

**PROPOSED SOLAR DEVELOPMENT
LAND AT ROSEDEW FARM
LLANTWIT MAJOR**

ENVIRONMENTAL STATEMENT

**VOLUME 2
CHAPTER 1: INTRODUCTION**

1. INTRODUCTION

Foreword

- 1.1 This Environmental Statement has been prepared on behalf of DR & EG Davies (the applicants) in support of a full planning application submitted to the Vale of Glamorgan Council (the Local Planning Authority). The title of the application is as follows:-

‘Construction of a ground-mounted solar pv generation project and associated works.’

- 1.2 This Environmental Statement summarises the findings of the Environmental Impact Assessment (EIA) for the proposed solar development on land at Rosedew Farm, Llantwit Major, which has been deemed necessary in the course of discussions with the Local Planning Authority.

EIA Requirement

- 1.3 A request for a formal Screening Opinion in accordance with Regulation 5 of Part II of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 was via letter dated 26th August 2014. This letter is contained in Appendix 1.

- 1.4 The Local Planning Authority considered this matter and duly responded under cover of letter dated 23rd September 2014. The covering letter and Screening Report are contained in full under Appendix 2. The conclusion reached by the Local Planning Authority is as follows:-

‘Having regard to the key issues identified in Schedule 3 of the Regulations and WO Circular 11/99, the Local Planning Authority is of the view that the characteristics of the development, characteristics of the impacts and location of the site are such that the potential impacts of the development are likely to be significant upon the environment, for the reasons identified in the screening opinion attached.’

‘The proposed solar farm would occupy a substantial area (14.5ha) within the Glamorgan Heritage Coast, a nationally defined area and as such it is considered that a scheme of this type would have a potentially significant impact upon a recognised environmentally sensitive location. Therefore, it is concluded that an Environmental Impact Assessment in this instance is considered to be a requirement, potentially having significant environmental effects.’

- 1.5 The client and development team have chosen not to pursue a Screening Direction from the Welsh Government, and instead to accept this conclusion reached by the Local Planning Authority.

The Purpose of the Environmental Impact Assessment

- 1.6 In broad terms, Environmental Impact Assessment (EIA) is the process of establishing the existing environmental (baseline) conditions and compiling, evaluating and presenting the significant environmental effects of the proposed development. The assessment is designed to assist in producing an environmentally sympathetic development. Recognising the potentially significant adverse environmental effects will lead to the early identification and incorporation of appropriate mitigation measures into the design of the development. These effects are considered during the construction and operation stages of the proposed development. The main steps in the assessment procedure can be summarised as follows:-

- Examination of the environmental character of the area and whether it is likely to be affected by the proposed development through baseline studies and surveys;
- Consider the possible interactions between the proposed development and the existing and future site conditions;
- Predict the possible effects, both beneficial and adverse, of the development on the environment;
- Propose design and operation modifications or other measures to avoid, minimise, mitigate or compensate effects or to enhance positive effects.

1.7 This Environmental Statement sets out the findings of the EIA. It includes:-

- A non-technical summary;
- The results of the assessment for the development considered including the baseline environment, likely significant effects, mitigation measures and residual impacts;
- A summary of the beneficial and adverse effects of the proposed development.

Scope and Content of the EIA

1.8 Scoping is the process of identifying the likely significant effects that should be considered in the Environmental Impact Assessment. These issues may arise during construction and eventual operation of a development.

1.9 No formal request for a Scoping Opinion was submitted to the Local Planning Authority. Instead, informal clarification was sought and received on the basis of the contents of the Screening Report (Appendix 2 refers). On the basis of the feedback received, this Environmental Impact Assessment relate to the following topic areas:-

- Landscape and Visual;
- Ecology; and
- Traffic and Transport.

1.10 The scope of each individual assessment identified above was thereafter discussed and agreed between consultant and relevant consultees. Further details are presented as part of the methodology for chapters 7, 8 and 9 which follow.

1.11 Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 1999 (as amended) sets out the information to be included in an Environmental Impact Assessment. The Directive and Regulations require that an Environmental Statement should include at least the following:-

- Description of the development, comprising information about the site and the design and size of the project;
- Outline of the main alternatives considered and an indication of the main reasons for the chosen scheme;
- Data necessary to identify and assess the main effects which the project is likely to have on the environment;
- Description of the likely significant effects of the project on the environment;
- Description of the measures envisaged in order to avoid, reduce or remedy any significant adverse effects;
- Indication of any difficulties encountered in compiling the required information; and
- Non-technical summary of the above information.

- 1.12 Under Schedule 4, the Regulations state that a description of the likely significant effects of the development on the environment ‘should cover the direct effects and any indirect secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the proposed development’ on the environment. This requirement will be incorporated into the Environmental Statement.

The Consultant Team

- 1.17 The Environmental Impact Assessment will be managed by Asbri Planning Ltd, with the assistance and guidance of the following:-
- **Tirlun Design Associates**, who undertook the required landscape and visual impact assessment;
 - **Wydean Ecology**, who prepared the ecology and biodiversity chapter, having regard to their own assessment work;
 - **Asbri Transport**, who undertook the required assessment on the traffic, transport and movement resource;

The Structure of the Environmental Statement

- 1.18 The assessment described in this Environmental Statement (ES) relates to the design of the scheme as it stands in January 2014. The ES is published in three volumes:-
- **Volume 1:** Non-Technical Summary
 - **Volume 2:** Environmental Statement to Main Report; and
 - **Volume 3:** Figures and Appendices to Main Report
- 1.19 A summary of the ES is provided in Volume 1. Using non-technical language, this provides a summary of the proposed development, the main likely environmental effects, the proposed mitigation measures and the predicted residual effects of the proposed development.
- 1.20 Volume 2 contains preliminary chapters and technical chapters for all issues addressed in the EIA, with Volume 3 providing the figures and appendices referenced in Volume 2.
- 1.21 The following table displays the structure of this particular volume:-

Figure 1-1:- Volume 2 (Written Statement) – Chapter Titles

Chapter No.	Title
Chapter 1	Introduction
Chapter 2	EIA process
Chapter 3	Site context
Chapter 4	Project description
Chapter 5	Planning Policy Context
Chapter 6	Need and Assessment of Alternatives
Chapter 7	Landscape & Visual Impact
Chapter 8	Ecology & Biodiversity
Chapter 9	Traffic, Transport & Movement
Chapter 10	Conclusions

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**VOLUME 2
CHAPTER 2: THE EIA PROCESS**

2. THE EIA PROCESS

Introduction

- 2.1 This chapter explains the main stages in the Environmental Impact Assessment (EIA) process, the approach followed to complete the EIA, including the legal requirements and other guidance underpinning the EIA process and the proposed approach to assessing impacts is also included in this chapter.

Legislation

- 2.2 In the UK, EIA's have been undertaken for certain major developments since the implementation of the European Council Directive on Environmental Assessment in 1985¹. The Directive was subsequently amended in 1997², 2003³ and 2009⁴ before being codified under Directive 2011/92/EU of 13th December 2011. The Directive requires that an Environmental Statement (ES) should include a certain level of information as set out in Paragraph 1.15 of the previous chapter.
- 2.3 The requirements of the Directive are implemented into UK legislation through the Environmental Impact Assessment (England and Wales) Regulations 1999, as amended.

The EIA Process

Main Stages and Guidance

- 2.4 The main steps in the assessment procedure leading up to the publication of the ES are as follows:-
- Scoping;
 - Description of the project/development;
 - Complete detailed baseline surveys;
 - Identification of potential environmental impacts;
 - Prediction of impacts;
 - Evaluation and assessment of significance;
 - Identification of mitigation measures and modifications to the design;
 - Identification of residual impacts and cumulative impacts; and
 - Presentation of results of the EIA in the ES (up to 16 week decision period).

¹ Council Directive 85/337/EEC of 27th June 1985 on the assessment of the effects of certain public and private projects on the environment

² Council Directive 97/11/EC of 3rd March 2007 amending Directive 85/337/EEC of 27th June 1985 on the assessment of the effects of certain public and private projects on the environment

³ Directive 2003/35/EC of the European Parliament and of the Council of 26th May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to Council Directives 85/337/EEC and 96/61/EC.

⁴ Directive 2009/31/EC of the European Parliament and of the Council of 23rd April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No. 1013/2006.

2.5 The approach involves a close working partnership between those undertaking the EIA and the engineering / design teams. Key stages in the process can be summarised as follows:-

- Identify relevant natural and man-made processes that may change the character of the site;
- Consider the possible interactions between the proposed development and both existing and future site conditions;
- Using the initial designs of the development, predict the possible environmental effects of construction and operation, both direct and indirect;
- Recommendations can then be made to avoid, minimise or mitigate adverse effects and enhance positive effects. Alterations to the design can then be reassessed and the effectiveness of mitigation proposals determined; and
- Any uncertainties inherent in the methods used, impact predictions made and conclusions drawn would be identified during the course of the assessment process.

2.6 The EIA has been undertaken, and the ES prepared, taking into account UK Environmental Legislation and guidance, including the published 'Environmental Impact Assessment: A Guide to Good Practice and Procedures' and The Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Impact Assessment (2004)'.

Approach to the Assessment of Impacts

2.7 The determination of the significance of the impacts arising from the proposed development is a key stage in the EIA process. It is this judgement that is crucial to informing the decision-making process. However, defining what is significant is not a simple task. The following criteria have been used (where appropriate to the issue being addressed) in the EIA to inform the assessment of the significance of an impact:-

- Type of impact (adverse/beneficial);
- Extent and magnitude of impact;
- Duration of impact (short term/long term);
- Sensitivity of receptor;
- Comparison with legal requirements, policies and standards;
- Comparison with applicable environmental thresholds; and
- Effectiveness of mitigation.

2.8 It should be noted that the residual significance of impacts is assessed taking into account mitigation, i.e. the assessment applies to the residual impacts. A residual impact is any impact that would remain following the implementation of proposed mitigation measures.

2.9 Unless specifically indicated in the methodologies to the following technical chapters, the significance of the impacts arising from the proposed development have been categorised throughout the ES using a seven point scale, as follows:-

- Insignificant;
- Minor (adverse or beneficial);
- Moderate (adverse or beneficial); and
- Major (adverse or beneficial).

- 2.10 Impacts are assessed for all phases of the development. Construction impacts are considered to be temporary, short term impacts which occur during the construction phase only. Permanent impacts are those long term effects which would occur as a result of the proposed development once it is in operation.

Cumulative Impacts

- 2.11 Schedules 3 and 4 of the Town and Country Planning (EIA) Regulations 1999 (as amended) emphasise the need for the consideration of cumulative effects at a project level. Schedule 4 details the information for inclusion in Environmental Statements. This includes the following:-

4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative⁵, short, medium and long-term, permanent and temporary, positive and negative effects of the development....⁶

- 2.12 Cumulative impacts are best described as *'impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project'*⁷. Significantly, the proximity of development (past, present or planned) to a particular project does not always provide the criteria for inclusion in an assessment of cumulative impact. What should be borne in mind is whether the other development affects the resources which would be affected by the project. If this is not the case then it will not be necessary to include it in the assessment⁸. Such an approach has been followed in the cumulative impact assessment that features in this Environmental Statement.
- 2.13 The results of the assessment of cumulative impacts need to be reported in the Environmental Statement either by integrating the assessment into each topic section or by producing a separate chapter. For the purposes of this Environmental Statement, the former approach is to be adopted, and the findings are incorporated into each technical chapter in the format preferred by each discipline.

⁵ Author's own underlining emphasis

⁶ This carries forward the same requirements as stated under Article 5(1), Annex IV (information required) of Directive 2011/92/EU of the European Parliament and the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment. Note: EU Directive 2011/92EU codifies the initial EIA Directive of 1985 and its three amendments.

⁷ As defined in 'Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions', Hyder Consulting, May 1999.

⁸ As stated in Section 6.4 of the same Hyder Consulting document.

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CHAPTER 3: SITE CONTEXT**

3. SITE CONTEXT

Introduction

- 3.1 This chapter provides an overview of the site context, in particular the site location and site description, which is used to inform the detailed technical assessment in future chapters.

Site Location

- 3.2 The site is situated within the jurisdiction of the Vale of Glamorgan Council, 500m to the south east of the edge of the urban area of Llantwit Major. The site lies approximately 1.3km from Llantwit Major town centre.
- 3.3 Further afield, the site is located approximately 14km south east of Bridgend town centre and 22.5km west of Cardiff City Centre. Other notable landmarks include Cardiff Wales Airport approximately 9km to the east, St. Athan Airfield 2.8km to the north east, and the M4 motorway located 13km to the north. The coastline is approximately 500 metres to the south of the site.

Site Description

- 3.4 The application site measures is centred on grid reference SS 97744 67637, on land at Rosedew Farm. The overall application site is identified as edged in red (with the other land in the wider holding edged in blue) on the site location plan, which is reproduced under Appendix 3.
- 3.5 The site extends to an area of 10.7 hectares and comprises of the northern parts of two agricultural fields, belonging to the wider agricultural unit associated with Rosedew Farm. It is generally open and lies on an area of undulating rural landscape. There is a gradual increase in levels towards the coast.
- 3.5 Being agricultural fields, the site does not encompass any buildings and it is used solely for agricultural purposes. There are no structures within the application site.
- 3.6 The site boundaries are currently demarcated by a mixture of existing mixed native field hedgerows, fences and some associated hedgerow trees, none of which are subject to a tree Preservation Order. However, the extreme southern boundary of the site is open, abutting the remainder of the agricultural field parcels. There is also an agricultural track which runs along the north of the site and along the western boundary, providing field access.
- 3.7 There are no public rights of way or cycle routes within the site or immediately adjacent. The Wales Coastal Path (otherwise known as the Heritage Coastal Path) is located approximately 500 metres to the south. A public right of way is found approximately 520 metres to the west which connects to the Wales Coastal Path.
- 3.8 There are no records of historic flooding on the site and flood zone maps indicate that watercourses in the vicinity have floodplains of limited extent that do not encroach onto any part of the application site. The flood risk across the application site is considered to be negligible and does not form part of the scope of this Environmental Impact Assessment.

3.9 There are no designated heritage assets such as Scheduled Ancient Monuments, Conservation Areas, Listed Buildings, Registered Park and Gardens or Registered battlefields within the application site.

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CHAPTER 4: PROJECT DESCRIPTION

4. PROJECT DESCRIPTION

Introduction

4.1 The development comprises a full planning application for the construction of a solar development and associated works. The title of the application presented to the Vale of Glamorgan Council as the local planning authority is as follows:-

‘Construction of a ground-mounted solar pv generation project and associated works’

4.2 This Environmental Statement summarises the findings of the Environmental Impact Assessment (EIA) for the construction and operation of the proposed development, which has been deemed as necessary for the extent of the proposed development that is the subject of this application.

4.3 The plans referred to and included as part of the Planning Application, and which provide context for this Environmental Impact Assessment are as follows:-

- Site Location Plan (prepared by Asbri Planning Ltd);
- Proposed Site Plan (prepared by GeoGen Technologies Ltd);
- Panel Cross Section Details (prepared by PUK-Solar);
- Inverter House External Dimensions (prepared by GeoGen Technologies Ltd);
- Inverter House Internal Dimensions (prepared by GeoGen Technologies Ltd);
- RMU & Metering Unit Details (prepared by SP Energy Networks);
- Detailed Landscape Mitigation Proposals (prepared by Tirlun Design Associates).

4.4 In addition, the following documents will be submitted in support of the application independent of the Environmental Impact Assessment:

- Design & Access Statement (prepared by Asbri Planning Ltd);
- Planning Statement (prepared by Asbri Planning Ltd);
- Archaeology Desktop Assessment (prepared by Archaeology Wales);
- Glint & Glare Assessment (prepared by AARDVaRC Ltd); and
- Preliminary Ecological Appraisal (prepared by Wyedean Ecology Ltd).

Location of Development

4.5 The proposed solar development will be focused on the extent of the application area identified in red by the site location plan which accompanies the full planning application (Appendix 3 refers). This red line area equates to 10.7 hectares / 26.44 acres of land. The applicant has taken all appropriate measures to notify the landowners within the application site in accordance with the procedure for submission of the planning application.

Primary Proposal

4.6 The primary proposal is for an agricultural diversification scheme comprising the installation of ground-mounted solar PV panels, to provide a total output of up to 5MW. It is estimated that the amount of electricity generated will be sufficient to power approximately 4000 homes.

Scheme Layout

- 4.7 The solar farm will be formed of photovoltaic (PV) panels grouped together in frames set out in rows of modules angled at 25 degrees. The panels will be ground mounted using steel piles set into the ground. The structures are not expected to exceed 2.1m in height with no foundations required.
- 4.8 Due to the need to maximise solar exposure, the panels will be orientated in a southern direction and tilted accordingly. The intention is to site the installations such that the highest point of the tilted panels is less than 1m i.e. below the normal height of the existing field boundary planting and hedges. Furthermore, it is proposed to use the latest anti-reflective panels, which in addition to being more efficient will further reduce the visible impact of panel installations.
- 4.9 To ensure that the solar farm can operate at its optimum efficiency, the solar panel arrays will be located away from any existing hedgerows or trees. This in turn will mitigate against overshadowing. And in order to facilitate hedgerow and boundary fence maintenance, along with human passage space, an internal clearance of 5m from the solar arrays to the boundary hedgerow will seek to be established. This will permit a corridor for wildlife and humans to traverse around the installation. In addition, the panels will be raised off the ground to allow the land to be grazed by sheep, thus retaining agricultural productivity and keeping the grass down.

Ancillary Development

- 4.10 Deployment will require the installation of 4 no. inverter stations, a power transformer cabin and a small sub-station structure, in order to convert the generated electricity from DC to AC and allow connection to the electricity distribution network. Connection to the National Grid will be taken from the perimeter of the site boundary towards the east, and will be undertaken by Statutory Undertakers under their permitted development rights.
- 4.11 Site security is a legal requirement for the grid electricity equipment, and the applicant is aware that the visual impact of security measures can sometimes cause concern. Security is required to protect the grid electricity equipment from animal and human interference and therefore it may be necessary for the electrical equipment and transformer housing to be protected by additional fencing enclosures. The detailed specification of this fencing will be confirmed at a later date. However, it will be necessary to install 2.5m high CCTV cameras located at the site perimeter at 35 metre centres.
- 4.12 The sub-station and inverter housing will be located within the site benefiting from existing natural screening which, in turn, can be reinforced as necessary. Details of the substation structures will be agreed with the network operator following the granting of planning consent and it is therefore respectfully requested that these form the basis of an appropriately worded planning condition and that the information provided is treated as indicative. For the purpose of this Environmental Statement, it is assumed that they will comprise Yorkshire boarding above concrete block walls in keeping with modern agricultural buildings found in the surrounding area.
- 4.13 There will also be a perimeter fence for the whole scheme which is expected to be 2m high galvanized wire deer fencing supported on timber stakes (subject to insurer requirements).

Access

- 4.14 It is proposed that the access is achieved via an existing farm access track that connects the main body of the site to the existing road network to the north west.
- 4.15 Due to the nature of solar PV installation, once installed, there will be minimal on-site activity. The applicant anticipates planned visits to the site once every 3 months for maintenance activities and this will be undertaken by a standard road-going vehicle. Within the perimeter of the solar site, the separation distance between rows of panels will avoid the need for the demarcation of formal access tracks.

Decommissioning

- 4.16 The proposal would have an operational lifespan of twenty five years. Upon reaching its twenty-fifth year, the proposal would enter its decommissioning phase, whereby all equipment would be dismantled and removed from the site. All traces of the panels and security fencing would be removed during this phase and scrapped/recycled accordingly. All waste materials would be transported to appropriate, licensed disposal facilities.

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CHAPTER 5: PLANNING POLICY FRAMEWORK

5. PLANNING POLICY FRAMEWORK

Introduction

- 5.1 This planning policy framework for the determination of the planning application is provided by International/national renewable energy policy, national planning guidance, together with the current development plan and adopted supplementary planning guidance.
- 5.2 The context of renewable energy policy is set by international agreements on climate change to reduce greenhouse gas emissions, principally the Kyoto Protocol. Within the UK, details of targets to meet the Kyoto Protocol are contained within the Climate Change Programme¹, which resulted in various reviews, white papers and culminating in Acts of Parliament.
- 5.3 National Planning Policy is contained within Planning Policy Wales (PPW)² and is supplemented by 21 Technical Advice Notes (TAN's) providing detailed guidance on a range of topics. National planning policy and the Wales Spatial Plan³ provide the overall strategic direction and may be material to decisions on individual planning applications⁴.
- 5.4 At the time of writing and submission, the development plan for the purposes of Section 38(6) of the Planning and Compulsory Purchase Act 2004 comprises the Vale of Glamorgan Council Unitary Development Plan 1996-2011 (adopted April 2005) and relevant Supplementary Planning Guidance.

International, European and UK Context

- 5.5 The Kyoto Protocol was agreed in 1997 at the United Nations Framework Convention on Climate Change. In signing up to the protocol, the European Union and its members agreed to an 8% reduction in greenhouse gas emissions below 1990 levels by 2012. Within the European Union, the UK Government agreed to a legally-binding 12.5% reduction in greenhouse gases and also to set a domestic goal of reducing carbon dioxide emissions by 20% of 1990 levels by 2010.
- 5.6 The United Kingdom Climate Change Programme (DETR, 2000) details the moves to be adopted so as to meet these targets. Measures include the climate change levy, a renewable energy obligation for energy suppliers (10% of electricity supply should be by renewable sources by 2010) and improving energy efficiency requirements of Building Regulations. An updated document was published by DEFRA and the devolved administrations in 2006 which, whilst reinforcing the commitment, included the following targets:-
- Reduction of carbon dioxide emissions by 20% below 1990 levels by 2010;
 - Reduction of carbon dioxide emissions by 60% by about 2050;
- 5.7 In March 2007, the European Union announced a legally-binding obligation on the Union to generate 20% of its electricity by renewable means by 2020. This was followed by the UK Government's consultation on a draft Climate Change Bill which aimed to introduce a

¹ The United Kingdom Climate Change Programme, DETR, 2000

² Planning Policy Wales (PPW), Welsh Assembly Government, Edition 7, July 2014

³ The Wales Spatial Plan: People, Places, Futures, Welsh Assembly Government, Updated 2008

⁴ Paragraph 1.1.4, Planning Policy Wales, Edition 7, July 2014.

framework for the UK to achieve its goals of reducing carbon dioxide emissions and ensure steps are taken towards adapting to the impacts of climate change.

- 5.8 The Climate Change Act became law on 26th November 2008. One of the key provisions of the Act is the introduction of legally binding targets on greenhouse gas emissions comprising reductions through action in the UK and abroad of at least 80% by 2050, and reductions in CO₂ emissions of at least 26% by 2020, against a 1990 baseline. The generation of electricity by renewable means such as solar energy can be a key contributor towards meeting these targets.
- 5.9 The Energy White Paper 'Meeting the Energy Challenge' was published in May 2007. This identified the two long-term energy challenges facing the nation as being 'tackling climate change by reducing carbon dioxide emissions both within the UK and abroad; and ensuring secure clean and affordable energy as we become increasingly dependent on imported fuel'. An Energy Bull followed in January 2008 as the Energy Act.
- 5.10 The Climate Change Act 2008 sets the Welsh Government's long-term goal for Wales of 60% reduction in carbon dioxide emissions by 2050. A key policy in achieving this is increased renewable energy. Importantly, the Renewable Energy report of the Welsh Government's Economic Development Committee stated in January 2003 that electricity generated from renewable energy sources should rise to 4 Terrawatt hours (TWh) per annum by 2010 and 7 TWh per annum by 2020. At present, the level of electricity generated from renewable sources is approximately only 1.4TWh per annum – considerably less than targets.
- 5.11 The UK has signed up to the EU Renewable Energy Directive which includes a UK target of 10% (2010) rising to 15% (2020) of energy from renewable sources by 2020. The policy aims to encourage further use of renewables to produce energy, which will help to meet Government targets for generating power from renewable sources.

National Planning Policy

Wales Spatial Plan

- 5.12 The Wales Spatial Plan, entitled 'People, Places, Futures', sets a strategic framework to guide future development and policy interventions. It integrates the spatial aspects of national strategies for social inclusion and economic development, health, transport and environment, translating the Welsh Government's sustainable development duty into practice.
- 5.13 The Plan includes an objective which seeks to reduce annual greenhouse gas emissions, highlight the implications of climate change and promotes a low-carbon economy.

Planning Policy Wales

- 5.14 Planning Policy Wales (Edition 7, July 2014) is the Welsh Government's principal planning policy document and it sets out the context for sustainable land use planning policy, within which local planning authorities' statutory development plans are prepared and development control decisions on individual applications and appeals are taken.
- 5.15 The main thrust of PPW is to promote sustainable development by ensuring that the planning system provides for an adequate and continuous supply of land available and sustainable for

development to meet society's needs in a way that is consistent with overall sustainability principles. The document emphasises right from the beginning the importance the planning system has to play in delivering sustainable development throughout the country.

5.16 The Government's aim is to secure an appropriate mix of energy provision for Wales, whilst minimising the impact upon the environment. This will be achieved in part by strengthening renewable energy production which includes solar and through a greater focus on energy efficiency and conservation. The document also includes specific development control advice requiring local authorities to consider the effects of sustainable energy schemes in relation to sustainable development criteria, particularly with regard to meeting the Welsh Government's renewable energy targets and to minimising potential detrimental environmental effects on local communities.

5.17 Under Chapter 4 (Planning for Sustainability), the main objective stated which relates to the installation of PV panels is as follows:-

'Supporting the need to tackle the causes of climate change by moving towards a low carbon economy. This includes facilitating development that reduces emissions of greenhouse gases in a sustainable manner, provides for renewable and low carbon energy sources at all scales and facilitates low and zero carbon developments.'⁵

5.18 In determining planning applications for renewable and low carbon energy development (and associated infrastructure), Paragraph 12.10.1 advises that local planning authorities should take into account:-

- ***The contribution a proposal will play in meeting identified national, UK and European targets and potential for renewable energy, including the contribution to cutting greenhouse gas emissions;***
- ***The wider environmental, social and economic benefits and opportunities from renewable and low carbon energy development;***
- ***The impact on the natural heritage, the coast and the historic environment;***
- ***The need to minimise impacts on local communities to safeguard quality of life for existing and future generations;***
- ***Ways to avoid, mitigate or compensate identified adverse impacts;***
- ***The impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so, consider whether measures to adapt climate change impacts give rise to additional impacts;***
- ***Grid connection issues where renewable (electricity) energy developments are proposed; and***
- ***The capacity of and effects on the transportation network relating to the construction and operation of the proposal.***

5.19 Chapter 12 (Infrastructure and Services) states that it is the aim of the Welsh Government to promote the generation and use of energy from renewable and low carbon energy sources at all scales and promote energy efficiency, especially as a means to secure zero or low carbon developments and to tackle the causes of climate change.

5.20 The chapter considers that the planning system has an important part to play in ensuring that the infrastructure on which communities and businesses depend is adequate to accommodate proposed development so as to minimise risk to human health and the environment and

⁵ Paragraph 4.4.3 Planning Policy Wales, 7th Edition, July 2014 (also referred to in Sections 4.7, 4.11 and Chapter 12).

prevent pollution at source. This includes minimising the impacts associated with climate change.

- 5.21 It is also stated that the Welsh Government's aim is to secure an appropriate mix of energy provision for Wales which maximises benefits to the economy and communities, whilst minimising potential environmental and social impacts⁶. This will be achieved through action on energy efficiency and strengthening renewable energy production. This forms part of the Welsh Government's aim to secure the strongest economic development policies to underpin growth and prosperity in Wales, recognising the importance of clean energy and the efficient use of natural resources, both as an economic driver and a commitment to sustainable development. This is reiterated in the Welsh Government's Energy Policy Statement.⁷
- 5.22 Planning Policy Wales, under Paragraph 4.3.1, provides several principles which underpin the national approach to sustainable development, one of which is '*respecting environmental limits, so that resources are not irrecoverably depleted or the environment irreversibly damaged*'. This principle is particularly pertinent to the development of solar farms and it is considered that local planning authorities should take this into account when determining a planning application.
- 5.23 PPW also seeks to protect the 'best and most versatile' agricultural land from development. In this regard, paragraph 4.10.1 states:-
- 'In the case of agricultural land, land of grades 1, 2 and 3a of the Department for Environment, Food and Rural Affairs (DEFRA) Agricultural Land Classification System (ALC)17 is the best and most versatile, and should be conserved as a finite resource for the future. In development plan policies and development management decision considerable weight should be given to protecting such land from development, because of its special importance. Land in grades 1, 2 and 3a should only be developed if there is an overriding need for the development, and either previously developed land or land in lower agricultural grades is unavailable, or available lower grade land has an environmental value recognised by a landscape, wildlife, historic or archaeological designation which outweighs the agricultural considerations. If land in grades 1, 2 or 3a does need to be developed, and there is a choice between sites of different grades, development should be directed to land of the lowest grade.'***
- 5.24 Section 3.3 of PPW describes the Environmental Impact Assessment (EIA) process, in particular what should be included in the assessment, and when it is necessary to carry out an EIA.
- 5.25 Section 5.2 (Caring for Biodiversity) introduces the UK Biodiversity Action Plan (UKBAP) and described its objectives, which include the conservation and where practicable, the enhancement of the following as listed under paragraph 5.2.4:-
- ***The overall quality and range of wildlife habitats and ecosystems;***
 - ***The overall populations and natural ranges of native species;***
 - ***Internationally important and threatened species, habitats and ecosystems;***
 - ***Species, habitats and natural and managed ecosystems characteristic of local areas; and***
 - ***Biodiversity of natural and semi-natural habitats where this has been diminished over recent decades.***
- 5.26 Section 5.5 (Development Management and the Conservation and Improvement of the Natural Heritage) states that biodiversity and landscape considerations must be taken into account in

⁶ Paragraph 12.8.6, Planning Policy Wales, 7th Edition, July 2014

⁷ A Low Carbon Revolution – The Welsh Assembly Government Energy Policy Statement, March 2010

determining individual applications and contributing to the implementation of specific projects. It further states:-

*'The effect of a development proposal on the wildlife or landscape of any area can be a material consideration. In such instances and in the interests of achieving sustainable development it is important to balance conservation objectives with the wider economic needs of local businesses and communities. Where development does occur it is important to ensure that all reasonable steps are taken to safeguard or enhance the environmental quality of land. Pre-application discussions between the developers, local planning authorities and statutory advisers such as Natural Resources Wales are recommended.'*⁸

5.27 In considering planning applications, the following is stated:-

*'When considering any development proposal (including on land allocated for development in a development plan) local planning authorities should consider environmental impact, so as to avoid, wherever possible, adverse effects on the environment. Where other material considerations outweigh the potential adverse environmental effects, authorities should seek to minimise those effects and should, where possible, retain and, where practicable, enhance features of conservation importance.'*⁹

5.28 Paragraphs 5.5.11 and 5.5.12 relate to protected species. It is confirmed that the presence of a species protected under European or UK Legislation is a material consideration when a local planning authority is considering a development proposal which, if carried out, would be likely to result in disturbance or harm to the species or its habitat.¹⁰

Technical Advice Notes (TAN's)

5.29 PPW is supported by 21 topic-based Technical Advice Notes (TAN's) which refer to land use planning considerations relating to various forms of development and act as guidance to local planning authorities in dealing with the determination of planning applications. The following are of relevance.

TAN 5 (Nature Conservation and Planning)

5.30 TAN 5 (September 2009) provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. It seeks to demonstrate how local planning authorities, developers and key stakeholders in conservation can work together to deliver more sustainable development that does not result in losses from the natural heritage but instead takes every opportunity to enhance it.

5.31 Section 5.3 outlines that Regulation 48 of the Conservation (Natural Habitats &c) Regulations 1994 places restrictions on the granting of planning permission for development which is likely to significantly affect a European site and which is not directly connected with or necessary to the management of that site, by requiring that an appropriate assessment is first carried out in respect of the implications of the development for the site's conservation objectives¹¹.

⁸ Paragraph 5.5.1, Planning Policy Wales, 7th Edition, July 2014

⁹ Paragraph 5.5.2, Planning Policy Wales, 7th Edition, July 2014

¹⁰ Paragraph 5.5.11, Planning Policy Wales, 7th Edition, July 2014

¹¹ The requirements of regulation 48 are applied to the grant of planning permission by regulation 54 of the Habitats Regulations.

- 5.32 The decision on whether an appropriate assessment is necessary is to be made on a precautionary basis. An appropriate assessment is required where there is a probability or risk that the project (either alone or in combination with other plans or projects) will have a significant effect on a European site. If an appropriate assessment is required then the local planning authority must then determine, in light of the conclusions of the assessment, whether it can ascertain that the proposal would not adversely affect the integrity of any European site. Again, the authority should adopt a precautionary approach in making its determination.
- 5.33 Regulation 49 requires an authority proposing to allow development that could adversely affect the integrity of a European site to consider, first of all, whether there are any alternative solutions. If there are alternative solutions that would have no (or a lesser) effect on the site's integrity, then permission cannot be granted. If there are no such alternatives, however, the authority should consider whether there are imperative reasons of overriding public interest for granting permission in accordance with the provisions of regulation 49: the authority may only grant permission if it is satisfied that such reasons exist.

TAN 6 (Sustainable Rural Communities)

- 5.34 Technical Advice Note 6 was produced in 2010. It states that it is an important part of moving towards a sustainable rural community is the creation of renewable energy sources. One way in which this can be done is through farm diversification where, for example, it is considered technologies like solar PV can be situated without damaging the agricultural value of the land.

TAN 8 (Renewable Energy)

- 5.35 The Technical Advice Note was produced in 2005 and focuses on the land use planning considerations of renewable energy. The TAN emphasises that the provision of electricity from renewable sources is an important component of the UK energy policy.
- 5.36 More specifically, paragraph 3.15 specifies that:-

'Other than in circumstances where visual impacts is critically damaging to a listed building, ancient monument or a conservation area vista, proposals for appropriately designed solar thermal and PV systems should be supported.'

TAN 12 (Design)

- 5.37 The Technical Advice Note was revised in June 2009 in order to update new requirements, including those for design and access statements. The TAN provides advice on design considerations and states that local planning policies and guidance should aim to:-
- *Create places with the needs of people in mind, which are distinctive and respect local character;*
 - *Promote layouts and design features which encourage community safety and accessibility;*
 - *Focus on the quality of the places and living environments for pedestrians rather than the movement and parking of vehicles;*
 - *Avoid inflexible planning standards and encourage layouts which manage vehicle speeds through the geometry of the road and building;*
 - *Promote environmental sustainability features, such as energy efficiency, in new housing and make clear specific commitments to carbon reductions and/or sustainable building standards;*

- **Secures the most efficient use of land including appropriate densities; and**
- **Consider and balance potential conflicts between these criteria.**

5.38 The TAN also documents a definition of ‘character’, which is contained within the guidance on designing in context¹² and reads as follows:-

‘.....Appraising “character” involves attention to topography; historic street patterns, archaeological features, waterways, hierarchy of development and spaces, prevalent materials in buildings or floorspace, architecture and historic quality, landscape character, field patterns and land use patterns, distinctive views (in and out of the site), skylines and vistas, prevailing uses and plan forms, boundary treatments, local biodiversity, natural and cultural resources and local distinctive features and traditions (also known as vernacular elements)’.

5.39 The TAN goes on to state that opportunities for innovative design will depend on the existing context of development and the degree to which the historic, architectural, social or environmental characteristics of an area may demand or inhibit a particular design solution. Thorough appraisal of context can provide design pointers, which help to inspire an innovative design response, which meets present and future needs. A contextual approach should not necessarily prohibit contemporary design.

TAN 18 (Transport)

5.40 TAN 18 confirms that integration of land use planning and development of transport infrastructure has a key role to play in addressing the environmental aspects of sustainable development and that it can help the Assembly Government achieve its wider sustainable development policy objectives. Paragraph 2.4 indicates that by influencing the location, scale, density and mix of land uses and new development, land use planning can help to reduce the need to travel and length of journeys, whilst making it easier for people to walk, cycle or use public transport.

Practice Guidance: Planning Implications of Renewable and Low Carbon Energy

5.41 In February 2011, the Welsh Government published Practice Guidance: Planning Implications of Renewable and Low Carbon Energy, including solar PV arrays. The Guidance document recognises under paragraph 8.4.16 ‘that a significant proportion of proposals for solar PV arrays will be on agricultural land’ and that the use of ‘high quality agricultural land’ and the ‘reversibility’ of proposals will be considered.

Local Planning Policy

5.42 The Development Plan for the purposes of Section 38(6) of the Planning and Compulsory Purchase Act 2004 comprises the Vale of Glamorgan Council Unitary Development Plan 1996-2011 (adopted April 2005) and relevant Supplementary Planning Guidance.

¹² Paragraph 4.8, TAN 12 refers.

Vale of Glamorgan Council Unitary Development Plan

5.43 For the purposes of Section 38(6), the Development Plan comprises the Vale of Glamorgan Unitary Development Plan 1996-2011 (UDP), which was adopted in April 2005, and relevant Supplementary Planning Guidance.

5.44 The site is not located within a defined settlement boundary, the closest of which would be that for Llantwit Major. It is therefore considered to be located in the open countryside.

5.45 Policy ENV1 (Development in the Countryside) states as follows:-

'Within the delineated countryside permission will only be granted for:

- (i) Development which is essential for agriculture, horticulture, forestry or other development including mineral extraction, waste management, utilities or infrastructure for which a rural location is essential;***
- (ii) Appropriate recreational use;***
- (iii) The re-use or adaptation of existing buildings particularly to assist the diversification of the rural economy; or***
- (iv) Development which is approved under other policies of the plan.'***

5.46 Policy ENV10 (Conservation of the Countryside) also aims to maintain and improve the countryside:-

'Measures to maintain and improve the countryside, its features and resources will be favoured, particularly in the Glamorgan Heritage Coast, areas of high quality landscape, and areas subject to development pressure and/or conflict such as the urban fringe.'

5.47 Policy ENV2 (Agricultural Land) seeks to protect the most versatile agricultural land from irreversible development:-

'The best and most versatile agricultural land (grades 1, 2 and 3a) will be protected from irreversible development, save where overriding need can be demonstrated. Non-agricultural land or land of a lower quality should be used when development is proposed, unless such land has a statutory landscape, nature conservation, historic or archaeological designation which outweighs agricultural considerations.'

5.48 The application site is located within the Glamorgan Heritage Coast. Policy ENV5 (The Glamorgan Heritage Coast) states as follows:-

'The special environmental qualities of the Glamorgan Heritage Coast will be conserved and enhanced. With the exception of limited informal recreation facilities at Cwm Colhuw, Ogmere-by-Sea and Dunraven, the remainder of the area will be treated as a remote zone with priority being given to agriculture, landscape and nature conservation.'

5.49 The amplification provided within Paragraph 3.4.17 states importantly recognises the importance of farm-based diversification proposals as part of the agricultural priority.

5.50 Policy EMP7 (Farm Diversification) states that all new proposals for the diversification of farmsteads will be permitted if:

- i. The diversification proposals are for small scale employment, commercial, recreational or tourism purposes;***

- ii. *Proposals for new structures are specifically designed for and necessary for the purpose of diversification;*
- iii. *Proposals are compatible with the surrounding landscape, adjacent land uses, and any new building or extension to existing buildings;*
- iv. *Proposals do not unacceptably affect the interests of agriculture, conservation, areas of ecological, wildlife, landscape, historic or archaeological importance;*
- v. *The provision of car parking, servicing and amenity space are in accordance with the council's approved guidelines;*
- vi. *Vehicular access is available or can be provided from the public highway without any unacceptable effect upon the appearance of the countryside; and*
- vii. *Proposals do not have an unacceptable impact upon the amenity and character of the local environment by virtue of noise, smell, traffic congestion or visual intrusion.*

5.51 Policy COMM8 (Other Renewable Energy Schemes) provides support for renewable energy schemes, providing the following criteria are met:

- i. *The proposal has no unacceptable effect on the immediate and surrounding countryside;*
- ii. *The proposal has no unacceptable effect upon the sites of conservation, archaeological, historical, ecological and wildlife importance;*
- iii. *Adequate measures are taken, both during and after construction, to minimise the impact of the development on local land use and residential amenity.*

5.52 Policy ENV27 (Design of New Developments) states as follows:-

'Proposals for new development must have full regard to the context of the local natural and built environment and its special features. New development will be permitted where it:

- i. *Complements or enhances the local character of buildings and open spaces;*
- ii. *Meets the council's approved standards of amenity and open space, access, car parking and servicing;*
- iii. *Ensures adequacy or availability of utility services and adequate provision for waste management;*
- iv. *Minimises any detrimental impact on adjacent areas;*
- v. *Ensures existing soft and hard landscaping features are protected and complemented by new planting, surface or boundary features;*
- vi. *Ensures clear distinction between public and private spaces;*
- vii. *Provides a high level of accessibility, particularly for public transport, cyclists, pedestrians and people with impaired mobility;*
- viii. *Has regard to energy efficiency in design, layout, materials and technology; and*
- ix. *Has regard to measures to reduce the risk and fear of crime.*

5.53 Policy ENV16 (Protected Species) states as follows:-

'Permission will only be given for development that would cause harm to or threaten the continued viability of a protected species if it can be clearly demonstrated that:

- i. *There are exceptional circumstances that justify the proposals;*
- ii. *There is no satisfactory alternative; and*
- iii. *Effective mitigation measures are provided by the developer.*

**PROPOSED SOLAR DEVELOPMENT
LAND AT ROSEDEW FARM,
LLANTWIT MAJOR**

ENVIRONMENTAL STATEMENT

**VOLUME 2
CHAPTER 6: NEED & ALTERNATIVES**

6. NEED & ASSESSMENT OF ALTERNATIVES

Introduction

- 6.1 This chapter provides an overview of the need for the proposed development and also an overview of the approach taken to an assessment of alternatives.
- 6.2 In identifying need, regard is given to a series of international, national and local level documents produced in respect of renewable energy or, more particularly, solar developments.
- 6.3 It is clear from UK and Welsh Government policy that climate change is recognised as a matter of global significance that has a fundamental influence on national and local policy and legislation. There is substantial scientific evidence that climate change is happening and its rate is increasing. For example, on the 9th September 2014 the World Metrological Organisation's Greenhouse Gas Bulletin showed an annual increase in CO₂ from 2012 to 2013 greater than any year since 1984.

The Need for the Proposed Development - UK Policy

- 6.4 The 2005 Kyoto Protocol provides a framework for international action on climate change. The UK Government published various reports, papers and reviews on the subject of climate change and energy in the period thereafter, resulting in the Climate Change Act 2008, which set legally binding targets of reducing greenhouse gas emissions by at least 80% by 2050, along with a reduction in CO₂ emissions by at least 26% by 2020 (compared with a baseline of 1990).
- 6.5 Associated with this, the UK has set a target of 15% of energy coming from renewable sources by 2020, compared with 4.1% in 2012 – this is set in place by the 2009 Renewable Energy Directive. The 2009 UK Renewable Energy Strategy then set out how this could be achieved.

UK Renewable Energy Strategy (2009)

- 6.6 Paragraph 2.1 of the Strategy noted that modelling suggests that renewables could provide more than 30% of our electricity by 2020. Paragraph 2.5 explains that this is projected to mean an increase in renewable energy from 40TWh (2008) to almost 240TWh in 2020.

National Renewable Energy Action Plan for the United Kingdom (2010)

- 6.7 This plan was produced by the Coalition Government and confirms their commitment to the pre-existing commitments, such as around 30% of electricity demand coming from renewable sources by 2020.
- 6.8 However, the plan also states on page 4 that:-

'It is important to stress that these figures are purely illustrative of how the overall 15% target for the UK could be met. They should not be taken as an upper limit to the UK ambition for renewables deployment.'

Annual Energy Statement (2013)

- 6.9 Paragraph 1.27 of the Statement notes that *'the trajectory of the third carbon budget suggests that the UK will have reduced its emissions by 34% by 2020'*. Moreover, according to paragraph 1.30, the latest projections show that '
- 6.10 The latest figures at the time of publication (from 2012) showed the UK has 4.1% of its energy from renewable sources, up from 3.8% in 2011. This is compared with the target of 15% by 2020.

Renewable Energy Roadmap Update (2013)

- 6.11 This is the most recent roadmap update, with the next one not due for publication until late 2015. As set out on page 13, in the second quarter of 2013, 12.8TWh of renewable electricity was generated, up from 8.2TWh in the same quarter of 2012. This represented 15.5% of electricity generation – compared with 19% nuclear, 29% gas and 25% coal.
- 6.12 Accordingly, of this 12.8TWh, 5.2TWh came from bioenergy, 3.76TWh from onshore wind and 2.47TWh from offshore wind. Solar PV along with wave and tidal (grouped together in the information) provided 0.42TWh. The increase in electricity from solar PV, wave and tidal was 22.4% from the previous year – the slowest increase of various renewable sources.
- 6.13 Paragraph 89 of the Update states that *'electricity generation from renewable sources for the period July 2012 to June 2013 reached 47.5TWh, increasing by 24% compared to the same period the year before. Overall capacity grew by 38% for the period July 2012 to June 2013.'* The solar PV capacity grew by 1GW in this period – a 70% increase.
- 6.14 Figure 4 of the Update shows that the estimated energy demand required to meet the 15% target in 2020 has been revised downward from previous years, with an expected requirement now in the range of 216-225TWh.
- 6.15 Paragraph 20 of the Update confirms that from July 2012 to June 2013 the amount of renewable electricity generated in Wales increased from 2.3TWh to 2.4TWh (a 1% rise). This accounted for 5% of the UK's renewables output.
- 6.16 Paragraph 60 of the Update discusses public opinion. It notes that 82% of the sampled UK adult population supported solar, whereas 72% supported offshore wind, 71% wave and tidal, 66% onshore wind and 60% biomass. These figures also date from March 2012.
- 6.17 According to paragraph 182:-
- 'We need to ensure that this level of support can be maintained – including by ensuring that solar PV is appropriately sited. We do however expect on-going deployment of the technology to continue at all scales.'***
- 6.18 Factually, solar PV accounts for 12% of renewable electricity capacity and 2.9% of generation. The majority of this comes from domestic installations; at June 2013, of the 2.4GW installed capacity, 1.7GW was small-scale and 0.2GW large-scale.

UK Solar PV Strategy Part 1: Roadmap to a Brighter Future (2013)

- 6.19 This strategy recognises solar PV as one of the eight key sources of renewable energy. At June 2013, the UK had 2.5GW of installed capacity, generating 1.4TWh from June 2012 to June 2013.
- 6.20 Paragraph 13 repeats the statistics referred to in paragraph 6.17 of this chapter. The strategy also refers to other Government reports, such as the Renewable Energy Roadmap Update 2012 and the Electricity Market Reform – the former of which shows there is a technical maximum of 20GW of solar PV being deployed by 2020.
- 6.21 Solar is regarded as one of the means towards delivering ‘genuine carbon reduction’ and supporting ongoing decarbonisation of the economy. One of the principles set out in the strategy (paragraph 6) is that:-

‘Support for solar PV should ensure proposals are appropriately sited, give proper weight to environmental considerations such as landscape and visual impact, heritage and local amenity, and provide opportunities for local communities to influence decisions that affect them.’

- 6.22 Related to this principle, paragraph 55 reconfirms the Government’s commitment to ‘bringing forward appropriately sited solar PV installations’ which forms ‘an essential part of a responsible UK energy policy’. Paragraph 57 states that:-

‘The key issue is ensuring that proposals to deploy solar PV take account of the circumstances of each project. A brownfield site may contain a Site of Special Scientific Interest or be part of an Area of Outstanding Natural Beauty. Likewise, even plots of the highest grade agricultural land could include areas which are in themselves lower grade and could legitimately be used for solar PV deployment. This is increasing evidence that, if well planned and managed, there can be biodiversity benefits arising from the deployment of solar PV at large scale.’

UK Solar PV Strategy Part 2: Delivering a Brighter Future (2014)

- 6.23 This document acknowledged that there was now 2.6GW of solar PV capacity in the UK. The Minister of State Greg Barker MP, in his foreword, believed that the UK could have 20GWp installed by the early part of the next decade. It notes that by the end of 2013 solar PV accounted for 14% of the UK’s renewable electricity capacity.
- 6.24 Paragraph 17 of this part of the strategy states that:-

‘Large-scale ground-mounted solar deployment has been much stronger than anticipated in government modelling. This can have impacts on visual amenity, and siting and design are important. It also has the potential to affect the financial incentives budget under the Levy Control Framework. Given the finite nature of this budget it will be necessary for the Government to continue to monitor the overall pipeline of projects against our ambitions for a diverse mix of renewable technologies and achieving value for money for consumers.’

- 6.25 According to paragraph 59, by February 2014 there were 184 operational large-scale solar farms in the UK (i.e. more than 1MWp of installed capacity), with 48 under construction and 194 with planning permission.
- 6.26 Paragraph 64 notes that whilst solar farms provide opportunities for greater generation than small-scale installations, they can have negative impacts on the rural environment if they are not

well-planned or well-screened. There can also be issues with local communities bearing amenity issues but receiving no benefit.

The Need for the Proposed Development - Welsh Policy

One Wales; One Planet (2009)

- 6.27 The Welsh Government's Sustainable Development Scheme (One Wales; One Planet) puts the promotion of sustainable development at the heart of the Government's work and follows on from the duty under the Government of Wales Act 2006. The Scheme defines sustainable development and sets out what this means for Wales.
- 6.28 The aim is for Wales, within the lifetime of a generation, to use only its fair share of the earth's resources, reducing its ecological footprint to the global average of available resources: 1.88 global hectares per person. This means, *inter alia*:-
- Reducing the use of carbon-based energy by 80-90%;
 - Producing as much electricity from renewable sources by 2025 as consumed;
 - A target to reduce emissions by 3% every year;
 - A target of at least a 40% reduction in greenhouse gas emissions in Wales by 2020 against a 1990 baseline.
- 6.29 This strategy confirms that in Wales there is:-
- A target to reduce emissions by 3% every year;
 - A target of at least a 40% reduction in greenhouse gas emissions in Wales by 2020 against a 1990 baseline.
- 6.30 It should be noted that the National Atmospheric Emissions Inventory reported to DECC (and the devolved administrations) in June 2014. In Wales there has been a reduction from 1990 to 2012 of 18%, but an observed 5% increase from 2011 to 2012.

A Low Carbon Revolution – The Welsh Assembly Government Energy Policy Statement (2010)

- 6.31 Appendix 1 of this report shows that solar PV is expected to make a small contribution to meeting Wales' energy potential to 2020 and 2025. Solar is grouped under the heading 'local electricity generation', which is earmarked to contribute 1GW of the target capacity of 22.5GW. The target is for this to be in place by 2020, whereas the larger contribution of onshore wind (2GW) is to be in place by 2015/17.
- 6.32 Therefore, in the highly unlikely event that 100% of the planning applications for onshore wind turbines are approved, then all approved wind turbines will need to be erected and connected by 2015/17 in order for the target for onshore wind to be met.
- 6.33 Although it is hard to evaluate offshore capacity due to the location of offshore wind farms, the capacity looks far short of the target by 2015/16. The pipeline of biomass projects is slightly more than half of the target for 2020.

- 6.34 The targets for tidal and wave generating capacity have a longer end-date, but the capacity in planning or awaiting construction is a long way short of the target of 12.5GW (it is quoted to be 257MW).
- 6.35 In terms of the local electricity generation capacity, the target of 1GW by 2020 includes wind. However, solar and hydro are currently on course to provide 578MW in the unlikely event that all current applications are approved and all approved schemes become operational.
- 6.36 Therefore, by no means does it look likely that the Welsh Government's own targets set out in the Low Carbon Revolution report will be met without significantly more applications being approved.

Energy Wales: A Low Carbon Transition (2012)

- 6.37 According to page 8, gas is responsible for around 50% of electricity generated in Wales. Generation from renewables increased from 2.9% in 2004 to 5.1% in 2010.

The Need for the Proposed Development - Local Policy

Vale of Glamorgan Local Development Plan 2011-2026: Renewable Energy Assessment

- 6.38 Although prepared for their planning policy service, this report provides a useful overview of national energy policy and how it manifests in the Vale of Glamorgan.
- 6.39 Table 16 shows that it is projected that the authority will have an electricity demand in 2020 of 612 GWh/yr. The assessment considers that 440GWh/yr can be generated from renewables by 2020, of which 276GWh/yr would come from the co-firing of Aberthaw power station with biomass.
- 6.40 Therefore, 72% of electricity demand could potentially be met by renewable energy resources within the Vale of Glamorgan, but this is reduced to 27% if Aberthaw is discounted, as the report recommends (due to the biomass only being viable in association with the coal).
- 6.41 Paragraph 5.5 states that:-
- 'The percentage of renewable electricity generation (by 2020 in the Vale of Glamorgan) is roughly 3% below the UK-wide target. The majority of the Vale of Glamorgan's renewable energy crops which make up 63% of this assessed overall capacity.'***
- 6.42 It should be noted, however, that solar farms are not considered within this assessment.

Approach to Assessment of Alternatives

- 6.43 A possible need to consider alternative sites stems primarily from the EIA Regulations, which allude to the requirement for 'an outline of the main alternatives studies and an indication of the main reasons for this choice taking into account environmental effects' to be included in an Environmental Statement.
- 6.44 Paragraph 83 of Welsh Office Circular 11/99, which accompanies the Regulations, notes the following:-
- 'Although the Directive and the regulations do not expressly require the developer to study alternatives, the nature of certain developments and their location may make the consideration of alternatives a material consideration...'***
- 6.45 The application site is located on agricultural land, a plentiful supply of which is located in the general area. However, it is only the applicant's land holding that is the subject of any alternative site appraisal. Alternative sites comprising a similar area (10.7ha) are available within the applicant's land holding, although these are also greenfield in nature. It should be noted that all such land is located within the Glamorgan Heritage Coast designation.
- 6.46 A solar pv development in this general area is considered to be a viable development proposition because of the availability of grid capacity and also a grid connection. The identified point of connection is to the east, and as the application site is located to the eastern extreme of the applicant's land holding, it is considered that the chosen site represents the least-intrusive option available. Furthermore, by moving the site as far to the east as possible within the applicant's land holding, the greater the separation from the Castle Ditches Camp Scheduled Ancient Monument (approximately 1.5km to the west).
- 6.47 It should also be borne in mind that the site was originally intended for a much larger area, to support a 10MW output scheme. The site area for this development comprised approximately 30 hectares and the applicant has moved to reduce the site area to 10.7 hectares so as to minimise environmental effects as far as practicable.

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VOLUME 2

CHAPTER 7: LANDSCAPE & VISUAL IMPACT

7. LANDSCAPE AND VISUAL IMPACT

Introduction

- 7.1 Tirlun Design Associates (TDA) have been instructed to undertake a landscape character and visual impact assessment (LC&VIA) of land at Rosedew Farm, Llantwit Major ('The Site') and assess the general visual and landscape character impacts a proposed new solar development would have upon its surrounding landscape.
- 7.2 Desktop research and site surveys were carried out in November 2014 and their findings are contained herein.
- 7.3 The LC&VIA considers likely effects upon:
- Landscape character and features, including effects on the aesthetic values of the landscape, caused by changes in the elements, characteristics, character and qualities/values of the landscape; and
 - Visual amenity, including effects upon potential viewers and viewing groups caused by changes in the appearance of the landscape as a result of the development.
- 7.4 The assessment also considers the potential effects of the development on the built heritage of the area, including listed buildings and scheduled ancient monuments.
- 7.5 The key objectives of the assessment are to:-
- Identify and evaluate the existing landscape character features and designations of the site and its surroundings;
 - Identify and evaluate the existing visual relationships between the site and its surrounding area;
 - Identify and evaluate the built heritage assets within the area surrounding the site;
 - Identify measures for avoiding/mitigating potential effects and feed these into the project design; and
 - Identify residual effects on the landscape resource, visual amenity and the level and significance of effects.

Legislative and Planning Policy Context

National Planning Policy

- 7.6 It is clear that the Welsh Government promotes the generation and use of energy from renewable sources and in this regard provides a mechanism to support the implementation of solar farms through Planning Policy Wales (Edition 7, July 2014) and Technical Advice Note 8: Planning for Renewable Energy (TAN8, 2005).
- 7.7 In determining planning applications for renewable and low carbon energy development (and associated infrastructure), Paragraph 12.10.1 of PPW advises that local planning authorities should take into account:-

- *The contribution a proposal will play in meeting identified national, UK and European targets and potential for renewable energy, including the contribution to cutting greenhouse gas emissions;*
- *The wider environmental, social and economic benefits and opportunities from renewable and low carbon energy development;*
- *The impact on the natural heritage, the coast and the historic environment;*
- *The need to minimise impacts on local communities to safeguard quality of life for existing and future generations;*
- *Ways to avoid, mitigate or compensate identified adverse impacts;*
- *The impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so, consider whether measures to adapt climate change impacts give rise to additional impacts;*
- *Grid connection issues where renewable (electricity) energy developments are proposed; and*
- *The capacity of and effects on the transportation network relating to the construction and operation of the proposal.*

7.8 Section 5.5 (Development Management and the Conservation and Improvement of the Natural Heritage) states that biodiversity and landscape considerations must be taken into account in determining individual applications and contributing to the implementation of specific projects. It further states:-

*'The effect of a development proposal on the wildlife or landscape of any area can be a material consideration. In such instances and in the interests of achieving sustainable development it is important to balance conservation objectives with the wider economic needs of local businesses and communities. Where development does occur it is important to ensure that all reasonable steps are taken to safeguard or enhance the environmental quality of land.'*¹

Local Planning Policy

Adopted Vale of Glamorgan Unitary Development Plan (1996-2011)

7.9 Unitary Development Plan (UDP) policies relevant to the proposed solar development and its location within the Glamorgan Heritage Coast and the countryside includes:-

- Policy ENV1 – Development in the Countryside
- Policy ENV5 – The Glamorgan Heritage Coast
- Policy COMM8 – Other Renewable Energy Schemes

7.10 Policy ENV1 (Development in the Countryside) states as follows:-

'Within the delineated countryside permission will only be granted for:

- (i) Development which is essential for agriculture, horticulture, forestry or other development including mineral extraction, waste management, utilities or infrastructure for which a rural location is essential;*
- (ii) Appropriate recreational use;*
- (iii) The re-use or adaptation of existing buildings particularly to assist the diversification of the rural economy; or*
- (iv) Development which is approved under other policies of the plan.'*

7.11 Policy ENV5 (The Glamorgan Heritage Coast) states as follows:-

¹ Paragraph 5.5.1, Planning Policy Wales, 7th Edition, July 2014

'The special environmental qualities of the Glamorgan Heritage Coast will be conserved and enhanced. With the exception of limited informal recreation facilities at Cwm Colhuw, Ogmere-by-Sea and Dunraven, the remainder of the area will be treated as a remote zone with priority being given to agriculture, landscape and nature conservation.'

7.12 Policy COMM8 (Other Renewable Energy Schemes) provides support for renewable energy schemes, providing the following criteria are met:

- i. The proposal has no unacceptable effect on the immediate and surrounding countryside;***
- ii. The proposal has no unacceptable effect upon the sites of conservation, archaeological, historical, ecological and wildlife importance;***
- iii. Adequate measures are taken, both during and after construction, to minimise the impact of the development on local land use and residential amenity.***

Assessment Methodology

7.13 The following section has been produced in accordance with the 'Guidelines for Landscape and Visual Impact Assessment (3rd Edition)' produced by The Landscape Institute and Institute of Environmental Management & Assessment (2013) and The Landscape Institute's Advice Note 01/11 'Photography and photomontage in landscape and visual impact assessment'.

Visual Appraisal Methodology

7.14 In addition to the research undertaken to establish the sites landscape/planning context and landscape character, a desktop assessment of the site was undertaken to identify local visual receptors and establish a Zone of Theoretical Visual Influence. The accuracy of this zone was then confirmed during the site survey.

7.15 Drawing no. TDA/2081/01 – Zone of Theoretical Visibility, Location of Photo Viewpoints & Heritage Assets (refer to Appendix 4), clearly identifies local visual receptors, including areas accessible to the general public and local heritage assets, and the sites ZTV based on a desktop topographical analysis which was verified on site.

7.16 As a consequence of the assessment described above, photo viewpoints were carefully selected to represent the developments possible impacts upon visual receptors located within the zone of theoretical visibility.

7.17 For document clarity and ease of interpretation viewpoints are categorised according to their distance from the Site as follows:

- Short-range – 0-0.5km from the centre of the site;
- Mid-range – 0.5-1km from the centre of the site;
- Long-range – 1+ km from the centre of the site.

7.18 A total of 11 no. photo viewpoints were selected and include:-

- Views from publicly accessible areas;
- Views that have a reasonably high potential number of viewers or are of particular importance to the viewers affected;

- Views that provide a representative range of viewing distances (i.e. short, medium and long range views);
- Views that represent a range of views with different characteristics that might be located in different landscape types e.g. semi-enclosed views, elevated views, or panoramic views; and
- Views that represent a range of viewing experience (i.e. static views, from residential properties and points from sequential views, for example from roads and footpaths).

7.19 A description of the viewpoints is provided in paragraphs 8.4 to 8.14 and their locations and view angles are illustrated by TDA drawing no. TDA/2081/01 – Zone of Theoretical Visibility, Location of Photo Viewpoints & Heritage Assets (refer to Appendix 4).

7.20 The sensitivity of these viewpoints are defined by the function of the occupation or activity of people experiencing the view at a particular location and the extent to which their attention or interest may be focused on the landscape around them. Viewer sensitivity, as defined for this assessment, is set out in Figure 7-1 below.

Figure 7-1: Definitions of viewer sensitivity

Sensitivity	Definition
High	Viewers whose attention or interest is focussed on the landscape/townscape such as communities or occupiers of residential properties.
Medium	Viewers with a moderate interest in their environment such as locations on routes through the landscape such as local footpaths or local roads or users of public sports grounds and amenity open space.
Low	Viewers with a passing interest in their surroundings and whose interest is not specifically focussed on the landscape e.g. working premises or locations on main roads or railways.

7.21 The magnitude of effect on each individual viewpoint has been assigned one of the following descriptions, based on professional judgement:-

- High – change resulting in a high degree of deterioration or improvement of an existing view;
- Medium – change resulting in a moderate deterioration or improvement of an existing view;
- Low – change resulting in a low degree of deterioration or improvement of an existing view;
- Negligible – very minor or no change to any existing view.

7.22 The significance of the development’s visual impact upon these viewpoints has been assessed using the Significance Matrix as set out in Figure 7-2 below:-

Figure 7-2:- Significance matrix for visual impact

Sensitivity / value of receptor	Magnitude of Effects			
	High	Medium	Low	Negligible
High	Substantial	Substantial	Moderate	Minor
Medium	Substantial	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible

7.23 The description of the level of significance used by Figure 7-2 can be seen in Figure 7-3 below:-

Figure 7-3:- Description of the level of significance of environmental effects

Level of Significance	Description
Substantial	Major effects (by extent, duration or magnitude) and/or a highly pronounced change in environmental conditions. Effects, both adverse and beneficial, which are likely to be important considerations at a regional or district level because they contribute to achieving regional or borough wide objectives, or could result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Intermediate effects (by extent, duration or magnitude) and/or pronounced change in environmental conditions. Effect that is likely to be an important consideration at a local level.
Minor	Noticeable but small effect or change in environmental conditions. These effects may be raised as local issues but are unlikely to be of importance in the decision making process.
Negligible	No discernible change or neutral effect on environmental conditions. An effect that is likely to have a negligible influence, irrespective of other effects.

Landscape Character Assessment Methodology

7.24 For the purposes of this assessment, the following definitions of landscape character sensitivity, set out in Figure 7-4 below, have been devised. Sensitivity is classified as high, medium or low.

Figure 7-4:- Definitions of landscape character sensitivity

Sensitivity	Definition
High	<p>A landscape of particularly distinctive sense of place and in good condition whose characteristics or components make a strong positive contribution to landscape character.</p> <p>Attributes that make up the landscape offer very limited opportunities for the accommodation of change, or development of successful mitigation.</p> <p>The landscape may be particularly important in policy terms (e.g. a nationally designated landscape).</p>

	N.B. Not all aspects noted above are required to apply concurrently to result in a high sensitivity.
Medium	<p>A landscape with some sense of place and/or in fair condition whose characteristics or components make some positive contribution to landscape character.</p> <p>Attributes that make up the landscape offer some opportunities for the accommodation of change, or for development of successful mitigation.</p> <p>The landscape may be locally important in policy terms (e.g. valued through local authority designations or containing features or qualities recognised as important at the local authority level).</p> <p>N.B. Not all aspects noted above are required to apply concurrently to result in a medium sensitivity.</p>
Low	<p>A landscape with a weak sense of place and/or in poor condition whose characteristics or components do not contribute positively to landscape character.</p> <p>Attributes that make up the landscape are tolerant of change and offer opportunities for successful mitigation.</p> <p>N.B. Not all aspects noted above are required to apply concurrently to result in a low sensitivity.</p>

7.25 Magnitude of change depends on the nature and scale of change that is expected to occur (i.e. any change in the backdrop to, or outlook from, a landscape that affects its character), as well as its geographical extent.

7.26 Magnitude of landscape change is described as ranging from high to imperceptible. Definitions are provided in Figure 7-5 below:-

Figure 7-5:- Magnitude of landscape change

Magnitude of change to landscape character caused by development			
High	Medium	Low	Imperceptible Change
An obvious change in landscape character and characteristics	Discernible changes in landscape character and characteristics	A small or localised change in character and characteristics of the landscape.	Imperceptible or no change in character and characteristics of the landscape.

7.27 The severity (or significance) of landscape effect depends on the nature of the landscape resource and its sensitivity and the magnitude of change. A higher level of effect is generally attached to large scale developments on sensitive and valued landscape resources.

- 7.28 Significance is determined by considering the sensitivity of the landscape receptor and the magnitude of change expected as a result of the development. Figure 7-6 illustrates the general relationship between the sensitivity of the receptor and the magnitude of change.

Figure 7-6:- Determining significance of effects on landscape character

		Sensitivity of Landscape Character		
Magnitude of Change	High	Major	Major or Moderate	Moderate or Minor
	Medium	Major or Moderate	Moderate or Minor	Minor
	Low	Moderate or Minor	Minor	Minor or Negligible
	Imperceptible Change	Negligible	Negligible	Negligible

Baseline Conditions

Site and Landscape Context

- 7.30 The proposed site at Rosedew Farm is located approximately 500 metres to the South east of the edge of Llantwit Major within the Glamorgan Heritage Coast as defined by the Vale of Glamorgan Adopted Unitary Development Plan (1996-2011).
- 7.31 The site, which lies in an undulating rural landscape, is approximately 10.7 hectares in size and is made up of and bounded by arable fields to the north, east south and west.
- 7.32 The site is defined by existing mixed native field hedgerows with some associated hedgerow trees.
- 7.33 Although the site does not contain any bridleways, byways or other routes public access it is surrounded by many. Refer to TDA drawing no. TDA/2081/01 – Zone of Theoretical Visibility, Location of Photo Viewpoints & Heritage Assets in Appendix 4.
- 7.34 Based upon the study of up to date mapping provided by Sustrans there are no local or national cycle routes adjacent to, nor within close proximity of the site.
- 7.35 The site does not contain any listed buildings or scheduled ancient monuments. However, there are some within the vicinity including Castle Ditches Camp Scheduled Ancient Monument.
- 7.36 The site does not include any trees which are subject to Tree Preservation Orders.
- 7.37 TDA/2081/01 – Zone of Theoretical Visibility, Location of Photo Viewpoints & Heritage Assets (refer to Appendix 4) clearly illustrates the site, its context and the location of local heritage assets.

Landscape Character

- 7.38 The Countryside Council for Wales has undertaken an extensive landscape character assessment of Wales using the LANDMAP information system.
- 7.39 LANDMAP is a GIS (Geographical Information System) based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent data set.
- 7.40 Specialists collect LANDMAP Information in a structured and rigorous way that is defined by five methodological chapters, the Geological Landscape, Landscape Habitats, Visual & Sensory, Historic Landscape and Cultural Landscape. Each of these elements and how they assess the site and its surroundings (including principal management recommendations and long term guidelines) are further explored below.

Geological Landscape

- 7.41 LANDMAP has located the site within the 'Llantwit-St. Athan' aspect area. It states that the area, which is classified as being of outstanding overall value, is a broad, low, dissected coastal plateau underlain by Lias (Lower Jurassic) with steep sided valleys and short steep cwms cut into cliffs adjacent to the coast.
- 7.42 The principal management recommendation and medium term guideline for this area is to ensure that no significant and potentially conservable features of geological or geomorphological significance are lost / damaged due to development.

Landscape Habitats

- 7.43 The site is located within the 'Boverton' aspect area. LANDMAP summarises that the area, classified as moderate overall value, as comprising gently sloping ground associated with the coastal plain intensively managed for agriculture and dominated by arable crops. Although notable arable weeds have been recorded, the aspect area has limited value for biodiversity.
- 7.44 The principal management recommendation & guidelines are to undertake sympathetic management to encourage biodiversity interest at the margins of cereal crops.

Visual and Sensory

- 7.45 The Visual & Sensory element of the assessment locates the site within the 'Heritage Coast Hinterland' aspect area. LANDMAP summarises that the area, classified as being of outstanding overall value, as a rolling coastal lowland plateau sloping towards the coast with a sense of openness. It has long views out to sea, and occasionally to Somerset. The maximum height is approximately 98m AOD near Wick and the lowest approximately 5m AOD at Cwm-Col-Huw. The land cover is a medium sized rectilinear pastoral and arable fields set within managed hedgerows and stone walls. Trees display coastal windblown characteristics. There are several small woodlands. Deciduous woodlands tend to be concentrated within small steep sided coastal valleys which are a distinctive feature of the landscape. Isolated coniferous woodlands/shelterbelts occur.
- 7.46 The principal management recommendation is to strongly restrict development.

- 7.47 In addition, the medium term guideline for this aspect area is to Manage the area as Heritage Coast in terms of detailing, hedgerow / woodland management and access while Improving settlement detailing and boundaries to reflect vernacular character.

Historic Landscape

- 7.48 The Historic Landscape element of the assessment locates the site within the 'St Donat's, Monknash and St Brides Major' aspect area.
- 7.49 Although LANDMAP classifies the overall value of this area as outstanding due to its surviving prehistoric sites, the assessment does not contain any principal management recommendations or guidelines.

Cultural Landscape

- 7.50 The Cultural Landscape element of the assessment locates the site within the 'Heritage Coast' aspect area. LANDMAP summarises the area, classified as being of high overall value, as extensive cliff lands of varying height, moorland and dips and hollows of greenery with a generally wild and unspoiled air.
- 7.51 The principal management recommendation & guidelines are to encourage landowners to keep stone walls and fences in good repair).
- 7.52 Based on the LANDMAP information system methodology above, The Vale of Glamorgan Council has undertaken an extensive landscape character assessment of the county. The results of this study are summarised by 'Landscapes Working for The Vale of Glamorgan' Volumes 1-4, produced by White Consultants, January 1999.
- 7.53 Using this methodology The Vale of Glamorgan is divided into 33 landscape character areas. The Rosedew Farm site falls within Landscape Character Area 2 'Costal Hinterland – West of Aberthaw Power Station' (Refer to Appendix 5).
- 7.54 In essence, the landscape assessment describes the overall character of the 'Coastal Hinterland' as a:
- 'Coastal influenced lias plateau sloping towards the sea with mixed productive farmland, woodland and incised valleys. Settlement is nucleated in small settlements with vernacular stone buildings and walls. Outstanding in its visual qualities, historic significance in parts including monastic grange at Monknash/Marcross, cultural significance and agricultural productivity'.***
- 7.55 Following a more detailed, site specific, visual appraisal and landscape assessment carried out in November 2014 It can be confirmed that the summary made by LANDMAP and The Vale of Glamorgan's document entitled 'Landscapes Working for The Vale of Glamorgan' (Volumes 1-4), produced by White Consultants, January 1999 is a broadly accurate description of the landscape at and surrounding Rosedew Farm.
- 7.56 Indeed, the site and its immediate setting comprise a rolling, open rural landscape, defined by a network of traditional field boundary hedgerows and walls.
- 7.57 The area, predominantly made up of arable fields, is visually dominated by the town of Llantwit Major and the linear woodland belt adjacent to Boverton Brook.

7.58 The sites landscape character is explored further later in this assessment. Refer to paragraphs 7.83-7.86

Visual Amenity

7.59 As described by the Visual & Sensory element of the LANDMAP assessment, the site sits within a rolling coastal lowland plateau, sloping towards the coast with a sense of openness. The area contains several small woodlands often concentrated within small steep sided coastal valleys.

7.60 Consequently and as illustrated by TDA drawing no. TDA/2081/01 – Zone of Theoretical Visibility, Location of Photo Viewpoints & Heritage Assets (refer to Appendix 4); the visual envelope of the site is restricted.

7.61 This is also clearly illustrated by Photo Viewpoints 1, 2, 4, 6, 7, 8, 9,10 &11 located within the Photographs section of this document and is explored further later in this assessment. Refer to pa

Assessment of Potential Impacts

7.62 Proposals for the solar development at Rosedew Farm are clearly illustrated on the site layout plan submitted as part of the planning application.

7.63 The proposals include the following:-

- The sensitive integration of the development into the existing field pattern and the retention of all existing trees, hedgerows and field boundary walls to minimise visual and landscape character impacts;
- Rows of photovoltaic panels fixed to galvanized steel legs which are driven into the ground to a maximum depth of 1.2 metres, minimising impact upon ground conditions in accordance with recommendations and guidelines set out within the Geological Landscape element of the LANDMAP assessment;
- Restricting the height of the photovoltaic panels to 2.1 metres, minimising visual and landscape character impacts upon their surroundings;
- Allowing sufficient room beneath the photovoltaic panels for sheep grazing thus continuing the use of the land for agricultural purposes;
- The incorporation of 4 no. inverter stations (6000mm wide x 2500mm height x 6000mm deep). Elevations to comprise Yorkshire boarding above concrete block walls in keeping with modern agricultural buildings found in the surrounding area;
- 2.0m high galvanized wire deer fencing with timber posts to minimise visual impact of secure boundary treatment;
- 2.5m high CCTV cameras located to the site perimeter at 35 metre centres.

7.64 At this point, it should be noted that the solar farm has been carefully designed and once decommissioned, can be easily removed and the area reverted to its previous condition nullifying any minor impacts the development has upon the landscape character of the area in the long term.

Visual Amenity Impacts – Construction and Operational Phases

- 7.65 Due to its location within a rolling coastal lowland plateau, the visual envelope of the site is restricted by the surrounding natural topography. Views are further restricted by small groups of woodland to the north of the development site.
- 7.66 This is clearly illustrated by the photographs taken from public footpaths, public rights of way and roads adjacent to and surrounding the site which are further described in paragraphs 7.68 to 7.78 below.
- 7.67 Photo viewpoints 1-11 below can be found in Appendix 6. Their locations and view angles are illustrated by TDA drawing no. TDA/2081/01 – Zone of Theoretical Visibility, Location of Photo Viewpoints & Heritage Assets (refer to Appendix 4).
- 7.68 **Photo Viewpoint 1** is a Mid-range view looking south from the public footpath linking Boverton Road & Tre-Beferad adjacent to Boverton Brook. The site is screened by the natural undulating topography of the area and the trees and vegetation associated with Boverton Brook. The development will not be visible from this photo viewpoint.

Figure 7-7:- Summary of Visual Amenity Impact – Photo Viewpoint 1

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
Medium (Public Right of Way)	Negligible (No change in view)	Negligible (No change in view)

- 7.69 **Photo Viewpoint 2** is a Mid-range view looking south west from a field access gate of an unnamed road approximately 700 metres north west of Boverton Mill Farm. The site is screened by the natural undulating topography of the area and intervening field boundary hedgerows. The development will not be visible from this photo viewpoint.

Figure 7-8:- Summary of Visual Amenity Impact – Photo Viewpoint 2

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
Medium (Public Right of Way)	Negligible (No change in view)	Negligible (No change in view)

- 7.70 **Photo Viewpoint 3** is a short-range panoramic looking north from section 101 of The Wales Coast Path adjacent to Stout Bay. The site is partially screened by the natural undulating topography of the area. A small section of solar arrays on the southern boundary of the site may be visible from this photo viewpoint.

Figure 7-9:- Summary of Visual Amenity Impact – Photo Viewpoint 3

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
High (Wales Coastal Path)	Low (Low change in view)	Minor Adverse (Noticeable but small change)

- 7.71 **Photo Viewpoint 4** is a long-range panoramic looking north east from Section 100 of The Wales Coast Path. The site is screened by the natural undulating topography of the area and intervening field boundary hedgerows. The development will not be visible from this photo viewpoint.

Figure 7-10:- Summary of Visual Amenity Impact – Photo 4

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
High (Wales Coastal Path)	Negligible (No change in view)	Negligible (No change)

- 7.72 **Photo Viewpoint 5** is a long-range panoramic looking north east from Section 100 of The Wales Coast Path adjacent to Castle Ditches. The site is partially screened by the natural undulating topography of the area and intervening field boundary hedgerows. A very small section of solar arrays on the western boundary of the site may be visible from this photo viewpoint.

Figure 7-11:- Summary of Visual Amenity Impact – Photo 5

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
High (Wales Coastal Path)	Negligible (Very minor change in view)	Negligible (Imperceptible change in view)

- 7.73 **Photo Viewpoint 6** is a long-range view looking east from public footpath above and to the west of Cwm Col-huw Beach. The site is screened by the natural undulating topography of the area and intervening vegetation. The development will not be visible from this photo viewpoint.

Figure 7-12:- Summary of Visual Amenity Impact – Photo 6

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
High (Wales Coastal Path)	Negligible (No change in view)	Negligible (No change)

- 7.74 **Photo Viewpoint 7** is a long-range panoramic looking south east from a public footpath above and to the west of Cwm Col-huw linking Lower House Farm to the Wales Coast Path. The site is screened by the natural undulating topography of the area and intervening vegetation. The development will not be visible from this photo viewpoint.

Figure 7-13:- Summary of Visual Amenity Impact – Photo 7

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
Medium (Public Right of Way)	Negligible (No change in view)	Negligible (No change)

- 7.75 **Photo Viewpoint 8** is a mid-range View looking south east from Colhugh Street adjacent to the public footpath linking Colhugh Street and Cwm Col-huw. The site is screened by the natural undulating topography of the area and intervening field boundary hedgerows. The development will not be visible from this photo viewpoint.

Figure 7-14:- Summary of Visual Amenity Impact – Photo 8

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
Medium (Public Right of Way)	Negligible (No change in view)	Negligible (No change)

7.76 **Photo Viewpoint 9** is a long-range Panoramic looking south east from Dimlands Road adjacent to Wellington Court. The site is screened by intervening field boundary hedgerows and associated hedgerow trees. The development will not be visible from this photo viewpoint.

Figure 7-15:- Summary of Visual Amenity Impact – Photo 9

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
Medium (Local Road)	Negligible (No change in view)	Negligible (No change)

7.77 **Photo Viewpoint 10** is a mid-range View looking south east from Ham Lane East at the entrance into Lon-Od-Nant. The site is screened by residential properties and trees on Lon-Od-Nant. The development will not be visible from this photo viewpoint.

Figure 7-16:- Summary of Visual Amenity Impact – Photo 10

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
Medium (Local Road)	Negligible (No change in view)	Negligible (No change)

7.78 **Photo Viewpoint 11** is a mid-range View looking south from the public footpath linking Ham Lane East and Shakespeare Drive adjacent to Boverton Brook. The site is screened by the natural undulating topography of the area and trees and vegetation associated with Boverton Brook. The development will not be visible from this photo viewpoint.

Figure 7-17:- Summary of Visual Amenity Impact – Photo 11

Sensitivity / value of receptor	Magnitude of Effects	Level of Significance
Medium (Public Right of Way)	Negligible (No change in view)	Negligible (No change)

7.79 With the exception of Photo Viewpoints 3, the visual amenity appraisal has established that views of the site from surrounding areas accessible to the general public are screened by a combination of native field boundary hedgerows & hedgerow trees, the natural undulating topography of the area and the trees and vegetation associated with Boverton Brook.

7.80 As a consequence, the significance of the developments impact upon the majority of photo viewpoints is identified as Negligible.

Impact Upon Heritage Assets

- 7.81 As the impact upon the surrounding landscape as demonstrated by the visual amenity appraisal is localised, the development will not impact upon the settings of the heritage asset identified as 1 on TDA drawing no. TDA/2081/01 - Zone of Theoretical Visibility, Location of Photo Viewpoints & Heritage Assets (refer Appendix 4).
- 7.82 This asset, located 1.5 kilometres from the site, is visually separated from the proposed development area by a combination of a significant difference in topography combined with the natural cover of the landscape as described by the visual amenity appraisal.

Landscape Character Impacts – Construction and Operational Phases

- 7.83 As described in assessment of baseline conditions, the Visual & Sensory element of the LANDMAP assessment locates the site within the 'Heritage Coast Hinterland' aspect area and classifies the area as being of outstanding overall value.
- 7.84 As a consequence, and as the summary provided by LANDMAP is a broadly accurate description of the landscape at and surrounding Rosedew Farm, the sensitivity of the site's landscape character using the definitions included in Figure 7-4, including its immediate setting and surrounding landscape, is assessed as High.
- 7.85 With regards to the magnitude of landscape change, although the character of the site will change, albeit temporarily, the impact upon the surrounding landscape, as demonstrated by the visual amenity appraisal, is localised. Consequently using the descriptions included Figure 7-5 the magnitude of change should be considered as Low.
- 7.86 On this basis, using the definitions included in Table 6, the severity or significance of the developments effect upon the landscape character of the area is assessed at worst as Moderate or Minor. A description of these classifications can be seen at Figure 7-18 below

Figure 7-18:- Summary of Landscape Character Impacts

Sensitivity / value of landscape	Magnitude of Effects	Level of Significance
<p>High (A landscape of particularly distinctive sense of place and in good condition whose characteristics or components make a strong positive contribution to landscape character – Glamorgan heritage Coast)</p>	<p>Low (Temporary change to site but localised landscape impact only).</p>	<p>Moderate or Minor Adverse</p>

Mitigation Measures

- 7.87 Following close consultation with the client, detailed landscape proposals for the proposed new solar farm (Refer to drawing no. TDA.2081.02 – Detailed Landscape Mitigation Measures in Appendix 7) have been carefully considered to mitigate the developments visual and landscape character impacts upon its surroundings in general and in particular Photo Viewpoints 3. Proposals include:-
- Allowing existing hedgerows to grow to a height of 3-3.5m. Any gaps in the existing hedgerow are to be in-filled with a mixture of appropriate native species; and
 - Planting a new native field boundary hedgerow with species of local provenance to the southern boundary for screening and biodiversity.

Residual Impacts

- 7.88 Upon implementation of the landscape mitigation measures as described above, the development's visual and landscape character impacts will be reduced and will continue to be reduced as the mitigation proposals become more established.

Visual Amenity

Construction & Operational Phases

- 7.89 With regards to Photo Viewpoints 3, once the landscape mitigation measures are established (likely to be in the region of 2-3 years), due to the close proximity of the photo viewpoint to the site it is considered that the minor adverse impact the development is likely to have upon this view will be reduced to negligible.

Post-Operational

- 7.90 Upon decommissioning, the solar panels can be easily removed. Consequently, in landscape terms, any short to medium term adverse visual impacts caused by the development will no longer occur. Furthermore, through the retention of landscape mitigation measures (implemented to screen the solar farm), the medium to long-term impact of the development upon the visual amenity of the area should be considered as minor beneficial.

Landscape Character

Construction & Operational Phases

- 7.91 Whilst the impact the development will have upon the landscape character of the site will remain, albeit temporarily, the landscape mitigation measures will reduce the influence of the development upon its setting and the wider landscape. As a consequence its significance should be reduced from moderate or minor adverse to minor adverse or negligible.

Post Operational

- 7.92 In addition to this, once decommissioned and through the retention of landscape mitigation measures the medium to long-term impact of the development upon the landscape character of the area should be considered as minor beneficial.

Summary and Conclusions

- 7.93 A detailed LVIA assessment has been carried out of the likely landscape and visual effects of the proposed solar development on land at Rosedew Farm, Llantwit Major. This study has been carried out in accordance with nationally-agreed 'best practice' standards of landscape assessment. A detailed inspection has been made of the site, looking at its present condition and at the potential development impacts.
- 7.94 Landscape and visual impacts have been assessed, taking into account the construction stage, operational stage and post operation when mitigation becomes establishes. The evaluation does take account of the full range of mitigation measures which are proposed.
- 7.95 The overall conclusion is that this development proposal complies with the raft of applicable national, regional and local planning policies related to the landscape. The proposed solar development on land at Rosedew Farm, Llantwit Major would be acceptable in landscape and visual terms.
- 7.96 A summary table of significance is included on the following page under Figure 7-19

Figure 7-19:- summary table of significance

Potential Effect	Nature of Effect	Significance	Mitigation Measures	Residual Effect
Construction Phase (Short Term)				
Visual Impact	Temporary	Minor Adverse	Implementation of Landscape Mitigation	Minor Adverse
Landscape Character Impact	Temporary	Moderate or Minor Adverse	Implementation of Landscape Mitigation	Moderate or Minor Adverse
Operational Phase (Short-Medium Term)				
Visual Impact	Temporary	Minor Adverse	Establishment of Landscape Mitigation Measures	Negligible
Landscape Character Impact	Temporary	Moderate or Minor Adverse	Establishment of Landscape Mitigation Measures	Minor Adverse or Negligible
Post-Operational Phase (Long Term)				
Visual Impact	Permanent	Minor Beneficial	Retention of Landscape Mitigation Measures	Minor Beneficial
Landscape Character Impact	Permanent	Minor Beneficial	Retention of Landscape Mitigation Measures	Minor Beneficial

**PROPOSED SOLAR DEVELOPMENT
LAND AT ROSEDEW FARM,
LLANTWIT MAJOR**

ENVIRONMENTAL STATEMENT

**VOLUME 2
CHAPTER 8: ECOLOGY / BIODIVERSITY**

8. ECOLOGY / BIODIVERSITY

Introduction

- 8.1 This chapter of the Environmental Statement concerns the potential ecological effects of the proposed development. It includes a summary of the current conditions found within the surveyed area, a valuation of the ecological features and an indication of impacts/mitigation associated with the construction and operation of the proposed development.
- 8.2 The scope of the Ecological Impact Assessment (EclA) has been developed based on:-
- Consideration of any ecological resources, focussing on those for which there is legal or planning policy in favour of protection or enhancement;
 - Data on sites of national and county importance within 1-2km of the proposed development boundary.
 - Data on notable flora and fauna; for example, legally protected, nationally rare/scarce, county rare/scarce, Section 42 species, Local (Vale of Glamorgan) and UK Biodiversity Action Plan, and other species of conservation concern within 1-2km of the proposed development boundary;
 - Review of the proposed masterplan and its effect on ecological resources.
- 8.3 The site is located to the south east of Llantwit Major, and currently consists of intensively managed, improved fields surrounded by species-poor hedgerows.

Legislative and Planning Policy Context

- 8.4 The main legislative considerations are those contained within the Wildlife and Countryside Act 1981 (as amended), The Conservation of Habitats & Species Regulations 2010, the Countryside and Rights of Way Act 2000, and the Natural Environment and Rural Communities (NERC) Act 2006.
- 8.5 The Natural Environment and Rural Communities Act 2006 (NERC) places a duty on all public authorities, in exercising its functions, to have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity - including restoring or enhancing a population or habitat. The duty applies to all public authorities and aims to raise the profile and visibility of biodiversity, to clarify existing commitments with regard to biodiversity and make it a natural and integral part of policy and decision-making.
- 8.6 In terms of planning policy, a number of over-arching policies are of relevance, not least of which are those described within Planning Policy Wales (PPW¹), which sets out land use planning policies of the Welsh Assembly Government with Chapter 5 dealing with Conserving and Improving Natural Heritage and Coast. The advice contained within PPW is supplemented by Technical Advice Notes (TAN's), with TAN 5 addressing Nature Conservation (published in September 2009).

¹ Welsh Assembly Government, Planning Policy Wales, 7th Edition, July 2014.

Technical Advice Note 5

8.7 TAN 5 identifies a number key principles for the land use planning system:-

- work to achieve nature conservation objectives through a partnership between local planning authorities, Natural Resources Wales (NRW), the Environment Agency, voluntary organisations, developers, landowners and other key stakeholders (PPW Paragraph 5.1.5);
- integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time (PPW 5.1.3 and 5.1.4);
- ensure that the UK's international obligations for site, species and habitat protection are fully met in all planning decisions (PPW 5.3.8-10);
- look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally (PPW 5.1).

Vale of Glamorgan Adopted Unitary Development Plan (1996 – 2011)

8.8 The Vale of Glamorgan Unitary Development Plan (UDP) 1996-2011 was formally adopted in 2005. The UDP sets out the Council's vision and objectives for the development and use of land in the Vale, together with the policies and proposals to implement them. From an ecological perspective, a number of policies within the Local Development Plan are considered of relevance to the site and these are listed below:

Policy ENV 10 – Conservation of the Countryside.

“Measures to maintain and improve the countryside, its features and resources will be favoured, particularly in the Glamorgan Heritage Coast, areas of high quality landscape, and areas subject to development pressure and/or conflict such as the urban fringe.”

Policy ENV 11 – Protection of Landscape Features.

“Development will be permitted if it does not unacceptably affect features of importance to landscape or nature conservation including: trees, woodland, hedgerows, river corridors, ponds, stone walls and species-rich grasslands.”

Policy ENV 12 – Woodland Management.

“The improvement, management and extension of woodland tree cover and hedgerows, particularly of broadleaf native species, will be favoured, especially where it:

- (i) Makes a significant improvement to the landscape, such as on derelict land, the urban fringe, or in the vicinity of major road/rail corridors and quarries; or***
- (ii) It helps to diversity and extend wildlife habitats; or***
- (iii) It adds to recreational and educational opportunities.”***

Policy ENV 13 – International Areas of Nature Conservation Importance.

“International sites which are designated or potential RAMSAR sites, Special Protection Areas or Special Areas of Conservation will be protected. Development or land use changes likely to have an adverse effect on such sites will not be permitted unless there is no alternative and there are imperative reasons of overriding public interest. Where such sites host a priority habitat or species (as listed in the EC Habitats Directive) developments will not be permitted unless required for reasons of human health or safety. If in exceptional circumstances development is permitted, appropriate conditions or agreed planning obligations will be used to secure adequate compensation or mitigation measures.”

Policy ENV 14– National Sites of Nature Conservation Importance.

“Development likely to have an adverse effect, either directly or indirectly on the conservation value of a National Nature Reserve, or a Site of Special Scientific Interest will not be permitted unless it there is no alternative and it can be demonstrated that the benefits arising from the development clearly outweigh the benefits arising from the special interest of the site. If development is permitted, appropriate conditions or agreed planning obligations will be used to secure adequate compensation or mitigation measures.”

Policy ENV 15– Local Sites of Nature Conservation Significance.

“Development and land use change likely to have an unacceptable effect on a Local Nature Reserve, a Regionally Important Geological / Geomorphological Site, or a site shown to be of importance for nature conservation will not be permitted unless the reasons for the proposal clearly outweigh the local importance of the site. If development is permitted, appropriate planning conditions or agreed planning obligations will be used to ensure that the impact on nature conservation is minimised.”

Policy ENV 16– Protected Species.

“Permission will only be given for development that would cause harm to or threaten the continued viability of a protected species if it can be clearly demonstrated that:

- (i) There are exceptional circumstances that justify the proposals;***
- (ii) There is no satisfactory alternative; and***
- (iii) Effective mitigation measures are provided by the developer.”***

8.9 The policy framework summarised herein has provided the context for the development proposals and the assessment of its environmental effects.

Assessment Methodology

8.10 Where an ecological feature (i.e. a habitat or species) is likely to be subject to an impact, both the value of the feature/resource and the likelihood of a significant effect occurring are considered. Where a significant effect is identified, the effect on the particular feature is evaluated as adverse or beneficial at the relevant geographical scale (local, district etc.).

8.11 The potential impacts of the proposed development during construction and operation on identified ecological receptors comprise:-

- direct loss of habitats;
 - isolation and fragmentation of habitats;
 - changes in artificial light levels; and
 - increased disturbance from construction, traffic and people.
- 8.12 Potentially sensitive ecological receptors are identified through the collation of baseline data from surveys and existing records. Once the receptors are identified, information on their legal and policy, conservation and distribution status, plus any known trends (i.e. population or migratory) are considered to measure their value.
- 8.13 All ecological receptors are described (including conservation status, status on site, sensitivity, planning and legal protection etc.) and assigned a value. The scale of value for ecological resources used in the present assessment is as follows:-
- International;
 - UK;
 - National (Wales);
 - Regional (South Wales);
 - County (Vale of Glamorgan);
 - District (Llantwit Major);
 - Local (Boverton and environs); and
 - Within immediate zone of influence or within the development site boundary.
- 8.14 All resources valued at above a given threshold of value (in this case within the immediate zone of influence is the lowest level) are considered in terms of whether any effects are likely to be ecologically significant or not. Activities associated with development are likely to cause significant ecological effects; therefore, it is necessary to identify associated changes and their implications in terms of scale, magnitude, duration, reversibility and timing for valued ecological resources.
- 8.15 For the purposes of this assessment, an ecologically significant effect is defined as an effect (adverse or beneficial) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative effects (based on IEEM 2006 guidance²). In this context, integrity is defined as the:-
- “Coherence of a site’s ecological structure and function across its whole area that allows it to sustain the habitat, complex of habitats and/or levels of populations...”***
- 8.16 The ecological significance of an effect is considered descriptively in terms of its nature (for example, beneficial or adverse). The ecological value of the resource and the planning policy and legal context are described and used to determine the scale (see above) at which the effect is considered. Finally, the residual effect of the scheme including consideration of any additional mitigation measures is presented.
- 8.17 The term ‘ecologically significant’ should not be confused with any other definitions of the term significant used elsewhere in this ES and it is recognised that the assessment criteria may be subject to variation between topic chapters. The assessment within the Ecology and Nature Conservation chapter has been undertaken using best practice guidelines published

² IEEM (2006) Guidelines for Ecological Impact Assessment in the United Kingdom.

by the Institute of Ecology and Environmental Management (IEEM). This guidance has been developed by the National Working Group on Ecological Impact Assessment convened under the auspices of IEEM. These guidelines have been subject to extensive formal consultation with amongst others, Natural England (formerly English Nature), the Environment Agency, the Institute of Environmental Management and Assessment (IEMA) and the Countryside Council for Wales (Natural Resources Wales since April 2013). The final guidance was published in June 2006.

- 8.18 The IEEM guidelines (2006) for Ecological Impact Assessment (EclA) represent current best practice and their use as part of this Environmental Statement is considered appropriate. Terms used to assign value to a given ecological feature and to assess the impact of the proposed development within these guidelines may differ from those used within other chapters of this Environmental Statement.
- 8.19 The assessment of likely significant effects considers the overall effect of the development on the identified ecological receptors, assessing the adverse effects that arise from construction and operation of the scheme and any beneficial environmental effects of mitigation and habitat creation measures. In considering the likelihood of a significant ecological impact on each of the valued ecological receptors, consideration is given to factors such as whether the impact is likely to be positive or negative, magnitude (size) of the impact, extent, duration, timing and frequency and reversibility. Where an impact is identified, the likelihood of occurrence is also indicated based on a four-point scale:
- Certain/near-Certain: probability estimated at 95% chance or higher.
 - Probable: probability estimated above 50% but below 95%.
 - Unlikely: probability estimated above 5% but less than 50%.
 - Extremely Unlikely: probability estimated at less than 5%.

Consultation

- 8.20 Consultation with Vale of Glamorgan Council (VGC) identified the following information would be required to inform the impacts of the proposed development:
- Detailed and comprehensive assessment of European Protected Species likely to be affected by the proposal including any species that occupy adjoining land and which may use the site or hedgerows surrounding it.
 - An ecological assessment to determine the quality of the grassland, hedgerows, and other habitats that may be affected by the proposed development.
 - Any ecological assessment report must include habitat enhancements for biodiversity.
- 8.21 The screening opinion from VGC was received after the field survey had taken place, but this confirmed the preliminary recommendations contained within the survey report, that no further work in respect of protected or priority species was required.
- 8.22 In order to provide an ecological context for the site, ecological records were requested from the South East Wales Biodiversity Records Centre (SEWBReC). Records were requested in relation to sites designated for their nature conservation interest (both statutory and non-statutory), as well as records of protected or otherwise notable flora and fauna. Records were requested for an area extending up to 1km from the proposed development site.

- 8.23 Habitat and species action plans listed in the UK Biodiversity Action Plan (BAP) were also consulted with regards to species or habitats that are potentially present on the site or in the surrounding study area. Relevant local plans within the Vale of Glamorgan BAP were also consulted.
- 8.24 Other sources of information were also utilised as appropriate to identify protected or notable nature conservation sites in the wider area. In particular, the VGC ecologist was able to provide records of both breeding birds, and rare arable plants, from within the local area, which were not in the public domain.

Baseline Conditions

Ecological Appraisal

- 8.25 Field surveys of the proposed development site was undertaken on the 18th and 20th December 2014 by Mr Denis Jackson DipEnvSci MSc FSB MCIEEM an ecologist who has eleven years professional ecological experience and holds survey and/or disturbance licences for bats, Dormouse, Great Crested Newt, White-Clawed Crayfish, Barn Owl, Red Kite and Goshawk.
- 8.26 The survey methodology followed the standard JNCC guidelines (1990)³ as amended by the Institute of Environmental Assessment (1995)⁴ to include protected and/or notable species. Within the surveyed areas, habitats and other ecological features were described and mapped and target notes used to identify features of particular interest/note.
- 8.27 The survey incorporated a search for any evidence of, or potential for, protected species such as bats, Badger *Meles meles* and Dormouse *Muscardinus avellanarius*. Although not directly impacted by the development proposals, the survey also included all hedgerows present on the proposed development site, both to establish their ecological value, and to determine whether or not they qualified as 'important' under the Hedgerow Regulations (1997). Incidental recording of birds seen or heard on or flying over the site were also recorded.
- 8.28 All ponds and other water bodies identified from mapping and within 500m of the development site boundary were investigated to determine their potential to support Great Crested Newt, using the methodology given in Oldham *et al* (2010).

Ecological Receptors - Statutory or Non-Statutory Protected Sites

- 8.29 The site does not contain any national or internationally designated statutory nature conservation designations such as Sites of Special Scientific Interest (SSSI), and there are none within 2km of the approximate site centroid,
- 8.30 There are three Sites of Importance for Nature Conservation (SINCs) which have some parts within 2km of the site.

³ Joint Nature Conservation Committee (JNCC) (1990) Handbook for Phase 1 Habitat Survey. A technique for environmental audit. JNCC, Peterborough.

⁴ Institute for Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment. E & FN Spon, Hong Kong.

- 8.31 Cwm Colhuw SINC is approximately 790m west of the site boundary. This site is a mosaic of semi-improved neutral and calcareous grassland with dense scrub and scrub woodland along Iron Age earthworks, supporting Section 42 bird species including Yellowhammer.
- 8.32 West of Cwm Colhuw SINC is very close to, and shares reasons for designation with Cwm Colhuw. Its closest point is approximately 910m from the site. For the purposes of this assessment, this site can be considered identical to Cwm Colhuw.
- 8.33 Summer House Bay West SINC is approximately 1,750m from the site boundary. It comprises a small area of semi-natural broad-leaved woodland and scrub on and around the remains of a hill fort.

Ecological Receptors - Habitats

- 8.34 The habitats on site consist of two recently planted Ryegrass leys, and a number of species-poor hedgerows.

Improved Grassland

- 8.35 This recently sown Ryegrass *Lolium perenne* ley comprised the majority of the habitats present on site and was found to support only a limited range of species. This crop had been recently sown, as part of a rotation following on from Oilseed Rape *Brassica napus*. Numerous rape stalks, and an occasional rape seedling could be seen within the grass crop. A number of plants typical of arable fields were noted, including Plantains *Plantago spp.*, Creeping Buttercup *Ranunculus repens*, Common Sorrel *Rumex acetosa*, Common Chickweed *Stellaria media* and Speedwells *Veronica spp.* There was a little more diversity at field margins, but these were all less than 3m wide and all appeared to have been subject to herbicidal spray-drift which limited botanical diversity.
- 8.36 Due to its low floristic diversity and uniformity this habitat is considered to have ecological value only within the site boundary.

Hedgerows

- 8.37 The fields on site were surrounded by a network of hedgerows. These had only limited species diversity including Hazel *Corylus avellana*, Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa*, Wych Elm *Ulmus glabra*, and Holly *Ilex aquifolium* with only very occasional mature Oak trees *Quercus petraea* and Ash *Fraxinus excelsior*. Some of the hedgerows were growing atop a low earth bank. Some hedgerows appeared to have suffered from the effects of spray drift, and most did not appear to have been managed for some time.
- 8.38 The distribution of these hedgerows at the site and the numbering system used throughout this ecology chapter is illustrated in the Preliminary Ecological Appraisal which is included at Appendix 8.
- 8.39 **H1** and its associated hedge-bank were mostly Hawthorn and Blackthorn with some other species including Holly, Spindle, Dogwood and Wych Elm. This hedge did not appear to have been recently managed.
- 8.40 **H2** did not have a hedge-bank beneath. This hedge, which forms the northern site boundary, was un-managed, and contained a number of mature trees including Ash and Holme Oak.

These trees were outwith the site boundary fence.

- 8.41 **H3** was un-managed and comprised mostly of Hawthorn with other occasional woody species. Grasses and other vegetation on the hedge-bank here appeared to have been recently cut back to prevent encroachment onto the trackway along its western side.
- 8.42 **H4 & H5** were mostly of Hawthorn, with no hedge-bank. This hedge appeared to have been recently flailed. There were two mature trees outwith the site boundary fence.
- 8.43 None of the hedgerows would be considered as 'Important' under the Hedgerows Regulations 1997 and none contained botanical species listed on Schedule 2 of those regulations.
- 8.44 Hedgerows are an important habitat resource for a wide range of species and provide valuable habitat connectivity at a landscape scale. Ancient and/ or Species-Rich Hedgerow habitat is also a UK BAP and Vale of Glamorgan Local Biodiversity Action Plan (LBAP) habitat but none of the hedgerows present on this site met the required criteria, and consequently all the hedgerows on site are considered to be of Local ecological value.

Waterbodies and flowing water.

- 8.45 There were no water features of any kind present within the site boundary, nor any immediately adjacent to it. Approximately 100m north of the northern site boundary is a small area of deciduous woodland, with a small stream, known as Hoddnant, running through it, in a steep gully. This fast-flowing stream flows westward through a park home site. Two water bodies were shown on Ordnance Survey mapping along the course of this stream, but these were found to be widenings of the stream in the area of an abandoned mill and subject to fast water flows.
- 8.46 Another water body was shown on mapping at NGR SS 9742 6792, approximately 270m north of the site boundary. This small, ornamental pond was approximately 70m² and surrounded by concrete surfaces. There was very little aquatic vegetation present and a number of very large (50cm +) Koi Carp were observed. A Habitat Suitability (HSI) Index was undertaken to determine the potential for this pond to support Great Crested Newt. The HSI concluded that the pond was considered to be poor in its potential to support this species.

Invasive Species

- 8.47 No invasive species, defined as being listed under Schedule 9, Section 14 of the Wildlife and Countryside Act 1981 (as amended) were found on site, and no mitigation or specific measures to control or eradicate invasive species will be required.

Ecological Receptors - Fauna

Bats

- 8.48 Desk study information received from the South East Wales Biodiversity Records Centre identified two bat species, both probably *Pipistrellus* species within 1km of the site, and a further three bat species (two *Pipistrellus*, one *Plecotus*) between 1km and 2km distant.
- 8.49 There are no buildings or other human structures on site.

- 8.50 There are no trees on any part of the site directly affected by the proposed development.
- 8.51 There are no features on site suitable for use by roosting bats. There are three trees in hedges H2 and H4 (TN3 and TN4) which were categorised as Category 2 (low roost potential) trees according to the methodology given in Hundt (2012). It should be noted that these trees are outwith the site boundary fence in both cases.
- 8.52 The Vale of Glamorgan LBAP⁵ contains a Species Action Plan for all species of bat and all bat species in the UK are afforded full statutory protection under both domestic and European legislation.
- 8.53 The site provides some potential commuting resource for bats, but the habitats on site are considered to be of only low value as a foraging resource for bat species. Historical records suggest that there is only very limited bat activity nearby although this could be a consequence of observer effort, rather than a true representation of bats present or otherwise. The hedgerows currently provide only limited ecological connectivity. The value of the bat resource is therefore considered to be only important at a local level.

Birds

- 8.54 Desk study information received from the South East Wales Biodiversity Records Centre detailed records of 13 species of bird within 1km of the site with including Eurasian Tree Sparrow *Passer montanus*, (but these records are more than 30 years old) Grey Partridge *Perdix perdix*, European Golden Plover *Pluvialis apricaria*, Black-Headed Gull *Chroicocephalus ridibundus*, Common Kestrel *Falco tinnunculus*, Common Bullfinch *Pyrrhula pyrrhula*, Song Thrush *Turdus philomelos*, Sky Lark *Alauda arvensis*, Yellow Wagtail *Motacilla flava*, Black Redstart, *Phoenicurus ochruros*, Osprey, *Pandion haliaetus*, Marsh Tit *Poecile palustris*, and Barn Owl *Tyto alba*.
- 8.55 Although no targeted bird surveys were undertaken at the site (based on consideration of the limited habitat types – i.e. improved grassland and hedgerows, together with intensive agricultural management regimes) a number of bird species were noted on or flying over the site and the surrounding area during the site surveys. These included Herring Gull, *Larus argentatus*, Common Buzzard *Buteo buteo*, House Sparrow *Passer domesticus*, Chaffinch *Fringilla coelebs*, Blackbird *Turdus merula*, Carrion Crow *Corvus corone* and Robin *Erithacus rubecula* (for full list see Appendix 8).
- 8.56 Although none of the bird species noted would be considered particularly rare, Herring Gull, House Sparrow and Starling is included on the Red List of species of Conservation Concern in the UK⁶ with Herring Gull and Starling appearing on the Red List and House Sparrow appearing on the Amber List in Wales⁷.
- 8.57 Based on the species recorded, the available habitats, and the recent and historical agricultural management regime for the site, it is considered that, although the crop area (currently, a grass ley) could have some limited value as a foraging resource, only the hedgerows are likely

⁵ Vale of Glamorgan Local Biodiversity Action Plan. Accessed via https://www.valeofglamorgan.gov.uk/files/Living/Environment/Biodiversity/Local_Biodiversity_Action_Plan.pdf

⁶ Eaton, M. A. Brown, A. F. Noble, D.G. Musgrove, A. J. Hearn, R. Aebischer, N. J. Gibbons, D.W. Evans, A. & Gregory, R.D. (2009) Birds of Conservation Concern 3: The Population Status of Birds in the United Kingdom, Channel Islands and Isle of Man British Birds 102: 296-341

⁷ Johnstone IG, Thorpe RI, Taylor R & Lamacraft D (2012) The state of birds in Wales 2012. RSPB Cymru, Cardiff.

to have significant value to birds attempting to breed. The value of the bird resource is therefore considered to be important only within the local area.

Badger

- 8.58 The nearest historical record identified was more than 1.6km distant. No Badger setts or other evidence (e.g. paths, foraging signs, latrine pits, hairs, etc.) were found on site during the survey and no features were present which were considered likely to support them although it remains possible that individuals could occasionally forage over the site. The value of the Badger resource is therefore considered to be important only within the local area.

Dormouse

- 8.59 The historical data received from South East Wales Biodiversity Records Centre did not identify any records of Dormice within 2km of the site. There is a known population of Dormouse approximately 1.2km to the north east in the St Athan / Llantwit Major area with a confirmed Dormouse nest (and thus likely breeding) found at the entrance to West Gate, MOD St Athan in approximately 2009 (Erica Dixon *pers. comm.*)
- 8.60 No Dormouse survey was carried out as part of this assessment on the basis that no hedgerows are to be directly impacted by the development proposals. The hedgerows do have some potential to support Dormice but the hedgerows are not species rich, some are very gappy, and some offer only limited connectivity with the wider environment. The Dormouse resource on site is therefore considered to be of local ecological value.

Hedgehog

- 8.61 The desk study identified five records of this species, the nearest being more than 1200m distant. No signs to suggest that this species might be using the site were found, although this may be a function of the time of year during which the field survey was undertaken. It is possible that individuals could be present, but if so, this is only likely to be within the hedgerows and, given that the site has been regularly sprayed with insecticide, it is unlikely that sufficient invertebrate prey species would be present to sustain a viable population. The value of the Hedgehog resource on site is therefore considered to be negligible and therefore Hedgehogs will not be considered further in this assessment

Great Crested Newt

- 8.62 There are no water bodies of any kind on site, and none within 500m of the site boundary have more than negligible potential to support this species. The habitats on site, with an absence of scrub and similar features, together with the intensive agricultural management regime in place in recent years significantly reduces the probability of this species being present on site due to a lack of suitable resting places, and limited availability of invertebrate prey. The Great Crested Newt resource on this site is therefore considered to be of negligible ecological value and will not be considered further in this assessment.

Reptiles

- 8.63 The desk study did not identify any historic records of reptiles on the site. There were records of Grass Snake approximately 430m distant and a Slow Worm 1.6km distant. Only the hedges and their associated banks are considered to offer any potential reptile habitat and any

individuals present are unlikely to forage beyond these where they would be very exposed to avian and other predators as they crossed field margins. The reptile resource on this site is therefore considered to be of negligible ecological value, and therefore this species will not be considered further in this assessment

Invertebrates

- 8.64 There were no invertebrate records from the site, and no records of rare, and/or protected invertebrate species nearby. The hedges and associated hedge-banks do have some potential to support a range of invertebrate species, but this is likely to be limited due to the limited range of botanical species present, and the likelihood of insecticidal spray drift from agricultural operations. Because of this, it is considered unlikely that any significant invertebrate populations could be present and the invertebrate resource on site is therefore considered to be of negligible ecological value and will not be considered further in this report.

Summary of Valued Ecological Features (Baseline)

- 8.65 A summary of the ecological features described as part of the baseline and their value at a geographical scale are summarised in Figure 8-1. Only those features identified at a value of 'within the site boundary' or above have been included and are considered further in this assessment.

Figure 8-1: Summary of Valued Ecological Features (Baseline)

Resource/Feature	Value at geographical scale
Designated sites	
Cwm Colhuw SINC	County
West of Cwm Colhuw SINC	County
Summer House Bay West SINC	County
Habitats	
Improved grassland	Within application boundary
Species-poor Hedgerows	Local
Species	
Bats	Local
Birds	Local
Badger	Local
Dormouse	Local

Assessment of Potential Impacts

- 8.66 The following section considers the overall effect of the development on the ecological receptors, assessing the adverse effects that arise from construction and operation of the scheme and any beneficial environmental effects of mitigation and habitat creation measures.

- 8.67 For the purposes of this assessment, an ecologically significant effect is defined as an effect (adverse or beneficial) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative effects (based on IEEM 2006 guidance⁸). In this context, integrity is defined as the:-
- “Coherence of a site’s ecological structure and function across its whole area that allows it to sustain the habitat, complex of habitats and/or levels of populations...”***
- 8.68 The ecological significance of an effect is considered descriptively in terms of its nature (for example, beneficial or adverse). The term ecologically significant should not be confused with any other definitions of the term significant used elsewhere in this ES and it is recognised that the assessment criteria may be subject to variation between topic chapters. The assessment within the Ecology and Nature Conservation chapter has been undertaken using best practice guidelines published by the Institute of Ecology and Environmental Management (IEEM).
- 8.69 The IEEM guidelines (2006) for Ecological Impact Assessment (EclA) represent current best practice and their use as part of this Environmental Statement is considered appropriate. Terms used to assign value to a given ecological feature and to assess the impact of the proposed development within these guidelines may differ from those used within other chapters of this Environmental Statement.
- 8.70 The assessment of likely significant effects considers the overall effect of the development on the identified ecological receptors, assessing the adverse effects that arise from construction and operation of the scheme and any beneficial environmental effects of mitigation and habitat creation measures. In considering the likelihood of a significant ecological impact on each of the valued ecological receptors, consideration is given to factors such as whether the impact is likely to be positive or negative, magnitude (size) of the impact, extent, duration, timing and frequency and reversibility. Where an impact is identified, the likelihood of occurrence is also indicated based on a four-point scale:
- Certain/near-Certain: probability estimated at 95% chance or higher.
 - Probable: probability estimated above 50% but below 95%.
 - Unlikely: probability estimated above 5% but less than 50%.
 - Extremely Unlikely: probability estimated at less than 5%.
- 8.71 Only the ecological features that are considered to be of value at or above ‘*within the application boundary*’ have been included in the ecological impact assessment. Features below this valuation are considered of negligible ecological value and as such have not been considered as part of this assessment. The predicted impact for each ecological feature has been assessed on the basis of the worst-case scenario. Although not all impacts are identified as being ecologically significant (that is the integrity of the feature may not be affected) there is still the possibility for beneficial or adverse effects on certain resources of value at a given geographical scale. In the case of any adverse effects, appropriate mitigation measures are considered.
- 8.72 For the purposes of this assessment ecologically significant effects are separated into short-term activities such as site clearance and construction and long term effects associated with an occupied residential development based on the proposed masterplan. The assessment of impacts presented in these sections is in the absence of any mitigation measures, which are summarised in the Mitigation Measures section which follows thereafter.

⁸ IEEM (2006) Guidelines for Ecological Impact Assessment in the United Kingdom.

Construction Stage

8.73 The following measures are considered as integral to this stage of the scheme and the assessment of impacts is based on the assumption that they would be implemented.

- Site preparation;
- Set up of contractors compounds and site security fencing;
- Change in disturbance levels from increased presence of people and vehicles;
- Installation of PV panels;
- Changes in artificial lighting; and,
- Excavation of ground for building foundations and installation of infrastructure to support the PV panels

Designated Sites

Cwm Colhuw SINC

8.74 The Cwm Colhuw SINC is located approximately 790m to the west of the site and there is no ecological connectivity via watercourses and only limited ecological connectivity via hedgerows. Based on this physical separation it is certain there would be no direct impact (i.e. habitat loss) on the designated site as a result of development. The methods of construction used to install PV panels and their associated support infrastructure generate little dust, noise or other airborne pollutants. This, together with the physical separation and the prevailing (south westerly) wind result in it being certain that there would be no significant effect on this receptor.

West of Cwm Colhuw SINC

8.75 West of Cwm Colhuw SINC is approximately 910m west of the site and there is no ecological connectivity via watercourses and only limited ecological connectivity via hedgerows. Based on this physical separation it is certain there would be no direct impact (i.e. habitat loss) on the designated site as a result of development. The methods of construction used to install PV panels and their associated support infrastructure generate little dust, noise or other airborne pollutants. This, together with the physical separation and the prevailing (south westerly) wind result in it being certain that there would be no significant effect on this receptor.

Summer House Bay West SINC

8.76 Summer House Bay West SINC is approximately 1,750m east of the site boundary and there is no ecological connectivity via watercourses and only limited ecological connectivity via hedgerows. Based on this physical separation it is certain there would be no direct impact (i.e. habitat loss) on the designated site as a result of development. The methods of construction used to install PV panels and their associated support infrastructure generate little dust, noise or other airborne pollutants. This, together with physical separation ensures there will be no significant effect on this receptor.

Habitats

Improved Grassland

8.77 The improved grassland fields were considered to have ecological value only within the site boundary, and therefore represent the most suitable areas of the site for development. This is reflected in the proposed masterplan. Activities associated with construction and site

preparation works for the installation of the photovoltaic panels would result in a certain significant adverse impact from the loss and shading of this grassland habitat.

Hedgerow

- 8.78 The masterplan will retain all the existing hedgerow resource across the site, with no sections being removed or otherwise modified, or deliberately disturbed. There is some potential (extremely unlikely) for a significant adverse impact to arise as a result of accidental damage to hedgerows by plant and machinery during construction works

Fauna

Bats – Roosting

- 8.79 There are no buildings or other features (including trees) within the site boundary with potential to support roosting bats. There are three mature hedgerow trees with some potential to support roosting bats although these are outside the site boundary fence. All trees identified as having potential to support roosting bats are to be retained as part of the proposed works and on this basis it is certain that no significant adverse impact would arise from roost damage, although a localised adverse impact (via inappropriate lighting) is probable in the absence of mitigation.

Bats – Foraging and commuting

- 8.80 The arable habitats present over the majority of the site are considered to be of negligible value to foraging bat species. No bat activity survey was carried out during the course of this assessment but it is considered possible that bats may use the hedgerows for foraging and commuting purposes. The hedgerows are all being retained without modification and therefore will not directly be impacted by the development. On this basis, a significant adverse impact would be extremely unlikely, although a localised adverse impact (e.g. via inappropriate lighting) is probable in the absence of mitigation.

Birds

- 8.81 During site clearance areas some potential areas of low quality ground-nesting habitat will be lost. Depending on the time of year that works are undertaken, birds, their nests, eggs and/or dependent young could be killed, injured or damaged. Although the hedgerows are not subject to development proposals, any ground clearance or other works undertaken during the bird breeding season could result in the disturbance of any avian species attempting to nest within the hedgerows although such disturbance is unlikely to be any greater than that from routine agricultural operations on the site. There is considered therefore to be an unlikely significant adverse impact within the immediate zone of influence in the short term due to the combination of habitat loss and increased disturbance (lighting) during construction / site preparation.

Badger

- 8.82 Although there are no setts present on the site, and the site offers little foraging potential, it is possible that Badgers do forage or traverse across it occasionally whilst moving between higher quality sites in the local area. During the construction phase of the development, there is potential for an unlikely significant adverse effect as a result of any badgers entering the site being killed or injured as a result of falling into open trenches, or consuming hazardous materials

Dormouse

- 8.83 Current development proposals do not require any interference, modification or removal of any hedges on site. Because of this, it is considered extremely unlikely that Dormice will be

adversely affected by the development proposals although there remains the potential for an extremely unlikely adverse impact on this species should any hedgerows be accidentally damaged during the course of works.

Operational Impacts

8.84 The operational stage assumes that all photovoltaic panels are installed and any associated buildings are constructed and functional. As with the consideration of construction impacts, the assessment in this section does not include for mitigation measures – these are described in the Mitigation Measures sub-section which follows. The operational stage will take into consideration the following likely impacts:-

- Loss of potential habitats beneath the PV panels;
- Loss of access to habitats on site as a result of fencing; and
- Increased disturbance from artificial lighting.

Designated Sites

8.85 The photovoltaic panels which will be installed as a result of this development do not emit noise or any other pollutants during operation and require little maintenance. Consequently, there will be no additional traffic or human activity on the site compared to the current situation with regular agricultural activities being undertaken. The site has considerable physical separation from all nearby protected sites and it is therefore considered certain that there will be no adverse significant impact on any site as a result of the development proposals.

Habitats

Improved grassland

8.86 It is not considered that there will be any significant effect as a result of the ground beneath being shaded out by the PV panels above. However, there is potential for a significant beneficial impact with the introduction of appropriate post-development management.

Hedgerows

8.87 As previously noted, all hedgerows are being retained as-is. There is potential (probable), for a significant adverse effect to arise from inappropriate or absent hedgerow management during the operational phase of the development which could include damage from grazing animals where they are able to come into contact with hedgerows. There is potential to achieve a significant beneficial impact by planting up existing hedges, establishing effective management regimes, and planting a new hedge at the southern part of the site.

Fauna

Bats

8.88 The habitats directly consumed by the development are of only negligible value to bats, and therefore the loss of these habitats is not considered to be significant. Inappropriate site lighting, which permits light-spill onto hedgerows, would result in a probable significant adverse effect. Habitat management regimes which improve both hedgerow quality, and connectivity, together with management of the grassland beneath the PV panels to increase invertebrate abundance would result in a probable significant beneficial effect.

Birds

- 8.89 Although some low quality ground-nesting and foraging habitat will be denied to birds as a result of the PV panels covering the ground, this is not considered to be significant. There is potential for habitat improvements and appropriate management prescriptions to result in a probable significant beneficial effect on breeding birds during the operational phase of the development.

Badger

- 8.90 Although there are no setts present on the site, and the site offers little foraging potential, it is possible that Badgers do forage or traverse across it occasionally whilst moving between higher quality sites in the local area. Without appropriate mitigation, security fencing installed to protect the PV panels from human interference, and damage by deer, would prevent Badgers from accessing the site, resulting in a possible significant adverse effect.

Dormouse

- 8.91 The habitats directly consumed by the development are of no value to Dormice and therefore the loss of these habitats is not considered to be significant. There is some potential for grazing animals to damage hedgerows resulting in an unlikely significant adverse effect. Habitat management regimes which improve both hedgerow quality, and connectivity, would result in a probable significant beneficial effect.

Mitigation Measures

- 8.92 In identifying the type and extent of mitigation through the groundwork, construction and operation stages, consideration has been given to the scale of the works within the application boundary in line with the proposed site layout.

- 8.93 The mitigation strategy that will be adopted and the measures incorporated into the scheme include the following key features:-

- A project ecologist appointed and on-call for the duration of the construction phase of the project;
- Contractor and/or staff briefings to advise on the ecological issues present on site;
- Improvements to and management of the grassland habit beneath the PV panels to increase botanical and invertebrate diversity;
- Protection of all hedgerows during construction by appropriate fencing;
- Retention and management of all hedgerows as appropriate, including trimming, hedge laying, coppicing and supplementary planting to improve structural integrity and species diversity. This management would be delivered by an appropriate landscape contractor under an agreed EMP;
- The planting of a new hedgerow with associated hedge-bank to improve ecological connectivity;
- Clearance of vegetation within the application boundary to be undertaken outside the bird breeding season (March-August inclusive) or, if this is not possible, under direct ecological supervision;
- Use of buffer strips to protect existing hedgerows;
- Inclusion within security fencing of access points for mammals such as Badger;
- Working to ensure that no hazards for Badgers are left exposed on site overnight;
- Design of site lighting to limit light spill onto retained hedgerow habitats;

- 8.94 To ensure the delivery of appropriate mitigation measures during the construction phase an Environmental Management Plan (EMP) will be prepared by the appointed contractor. The EMP would be agreed with Vale of Glamorgan Council prior to the commencement of construction works.
- 8.94 The impact assessment presented earlier assumed that no mitigation would be applied. The following sections address each of the valued ecological receptors and describe the measures to be adopted through site clearance, construction and operation to minimise as far as practicable the effects of the scheme.
- 8.95 The mitigation measures described within this section have been devised to retain elements of the key biodiversity resources identified at the site and to contribute to the maintenance of biodiversity locally. Delivery of the mitigation measures described in subsequent sections would be incorporated into an Environmental Management Plan (EMP) for the site, the detail of which could be controlled via suitably worded planning conditions.

Designated Sites

- 8.96 There will be no significant effects on any designated sites and therefore no mitigation is required.

Habitats

Intensive Grassland

- 8.97 It is certain that some grassland will be lost or damaged during construction and that most of what remains will be shaded by PV panels and, although this habitat is considered to be of only low ecological value, there is considered to be a certain long-term adverse effect.
- 8.98 Retained grassland both between and beneath PV panels, at site boundaries, and along all access routes, will be subject to a conservation management regime for the lifetime of the scheme to increase botanical diversity, and to provide habitat enhancement for breeding birds and other species
- 8.99 Grassland throughout the area of the development will be allowed to grow tall throughout the summer period, followed by low-density sheep grazing from late September until the end of February the following year. Grassland may also be mown, if required, but not before September 15th at the earliest, and aftermath grazing will still be implemented.
- 8.100 Before construction work begins, an Environmental Management Plan (EMP) will be submitted to Vale of Glamorgan Council for approval. This plan will contain fully detailed management and monitoring prescriptions for the lifetime of the development.
- 8.101 On the basis of the mitigation proposed there, the impact on the grassland habitat is not considered to be significant, with a probable neutral impact in the short term (1-3 years) and a probable significant beneficial long-term impact following that.

Hedgerows

- 8.102 Although not directly impacted by the development, accidental damage to hedgerows during construction is considered to have potential to result in an extremely unlikely adverse effect. To avoid this, before development commences, a sheep-proof fence will be erected on the

development-side of all existing and new hedges where a suitable pre-existing fence does not exist. The detailed location and spacing from the existing hedges will be agreed in advance with the Project Ecologist. This fencing will deter machinery operators from damaging the hedge, and serve to prevent damage by grazing animals post-development

- 8.103 To improve ecological connectivity, and to provide additional habitat for Dormouse and nesting birds, a hedge, with hedge-bank, will be planted at the southern site boundary connecting H1 and H5 (Appendix 8). There is a boundary shown at this approximate location on the 1877 – 1878 Ordnance Survey 1:2,500 map series. Planting will comprise a mix of native species of local provenance such as Blackthorn, Dog Rose, Elder, Guelder Rose, Hawthorn, Hazel, Holly, Wild Privet and Wych Elm. Under-planting with species such as Ivy and Honeysuckle will serve to further improve the ecological value of any hedgerow thus created. Hedgerow trees will also be incorporated. Gaps in existing hedgerows will be planted up with native hedge and tree species.
- 8.104 In addition to the habitat prescriptions detailed above, all hedgerows across the site will be subject to an appropriate management regime to improve their structural integrity and ecological value.
- 8.105 On this basis, the long term impact on hedgerows across the site is unlikely to be significant, with a neutral impact probable in the short – medium term (1-5 years), and a probable significant beneficial impact in the long term, due to the improvement of existing hedgerows, planting of a new hedgerow and the adoption of management to maintain existing hedgerows and new planting at the site.

Fauna

Bats – Roosting

- 8.106 The key ecological features on the site for bats are the hedgerows and three mature trees within the hedgerows, which have some low potential to support roosting bats. All of these features are being retained. The significant issue potentially affecting roosting bats is site lighting, which can have disruptive implications on the roosting, foraging and commuting behaviour of bat species sensitive to artificial light.
- 8.107 This issue will be mitigated during the construction phase by ensuring that no construction works will take place on site more than 30 minutes after sunset or before sunrise, to minimise the impact of lighting on construction vehicles on any bats using the site.
- 8.108 This issue will be mitigated during the operational phase by maintaining ‘dark corridors’ along hedgerows and ensuring that all security lighting is installed such that light-spill onto hedgerows is minimised, and by using passive infra-red triggers, which operates lighting for a maximum of two minutes, and only in the area where the triggering event occurred.
- 8.109 On this basis, the impact of construction or operational phase site lighting is extremely unlikely to have a significant adverse impact on bats. Lighting can be attractive to night-flying insects and could offer a useful additional foraging resource to the more common bat species known in the area (Pipistrelle); however this would not be considered an ecologically significant beneficial effect.

Bats – Foraging / Commuting

- 8.110 The potential impacts on, and mitigation in respect of foraging / commuting bats at this site are identical to those given above for roosting bats. The planned improvements to the existing hedgerows, together with new hedgerow planting and on-going management prescriptions will probably result in a significant beneficial effect in the medium – long term.
- 8.111 With the inclusion of all these measures, the overall development is considered extremely unlikely to result in a significant adverse impact on bats. An adverse significant impact is extremely unlikely in the short term and only within the immediate zone of influence,. There will be a probable significant beneficial effect in the long term as new planting matures and hedgerow management prescriptions increase the height and width of the existing hedges present.

Birds

- 8.112 In order to minimise impacts as far as practicable and comply with relevant legislation, ground works which could result in the killing or injuring of, or disturbance to, nesting birds will take place outwith the bird breeding season, which typically runs from March to August inclusive. If this is not possible, such works will only be undertaken immediately following inspection by an ecologist to ensure that no nesting birds are present. Where nesting birds are found, no works will be permitted within 20m of an active nest.
- 8.113 Retention of and enhancement to existing hedgerow habitats, together with the planting of a new hedgerow, as described for bats, would retain nesting/foraging habitat within the immediate zone of influence and is likely (probable) to result in an overall beneficial effect for nesting birds.
- 8.114 With the inclusion of these measures, the overall development is considered extremely unlikely to result in a significant adverse impact on nesting birds, due to the timings of works, pre-works checks where required, and retention of habitat.

Badger

- 8.115 Although there was no evidence of Badger using the site for any purpose, a precautionary method of working is required to avoid inadvertently committing any offence and mitigation is required to avoid any loss of potential foraging habitat.
- 8.116 To allow Badgers continued access to the site, security fencing, where required, will be installed with gaps every 30m at the base with minimum dimensions of 20cm x 20cm to allow Badgers and other similar sized wild mammals to pass freely.
- 8.117 To improve the quality of potential foraging habitat present, the recommendations contained elsewhere in this statement in respect of habitat improvements will be implemented in full.
- 8.118 To avoid unintentionally killing or injuring Badgers during the course of works, all materials that could cause a hazard to Badgers, such as fuels, oils and other chemicals will be stored in a manner that prevents Badgers accessing them. In addition, all pits, trenches and other sub-surface workings that could entrap Badgers, will be either covered at night to prevent access, or provided with a means of escape, such as a suitably propped and secured plank, at a shallow angle to the surface
- 8.119 With the inclusion of these measures, the overall development is considered extremely unlikely to result in a significant adverse impact on Badgers and, once the habitats on site have

had time to mature, it is considered likely that an overall significant improvement in availability of foraging habitat will be achieved.

Dormouse

- 8.120 The majority of the habitats present have no potential to support Dormouse, but there is some potential for them to use the hedgerows. No hedgerow will be directly impacted by the development proposals, but there remains the potential for accidental damage to the hedgerows to occur through contact with plant and machinery. To reduce this risk, the hedgerows will be fenced prior to commencing construction to reduce the risk of accidental damage.
- 8.121 In addition, the EMP will contain detailed management prescriptions which will include planting up gaps in hedgerows, managing them to improve their likely value to Dormice, and planting a new hedgerow, with hedge-bank, to improve ecological connectivity within the site boundary, and to the wider environment. It is probable that these measures will result in the long-term significant improvement to Dormouse habitats on site.

Residual Impacts

- 8.122 Following consideration of the potential impacts of the development on valued ecological resources during construction and operation, and the implementation of mitigation measures described in the previous section, the residual impact of the scheme is summarised in Figure 8-2.
- 8.123 The table indicates that no long-term significant adverse impacts would be associated with the proposed development, although short-term adverse impacts may occur due to the loss of grassland habitats and there is some potential for accidental damage to hedgerows. There is further potential for these already poor quality habitats to deteriorate further without appropriate management prescriptions.
- 8.124 There are also construction and operational impacts associated with bats, birds, Badger and Dormouse. With mitigation, these impacts are all considered to be extremely unlikely and, in the medium to long term, the habitat enhancement and management prescriptions proposed will result in probable significant beneficial effects for both the habitats present and the fauna with potential to use the site.
- 8.125 None of the features present on site, or within the zone of influence, were assigned a value higher than 'County' (the three nearby SINC sites) and with all others considered of value at a 'Local' or 'Within the Application Boundary' scale.
- 8.126 There are no international or nationally protected sites within 10km of the proposed development and as a consequence, it is certain that no such sites will be adversely impacted by the proposed development.
- 8.127 As previously identified, due to the physical separation between the application site and the three nearby SINC sites, together with the inherently low ecological impact of photovoltaic panels, both during installation, and operation, these sites are considered not to be within the development's zone of influence.

Figure 8-2: Summary of residual effects of the proposal together with mitigation measures

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
<u>Cwm Colhuw SINC</u> Construction Impacts	No impact certain	Not significant	Not required	Not applicable	No significant impacts certain
<u>Cwm Colhuw SINC</u> Operational Impacts	No impact certain	Not significant	Not required	Not applicable	
<u>West of Cwm Colhuw SINC</u> Construction Impacts	No impact certain	Not significant	Not required	Not applicable	No significant impacts certain
<u>West of Cwm Colhuw SINC</u> Operation Impacts	No impact certain	Not significant	Not required		
Summer House Bay West SINC Construction Impacts	No impact certain	Not significant	Not required	Not applicable	No significant impacts certain
Summer House Bay West SINC Operational Impacts	No impact certain	Not significant	Not required	Not applicable	

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Improved Grassland Construction impacts	Loss and shading	Certain significant adverse impact	Retained grassland will be subject to management to enhance its ecological value with the details contained within an approved EMP.	Negligible	The grassland management proposals are likely (probable) to result in a significant beneficial impact.
Improved Grassland Operational impacts	Shading of grassland beneath PV panels	Not significant. Certain long-term adverse impact.	Retained grassland will be subject to management to enhance its ecological value with the details contained within an approved EMP.	Negligible	

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Hedgerow Construction Impacts	No hedgerow directly impacted by the development. Risk of accidental damage by plant.	Significant adverse impact extremely unlikely.	Pre-construction fencing to reduce risk of accidental damage. Planting of new hedgerow with hedge-bank to provide additional habitats and improve ecological connectivity. Gapping up and under-planting of existing hedgerows. Appropriate management prescriptions to maximise the ecological value of this resource.	Negligible risk of hedgerow damage by maintenance vehicles and agricultural machinery.	Significant adverse impact extremely unlikely. In the long term, a beneficial impact is likely (probable) based on new hedgerow planting and adoption of appropriate management prescriptions to maintain existing hedgerows and new planting at the site.
Hedgerows Operational Impacts	Damage from grazing animals. Inappropriate management or lack of management.	Significant adverse impact probable.	Hedges will be fenced to prevent damage by grazing animals. Management and enhancement works, detailed in EMP, to improve retained hedgerows. Provision of buffer strips along majority of retained hedgerows.	Inappropriate management or lack of management.	

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Bats - Roosting Construction Impacts	Disturbance by increased human presence; traffic and artificial light	Significant adverse impact probable due to increased lighting and human disturbance within the site boundary.	Limitation of working to daylight hours only.	Negligible	Significant impact extremely unlikely. In the long term, a significant beneficial impact is probable as a result of proposed habitat improvements.
Bats - Roosting Operational Impacts	Disturbance by increased human presence; traffic and artificial light.	Significant adverse impact probable due to increased lighting and human disturbance within the site boundary	Limitation of working to daylight hours only. Maintenance of dark corridors along hedgerows through appropriate lighting design.	Occasional short-term disturbance when security lighting is triggered.	
Bats - Foraging Construction Impacts	Disturbance by increased human presence; traffic and artificial light	Significant adverse impact probable due to increased lighting and human disturbance within the site boundary	Limitation of working to daylight hours only.	Disturbance by increased human presence; traffic and artificial light	Significant adverse impact extremely unlikely. In the long term, a significant beneficial impact is probable as a result of proposed habitat improvements.
Bats - Foraging Operational Impacts	Disturbance by increased human presence; traffic and artificial light	Significant adverse impact within the immediate zone of influence probable due to increased lighting and human disturbance within the site boundary	Limitation of working to daylight hours only.	Disturbance by increased human presence; traffic and artificial light	

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Birds Construction Impacts	<p>Killing and injuring of, or disturbance to, breeding birds, their nests, eggs or chicks within the grassland area.</p> <p>Loss of low quality grassland breeding habitat.</p> <p>Accidental damage to hedgerows containing breeding birds.</p> <p>Disturbance to breeding birds in hedgerows by machinery and increased traffic/ human presence.</p>	Unlikely significant adverse impact within the site boundary	<p>Vegetation clearance outside the breeding season or pre-works ecological inspection by an experienced ornithologist to ensure no working within 20m of an active nest.</p> <p>Retention of all hedgerow habitat with protection from accidental damage.</p>	The possibility of disturbance to nesting birds that were not identified during the pre-construction inspection.	<p>Significant impact extremely unlikely.</p> <p>Within the medium-long term, probable significant beneficial impact as a result of habitat improvements and appropriate management regimes.</p>
Birds Operational Impacts	<p>Denial of access to some grassland habitats as a result of the presence of PV panels.</p> <p>Disturbance by increased traffic, human presence and pets.</p>	<p>Not significant.</p> <p>Unlikely impact on ground-nesting species within the site boundary in the short-medium as birds become adapted to the presence of panels.</p>	Creation of foraging and nesting habitats through management of grassland habitats beneath panels, planting of new hedgerow, and on-going hedgerow management.	Negligible	

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Badger Construction Impacts	Risk of injury and mortality.	Unlikely significant adverse impact as a result of Badgers becoming entrapped on site, or coming into contact with hazardous materials.	Prevention of access to potentially dangerous materials. Covering of trenches and/or providing means of egress to prevent entrapment	Negligible	Adverse impact due to accidental killing or injuring extremely unlikely.
Badger Operational Impacts	Lack of access to potential low value foraging habitat. Potential barriers to dispersal	Possible adverse significant impact.	Installed security fencing will permit access by Badger (and other mammals such as Hedgehog or Polecat) to the site.	Negligible.	Significant adverse impact during the operational phase of the development extremely unlikely as Badgers will have full access to the site. In the longer term, proposed habitat enhancements will result in a probable significant beneficial impact.

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Dormouse Construction Impacts	Potential for disturbance, killing or injuring as a result of accidental damage to hedgerows by construction plant.	Significant adverse impact extremely unlikely.	<p>Pre-construction fencing to reduce risk of accidental damage.</p> <p>Provision of buffer strips along all hedgerows.</p> <p>Planting of new hedgerow with hedge-bank to provide additional habitats and improve ecological connectivity.</p> <p>Gapping up and under-planting of existing hedgerows.</p> <p>Appropriate management prescriptions to maximise the ecological value of this resource.</p>	Negligible risk of hedgerow damage by maintenance vehicles and agricultural machinery.	<p>Significant impact extremely unlikely.</p> <p>In the long term, a beneficial impact is likely (probable) based on new hedgerow planting and adoption of appropriate management prescriptions to maintain existing hedgerows and new planting at the site.</p>

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Dormouse Operational Impacts	Potential damage to hedgerow habitats from grazing animals. Inappropriate management or lack of management.	Adverse significant impact unlikely.	Hedges will be fenced to prevent damage by grazing animals. Management and enhancement works, detailed in EMP, to improve retained and new hedgerows.	Inappropriate management or lack of management.	

Statement of Significance

- 8.128 Figure 8-2 demonstrates that the proposed development is extremely unlikely to result in a significant adverse impact on the existing site habitats or ecological features. The mitigation measures proposed would allow for retention and/or provision of habitats, at a similar or greater scale and/or quality than the habitats to be lost (i.e. grassland and hedgerows) and this, in turn, would provide resources for continued use of the site by birds and roosting/foraging bats, Badgers, Dormouse, and potentially other species which do not use the site today.
- 8.129 Although there is potential for some loss of biodiversity at the site level in the short term, this is considered to be extremely unlikely. In the long-term, a significant increase in site biodiversity is considered probable as a result of the proposed habitat improvements and management prescriptions.

Summary and Conclusions

- 8.130 The combination of desk and field surveys undertaken have identified that valued ecological features exist within and adjacent to the proposed development footprint.
- 8.131 The ecological features and potential receptors (i.e. protected sites, habitats and species) at and immediately adjacent to the site were assigned a value at a geographical scale ranging from 'County' (Cwm Colhuw SINC, West of Cwm Colhuw SINC and Summer House Bay West SINC), 'Local' (Hedgerows, bats, birds, Badger and Dormouse) to 'within the application boundary' (improved grassland). The potential impact of the scheme on these features has been assessed using best practice guidelines.
- 8.132 No statutory or non-statutory designations apply to any part of the site and it is certain that there is no potential for any designated site to be impacted by the development proposals.
- 8.133 During construction, the majority of the improved grassland habitat will be impacted by construction plant. No hedgerows will be deliberately impacted by the proposals although there is an extremely unlikely possibility of accidental damage during the course of works and probable damage from grazing animals during the operational phase of the development.
- 8.134 A significant adverse impact was considered probable on bats as a result of disturbance both during and post construction from security lighting. It was considered that a significant adverse impact on breeding birds was unlikely due to disturbance, killing or injuring by machinery during the construction phase, and an unlikely short-term adverse impact on breeding birds as they become adapted to the presence of the PV panels on site.
- 8.135 It was considered that there was an unlikely potential for a significant impact on Badgers to arise as a result of accidental killing and injuring during construction, either by becoming entrapped in trenches, or by coming into contact with hazardous materials and also during operation as a result of being unable to enter the site due to the presence of security fencing. There was potential for an extremely unlikely significant adverse impact on Dormouse during construction as a consequence of accidental hedgerow damage, and a probable significant adverse effect on the same species as a result of on-going damage to hedgerows by grazing animals during the operational phase of the development.

- 8.136 A range of mitigation measures to avoid, or minimise the impacts of the development during construction and operation have been incorporated into the scheme. Mitigation measures incorporated into the construction phase include the provision of fencing to protect hedgerows, avoidance of key periods (e.g. bird nesting season) during construction works, (or where this is not possible, pre-construction site checks for breeding birds), and production of an Environmental Management Plan detailing measures to manage existing habitats on site to maximise biodiversity. As part of the development, new habitat features would be created and would include allowing species-rich grassland to develop beneath the PV panels over time, planting up existing hedgerows, and planting a new hedgerow, with hedge-bank, along the southern site boundary.
- 8.137 The mitigation measures proposed would allow for retention, improvement, or provision of habitats, at a similar scale to the ecological valuable habitats to be lost (i.e. grassland and hedgerow habitat,) and this in turn would provide resource for continued, and potentially new use of the site by bats, birds, Badger and Dormouse. For these groups, it is likely that there will be only negligible impacts in the short term, with significant net beneficial impacts in the medium to long term as planting matures, and management prescriptions work to increase overall biodiversity of the site.

**PROPOSED SOLAR DEVELOPMENT
LAND AT ROSEDEW FARM,
LLANTWIT MAJOR**

ENVIRONMENTAL STATEMENT

VOLUME 2

CHAPTER 9: TRAFFIC, TRANSPORT & MOVEMENT

9. TRAFFIC, TRANSPORT AND MOVEMENT

Introduction

- 9.1 This chapter of the environmental statement is produced by Asbri Transport and investigates the local highway network surrounding the proposed development site, proposed access arrangements and considers the impact of the construction and operational traffic related to the proposed development.
- 9.2 The proposals are for the construction of a 5MW solar park as described in Chapter 4 (Project Description) of this Environmental Statement, on land at Rosedew Farm, Llantwit Major in the Vale of Glamorgan which is outlined in Chapter 3 (Site Context). The methodology of assessment accords with that which is presented in Chapter 2 (The EIA Process).
- 9.3 The proposed scheme is expected to remain operational for 25 years. The proposals to construct the solar park will involve the installation of approximately 17,000 solar photovoltaic (PV) panels, and in-field transformer and electricity substation in a secure compound.

Legislative and Planning Policy Framework

National Planning Policy

Wales Spatial Plan

- 9.4 The Wales Spatial Plan – People, Places Future (WSP) – was originally adopted by the National Assembly for Wales in November 2004, and updated in 2008 to bring the WSP into line with One Wales: Connecting the Nation.
- 9.5 The Plan has amongst its goals: ‘Achieving sustainable accessibility. To balance the social, economic and environmental impacts of travel, while enhancing accessibility and to tackle the challenge of benefiting from larger networked regions while reducing the negative impacts of travel’.
- 9.6 The Plan aims to support and develop the renewable energy sector, seizing opportunities to create jobs in renewable energy, recycling and waste industries while maximising the efficient use of the existing transport infrastructure for the movement of people and freight.

Planning Policy Wales (7th Edition, July 2014)

- 9.7 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs). Procedural advice is given in circulars and policy clarification letters.
- 9.8 The UK is subject to the requirements of the EU Renewable Energy Directive. These include a UK target of 15% of energy from renewables by 2020.
- 9.9 The UK Renewable Energy Strategy (2009) and the UK National Renewable Energy Action Plan (2010) sets the path for the delivery of these targets, promoting renewable energy to reduce global warming and to secure future energy supplies. The Welsh Government is committed to

playing its part by delivering an energy programme which contributes to reducing carbon emissions as part of the approach to tackling climate change. The Welsh Government's Energy Policy Statement (2010) explains its aim by 2050, for local energy needs to be met by low carbon electricity production. The approach is to reduce energy consumption and improve energy efficiency first and maximise renewable and low carbon energy generation at every scale across Wales, whilst avoiding, and where possible minimising environmental, social and economic impacts.

- 9.10 The Welsh Government is committed to using the planning system to optimise renewable energy and recognise that the benefits of renewable energy are part of the overall commitment to tackle climate change by reducing greenhouse gas emissions as well as increasing energy security.
- 9.11 Local Planning Authorities should plan positively and facilitate the development of all forms of renewable and low carbon energy to move towards a low carbon economy to help tackle the causes of climate change. Specifically, they should make positive provision by considering the contribution that their area can make towards developing and facilitating renewable and low carbon energy, and ensuring that development plan policies enable this contribution to be delivered.
- 9.12 The Policy states that in determining applications for renewable energy schemes, the Local Planning Authority needs to take account of the capacity of and effects on the transportation network relating to the construction and operation of the proposal.

One Wales: Connecting the Nation – The Wales Freight Strategy

- 9.13 The Wales Freight Strategy, published in May 2008, recognises that freight transport is essential for many aspects of daily life and sets out high level aims and policies for freight transport. It identifies a series of steps towards their delivery whilst recognising that the freight industry is commercially driven.
- 9.14 The Strategy recognises that road offers the most flexible of freight modes with greatest geographical coverage. The Strategy recommends agreeing routeing strategies for goods vehicles to help address concerns of residents.

Local Planning Policy

Vale of Glamorgan Unitary Development Plan (UDP) 1996-2011

- 9.15 The UDP sets out the Council's vision and objectives for the development and use of land in the Vale of Glamorgan, together with the policies and proposals to implement them over a 15 year period to 2011. It has a fundamental role in delivering sustainable development.
- 9.16 The UDP has an important role in defining strategic and detailed policies which can contribute to achieving global environmental objectives such as reducing acid rain, minimising global warming, halting the depletion of the ozone layer and reducing the consumption of non-renewable resources. To this end the Plan will strive to promote sustainable practices through policies which seek to encourage recycling and reduce waste material; reduce pollution and ensure the efficient use of valuable resources; conserve important nature areas; reduce the need for personal transportation and encourage alternative modes of travel and ensure the reuse of both brownfield sites and derelict and degraded buildings.

- 9.17 Proposals which encourage sustainable practices will be favoured including proposals which contribute to energy conservation or efficiency, waste reduction or recycling; pollution control; biodiversity and the conservation of natural resources.
- 9.18 Policy ENV1 recognises that there may be a number of appropriate uses which may be permitted in the countryside, subject to no unacceptable effects. Examples include the development of renewable energy schemes (Policy COMM8). *'Proposals for other renewable energy schemes will be permitted if all of the following criteria are met:*
- The proposal has no unacceptable effect on the immediate and surrounding countryside;
 - The proposal has no unacceptable effect upon the sites of conservation, archaeological, historical, ecological and wildlife importance;
 - Adequate measures are taken, both during and after construction, to minimise the impact of the development on local land use and residential amenity.'

Assessment Methodology

- 9.19 As stated above, the purpose of this chapter of the Environmental Statement is to outline the development proposals, review the development proposals in relation to national and local planning policies; assess the impact of the proposed development, particularly during construction, on the surrounding transport network and identify any mitigation measures and residual impacts.
- 9.20 This chapter considers the principal traffic impacts associated with the construction of the site, including the proposed access arrangements and likely volume and type of construction and operational traffic.
- 9.21 Traffic associated with the operation of solar parks is minimal, therefore, the effect of the site on the highway network following commissioning is only briefly considered in this chapter.
- 9.22 This chapter will conform to the approach regarding assessment of impacts that is presented in Chapter 2 (The EIA Process). The following criteria have been used to inform the assessment of the significance of an impact:
- Type of impact (adverse/beneficial);
 - Extent and magnitude of impact;
 - Duration of impact (short term/long term);
 - Sensitivity of receptor;
 - Comparison with legal requirements, policies and standards;
 - Comparison with applicable environmental thresholds; and
 - Effectiveness of mitigation.
- 9.23 The residual significance of impacts is assessed taking into account mitigation, i.e. the assessment applies to the residual impacts. A residual impact is any impact that remains following the implementation of proposed mitigation measures.
- 9.24 The significance of the impacts arising from the proposed development has been categorised using a seven point scale, as follows:
- Insignificant;

- Minor (adverse or beneficial);
- Moderate (adverse or beneficial);
- Major (adverse or beneficial).

9.25 Impacts are assessed for all phases of the development. Construction impacts are considered to be temporary, short term impacts which occur during the construction phase only. Permanent impacts are those long term effects which would occur as a result of the proposed development once it is in operation.

Baseline Conditions

Site Location

9.26 The 10.7 hectare site, currently used as farm land, is located off an un-named private road running through Ham Manor Park, approximately 1.5km to the south east of the centre of the coastal town of Llantwit Major in the centre of the Vale of Glamorgan.

9.27 The site is surrounded by agricultural land with access via an un-named private lane. The access to the site is from Mill Lay Lane and through Ham Manor Park, a retirement park. At the southern end of Ham Manor Park, the un-named private road leads to the site access adjacent to the entrance to Acorn Camping and Caravan Park. From the site access a farm track passes south of Acorn Camping and Caravan Park to the north western corner of the solar park.

9.28 The location of the site is shown in Appendix 9.

Highway Network

9.29 The highway network in the vicinity of the site is shown in Appendix 10.

Ham Lane East / Mill Lay Lane

9.30 Ham Lane East is a residential road running from Boverton Road, a local distributor road, in the north. Its junction with Boverton Road is a simple priority junction with good visibility in both directions. To the south Ham Lane East becomes Mill Lay Lane. As it continues further south Mill Lay Lane turns west through 90 degrees and becomes Ham Lane South. At this corner it forms a priority junction with the southern arm of Mill Lay Lane being the minor arm of the junction. Immediately south of this junction is the access to Ham Manor Park on the eastern side of Mill Lay Lane. The road is between 6 - 7m wide with footways on both sides of the carriageway and is a bus route.

9.31 Ham Lane East and Mill Lay Lane are lit and subject to a 20mph speed limit for the majority of its length, changing to a 30mph limit on Mill Lay Lane. Two primary schools, a secondary school and leisure centre are accessed from Ham Lane East. Ham Lane East is traffic calmed with speed cushions and road narrowings. Outside the schools there are parking restrictions along the eastern edge of the carriageway with some parking laybys. On-street parking bays are provided along the western edge reducing the effective carriageway width to approximately 5m.

- 9.32 At the southern end of the road, there is no footway on the eastern side of the carriageway for the 50m prior to its junction with Ham Lane South. At this point the road narrows to approximately 5.5m.

Ham Manor Park

- 9.33 Ham Manor Park is a private retirement community accessed off Mill Lay Lane. The main route through the Park is of varying width with a number of passing places. At the access to Ham Manor Park there is sufficient space for a vehicle leaving the Park to wait at the give way line in the event that a construction vehicle is arriving.

Public Rights of Way

- 9.34 There are no Public Rights of Way crossing, or in the vicinity of the site. The existing public footpaths and rights of way in the local area are shown on Appendix 11.

Proposed Access Arrangements

- 9.35 It is proposed to access the site via the existing field access, adjacent to the entrance to Acorn Camping and Caravan Park, at the southern end of Ham Manor Park, as shown in Appendix 12.
- 9.36 This access is approximately 5m wide and will be able to accommodate safely the range of construction and delivery vehicles expected at the site. From the access, construction vehicles will travel along the existing farm track south of the boundary of Acorn Camping and Caravan Park to the northern edge of the solar park. This farm track is approximately 300m in length and will be temporarily upgraded, with a localised widening at the southernmost corner, for the duration of the construction.
- 9.37 Delivery vehicles, including 16.5m articulated vehicles, 10m rigid vehicles and a mobile crane, will be able to enter and exit the site in a forward gear. A vehicle swept path analysis for a 16.5m articulated vehicle, 10m rigid vehicle and mobile crane has been carried out at the proposed access and along the farm track to the northern edge of the solar park, refer Appendices 13, 14 and 15. This analysis includes the vehicles travelling to the site from Mill Lay Lane (junction with Ham Lane South and Ham Manor Park), through Ham Manor Park to the site access. These swept path plots demonstrate that the route is able to accommodate the largest vehicles expected to access the site.
- 9.38 Following commissioning, it is anticipated that the access will be used infrequently by small vans or 4x4 vehicles. Once construction is complete the access will remain as a simple gated arrangement.

Assessment of Potential Impacts

- 9.39 In order to assess the impact of the development proposals on the existing transport infrastructure, it is necessary to establish the vehicle trips likely to be generated by the proposed development.

Trip Generation

- 9.40 Vehicle movements generated by the proposed facility can be categorised as follows:
- Staff vehicles;
 - Construction vehicles; and,
 - Operational vehicles.

Staff Vehicles

- 9.41 It is anticipated that there will be approximately 30 - 50 construction staff on site at any one time, with the exact number depending on each phase of construction. Once construction is complete and the site is operational, there will be no full-time staff employed at the facility. Staff trips will be made primarily by car or van. A temporary parking area will be provided on site for construction staff. No specific routing will be imposed on staff travel to site unless driving a goods vehicle in which case the designated route must be followed. It is anticipated that staff will arrive at site in the morning peak period and depart in the evening peak period.

Construction Vehicles

- 9.42 It is anticipated that the solar park will take approximately eight weeks to construct, including preparation, assembly and erection of PV panels, installation of transformers and connection to the grid. Within the construction programme there is likely to be an intense period of activity over a two week period, when the majority of construction materials and panels will be brought to site.
- 9.43 It is anticipated that construction operations will be undertaken between 0730 and 1800 Monday to Friday and 0730 to 1300 on Saturday.
- 9.44 The components required to construct solar parks are generally shipped from overseas. The proposals require deliveries associated with the following:
Erection of approximately 17,000 solar panels and frames that support the arrays (groups of PV panels). These are usually shipped in 40ft containers and transferred to site by 16.5m (40 tonnes) articulated vehicles;
- Inverters, which can weigh up to 21 tonnes to power up to a 10MW park, and will be transported to site by an articulated vehicle;
 - In-field transformers/substation weigh about 4 tonnes and measure approximately 6m x 3m and will be transported to site by 10m rigid vehicles;
 - A secure compound including portacabins for office, site welfare and storage facilities will be delivered to site by articulated vehicles;
 - Site set up and enabling works including general building materials and aggregates for the on-site access track system and hard standings. This will include temporarily upgrading the farm track to the construction compound (approximately 300m in length). These materials are likely to be sourced locally and will typically be delivered in 10 tonne lorry loads; and,
 - Finally, a mobile crane will be required on site for the duration of the construction.
- 9.45 It is intended that all deliveries will be carried out by vehicles that fall within the current UK limits for weight (maximum 44 tonnes), length (maximum 12m for a rigid and 16.5 for an articulated vehicle) and width (maximum 2.55m excluding wing mirrors). No deliveries of abnormal loads are expected for the construction of the solar park. Figure 9-1 below identifies the number of HGVs accessing the site.

Figure 9-1:- Type and anticipated number of construction vehicles

Components	No. of vehicles
40t/16.5m artics	
Solar panels 17,000 modules (700 pcs/veh)	25
Decentral inverters (1 veh/10 MW)	1
Mounting system (1-2 veh/MW)	10
Cabling (1 veh/MW)	5
Office/welfare facilities/storage	4
10-18t/<10m rigid vehicles	
Site set up/enabling works/building materials/aggregates	20
Transformers	2
Circuit breakers/switchgear	2
Crane	1
Total	70

9.46 It can be seen from the table above that the proposal is likely to generate a total of 70 vehicle trips (two-way) during the most intensive phase of construction. Based on a two week period, this will equate to approximately seven vehicle trips (two-way) per day.

Operational Vehicles

9.47 Following commissioning, minimal maintenance is expected in relation to the PV panels and other fixed elements of the site. Once operational there will be no staff based permanently on site. Visits for maintenance, cleaning and monitoring are likely to be infrequent, approximately four times a year. These trips will typically be made by small vans or 4x4 vehicles. There will be sufficient space on site for these vehicles to enter, park and manoeuvre before exiting the site in forward gear.

9.48 Due to this very low number of vehicle movements, traffic associated with the operation of this site will have an indiscernible impact on the local highway network.

Assignment and Distribution of Development Traffic

9.49 As part of a Construction Traffic Management Plan, designated construction traffic routes will be agreed with the Highways Authority and all construction vehicles will adhere to these recommended routes.

9.50 Upon leaving the site, vehicles will head through Ham manor Park to Mill Lay Lane and on to Ham Lane East. At the northern end of Ham Lane East it is recommended that the most appropriate route to the strategic highway network, at the B4265, is for vehicles to turn left along Boverton Road.

9.51 Boverton Road is a single carriageway road, approximately 6m wide with footways on both sides. It is lit and subject to a 30mph speed limit with residential properties along its northern side. It meets Le Pouliguen Way at a mini roundabout approximately 260m west of its junction with Ham Lane East.

- 9.52 Le Pouliguen Way heads north past the train station and bus station to a mini roundabout junction with Llanmaes Road, approximately 260m from Boverton Road. It is a single carriageway road, approximately 6.5m wide, with footways on both sides, is lit and subject to a 30mph speed limit. It provides access to the train station car park on its northern side and to town centre parking on its southern side. Parking restrictions, in the form of double yellow lines, are present along both sides of the carriageway. Opposite the entrance to the train station the carriageway narrows at a zebra crossing to approximately 6m as a traffic calming feature. At the mini roundabout with Llanmaes Road the speed limit reduces to 20mph.
- 9.53 Llanmaes Road heads north to a traffic signal junction with the B4265, approximately 850m away. It is a single carriageway road with residential properties on both sides and is a bus route. It is lit, subject to a 30mph speed limit and is over 7m wide. Just north of the mini roundabout junction with Le Pouliguen Way the road narrows under the railway bridge and there is one-way working controlled by traffic signals.
- 9.54 The B4265 is a single carriageway bypass of Llantwit Major which meets Llanmaes Road at a traffic signal junction. The B4265 is approximately 8m wide and is subject to a 50mph speed limit. It has no footways and is unlit. At the B4265 vehicles can either head west towards Cowbridge (and the A48) or east towards Barry (and the A4050).

Route to the M4 via A48

- 9.55 In order to reach the motorway network, vehicles can head west along the B4265 and then north along the B4270. This connects to the A48 approximately 7km from the B4265. There are no footways on either side of the carriageway (apart from at the northern end), instead there is a mix of grassed verges and hedging. The road is subject to the national speed limit, albeit curvilinear and undulating in nature, is a bus route and is currently used by a large proportion of HGV's travelling in both a northbound and southbound direction to access the industrial estates around Llandow.
- 9.56 The A48 is a major trunk road through South Wales and runs from Gloucester to Carmarthen. It connects Cowbridge to Newport and Cardiff in the east and Bridgend, Port Talbot and Swansea in the west. Approximately 12km to the east of Cowbridge, through the villages of Bonvilston and St. Nicholas it connects to the A4231 at Culverhouse Cross. The A4231 is a two-lane dual carriageway road which leads north to the M4 (approximately 5km from Culverhouse Cross).

Route to the M4 via A4050

- 9.57 Alternatively, vehicles can head east along the B4265 past Aberthaw Power Station and Cement Works, which becomes the A4226 Port Road and runs along the north of Barry. This leads to the A4050 to Culverhouse Cross and connects to the A4231 dual carriageway. This route from the site to Culverhouse Cross is approximately 20km long. It connects Barry, Wenvoe and Culverhouse Cross and more strategically is a key link road from the M4 to Cardiff Airport.
- 9.58 The routes between the site and the strategic highway network are shown on Appendix 16.

Future Traffic Flows

- 9.59 The impact of the development has been assessed for an opening year of 2015. Given that only the construction traffic will have an impact on the surrounding highway network, and operational traffic is minimal, future years have not been assessed further.

Junction Capacity

- 9.60 Given that the construction traffic will only have a minor, short-term, adverse impact on the surrounding highway network, with typically seven construction vehicles a day accessing the site for two weeks, and operational traffic flows are minimal, no junction capacity assessments have been considered to be necessary.
- 9.61 Overall, it is considered that the proposed development will have an imperceptible effect on the operation of the local highway network and no highway measures are required to accommodate the development.

Mitigation Measures

Construction Traffic

- 9.62 It is anticipated that a Construction Traffic Management Plan (CTMP) will be required. This document will indicate the construction phasing, hours of operation and the level of vehicle activity. Submission of this document offers the opportunity for the impact on construction traffic on the surrounding highway network to be minimised.
- 9.63 The CTMP will control the impact of construction traffic on the surrounding highway network, and it is therefore anticipated that the residual impact will be minor adverse.
- 9.64 As part of the CTMP, construction and delivery vehicles accessing the site will be required to follow a construction routeing strategy using routes identified in order to minimise impacts on the surrounding highway network, specifically less suitable routes. These routes will be agreed with the Highway Authority. All suppliers and contractors will be notified of the agreed construction routeing strategy and expected to comply.
- 9.65 A site delivery system will be in operation, with time slots allocated to deliveries in order to control the time of arrival of deliveries and ensure that no vehicles are attempting to depart at the same time. All vehicles will be required to book a delivery time slot with specific times of the day allocated for arrivals and other times for departures to ensure large vehicles do not meet along the lane.
- 9.66 Despite the low level of general vehicles using Ham Lane East, the sensitive nature of the schools located along this road requires additional consideration. It is proposed to restrict construction traffic deliveries during school opening and closing times, typically between 8.30am-9.30am and 2.45pm-3.45pm Monday to Friday during term time.
- 9.67 No vehicle parking, loading or unloading will take place from the public highway and suitable wheel washing facilities will be installed, if required, to ensure no mud or debris is deposited on the public highway during the construction period.
- 9.68 A construction signage strategy will be agreed with the Highway Authority and implemented prior to construction on site. This signage strategy will be in place from the B4265 along Llanmaes Road, Le Pouliguen Way, Boverton Road, Ham Lane East, Mill Lay Lane and through Ham Manor Park to the site in order to direct construction vehicles to the site and provide road users with advance warning of the potential for meeting construction traffic. Access signage and signage

along the route will be in accordance with Chapter 8 Traffic Signs Manual Part 2: Traffic Safety Measures and Signs for Road Works and Temporary Situations.

Monitoring

- 9.69 The measures detailed within this report will be monitored by the contractor to ensure they are adhered to, with delivery routes and timings recorded, in order to ensure that access arrangements operate in a manageable way and any adverse impacts avoided.

Residual Impacts

- 9.70 Following consideration of the potential impacts of the development on traffic, transport and movement interests during the construction and operation phases, and also the implementation of described mitigation measures, the residual impact of the scheme is summarised in Figure 9-2 below.
- 9.71 Overall, with the introduction of the proposed mitigation measures, the impacts will be reduced at the construction phase and mitigation measures are unnecessary for the operational phase. No major adverse impacts will remain and it is therefore considered that the proposed development will not represent a significant effect on the environment from a traffic, transport and movement standpoint.

Figure 9-2:- Summary of residual effects of the proposed development

Development Phase	Description of Potential Impact	Assessment of Significance Without Mitigation	Proposed and Recommended Mitigation Measures	Residual Impact
Construction	Construction traffic will have an impact on the operation of the highway network, potentially increasing disruption during network peak periods	Minor adverse	A Construction Traffic Management Plan, including signage strategy and restricted delivery times, will be produced to reduce the impact of the construction phase of the development proposals	Minor Adverse
Operational	The generation of up to four vehicles (two-way) per annum for maintenance	Insignificant	None proposed	Insignificant

Summary and Conclusions

- 9.72 This chapter assesses the impact of the proposed development on the surrounding transport network, and identifies any measures required to mitigate the impact of the proposed development.

- 9.73 It is proposed to access the solar park at an existing field access at the southern end of Ham Manor Park, with Ham Manor Park being reached via Mill Lay Lane. From the access the site will be reached via a 300m long existing track that skirts the southern boundary of the Acorn Camping and Caravan park. It has been demonstrated that this access can accommodate the largest vehicles expected to access the site.
- 9.74 Mill Lay Lane and Ham Lane East and the route to the B4265 via Boverton Road and Le Pouliguen Way are able to accommodate HGV's and this has been demonstrated by a vehicle swept path analysis.
- 9.75 The proposals require deliveries by 16.5m articulated vehicles, 10m rigid vehicles as well as a mobile crane arriving on-site. It is anticipated that approximately 70 trips (two-way) will be generated by the proposals during an intensive two week phase of the construction. This equates to approximately seven trips per day.
- 9.76 In order to minimise any transport impacts on the public highway of the construction and delivery vehicles, the following mitigation measures, which will be set out in a CTMP, are proposed:-
- Implementation of a construction routeing strategy to ensure all construction and delivery vehicles use the most appropriate route;
 - A site delivery system will be in operation, including restricted delivery times to avoid school opening and closing times;
 - Installation of wheel washing facilities at the site access; and,
 - Introduction of temporary traffic management signage for the duration of the construction works.
- 9.77 Once operational, there will be no staff based permanently on site. Visits for maintenance, cleaning and monitoring are likely to be infrequent – approximately four times a year.
- 9.78 Overall, it is considered that with the introduction of the proposed mitigation measures, the impacts will be reduced during the construction phase and mitigation measures are unnecessary for the operational phase. No major adverse impacts will remain and it is therefore considered that the proposed development will not represent a significant effect on the environment from a traffic, transport and movement standpoint.

**PROPOSED SOLAR DEVELOPMENT
LAND AT ROSEDEW FARM
LLANTWIT MAJOR**

ENVIRONMENTAL STATEMENT

**VOLUME 2
CHAPTER 10: CONCLUSIONS**

10. CONCLUSIONS

Introduction

10.1 This Environmental Statement has been prepared on behalf of DR & EG Davies (the applicants) in support of a full planning application submitted to the Vale of Glamorgan Council. The title of the application is as follows:-

'Construction of a ground-mounted solar pv generation project and associated works.'

10.2 This Environmental Statement summarises the findings of the Environmental Impact Assessment (EIA) for the proposed solar development on land at Rosedew Farm, Llantwit Major, which has been deemed necessary in the course of discussions with the Local Planning Authority.

10.3 No formal request for a Scoping Opinion was submitted to the Local Planning Authority. Instead, informal clarification was sought and received on the basis of the contents of the Screening Report (Appendix 2 refers).

10.4 The key issues which are the subject of this Environmental Impact Assessment are as follows:-

- Landscape and Visual;
- Ecology; and
- Traffic and Transport.

10.5 This chapter summarises the findings of the Environmental Impact Assessment of the intended development, and in particular the observed adverse impacts and mitigation proposed.

Adverse Impacts

10.6 Each of the technical chapters (Chapters 7-9) has benefited from thorough and appropriate assessment to an agreed scope. Each respective assessment has resulted in the identification of potential impacts, the implementation of necessary mitigation and then an assessment of residual impacts that remain.

- 10.7 **Chapter 7** relates to the Landscape and Visual Impact. It is informed by a desk top study, and a study from within and around the site.
- 10.8 An assessment of the baseline conditions of the site has been undertaken and is summarised as follows:-
- The site is located within the Glamorgan Heritage Coast;
 - The Wales Coastal Path falls approximately 500metres to the south of the site;
 - LANDMAP has located the site within the 'Llantwit-St. Athan' aspect area. It states that the area, which is classified as being of outstanding overall value, is a broad, low, dissected coastal plateau underlain by Lias (Lower Jurassic) with steep sided valleys and short steep cwms cut into cliffs adjacent to the coast;
 - The Visual & Sensory element of the assessment locates the site within the 'Heritage Coast Hinterland' aspect area.
 - Due to its location within a rolling coastal lowland plateau, the visual envelope of the site is restricted by the surrounding natural topography. Views are further restricted by small groups of woodland to the north of the development site.
- 10.9 In terms of visual impact, the significance of the development's impact upon the majority of viewpoints, was identified as Negligible. There was one particular viewpoint where it was considered that the level of significance was Minor Adverse, which was the viewpoint to the south upon the Wales Coastal Path, north of Stout Bay. However, this was due to the close proximity of the viewpoint to the site, and it was concluded that once the landscape mitigation measures are established (likely to be in the region of 2-3 years), the minor adverse impact the development will be reduced to negligible.
- 10.10 Upon decommissioning, the solar panels can be easily removed. Consequently, in landscape terms, any short to medium term adverse visual impacts caused by the development will no longer occur. Furthermore, through the retention of landscape mitigation measures (implemented to screen the solar farm), the medium to long-term impact of the development upon the visual amenity of the area should be considered as minor beneficial.
- 10.11 In terms of landscape character, during construction and operation, whilst the impact the development will have upon the landscape character of the site will remain, albeit temporarily, the landscape mitigation measures will reduce the influence of the development upon its setting and the wider landscape. As a consequence its significance should be reduced from moderate or minor adverse to minor adverse or negligible.
- 10.12 Once decommissioned and through the retention of landscape mitigation measures the medium to long-term impact of the development upon the landscape character of the area should be considered as minor beneficial.
- 10.13 The assessment concluded that upon implementation of the landscape mitigation measures, the development's visual and landscape character impacts will be negligible and localised, and will be reduced and will continue to be reduced as the mitigation proposals, hedgerows in particular, become more established.
- 10.14 **Chapter 8** provides an assessment of the ecological and biodiversity resource. It is informed by studies of the site, including a suite of ecological surveys including an extended Phase 1 habitat survey, desk study, botanical survey, and surveys for bats, otter, water vole, breeding birds, reptiles, great crested newt and invertebrates.

- 10.15 An assessment of the baseline conditions has been undertaken and is summarised as follows:-
- The site does not contain any national or internationally designated statutory nature conservation designations such as Sites of Special Scientific Interest (SSSI), and there are none within 2km of the approximate site centroid.
 - Three Sites of Importance for Nature Conservation (SINCs) are located within 2km of the proposed development site.
 - The ecological features and potential receptors (i.e. protected sites, habitats and species) at and immediately adjacent to the site were assigned a value at a geographical scale ranging from 'County' (Cwm Colhuw SINC, West of Cwm Colhuw SINC and Summer House Bay West SINC), 'Local' (Hedgerows, bats, birds, Badger and Dormouse) to 'within the application boundary' (improved grassland).
 - No historic species records have been recorded for the site, although records exist within 400m of the site boundaries which indicate that the following may be of relevance to the site:- bats, badger, great crested newt, reptiles, invertebrates and breeding birds.
- 15.14 Mitigation measures incorporated into the construction phase include the provision of fencing to protect hedgerows, avoidance of key periods (e.g. bird nesting season) during construction works, (or where this is not possible, pre-construction site checks for breeding birds), and production of an Environmental Management Plan detailing measures to manage existing habitats on site to maximise biodiversity. As part of the development, new habitat features would be created and would include allowing species-rich grassland to develop beneath the PV panels over time, planting up existing hedgerows, and planting a new hedgerow, with hedge-bank, along the southern site boundary.
- 10.16 The proposed development is extremely unlikely to result in a significant adverse impact on the existing site habitats or ecological features. The mitigation measures proposed would allow for retention and/or provision of habitats, at a similar or greater scale and/or quality than the habitats to be lost (i.e. grassland and hedgerows) and this, in turn, would provide resources for continued use of the site by birds and roosting/foraging bats, Badgers, Dormouse, and potentially other species which do not use the site today.
- 10.17 All issues of significance during construction and operational stages are considered to have been reduced to a negligible to minor effect through the design of mitigation measures, such that no significant negative residual impacts will occur.
- 10.18 **Chapter 9** assesses the likely significant effects of the proposed development in terms of traffic, transport and movement.
- 10.19 It is proposed to access the solar park at an existing field access at the southern end of Ham Manor Park, with Ham Manor Park being reached via Mill Lay Lane. From the access, the site will be reached via a 300m long existing track that skirts the southern boundary of the Acorn Camping and Caravan park. It has been demonstrated that this access can accommodate the largest vehicles expected to access the site.
- 10.20 During the construction phase, it was considered that construction traffic will have an impact on the operation of the highway network, potentially increasing disruption during network peak periods.
- 10.21 In order to minimise any transport impacts on the public highway of the construction and delivery vehicles, the following mitigation measures, which will be set out in a Construction Traffic Management Plan, are proposed:-

- Implementation of a construction routing strategy to ensure all construction and delivery vehicles use the most appropriate route;
 - A site delivery system will be in operation, including restricted delivery times to avoid school opening and closing times;
 - Installation of wheel washing facilities at the site access; and,
 - Introduction of temporary traffic management signage for the duration of the construction works.
- 10.22 Once operational, it is estimated that there will be the generation of up to four vehicles (two-way) per annum for maintenance, which was considered to be insignificant.
- 10.23 Overall, it is considered that with the introduction of the proposed mitigation measures, the impacts will be reduced during the construction phase and mitigation measures are unnecessary for the operational phase. No major adverse impacts will remain and it is therefore considered that the proposed development will not represent a significant effect on the environment from a traffic, transport and movement standpoint.

Summary

- 10.24 Overall, it is considered that adverse impacts identified as a result of the proposed development can be successfully mitigated against during construction and operational phases, as far as practically possible. Therefore, it is concluded that the proposed scheme will not have a significant adverse impact on the wider environment. It is also considered that the proposed development is acceptable and, assuming other material considerations dictate otherwise, should be considered favourably by the local planning authority.