Fferm Solar Larnog

Environmental Statement

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4. Design Evolution and Alternatives

4.1. Introduction

4.1.1. This chapter provides a summary of the need for the Proposed Development and outlines the main alternatives to the Proposed Development that have been considered by the Applicant, together with the principal reasons for proceeding with the Proposed Development.

4.1.2. The Proposed Development forms part of the Applicant's programme to develop renewable energy generation projects on the public estate, supporting Welsh Government's ambitions relating to renewable energy generation, decarbonisation and energy security.

4.2. Need for the Proposed Development

Climate Change

4.2.1. The Welsh Government Net Zero Carbon Budget, 2021[1] reports upon past progress and future ambition towards combatting climate change:

> *"In the last six years, we have laid the legislative foundations for a cleaner, fairer, stronger Wales, including through the Well-being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016. Wales has consistently followed the science, starting in 2016 with a target for an 80% reduction in our emissions by 2050. In 2019 we accepted the CCC's recommendation to increase our ambition to 95% shortly after the Senedd became the first Parliament in the world to declare a climate emergency in 2019. On accepting the recommendation, we were clear our ambition should be in line with the spirit of the Paris Agreement in which richer, developed nations should set in law a net zero target by the middle of this century".*

[1] Welsh Government (2021). Net Zero Wales Carbon Budget 2 (2021 to 2025). (c. 1), pp. 10. (Online). Available at: https://gov.wales/sites/default/files/publications/2021-10/net-zero-wales-carbon-budget-2-2021-25.pdf (Accessed: September 2026).

4.2.2. The Climate Change (Wales) Regulations 2021[2] reiterates the dangers posed by climate change and the response of Welsh Government:

> *"Climate science continues to demonstrate that human activity is warming the planet and that the resulting effect on weather patterns is having increasingly negative consequences for ecosystems, economies, and people. The Welsh Government is proposing to increase Wales's climate targets in response to the latest climate science and the recommendations of the Climate Change Committee (CCC)".*

4.2.3. The Climate Change (Wales) Regulations 2021 go on to include the following targets:

- *"Carbon Budget 2 (2021-2025): an average of 37% below the baseline with a credit ('offset') limit of 0%;*
- *Carbon Budget 3 (2026-2030): an average of 58% below the baseline;*
- *2030 target for an emissions reduction of 63% against the baseline;*
- *A 2040 target for an emissions reduction of 89% against the baseline; and*
- *A 2050 target for an emissions reduction of at least 100% against the baseline ('net zero')".*

4.2.4. The 'sustainable development principle' established by the Welsh Government in the Well-being of Future Generations (Wales) Act (2015)[3] was introduced to ensure public bodies act in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs. A key element of this is stated as "*tackling climate change by reducing the greenhouse gas emissions that cause climate change and ensuring that places are resilient to the consequences of climate change*".

4.2.5. In 2021, Future Wales: The National Plan 2040 (Future Wales)[4] was introduced as a national development framework to combat the "*climate emergency which is actively changing our environment and directly affecting communities*". Future Wales aims to help plan new development and manage land use through enhancing the economic, social, environmental, and cultural well-being of Wales. Future Wales builds on the well-being goals set out in the Future Generations (Wales) Act (2015) to create a Prosperous, Resilient, Healthier, More Equal, Cohesive, Globally Responsible and Vibrant and Thriving Wales.

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[2] Welsh Government (2021). The Climate Change (Wales) Regulations 2021: integrated impact assessment. (c1), pp. 3. (Online). Available from: https://gov.wales/sites/default/files/pdf-versions/2021/7/5/1625823413/climate-change-wales regulations-2021-integrated-impact-assessment.pdf (Accessed: September 2026).

[3] Welsh Government (2015). Well-being of Future Generations (Wales) Act 2015. (c. 1). (Online). Available at: https://www.futuregenerations.wales/wp-content/uploads/2017/01/WFGAct-English.pdf (Accessed: September 2026).

[4] Welsh Government (2021). Future Wales the National Plan 2040. (c. 2), pp. 45. (Online). Available at: https://gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf (Accessed: September 2026).

4.2.6. Future Wales also specifies: "*It is vital that we reduce our emissions to protect our own well-being and to demonstrate our global responsibility. Future Wales together with Planning Policy Wales will ensure the planning system focuses on delivering a decarbonised and resilient Wales through the places we create the energy we generate, the natural resources and materials we use and how we live and travel*".

4.2.7. Future Wales identifies renewable energy generation as key to the delivery of its carbon budgets. Policy 17 and 18 set out Future Wales' approach to renewable energy with Policy 17 stating that the Welsh Government strongly supports the principle of developing renewable and low carbon energy from all technologies and at all scales to meet future energy needs.

4.2.8. The latest version of Planning Policy Wales (Edition 12)[5] (PPW12) acknowledges Wales has been set a 95% net zero target for 2050 by the CCC and how nationally, the intention is to go beyond this to become fully net zero. PPW12 outlines:

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

4.2.9. National policy and legislation have been drafted in recognition of the need to tackle climate change, with renewable energy developments seen as a key means by which present and future carbon budgets can be achieved. In this context, the Proposed Development would contribute towards national and Welsh Government climate change and renewable energy objectives through the generation of renewable electricity, helping to support the transition to a low-carbon energy system and the achievement of emissions reduction targets.

Renewable Energy and Energy Security

4.2.10. Renewable energy produces energy without burning fossil fuels that release CO_2 and contribute to climate change. Renewable energy also provides a new and alternative energy source to tackle energy security issues. Increased use of renewable energy is therefore a key part of European, UK and Welsh energy strategy.

4.2.11. In September 2017, the Welsh Government Cabinet Secretary for Environment and Rural Affairs announced to the Welsh Assembly that it was setting a target of Wales generating

[5] Welsh Government (2024). Planning Policy Wales 12th Ed. (c. 3), pp. 31. (Online). Available at: https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf (Accessed: September 2026).

70% of its electricity consumption from renewable energy by 2030 and a target for one Gigawatt of renewable electricity capacity in Wales to be locally owned by 2030[6]. In January 2023, The Welsh Government released a consultation document for the review of Wales' renewable energy targets[7], which proposed updating the target from 70% to 100% by 2035 and with 1.5GW to be locally owned within this timescale, these targets have now been adopted[8].

4.2.12. Future Wales (page 48) also maintains "*Wales can become a world leader in renewable energy technologies. Our wind and tidal resources, our potential for solar generation, our support for both large and community scaled projects and our commitment to ensuring the planning system provides a strong lead for renewable energy development, mean we are well placed to support the renewable sector, attract new investment and reduce carbon emissions*".

4.2.13. Key targets for renewable energy are set out below in **Table 4.1**.

Table 4.1: Key renewable energy targets

Consideration	Target
Greenhouse gas reduction	60% by 2030, 80% by 2050[9]
Electricity from renewable sources	70% by 2030[5] and 100% by 2035[10]

4.2.14. PPW12 states that:

> *"Local authorities should facilitate all forms of renewable and low carbon energy development and should seek cross-department co-operation to achieve this. In doing so, planning authorities should seek to ensure their area's full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved. Planning authorities should seek to maximise the potential of renewable energy by linking the development plan with other local authority strategies, including Local Well-being plans and Economic/Regeneration strategies".*

4.2.15. PPW12 reaffirms the Welsh Government renewable energy targets and states:

[6] Welsh Parliament (2017). Lesley Griffiths high on ambition for clean energy. Available at: https://record.senedd.wales/Plenary/4644#C26839 (Accessed: September 2026)
[7] Welsh Government (2023). Consultation Document Review of Wales' Renewable Energy Targets (Online). Available at: https://www.gov.wales/sites/default/files/consultations/2023-01/consultation-document-review-of-renewable-energy targets_0.pdf (Accessed: September 2026)
[8] Welsh Parliament (2023). Written Statement: Publication of Summary of Responses to the Consultation on Wales' Renewable Energy Targets (Online). Available at: (Accessed: September 2026).
[9] UK Government (2008). Climate Change Act 2008. (online) Available at: https://www.legislation.gov.uk/ukpga/2008/27/contents (Accessed: September 2026).
[10] Welsh Government (2023). Press Release: Wales aims to meet 100% of its electricity needs from renewable sources by 2035 Available at (online): https://www.gov.wales/wales-aims-meet-100-its-electricity-needs-renewable-sources-2035 (Accessed: September 2026).

"The benefits of renewable and low carbon energy, as part of the overall commitment to tackle the climate emergency and increase energy security, is of paramount importance."

4.2.16. PPW sets out eight bullet points for the planning system to achieve:

- *"Integrate development with the provision of additional electricity grid network infrastructure;*
- *Optimise energy storage;*
- *Facilitate the integration of sustainable building design principles in new development;*
- *Optimise the location of new developments to allow for efficient use of resources;*
- *Maximise renewable and low carbon energy generation;*
- *Maximise the use of local energy sources, such as district heating networks;*
- *Minimise the carbon impact of other energy generation; and*
- *Move away from the extraction of energy minerals, the burning of which is carbon intensive."*

4.2.17. This will put Wales on the path to meet the longer-term target of 1 GW of renewable energy generation capacity to be locally owned by 2030.

4.2.18. Overall, there is a growing need to increase renewable generation and storage capacity to meet increasing electricity demand in the future and national carbon and greenhouse reduction targets, including those key targets identified in **Table 4.1**. The Proposed Development would contribute towards meeting this identified need by increasing renewable energy generation capacity and supporting the transition to a low-carbon electricity system.

4.3. Site Selection, Alternatives and Design Evolution

4.3.1. The EIA Regulations 2017 require that the ES should include:

"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the applicant or appellant which are relevant to the proposed development and its specific characteristics and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects". (Schedule 4(2))

4.3.2. The following sections of this ES chapter set out the reasonable alternatives considered, including the reasons for the selection of the Site, layout and design of the Proposed Development.

Do Nothing Scenario

4.3.3. Under the "do-nothing" scenario, the electricity being generated by the Proposed Development would not be delivered. As a consequence, no contribution would be made towards increasing the supply of renewable electricity or supporting the transition to a low-carbon energy system.

4.3.4. A 'do nothing' scenario would not contribute to meeting the growing demand for electricity and would not support Welsh Government ambitions to increase the proportion of electricity generated from renewable sources and strengthen the role of renewable energy within the future energy mix.

4.3.5. Consequently, the do-nothing scenario was discounted as it would not contribute towards Welsh Government's ambitions relating to renewable energy generation, decarbonisation, and energy security.

Site Selection and Design Evolution

Introduction

4.3.6. This section explains how good design has been embedded into the Proposed Development from the outset of the design process. Good design is important and has a direct effect on the communities that host renewable energy projects. It is as much about processes and behaviours as it is about delivering design outcomes that support sustainable development.

4.3.7. In Wales, the design of renewable energy projects is the subject of key policy documents and guidance notes. In 2023, the Design Commission for Wales published Designing for Renewable Energy in Wales[11] which sets out criteria for good design of energy infrastructure. Whilst the document is not a policy document, it is informed by Planning Policy Wales, Future Wales: The National Plan 2040 and the Well-being of Future Generations Act 2015. The Applicant has utilised this document throughout the iterative design process for the Proposed Development, with due consideration to the Design Objectives set out in Section 4.2 and Section 6 of Designing for Renewable Energy in Wales.

4.3.8. In addition, the Applicant has had regard to relevant policies contained in the Vale of Glamorgan Council's Local Development Plan 2011-2026[12], which is also supported by

[11] Design Commission for Wales (2023) Designing for Renewable Energy in Wales. Available online at: Designing for Renewable Energy in Wales (Accessed: September 2026).
[12] Vale of Glamorgan Council (2017). Local Development Plan: Written Statement 2011 – 2026. Available online at: https://www.valeofglamorgan.gov.uk/Documents/Living/Planning/Policy/LDP/LDP-Adoption/Adopted-LDP-Written-Statement-June-2017-final-interactive-web-version.pdf (Accessed: September 2026).

Supplementary Planning Guidance (SPG) for renewable energy[13]. Whilst the SPG is not explicitly targeted at the design of large-scale renewable energy developments, particular attention has been given to the planning considerations for such developments, as set out in Chapter 7 of the Local Development Plan.

Site Selection

4.3.9. The Site forms part of a wider Welsh Government landholding located between Penarth and Sully, as shown on **Figure 1.1: Site Location Plan**. At the start of the site selection process, the wider landholding (depicted by the Land Ownership Boundary in **Figure 1.1**) was identified as having potential to accommodate a solar photovoltaic (PV) development due to its availability, scale and location. It is located within an area that benefits from suitable solar irradiance levels and favourable topography for solar energy generation.

4.3.10. A review of environmental, technical and planning considerations was undertaken to identify the principal constraints and opportunities associated with the land within the Land Ownership Boundary (please refer to **Figure 1.1**). This included consideration of ecology, landscape and visual effects, cultural heritage, flood risk, agricultural land classification, access arrangements, proximity to residential receptors and the capacity of the local electricity network.

4.3.11. Through the site selection process, the area within the Land Ownership Boundary was identified due to a combination of the following environmental and technical considerations:

- Appropriate solar irradiance levels and favourable topography, supporting the efficient generation of renewable electricity;
- Proximity to the existing electricity network, enabling connection to available grid capacity. Penarth Primary Substation and Sully Grid Bulk Supply Point are located approximately 2.2 km north and approximately 2.35 km north-west from this land;
- That it does not comprise any Best and Most Versatile (BMV) agricultural land, thereby avoiding the loss of higher quality agricultural resources;
- It provides sufficient land area to maximise the available grid connection capacity while maintaining appropriate stand-off distances from sensitive residential receptors;
- There are no international or nationally designated environmental sites within the landholding, reducing the potential for effects on protected environmental features; and

[13] Vale of Glamorgan Council (2019) Supplementary Planning Guidance: Renewable Energy. Available online at: Renewable Energy SPG March 2019 (Accessed: September 2026).

- The land is accessible from the local road network and can be reached without relying on land immediately adjacent to the strategic road network, supporting the practicable delivery of the Proposed Development.

4.3.12. Through the subsequent design evolution process, environmental, technical and operational considerations were used to refine the area for development and identify the Site taken forward for assessment (see **Paragraphs 4.3.15** to **4.3.47** below). This is also shown within **Figure 4.1: Design Evolution**.

Design Evolution

4.3.13. This section summarises the design evolution of the Proposed Development to date. It explains how the area proposed for development has evolved and reduced through the design process. It explains how the spatial layout of the Proposed Development has been shaped by the environmental and technical assessment process.

4.3.14. An illustrated summary of the changes to the design is shown in **Figure 4.1**.

Design Point 1: Initial Site Appraisal and Identification of Suitable Development Areas

4.3.15. Following the initial site selection by the Applicant, the Site was subject to a preliminary assessment. The purpose of the assessment was to identify the opportunities and constraints of the Site and identify potential land parcels which could support the Proposed Development.

4.3.16. The assessment, which included site visits and desktop analysis (using Geographical Information Systems (GIS)), considered known environmental, engineering, and technical factors/receptors. As part of the assessment, the following design principles informed the design output:

- Avoidance of International, National, and Local Ecological Designations: Including International designations (e.g. SPA), National designations (e.g. SSSI), and Local designations (e.g. SINC);
- Avoidance of known heritage assets: Including Registered Gardens and Designed Landscapes, Registered Battlefields, World Heritage Sites, Listed Buildings, Conservation Areas and Scheduled Ancient Monuments;
- The pattern of settlement, topography, and land use: Identification of residential properties and settlements, avoidance of steep gradients (not suitable for energy infrastructure), and publicly accessible areas/routes;
- Avoidance of woodland, trees, and hedgerows: A 10 m buffer was applied to all field boundaries to avoid all habitats within the Site Boundary. Records of all areas of woodland were drawn from aerial base mapping and publicly accessible datasets; and
- Existing infrastructure: Including overground and underground utilities, other buildings, and roads.

4.3.17. Land parcels identified as having the potential to support development were subsequently taken forward for further consideration and design refinement.

Design Point 2: Environmental and Technical Assessment of Potential Development Areas

4.3.18. To refine the potential land parcels suitable for ground-mounted solar PV development, the Applicant commissioned several studies to support the design process:

- Preliminary Ecological Appraisal (PEA): WSP was commissioned to undertake a PEA in January 2025. The PEA was informed by a Phase 1 habitat survey and Daytime Bat Walkover (DBW) of habitats within and in proximity to the Site;
- Draft Historic Environment Desk-Based Assessment (HEDBA): WSP was commissioned to provide a draft HEDBA of the Site in February 2025. The HEDBA has been informed by a site walkover and interrogation of historic mapping, Historic Environment Records (HER), and consideration of archaeological evaluation works completed at neighbouring sites; and
- Initial Landscape and Visual Appraisal: WSP was commissioned to provide a landscape and visual appraisal of the Site in February 2025. The aim of the study was to assess the Site's suitability for accommodating a solar development. The appraisal was informed by a site walkover.

4.3.19. In parallel, an indicative solar PV layout was prepared using GIS analysis and preliminary engineering design work, enabling the project team to assess field size, accessibility and the practical requirements associated with accommodating solar PV infrastructure.

4.3.20. The project team held an inter-disciplinary workshop to review the outcomes of each study and further consider the suitability of each field to accommodate ground mounted solar PV development. As part of the workshop, each field was numbered and subsequently assigned a suitability rating (Good, Moderate, Poor). Reasons for assigning a 'Poor' rating included:

- Topography, steeper inclines, and proximity to recognisable landscape features, including Hopkins Mount;
- Proximity to residential properties and St Lawrences Church;
- Potential views from residential properties and public roads; and
- The practicalities of locating infrastructure in smaller fields and accessibility.

4.3.21. Only fields assessed as having a good or moderate capacity to accommodate development were progressed to the next stage of design evolution.

Design Point 3: Detailed Environmental Surveys and Layout Refinement

4.3.22. Following identification of the preferred development areas, further environmental and technical surveys were undertaken to inform design development. These included the following:

- Preliminary Risk Assessment (PRA): In July 2025, WSP was commissioned to complete a Geo-Environmental PRA of the Site. As part of the work, WSP developed a preliminary Conceptual Site Model (CSM) to identify potential contamination risks associated with the Proposed Development and highlighted any environmental considerations (i.e. potential risks / constraints) with respect to ground, ground gas and groundwater conditions;
- Geophysical Survey: In July 2025, Dyfed Archaeological Services, a contracting arm of Heneb: the Trust for Welsh Archaeology, were commissioned to prepare a Written Scheme of Investigation (WSI) for a Geophysical Survey of the Site, and, subsequently, carry out and report on the Geophysical Survey; and
- Bat Surveys: Bat surveys, in the form of static detector surveys, night-time walkover surveys, and Potential Roost Feature (PRF) aerial inspection surveys, have been undertaken throughout 2025 (Spring: April – May; Summer: June – July, August; and Autumn: September – October). The bat surveys provided a more detailed understanding of bat activity and the distribution of potential roosting features.

4.3.23. The project team held an inter-disciplinary workshop to review the outcomes of each study and further consider the suitability of each field to accommodate ground mounted solar PV development. The following design changes were implemented as part of the workshop:

- Removal of proposed fields east of Fort Road:
    - The geophysical survey identified anomalies in several fields towards the east of the Site, indicating the potential presence of buried archaeological features. Please refer to **Appendix 9D: Geophysical Survey Report**; and
    - The project team were concerned with views from the Wales Coastal Path across the eastern part of the Site. There are large parts of the Site exposed following recent footpath alterations along the Wales Coastal Path due to coastal erosion.
- Increased separation from residential properties: The potential infrastructure footprint in two fields, one to the west of St Mary's Well Bay Road and one to the west of Fort Road, was reduced to increase the separation distance from residential properties.

4.3.24. The location of the Project Substation compound was also reviewed and relocated outside areas designated for mineral safeguarding following discussions with the Vale of

Glamorgan Council (hereafter 'the Council'). These changes resulted in a more constrained and environmentally responsive development envelope.

4.3.25. The remaining fields (and in some cases, sections of field) formed the basis of the potential areas for ground-mounted solar PV development.

Design Point 4: Refinement of Infrastructure and Compound Locations

4.3.26. As the layout evolved, further consideration was given to the siting of key infrastructure, including the Project Substation compound, Battery Energy Storage System (BESS) infrastructure and associated plant. The project substation, BESS, and associated infrastructure would be located within one compound measuring approximately 65 m in length and 65 m in width. To identify suitable locations for a compound of this size, the following design considerations have informed the site selection process:

- Proximity to residential properties and Public Rights of Way (PRoW): The compound should be located away from residential properties and PRoW to reduce any potential amenity effects (visual and noise);
- Proximity to public highway: The compound should be located close to the public B4267 (Lavernock Road) to facilitate access; and
- Explore opportunities for natural screening: Potential land parcels for accommodating the compound should be based on topography and screening from existing woodlands or tree belts that may help to reduce the landscape and visual impact of these elements.

4.3.27. Alternative infrastructure locations were evaluated against environmental, engineering and operational criteria, allowing the project team to identify preferred locations that balanced technical requirements with environmental considerations. Two areas within the Site were identified as suitable for the compound, both areas are located within a large field to the west of St Mary's Well Bay Road.

Design Point 5: Design Refinements Following Consultation and Assessment

4.3.28. A further design review was undertaken following receipt of the EIA Screening Opinion and Pre-Application Advice from the Council. The following changes were applied to the design:

- Removal of any infrastructure within the triangular field located adjacent to the B4267 Lavernock Road and St Mary's Well Bay Road;
- Increased the separation distance (up to 20 m) between the Wales Coastal Path and infrastructure in two fields located immediately to the east of The Bay Caravan Park; and
- Refined the located of the Project Substation compound. Following advice from the Council, the Project Substation compound was located outside areas designated for mineral safeguarding.

4.3.29. The revised design formed the basis of the Proposed Development presented as part of the EIA Scoping Report (see **Appendix 1B: Scoping Report**).

Design Point 6: Further Design Refinements Prior to Pre-Application Consultation

4.3.30. Further refinements to the Proposed Development were undertaken following the receipt of the Scoping Direction (see **Appendix 1C: Scoping Opinion**) and progression of the iterative Environmental Impact Assessment (EIA) process. These refinements were informed by ongoing consultation with stakeholders, technical design development, and the outcomes of surveys and assessments. The changes sought to optimise the Proposed Development while balancing technical, environmental and operational requirements.

4.3.31. The following amendments were incorporated into the design.

Site Access

4.3.32. A review of potential access arrangements was undertaken during the design process to identify the most suitable permanent access location for the Proposed Development. Three potential access points along St Mary's Well Bay Road were assessed, supported by swept path analysis and consideration of environmental, technical and highway constraints. Key factors considered included the ability to safely accommodate construction traffic, visibility and highway safety requirements, minimising vegetation removal (i.e. through the use of existing field accesses), minimising impacts on existing road, PRoW and other nearby receptors.

4.3.33. The review identified that the previously proposed access to the western parcel presented potential constraints due to its close proximity to The Bay Caravan Park and the Wales Coast Path, which had potential amenity and highway safety considerations. Alternative access options were therefore examined to determine whether these constraints could be addressed whilst maintaining safe and efficient site access and minimising environmental impacts.

4.3.34. Following the comparative assessment, a preferred access location was identified slightly further north along St Mary's Well Bay Road. This option was preferred due to the following factors:

- Utilises an existing field access gate, so would minimise vegetation removal, which would be limited to that necessary to achieve required visibility splays;
- Located further from the existing caravan site and avoids conflict with the Wales Coast Path; and
- Provides a safe and suitable access capable of accommodating construction and operational traffic. Whilst visibility is marginally reduced compared to the previously access point, the access remains acceptable and can be safely managed during construction through the implementation of appropriate mitigation measures (i.e. use of banksmen).

4.3.35. The Site access options and the preferred access point was subsequently discussed with the Vale of Glamorgan Council Highways Officer, whose feedback confirmed that the preferred option represented an acceptable approach.

Drainage Strategy:

4.3.36. An attenuation basin has been incorporated into the layout to manage surface water runoff associated within the impermeable area of the substation compound, following development of the drainage strategy (see **Appendix 11E: Flood Consequences Assessment and Outline Drainage Statement**).

Solar PV Layout Optimisation:

4.3.37. The solar PV layout was refined following the progression of engineering design and environmental assessment work. The layout was optimised to maximise capacity, whilst maintaining appropriate stand-off distances from hedgerows, trees, and watercourses identified through the EIA process.

Internal Access Tracks:

4.3.38. The layout incorporates an internal access track network designed to provide suitable access for the construction, operation and decommissioning of the Proposed Development, whilst minimising land take.

Landscape and Ecological Design:

4.3.39. The identification of areas for habitat creation and enhancement, including hedgerow reinforcement, new native planting and the creation of species-rich grassland areas. These measures have been incorporated into the design to support strengthening ecological connectivity, support landscape integration, and contribute towards the delivery of Net Biodiversity Benefit (NBB). In addition, since scoping, an area of land to the east of the main solar array has been included within the Site Boundary to facilitate ecological mitigation for skylark (see **Figure 5.1: Indicative Site Layout**). The landscape and ecology masterplan is detailed within **Appendix 6G: Outline Landscape and Ecology Management Plan** and further details on NBB are provided in **Appendix 7G: Net Benefit for Biodiversity Report.**

Permanent Diversion of Public Footpath L1/5/2

4.3.40. Public Footpath L1/5/2 currently passes through the eastern parcel of the Site. During the iterative design process, consideration was given to the interaction between the existing route and the Proposed Development, alongside opportunities to improve accessibility and connectivity for users of the local PRoW network.

4.3.41. As part of the design of the landscape masterplan and following discussions with the Local Planning Authority (LPA), a permanent diversion of Public Footpath L1/5/2 was developed as part of the Proposed Development. The existing alignment is constrained

by overgrown vegetation at the eastern boundary of the Site, which limits accessibility and reduces the usability of the route.

4.3.42. The proposed diversion has been designed to provide a more accessible, clearly defined and attractive route through the Site, whilst maintaining connectivity within the wider PRoW network. The alignment has been developed to integrate with the Proposed Development and associated landscape and ecological enhancement measures, as detailed within **Appendix 6G: Outline Landscape and Ecology Management Plan**.

Design Parameters

4.3.43. As the design process has progressed, the Proposed Development has continued to be refined in response to the findings of surveys and assessments, engineering design development, stakeholder consultation and an improved understanding of site-specific constraints and opportunities. This process has informed the refinement of the design parameters assessed within the ES since the submission of the Scoping Report, including:

- Reduction in the footprint of the Project Substation compound (from 65x65 m to 60x54m), reducing the overall land take associated with the Proposed Development;
- Reduction in maximum height of palisade fencing around the Project Substation compound (from 3 m to 2.75 m);
- Height of solar PV panels and mounting structures (from 4 m to 3.5 m AGL), reducing the visibility of the Proposed Development; and
- Increase in the number of transformer stations (from four to six) to reflect updates to the solar PV layout.

4.3.44. The design parameters that form the basis of the Environmental Impact Assessment are presented in **Chapter 5: Project Description**.

Summary

4.3.45. The Design Point 6 layout forms the Proposed Development assessed within this ES and is shown in **Figure 5.1**. The final design reflects the iterative process of refinement that has incorporated the above environmental and technical considerations.

4.3.46. The assessment of the likely significant environmental effects of the Proposed Development is presented within the technical chapters of this ES (see **Chapters 6** to **9**). The chapters also set out the mitigation measures that have been considered necessary to reduce the environmental effects of the Proposed Development that could not be avoided through the design.

Design Point 7: Final Design Updates following Pre-Application Consultation

4.3.47. Following the completion of the Pre-application Consultation (PAC) process, the Applicant will review all feedback received from consultees, stakeholders and local

communities in addition to the consideration of the EIA findings. Where appropriate and feasible, further refinements to the Proposed Development would be incorporated to address consultation responses, environmental considerations and technical requirements. The resulting Site Layout will be provided and assessed as part of the final ES.