hons) MSc.
Assistant Engineer - Sustainable Drainage Approval Body (SAB).
Peiriannydd Cynorthwyl - Corff Cymeradwyo Draenio Cynaliadwy (SAB).

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