

AFON DDAW SOLAR AND ENERGY STORAGE PROJECT

Request for Scoping Direction under Town and Country Planning
(Environmental Impact Assessment) (Wales) Regulations 2017

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REPORT

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Contents

1	INTRODUCTION	1
1.1	Introduction.....	1
1.2	Statutory Framework and Purpose of the Environmental Statement.....	1
2	THE SITE AND THE PROPOSED DEVELOPMENT	3
2.1	The Site and its surroundings	3
2.2	Project description.....	6
3	GENERAL APPROACH TO EIA	9
3.1	Information required	9
3.2	Structure of the Environmental Statement (ES).....	10
3.3	EIA Methodology	10
4	SCOPE OF ASSESSMENT	15
4.1	Work undertaken to date.....	15
4.2	Topics scoped out of assessment.....	15
4.3	Content of the Environmental Statement	28
5	ES CHAPTERS 1- 4.....	30
5.1	Introduction.....	30
5.2	Proposed Development Description	30
5.3	Need and Alternatives Considered	30
5.4	Environmental Assessment Methodology.....	30
6	LANDSCAPE AND VISUAL	31
6.1	Introduction.....	31
6.2	Legislative, policy context and guidance.....	31
6.3	Baseline information and study area	32
6.4	Proposed approach	35
6.5	References	36
7	ECOLOGY AND BIODIVERSITY	38
7.1	Introduction.....	38
7.2	Legislative, policy context and guidance.....	38
7.3	Baseline information and study area	41
7.4	Proposed approach	47
7.5	References	64
8	HISTORIC ENVIRONMENT	68
8.1	Introduction.....	68
8.2	Legislative, policy context and guidance.....	68
8.3	Baseline information and study area	68
8.4	Proposed approach	80
8.5	References	81
9	CLIMATE CHANGE	82
9.1	Introduction.....	82
9.2	Legislative, policy context and guidance.....	82
9.3	Baseline information and study area	83
9.4	Proposed approach	84
9.5	References	87
10	HYDROLOGY AND FLOOD RISK	89
10.1	Introduction.....	89
10.2	Legislative, policy context and guidance.....	89
10.3	Baseline information and study area	89

10.4	Data Sources.....	90
10.5	Assessment of effects.....	99
10.6	Embedded Mitigation	101
10.7	Mitigation Measures	102
10.8	Potential cumulative effects and inter-relationships.....	103
10.9	References	103
11	NOISE AND VIBRATION	1
11.1	Introduction.....	1
11.2	Legislative, policy context and guidance.....	1
11.3	Baseline information and study area.....	2
11.4	Proposed approach.....	2
11.5	References	5

Figures (in-text)

Figure 2.1 – Tracker Panel Elevation

Figure 2.2 – Static Panel Elevation

Figure 10.1 – Hydrology and Flood Risk Study Area

Figure 10.2 – Watercourses within the Hydrology and Flood Risk Study Area

Figure 10.3 – Development Advice Map

Figure 10.4 – NRW Flood Map for Planning 1/2

Figure 10.5 – NRW Flood Map for Planning 2/2

Figure 10.6 – Superficial Deposits

Figure 10.7 – Bedrock Geology

Figure 10.8 – SPZ Mapping

Figure 10.9 – Ground Water Body Catchments

Appendices

Appendix 1.1 – Indicative Proposed Site Location Plan

Appendix 6.1 – Landscape Figures

Appendix 6.2 – LVIA Methodology

1 INTRODUCTION

1.1 Introduction

- 1.1.1 This Scoping Report has been prepared by RPS on behalf of Lightsource Renewable UK Developments Ltd (here after referred to as Lightsource bp) in relation to the application for the proposed Afon Ddaw Solar and Energy Storage Project across approximately 10 sites between Junction 34 of the M4 and West Aberthaw in the Vale of Glamorgan, hereafter referred to as the 'Proposed Development'. An Indicative Proposed Site Location Plan is at Appendix 1.1.
- 1.1.2 Lightsource bp proposes to submit an application for development consent to the Planning and Environment Decisions Wales (PEDW). The application will be accompanied by an Environmental Statement (ES) prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017, as amended (the EIA Regulations), and other required documents.
- 1.1.3 This Scoping Report sets out the proposed content, methodologies and key issues to be included within the Environmental Impact Assessment (EIA) process and the resulting ES to be submitted with the application. The purpose of this document is to obtain a Scoping Opinion from PEDW (on behalf of the Welsh Ministers) and in doing so, this Scoping Report provides information for statutory consultees and the Welsh Ministers to agree the scope of the ES and what the Applicant intends to assess within the ES.

1.2 Statutory Framework and Purpose of the Environmental Statement

Statutory Framework

- 1.2.1 The indicative scale and size of the Proposed Development being greater than 10MW means the application will be classed as a Development of National Significance (DNS). The DNS Application is to be determined by the Welsh Ministers and submitted to PEDW who appoint an Inspector to examine the application and make a recommendation to the Welsh Ministers based on the planning merits, national priorities and the benefits the Proposed Development is likely to bring if approved. The Welsh Ministers then decide whether or not to grant permission.
- 1.2.2 As stated in PEDW's DNS Procedural Guidance document (2019), the statutory basis for the Development of National Significance ('DNS') process is provided by the Planning (Wales) Act 2015, which amends the Town and County Planning Act 1990 ('the Act'), and the Developments of National Significance (Wales) Regulations 2016 (as amended) and subsequent Regulations. The purpose of the DNS process is to ensure timely decisions are made on those planning applications that are of the greatest significance to Wales, because of their potential benefits and impacts.
- 1.2.3 As per the statutory requirements set out in the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017, referred to hereafter as the '2017 EIA Regulations', if significant environmental effects are likely to arise from implementation of a proposed development, then an EIA is required to be submitted along with the application. The Proposed Development falls under Section (3) 'Energy Industry' (a) 'Industrial installations for the production of electricity, steam and hot water (unless included in Schedule 1) of Schedule 2. As the Proposed Development exceeds the area threshold of 0.5 ha listed within Column 2 of Schedule 2 (3) (a) and based on current available information, the applicant has elected to carry out an EIA and an Environmental Statement (ES) will be submitted in support of the planning application.

Purpose of EIA

- 1.2.4 EIA is the process of identifying and assessing the significance of effects likely to arise from a proposed development. This requires consideration of the likely changes to the environment, where

these arise as a consequence of the Proposed Development, through comparison with the existing and likely future baseline conditions in the absence of the Proposed Development.

Purpose of scoping

- 1.2.5 The process of identifying the matters to consider within an ES (establishing the scope of the assessment) is known as scoping. Scoping is not a mandatory requirement under the EIA Regulations. However, it is recognised that through the scoping exercise, the key environmental matters are identified at an early stage, which permits subsequent work to concentrate on those environmental topics for which significant effects may arise as a result of a proposed development.

Purpose of this scoping report

- 1.2.6 This document sets out details of the Proposed Development, the proposed EIA methodology and the proposed scope of technical assessments and invites comments from Welsh Ministers and its consultees regarding the scope of works. The intention of this scoping exercise is to gain agreement from all key parties regarding the proposed methodology and scope of assessment.
- 1.2.7 This Scoping Report has been informed by the following:
- Desk-top studies, site visits and surveys;
 - Review of relevant websites, such as those provided by statutory consultees;
 - Local planning policy, Planning Policy Wales and Technical Advice Notes;
 - The EIA Regulations and EIA good practice guidance; and
 - Experience of other similar developments.

The applicant

- 1.2.8 The Applicant, Lightsource bp, is a leading developer of solar and battery energy storage projects. Headquartered in the UK, Lightsource bp has been developing solar projects in the UK for over a decade, providing renewable, sustainable energy to businesses and communities across the country.
- 1.2.9 Lightsource were established in 2010 and have developed significant expertise in the UK renewable energy sector. In 2017 Lightsource joined forces with bp and rebranded to become Lightsource bp.

Public consultation

- 1.2.10 An important part of the applicant's planning process is engaging with local communities to provide information on the project and gather local feedback. Lightsource bp work with various stakeholders and seek to benefit the local community via their solar projects – not just by generating sustainable electricity, but by supporting the local ecosystem as well.
- 1.2.11 As part of the consultation process, the applicant will engage with the local community in order to inform local people about the proposals, to explain the development and its likely effects and to take on board any concerns or issues. The ES will include a summary of the pre-application public consultation carried out.

2 THE SITE AND THE PROPOSED DEVELOPMENT

2.1 The Site and its surroundings

- 2.1.1 The majority of the Proposed Development lies within the administrative boundary of Vale of Glamorgan Council with a small portion to the north of the Site falling within the administrative boundary of Rhondda Cynon Taf Borough Council.
- 2.1.2 The Proposed Development comprises ten discrete areas. Nine of the proposed areas lie between Junction 34 of the M4 and St Athan in the Vale of Glamorgan and are allocated for the provision of solar panels and associated ancillary development (referred to hereafter as 'PV Areas'). The remaining Site comprises the proposed Battery Energy Storage System ('BESS') facility with ancillary equipment and associated cables, located to the north of the Aberthaw Power Station.
- 2.1.3 The Site also includes an indicative cable route corridor within which cables will be laid to connect each PV area to the point of connection at Aberthaw 275kV Substation. For the purposes of this EIA Scoping Direction request, a broad corridor has been identified within which the cables will be located. It is important to note that development in these corridors will only comprise the laying of single cable route alignments, however, a broad area is identified to allow flexibility at this point in time when those alignments are not yet confirmed. At the point of preparing the EIA, cable route alignments will be identified for assessment.
- 2.1.4 Please see drawing GBR_Afon Ddaw_AD - SLP_02 which shows the Site location and red line boundary. The Site area extends to approximately 526ha in total.

PV Area 1

- 2.1.5 PV Area 1 is located approximately 5km north of the point of connection at the Aberthaw 275kV Substation. The area encompasses numerous irregularly shaped land parcels comprising agricultural fields.
- 2.1.6 The majority of PV Area 1 comprises three land parcels – one approximately 420m south of St Hilary, one just south-east of St Mary Church and one to the north-east of Treguff. Two smaller parcels make up the remainder of PV Area 1 and lie fairly centrally between the aforementioned parcels. Overall, PV Area 1 makes up approximately 167ha of land within the red line boundary.
- 2.1.7 River Thaw runs along the northern boundary of the eastern land parcel, running in a southerly direction. An unnamed tributary of the River Thaw runs in a southwest direction and bisects the eastern land parcels.
- 2.1.8 The vast majority of field boundaries benefit from extensive existing hedgerows. An existing solar development of approximately 9ha lies south of PV Area 1.

PV Area 2

- 2.1.9 PV Area 2 lies just north of the A48 at Pant Wilkin Farm approximately 1.5km south-east of Aberthaw and 0.8km north-east of St Hilary. It comprises two parcels which are connected via an unnamed road extending approximately 340m. PV Area 2 makes up approximately 35ha of land within the red line boundary.
- 2.1.10 The northern parcel is predominantly bound by agricultural fields to the east and west with farm buildings and holiday lets adjoining a small portion of the southern and northern boundaries. The southern parcel is bound by agricultural fields to the north, east and west with the A48 flanking the southern boundary. There is sporadic planting to the south of PV Area 2 and the Nant Aberthaw River bisects the two parcels.

PV Area 3

- 2.1.11 PV Area 3 is located approximately 0.5km north-east of Cowbridge and 0.8km south-west of the smaller Trerhyngyll. The area is made up of numerous contiguous agricultural fields forming a singular parcel that extends to approximately 63ha in total. The PV Area is bound by an unnamed road to the north and agricultural fields to the east, south and west. An unnamed river and tributaries run through the PV Area and along west border.
- 2.1.12 Extensive existing hedgerows are present along the vast majority of the PV Area boundary. In addition, numerous existing tree and hedgerow belts intersect the parcel. A cluster of sporadically located farm buildings lie north and north-east of the PV Area between the northern boundary and the village of Trerhyngyll.

PV Area 4

- 2.1.13 PV Area 4 is located directly north of Welsh St Donats which adjoins the PV Area at its southernmost point. The PV Area is located 0.5km south of Ystradowen, and 0.2 and 0.5km east of Prisk and Maendy, respectively. The area comprises numerous contiguous agricultural fields that extend to approximately 76ha. Several agricultural buildings are located sporadically within 1km of the red line boundary.
- 2.1.14 The PV Area is predominantly bound by agricultural fields with the notable exception of Hensol Woods to the east. An area of Ancient Woodland is located within the red line boundary of this parcel towards the central southern area, though this will be excluded from development. Further areas of Ancient Woodland are located immediately to the north-east. An unnamed road dissects the PV Area from the south to the north and flanks the north-eastern edge between the PV Area and Hensol Woods. A watercourse also crosses the PV Area.

PV Area 5

- 2.1.15 PV Area 5 comprises of two parcels each made up of adjoining agricultural fields. At its most westerly point, the PV Area is approximately 1km west of Clawdd Coch and adjoins the Vale Resort to the north-east. The area also comprises two smaller parcels (0.2ha and 0.1ha) situated between the larger parcels. Overall, PV Area 5 extends to approximately 48ha.
- 2.1.16 The PV Area is notably surrounded by large areas of Ancient Woodland to the north-east, east and south-west of the larger parcel, some of which falls within the red line boundary, though will be excluded from development. The remainder of the boundary is predominantly adjoined by agricultural land and roads. The PV Area also benefits from sporadic existing hedgerows along its boundaries and intersecting the parcel.

PV Area 6

- 2.1.17 PV Area 6 is located approximately 0.7km north-east of PV Area 5 and adjoins the eastern side of the Vale Resort. Hensol lake lies approximately 450m to the north-west. A comparatively small parcel comprising adjoining agricultural fields, PV Area 6 extends to approximately 24ha. The PV Area is bound by the Vale Resort to the south and roads to the north, east and west. Areas of woodland lie beyond the road to the east and west with agricultural land to the north. A small area of woodland lies in the central southern area of the parcel.

PV Area 7

- 2.1.18 PV Area is located approximately 165m north-west of PV Area 5 at its closest point and comprises an irregularly shaped parcel of land made up of adjoining fields and extends to approximately 25ha. The PV Area is bound by agricultural fields and Ancient Woodland along all boundaries with pockets of Ancient Woodland falling within the red line boundary, predominantly towards the north. Areas of Ancient Woodland would be excluded from development. The PV Area benefits from existing planting along its boundaries. The Nant Dyfrgi River runs along the western boundary.
- 2.1.19 The village of Talygarn is located 475m from the PV Area at its most northerly point with the M4 situated further north. The registered park and gardens of Talygarn are located adjacent to the

boundary to the north-west. The western boundary approximately follows the administrative boundary between Rhondda Cynon Taf and the Vale of Glamorgan.

PV Area 8

- 2.1.20 PV Area 8 is a singular parcel comprising adjoining agricultural fields located 0.7km south-west of the M4 beyond which lies Llanharry within the administrative boundary of Rhondda Cynon Taf County Borough Council. The parcel extends to approximately 23ha.
- 2.1.21 The PV Area adjoins Ruthin Quarry to the north and Cowbridge Road to the south-west with the latter benefitting from sporadic planting. Areas of Ancient Woodland are located along the Site boundaries to the north-east and west, though will be excluded from development. Agricultural buildings lie beyond Cowbridge road at the southernmost point of the PV Area and adjacent to the eastern boundary. A small watercourse lies to the south of the PV Area.

PV Area 9

- 2.1.22 PV Area 9 is the most northerly PV Area and is located within the administrative boundaries of both the Vale of Glamorgan Council and Rhondda Cynon Taf County Borough Council. The PV Area is comprised of one roughly triangular shaped parcel of agricultural land which lies directly south of Degar Farm and the M4 corridor, beyond which lies Llanharry. The area extends to approximately 27ha.
- 2.1.23 The PV Area is bound by Degar Road to the north and agricultural fields to the west. There is a small area of Ancient Woodland located on the eastern boundary – beyond this, Addison Avenue in Llanharry crosses the M4 southward and follows the eastern boundary of the PV Area. Numerous single dwellings adjoin the PV Area at its southernmost point, beyond which lie further agricultural fields. Planting along the Site boundary is sporadic.

BESS Area

- 2.1.24 The BESS Area comprises two irregularly shaped land parcels which together extend to approximately 13ha. While approximately 40% of the BESS Area boundary is bordered by agricultural land parcels, the character of the local landscape is dominated by the Site's proximity to Aberthaw Power station and the existing solar development which adjoin the BESS Area to the south and the north, respectively.
- 2.1.25 The village of West Aberthaw is located between the two BESS Areas which are separated by approximately 150m. The village of Gileston lies adjacent to the BESS Area to the west. The BESS Area is flanked by Loverose Way to the east and south of the eastern parcel which connects to the B4265 approximately 600m north of the BESS Area. Both parcels benefit from extensive existing hedgerow planting along the field boundaries.

Cable route

- 2.1.26 At this stage, there are three easement options being considered to accommodate the cable route:
- Option 1: entirely soft dig via third-party easements.
 - Option 2: a combination of easements on third-party land and installation in the highway under Section 50 of the New Roads and Street Works Act 1991.
 - Option 3: entirely installed in the highway under Section 50 of the New Roads and Street Works Act 1991.
- 2.1.27 At this stage, those alignments are indicatively identified, but not yet confirmed. For the purposes of this EIA Scoping Direction request, a broad area has been identified within which the final alignments will route. The alignment of these cable routes will be identified ahead of the completion of the EIA.

The purpose of identifying a broad area at the EIA Scoping Stage is to ensure that all land within which the alignments may possible route has been considered.

- 2.1.28 The possible connection routes are outlined accordingly on GBR_Afon Ddaw_AD - SLP_02. It is the Applicant's intention that one of the above options will be confirmed prior to undertaking the EIA.

2.2 Project description

- 2.2.1 Lightsource bp proposes to develop a solar photovoltaic electricity generating station ('solar farm') and associated ancillary development, with an installed generation capacity of up to 249 MW across 9 PV Areas together with a battery energy storage system ('BESS'), ancillary equipment and associated cables with an export capacity of 249 MW.

- 2.2.2 The point of connection will be at the existing National Grid 275kV Substation located near the Aberthaw Power Station. A customer substation is proposed within the BESS Area to be connected to the National Grid Substation by a 275kV underground cable. 132kV cabling is proposed from this customer substation to another customer substation to be located at PV Area 1. It is proposed that all remaining PV Areas are to be served by 33kV cabling.

- 2.2.3 The power generated by the 9 PV Areas would be enough to power approximately 96,700 typical family homes and result in an approximate saving of 49,600 tonnes of CO2 per annum – the equivalent of removing 34,200 cars from the road.

- 2.2.4 The main components of a solar farm are:

- Solar panels and mounting structures
- Inverters
- Transformers
- Cabling
- Medium voltage switchgear
- Containerised control rooms

- 2.2.5 The main components of a BESS facility are:

- Battery storage units
- Battery interface cabinets
- Medium voltage stations and control rooms
- Intake substation

- 2.2.6 The main components of the High Voltage 400/132kV and 132/33kV Substations are:

- Transformers
- Switchgear
- Control Buildings
- Cabling

- 2.2.7 During construction and decommissioning temporary site compounds will be required to host staff facilities, take deliveries of components and store plant and equipment securely while not in use.

- 2.2.8 Lightsource bp is currently considering two panel type options for the Site:

- Rotating 'tracker' mounting structures hosting panels up to 3m tall (**Figure 2.1**)

- The traditional static south facing fixed tilt structures hosting panels up to 3.2m tall (**Figure 2.2**);

Figure 2.1. Tracker Panel Elevation

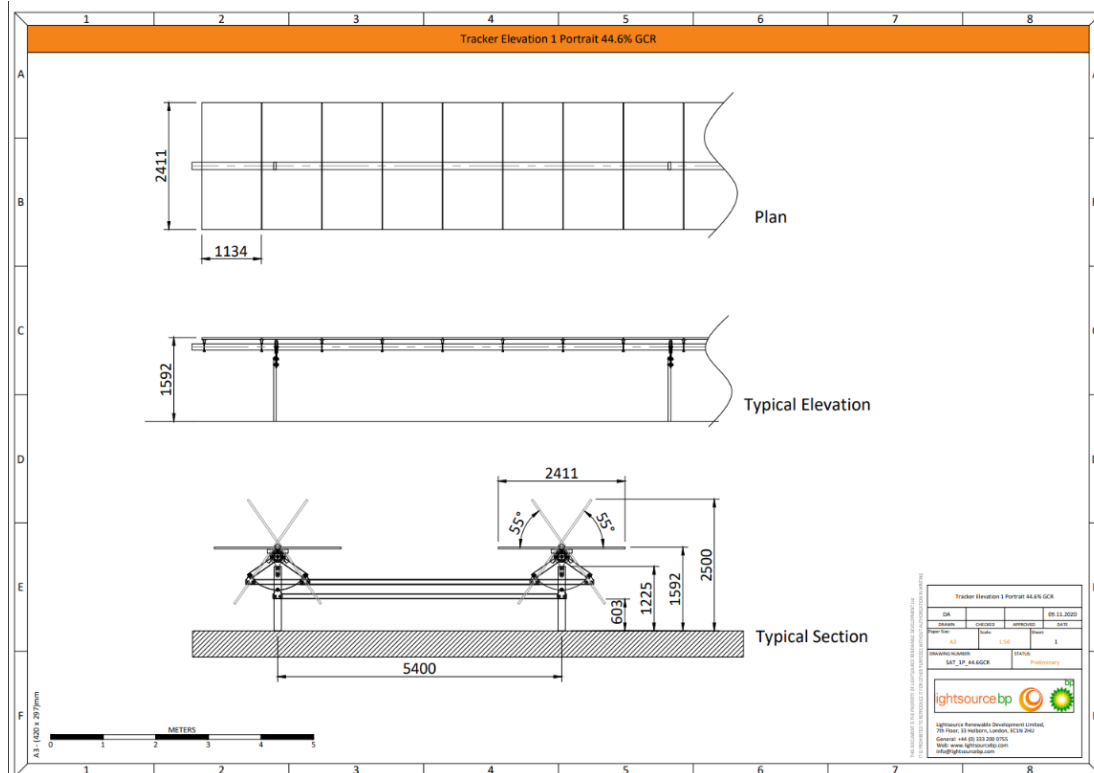
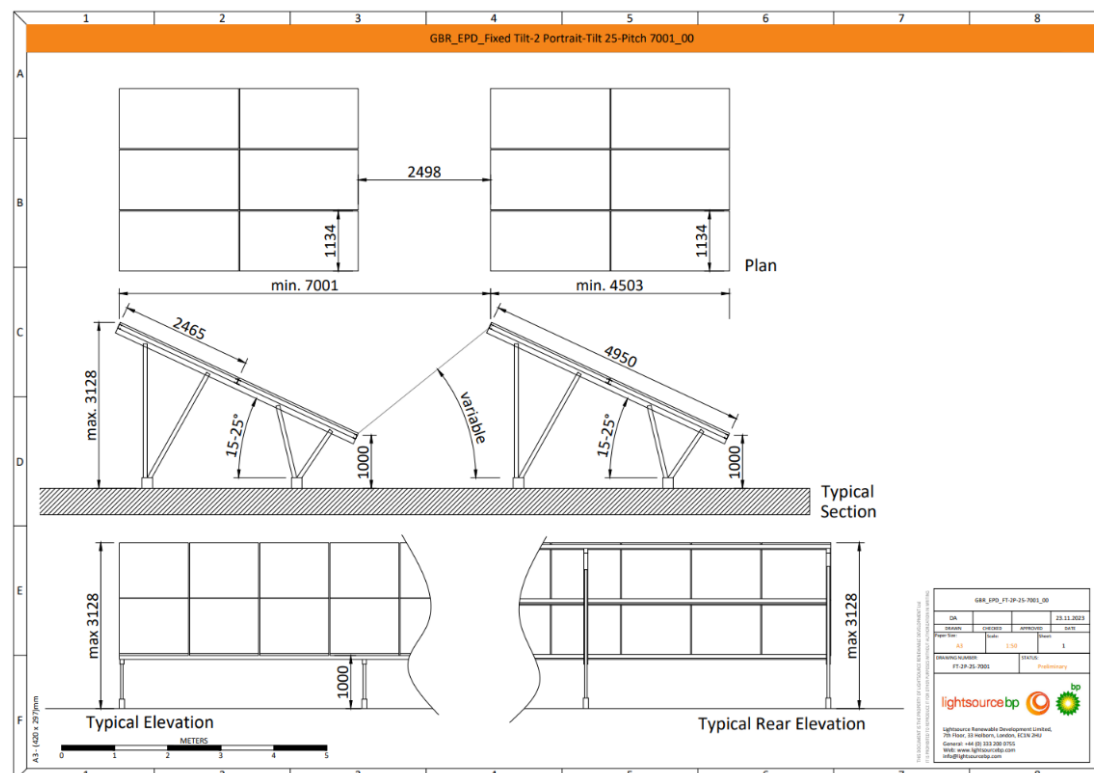


Figure 2.2 – Static Panel Elevation



2.2.9 In terms of the traditional static option, the solar panels have a ground coverage ratio (GCR) of between 40% and 70% of the land which they occupy, typically, and are arranged in series of rows

up to a height of 3.2m at the highest point and tilted southwards at an angle of 10-25 degrees. The support frame uprights are pile driven into the ground; 'string' inverters are usually mounted onto the support structures while some excavation is required for the transformers' foundations.

- 2.2.10 The 'tracker' option would be ground mounted to a piled structures made of galvanized steel or aluminium and would have a maximum height of up to 3m depending on the position of the tracker and lower edge height of 0.5 - 0.8m. The main difference between the two types of structures is that the trackers rotate very slowly and are orientated east-west. The solar panels would utilise a single axis tracking system and bifacial panels that increases continuous electrical productivity. The panels have an anti-reflective coating to ensure maximum absorption of solar radiation and reduction of reflections. The trackers are turned by small electric motors located on the panel arrays.
- 2.2.11 The majority of the cabling associated with the Proposed Development will be laid underground via surface dug trenches of approximately 1 m deep and 50cm wide and backfilled. Where surface dug trenches are not possible or practical or would have an unacceptable environmental effect, horizontal directional drilling (HDD) will be utilised, e.g. beneath hedgerows, watercourses, woodland and highways if required.
- 2.2.12 Construction is expected to take approximately 2 years while decommissioning will take up to 1 year. It is unlikely that all PV and BESS Areas would be constructed at the exact same time, and it is likely that a staged approach to construction would be adopted.
- 2.2.13 A solar farm is a temporary and fully reversible use, unlike housing for example, with all equipment removed from site at the end of the installation's operational life (approximately 40 years). The methods used in construction (limited concrete) mean that remediation works following the removal of the panels and associated infrastructure are relatively minor and will return the Site to its previous greenfield character.
- 2.2.14 The solar farm will be designed to accommodate sheep grazing beneath and between the rows of panels, providing an efficient dual use of land for renewable energy generation and agriculture. The solar farm will be enclosed by 2m tall post and wire 'deer' fencing with 3m tall security cameras in selected locations. There will be security fencing around the BESS compound which will function to restrict unauthorised access into the compound and to deter theft or vandalism. Fencing is typically welded mesh up to approximately 2.5m high with metal posts.

3 GENERAL APPROACH TO EIA

3.1 Information required

3.1.1 Although there is no statutory provision as to the form of an ES, it must contain the information specified in Regulation 17(3), including any relevant information specified in Schedule 4 of the EIA Regulations, as set out below:

1. A description of the development including in particular:
 - a. A description of the location of the development;
 - b. A description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
 - c. A description of the main characteristics and the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the minerals and natural resources (including water, land, soil and biodiversity) used;
 - d. An estimate, by type and quantity, of expected residues and emissions (such as water, air, soils and sub soil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.
2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development; population, human health, biodiversity (for example fauna and flora), land, (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including archaeological aspects, and landscape.
5. A description of the likely significant effects of the development on the environment resulting from, inter alia:
 - a. The construction and existence of the development, including, where relevant, demolition works;
 - b. The use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - c. The emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
 - d. The risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
 - e. The cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
 - f. The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
 - g. The technologies and the substances used.

3.1.2 The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.

1. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
2. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.
3. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
4. A non-technical summary of the information provided.
5. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.

3.1.3 The information supplied in the ES will provide a clear understanding of the likely significant effects of the project upon the environment. The following sections outline the overall approach to EIA in order to meet these legal requirements.

3.2 Structure of the Environmental Statement (ES)

3.2.1 The ES will be structured logically, enabling all relevant environmental information to be found quickly and easily. The ES will describe the EIA process and its findings, and will include the following sections:

- Non-Technical Summary (as a standalone document)
- Written Statement (ES Volume 1)
- Figures (ES Volume 2)
- Appendices (ES Volume 3)

3.3 EIA Methodology

Relevant EIA guidance

3.3.1 The EIA process will take into account relevant government or institute guidance, including:

- Welsh Office Circular 11/99: Environmental Impact Assessment
- Highways Agency et al. (2008) Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5. HA 205/08
- Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment
- Institute of Environmental Management and Assessment (2011) The State of Environmental Impact Assessment Practice in the UK. Special Report

- Institute of Environmental Management and Assessment (2015a) Environmental Impact Assessment: Guide to Shaping Quality Development
- Institute of Environmental Management and Assessment (2015b) Climate Change Resilience and Adaptation
- Institute of Environmental Management and Assessment (2016) Environmental Impact Assessment: Guide to Delivering Quality Development
- Institute of Environmental Management and Assessment (2017) Environmental Impact Assessment: Assessing Greenhouse Gas Emissions and Evaluating their Significance
- Institute of Environmental Management and Assessment (2017) Health in Environmental Impact Assessment: A Primer for a Proportional Approach.

3.3.2 Other topic-specific specialist methodologies and good practice guidelines will be drawn upon as necessary and have been stated in topic sections.

Key elements of the general approach

3.3.3 The assessment of each environmental topic will form a separate chapter of the ES. For each environmental topic, the following will be addressed:

- Methodology and assessment criteria
- Description of the environmental baseline (existing conditions)
- Identification of likely effects
- Evaluation and assessment of the significance of identified effects, taking into account any measures designed to reduce or avoid environmental effects which form part of the project and to which the developer is committed
- Identification of any further mitigation measures envisaged to avoid, reduce and, if possible, remedy adverse effects (in addition to those measures that form part of the project)

Methodology and assessment criteria

3.3.4 Each topic chapter will provide details of the methodology for baseline data collection and the approach to the assessment of effects. Details of the proposed approach for each topic chapter are provided in Sections 5 – 11 of this Scoping Report. Each identified environmental topic will be considered by a specialist in that area. The identification and evaluation of effects will consider relevant topic-specific guidance where available.

Description of the environmental baseline

3.3.5 The existing and likely future environmental conditions in the absence of the project are known as 'baseline conditions'. Each topic-based chapter will include a description of the current (baseline) environmental conditions. The baseline conditions at the Site and within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.

3.3.6 The baseline for the assessment of environmental effects will primarily be drawn from existing conditions during the main period of the EIA work. Consideration will also be given to any likely changes between the time of survey and the future baseline for the construction and operation of the project. In some cases, these changes may include the construction or operation of other planned developments in the area. Where such developments are built and operational at the time of writing and data collection, these will be considered to form part of the baseline environment. Where sufficient and robust information is available, such as expected traffic growth figures, other

future developments will be considered as part of the future baseline conditions. In all other cases, planned future developments will be considered within the assessment of cumulative effects.

- 3.3.7 The consideration of future baseline conditions will also take into account the likely effects of climate change, as far as these are known at the time of writing. This will be based on information available from the UK Climate Projections project (UKCP18), which provides information on plausible changes in climate for the UK (Environment Agency and Met Office, 2018) and on published documents such as the UK Climate Change Risk Assessment 2017 (Committee on Climate Change, 2016).

Assessment of effects

- 3.3.8 The EIA Regulations require the identification of the likely significant environmental effects of the project. Each topic chapter will take into account both the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of the effect.

Sensitivity and importance of receptors

- 3.3.9 Receptors are defined as the physical resource or user group that would be affected by a Proposed Development. The baseline studies will identify potential environmental receptors for each topic and will evaluate their sensitivity to the Proposed Development. The sensitivity or importance of a receptor may depend, for example, on its frequency or extent of occurrence at an international, national, regional or local level.

Magnitude of impact

- 3.3.10 Impacts are defined as the physical changes to the environment attributable to the project. For each topic, the likely environmental impacts will be identified. The magnitude of the impact will be described using defined criteria within each topic chapter.
- 3.3.11 The categorisation of the impact magnitude may take into account the following four factors:
- Extent
 - Duration
 - Frequency
 - Reversibility
- 3.3.12 Impacts will be defined as either adverse or beneficial. Depending on discipline, they may also be described as:
- Direct: arising from activities associated with the project. These tend to be either spatially or temporally concurrent.
 - Indirect: impacts on the environment which are not a direct result of the project, often produced away from the project site or as a result of a complex pathway.
- 3.3.13 Impacts will be divided into those occurring during the construction phase and those occurring during operation. Where appropriate, some chapters may refer to these as temporary and permanent impacts.

Significance of effects

- 3.3.14 Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact to the sensitivity of the receptor or resource.

- 3.3.15 The magnitude of an impact does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.
- 3.3.16 Levels of significance that will be used in the assessment include, in descending order:
- Substantial
 - Major
 - Moderate
 - Minor
 - Neutral
- 3.3.17 Where an effect is described as 'neutral' this means that there is either no effect or that the significance of any effect is considered to be negligible. All other levels of significance will apply to both adverse and beneficial effects. These significance levels will be defined separately for each topic within the methodology sections.
- 3.3.18 In all cases, the judgement made as to significance will be that of the author of the relevant chapter with reference to appropriate standards/guidelines where relevant.

Cumulative effects

- 3.3.19 The cumulative effects of the Proposed Development in conjunction with other proposed schemes will be considered. The cumulative effects assessment will consider any developments that are formally in the planning system at the time of submission. Developments that are built and operational at the time of assessment will be considered as part of the baseline.
- 3.3.20 It is proposed that the ES will consider the following cumulative schemes:
- Brynwell Farm Renewable Energy Hub (DNS/3261558)
 - Parc Dyffryn Solar Farm (DNS/3267575)
 - Oaklands Solar Farm and BESS (DNS/3245503)
 - Parc Worlton Solar Farm (DNS/CAS-02112-T2N0G8)
 - Land at Pen-Onn Solar Farm (DNS/3273713)
 - East Aberthaw Solar Farm (DNS CAS-01391-M3G6Q9)
 - Land at Moulton Solar Development (2020/00708/SC1)
 - Land at Port Road, Rhose (Vale of Glamorgan Replacement Local Development Plan Candidate Site 361) for circa 3ha for 'other uses'
- 3.3.21 The applicant intends to submit a pre-application advice request in parallel with this EIA Scoping Direction request. Accordingly, the cumulative schemes to be considered in the ES will be agreed with the Vale of Glamorgan Council prior to this list being finalised.

Mitigation measures

- 3.3.22 The EIA Regulations require that where significant effects are identified 'a description of any features of the Proposed Development, or measures envisaged in order to avoid, prevent or reduce or, if possible, offset likely significant adverse effects on the environment' should be included in the ES.

- 3.3.23 The development of mitigation measures is part of an iterative EIA process. Therefore, measures will be developed throughout the EIA process in response to the findings of initial assessments. The project that forms the subject of the planning application will include a range of measures designed to reduce or prevent significant adverse environmental effects arising, where practicable. In some cases, these measures may result in enhancement of environmental conditions. The assessment of effects will therefore take into account all measures that form part of the project and to which Lightsource bp are committed.
- 3.3.24 The topic chapters will therefore take into account all measures that form part of the Proposed Development, including:
- Measures included as part of the project design (sometimes referred to as primary mitigation).
 - Measures to be adopted during construction to avoid and minimise environmental effects, such as pollution control measures. These measures would be implemented through the Construction Environmental Management Plan (CEMP).
 - Measures required as a result of legislative requirements.
- 3.3.25 Where required, further mitigation measures will be identified within topic chapters. These are measures that could further prevent, reduce and, where possible, offset any residual adverse effects on the environment.
- 3.3.26 In some cases, monitoring measures may be appropriate, for example, to ensure that proposed planting becomes established. Where appropriate, monitoring measures will be set out.

Summary tables

- 3.3.27 Tables will be used to summarise the effects of the project for each environmental topic.

4 SCOPE OF ASSESSMENT

4.1 Work undertaken to date

- 4.1.1 The following studies have been undertaken or are currently ongoing in relation to the Proposed Development.
- 4.1.2 Topographical surveys of PV Areas 1 – 9 and the BESS Area are ongoing and are expected to be completed by the end of 2024. The results of the topographical surveys will inform the design of the Proposed Development.
- 4.1.3 A walkover and arboricultural appraisal (BS5837:2012 standard) was completed between August and September 2024. Whilst a detailed Tree Survey and Arboricultural Impact Assessment will be undertaken once the design of the Proposed Development is confirmed, the walkover has been undertaken to inform the design of the Proposed Development in order to avoid existing trees as far as possible in siting the solar PV panels, BESS units and associated infrastructure.
- 4.1.4 Extended UK Habitat Classification surveys have been undertaken for the entire Site. The survey included habitats onsite and immediately adjacent habitats where access was possible. As part of the 'extended' habitat survey, where access was possible, the red line boundary and 30 m adjacent to the red line boundary was also searched for evidence of badger. Breeding and wintering bird surveys are currently being undertaken across the Site. Further detail is provided at Section 7.
- 4.1.5 An initial baseline sound survey was completed in August 2024 at the BESS Area in order to confirm the likely design requirements to ensure that the Proposed Development is designed to emit acceptable noise levels. Further information is included at Section 11 below.
- 4.1.6 Agricultural Land Classification (ALC) Surveys have been commissioned to target areas of the Site which are identified as Best and Most Versatile (BMV) agricultural land according to the Welsh Government predictive viewer. The methodology for undertaking these surveys has been agreed with the Welsh Government Land Quality Advice Service (LQAS) and the surveys are ongoing.

4.2 Topics scoped out of assessment

- 4.2.1 Taking into account the findings of the above studies, together with our knowledge of the Site and surrounding area, it is proposed that the following topics are not included in the scope of the ES:
- Planning policy context
 - Population
 - Transport
 - Human Health
 - Land (for example land take)
 - Soil (for example organic matter, erosion, compaction, sealing)
 - Air
 - Material Assets
 - Ground Conditions
 - Risk of Major Accidents
 - Arboriculture

Population and Human Health

- 4.2.2 The construction phase will have a temporary effect on employment provision through the creation of construction jobs. This is unlikely, however, to result in a significant change in population as workers are unlikely to relocate to an area on a permanent basis. Therefore, a minor beneficial effect is therefore anticipated for a temporary period. This would not be significant in EIA terms.
- 4.2.3 The direct human health effects of the Proposed Development are limited, the Proposed Development will displace primary fossil fuel derived electricity, and the consequent Greenhouse Gases and other pollutants released during fossil fuel combustion and would result in a beneficial effect on human health. This would not be significant in EIA terms.
- 4.2.4 Population and human health are therefore proposed to be scoped out of the ES.

Transport

- 4.2.5 Once operational, the solar farm will be operated remotely and only require between 10-20 visits per year for maintenance, monitoring and cleaning of the panels and Site. The vehicle movements associated with the occasional visits to the Site would have a negligible influence on the surrounding population and highway network. This would not be significant in EIA terms.
- 4.2.6 Impacts associated with construction traffic are expected to be of a short duration and temporary in nature. Though construction is estimated to take no longer than 2 years, works would not be ongoing on all parcels at the same time and as construction on each parcel is completed, those works would then move onto another parcel. Thus, the road deliveries to the Site would be spread across the highway network over the 2-year period rather than being continuous at each parcel over the period.
- 4.2.7 The Site has good links to the strategic and the principal road network; in particular, the M4 routes east to west to the north of the Site. The A4232, the A473, the A48, the A4050 and the A4226 all form part of the principal road network providing key distributor routes for travel to / from the M4 and are all accessible from the Site. Large numbers of HGV movements already route along these routes (the M4, the A4232, the A473, the A48, the A4050 and the A4226) on a daily basis and they are predicted to form the key routes to access the Site.
- 4.2.8 The local roads between these key routes and each parcel generally provide access to a small number of residential properties, farms and agricultural fields, thus there are already large vehicles routing along them. Residential properties along these local routes are generally set back from the highway with screening formed by the hedgerow which typically lines both sides of the carriageway and there are few sensitive receptors.
- 4.2.9 Access will therefore be focussed along the key routes of the M4, the A4232, the A473, the A48, the A4050 and the A4226, along which there are already large numbers of HGV movements, and the use of local roads would be limited to the construction of each individual parcel to which it accesses. Such access along those local roads would not be over the whole 2-year construction period, but only limited to small number of months, after which the works would then move onto another parcel.

- 4.2.10 An access strategy will be prepared as part of a Transport Assessment that will be included as an appendix to the ES. The access strategy and Transport Assessment will assess the highway geometries and layouts of the access routes along with their existing traffic volumes and road safety records and will determine any traffic management and mitigation measures that may be required such that the construction vehicles would not result in any material impacts upon road users, the operation of the highway and highway safety. Construction impacts, whilst considered unlikely to result in significant effects, will be assessed through the production of a Transport Assessment which will be included as an appendix to the ES.
- 4.2.11 The Transport Assessment will make recommendations for appropriate construction traffic management and mitigation measures to be implemented. These traffic management and mitigation measures will be set out and secured within an Outline Construction Traffic Management Plan (CTMP) which will be prepared and submitted as an Appendix to the ES. A detailed CTMP detailing the delivery routes, construction routes, construction compounds and any associated parking or management of construction traffic will be prepared prior to the construction of the Proposed Development. It is also proposed that details of the operational traffic movements and any onsite parking and turning spaces will be provided as part of the planning application.
- 4.2.12 It is considered that transport, both construction and operational can be scoped out of the ES and adequately addressed through the submission of separate standalone technical reports which will accompany the planning application.

Land (for example land take)

- 4.2.13 The Site comprises agricultural land which will be developed for the production of renewable energy. The Site will be designed to be capable of enabling sheep grazing during its operational life, and therefore it is anticipated that energy and agriculture will remain in a co-use across the Site. The Proposed Development is fully reversible and the agricultural potential of the Site can be fully restored following decommissioning. Soil is dealt with as a separate matter below.
- 4.2.14 The Site is also within an identified Mineral Resource Area, comprising predominantly Sandstone, Sand and Gravel (1 and 2) and Limestone (1 and 2) as per the VoG Minerals Safeguarding Area Maps (Minerals Safeguarding SPG, 2018). However, these areas are recorded to extend significantly beyond the Site boundary and the proposed use is temporary, and therefore sterilisation of minerals is not considered a significant impact. Notwithstanding, a Minerals Resource Assessment will be prepared in order to assess the impact of the Proposed Development on existing resources and will be submitted as an appendix to the ES.
- 4.2.15 Overall, the land will not be irreversibly developed and will remain in agricultural use as grazing of sheep will be possible whilst the solar arrays are in place and as such no likely significant lasting adverse effects on the quality of the land is expected.
- 4.2.16 Land is therefore proposed to be scoped out of the ES.

Soil (for example organic matter, erosion, compaction, sealing)

- 4.2.17 As set out above, the Proposed Development is temporary in nature and fully reversible. In order to identify the distribution of ALC grades across the Site, detailed surveys are underway for land which is identified as BMV agricultural land according to the Welsh Government predictive viewer. The methodology for these surveys has been agreed with the Welsh Government LQAS.
- 4.2.18 Appropriate construction, operation and decommissioning techniques will be implemented to reduce above and below ground works and to minimise any compaction of soil mitigating any potential impact on the soils structure and ability to infiltrate water. An Outline Soil Resource Management Plan will be prepared to be submitted with the planning application to detail soil management measures to be implemented during each phase such that the agricultural land is maintained with no likely significant lasting adverse effects on the quality of the soil.

- 4.2.19 The Outline Soil Resource Management Plan will include measures to control soil storage, maintenance of infrastructure, soil stripping, bund management, movement of soils, retaining soils, timing, determining soil suitability, avoiding compaction and ameliorating compaction. It is anticipated that through implementation of measures to be detailed within the Outline Soil Resource Management Plan that there will be no significant effects on soil.
- 4.2.20 Soil is therefore proposed to be scoped out of the ES.

Air

- 4.2.21 During the construction period, good practice dust control measures, as recommended by the Institute of Air Quality Management (IAQM), will be implemented via a CEMP. An Outline CEMP will be prepared prior to the submission of the planning application and will be submitted as an appendix to the ES. In addition, a construction dust risk assessment will be undertaken which will assess the risk of dust impacts from construction activities associated with the solar farm itself and the proposed cable corridor options. The dust risk assessment will also inform the measures to be included within the CEMP, as commensurate to the assessed risk, and will be included in the Outline CEMP.
- 4.2.22 Impacts associated with construction traffic are expected to be of a short duration and temporary in nature. Currently, the construction phase is estimated to take no longer than 2 years. Where national assessment screening criteria, as outlined by the IAQM, are anticipated to be exceeded a detailed air quality dispersion modelling assessment will be undertaken for all relevant human and ecological receptors. Where required, the assessment will be undertaken in accordance with guidance published by the IAQM and submitted as an appendix to the ES.
- 4.2.23 At this stage, the operation of the Proposed Development is not anticipated to result in any direct emissions to air (e.g. as a result of emissions from combustion plant or other combustion sources) and thus local air quality impacts associated with the Proposed Development are not anticipated.
- 4.2.24 As described in 4.2.7, the increase in local traffic volumes once the development is operational will be minimal. Therefore, the effects from operational traffic-related air pollutants are anticipated to be not significant.
- 4.2.25 Air is therefore proposed to be scoped out of the ES on the basis that all potential impacts and effects will be temporary in nature and will be fully addressed in technical reports included as appendices to the ES.

Material assets

- 4.2.26 The EIA Regulations refer to 'material assets', including architectural and archaeological heritage. The phrase 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons.
- 4.2.27 Material assets are in practice considered across a range of topic areas within an ES, in particular the historic environment chapter. This topic is proposed to be included within the ES (see Table 4.1). Therefore, no separate consideration of material assets is considered necessary.
- 4.2.28 Material assets is therefore proposed to be scoped out of the ES.

Ground Conditions

- 4.2.29 This section of this EIA Scoping Report describes the baseline environment in relation to Ground Conditions and primarily considers issues relating to soils and groundwater contamination and geology. Groundwater (and surface water) is considered within the context of potential pollution issues and the potential impact of the Proposed Development on existing groundwater (and surface water) abstractions within the study area. Geology is assessed in terms of potential impact on identified mineral safeguarding areas and designated geological conservation sites listed by the Joint Nature Conservation Committee (JNCC) in the Geological Conservation Review (GCR). These

sites are typically notified as Sites of Special Scientific Interest (SSSIs) or are being considered for notification as such.

- 4.2.30 To provide sufficient detail for this scoping assessment, the Site has been sub-divided into six groups, based on proximity (referenced as Group 1 – 6) as follows.

Table 4.1: Grouping of Land Parcels

Group	Land Parcels included
Group 1	PV Area 9
Group 2	PV Area 4, PV Area 5, PV Area 6, PV Area 7, PV Area 8
Group 3	PV Area 3
Group 4	PV Area 2
Group 5	PV Area 1
Group 6	BESS Area

Legislative and Policy Context

- 4.2.31 The following key legislation and policy documents relevant ground conditions will be considered within the assessment process:

- Planning Policy Wales – Edition 12 2024
- Well-being of Future Generations (Wales) Act 2015
- Water Framework Directive 2000
- The Groundwater Directive 2006
- Environmental Liability Directive 2004
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- Groundwater (England and Wales) Regulations 2009
- The Water Supply (Water Quality) Regulations 2016, as amended
- The Private Water Supplies (Wales) Regulations 2017
- The Water Resources Act 1991 (as amended)
- The Water Act 2014
- The Environment Act 1995
- Environmental Protection Act (EPA) 1990 (as amended)
- Contaminated Land (Wales) Regulations 2006 (as amended)
- Environmental Permitting (England and Wales) Regulations 2016 (as amended)
- Wildlife and Countryside Act 1981 (as amended)
- Vale of Glamorgan Adopted Local Plan 2011 – 2026, (Adopted June 2017)

Guidance Documents

- 4.2.32 Guidance documents relevant to ground conditions that will be considered within the assessment include the following:

- Land Contamination: Risk Management (LCRM) (Environment Agency, 2020 and amended 2023).

- British Standard BS 10175 Investigation of Potentially Contaminated Sites (BSI, 2011 and amended 2017).
- Construction Industry Research and Information Association (CIRIA) Document C665: Assessing Risks Posed by Hazardous Ground Gases to Buildings (CIRIA, 2007).
- British Standard requirements for the 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings' (BS8485:2015+A1:2019) (BSI, 2015).
- Defra Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (Defra, 2012).

Data Sources

4.2.33 The baseline conditions in relation to ground conditions have been determined from a preliminary review of online information available from the British Geological Survey (BGS), Groundsure, the Coal Authority (CA), Vale of Glamorgan Council and National Resources Wales (NRW). This is restricted to:

- Published 1:50,000 scale Geological Mapping – Solid and Drift (BGS)
- Borehole Records (BGS)
- Geological Conservation Review Sites (NRW)
- Geological Conservation SSSIs (Groundsure)
- Regionally Important Geological Sites (RIGS) (Vale of Glamorgan)
- Recorded Landfill Sites (Groundsure/Vale of Glamorgan)
- Source Protection Zones (Groundsure)
- Aquifer Status (NRW)
- Mineral Safeguarding Areas (Vale of Glamorgan)
- Development High Risk Areas (CA)

4.2.34 A detailed Desk Top Study (DTS) and Preliminary Risk Assessment (PRA) will be undertaken in support of the planning application and included as an appendix to the ES.

Study Area

4.2.35 The study area includes each group of land parcels and an additional buffer of 250 m. This is considered sufficient to enable the identification of off-site potential sources of contaminants of concern, other factors which may have influenced site conditions and/or sensitive off-site receptors that require consideration.

4.2.36 An extensive area of buffer land to allow for possible variations in the final routing of cable corridors has been applied to the Proposed Development at the time of EIA Scoping.

Baseline Conditions

Group 1 – PV Area 9

4.2.37 The land parcel forming Group 1 has superficial cover of Glacial Till deposits, typically comprising a heterogeneous mix of granular and cohesive deposits. The underlying bedrock comprises predominantly Lower Carboniferous ooidal limestone made up of thick bedded, cross bedded, pale grey ooid grainstones with scattered beds of medium grey fine-grained skeletal packstone of the Cornelly Oolite Formation of the Hunt's Bay Oolite subgroup. In the north this is overlain by strata of the Stormy Limestone Formation, also comprising ooidal packstones, grainstones and calcitic

mudstones. The limestone strata are part of a designated Limestone 1 Mineral Safeguarding Area, representing resources of National Importance.

- 4.2.38 The Glacial Till deposits are identified as a Secondary (undifferentiated) Aquifer, the strata of the Hunts Bay Oolite Supergroup a Principal Aquifer.
- 4.2.39 There is no evidence of artificial or Made Ground based on published geological mapping and there are no available BGS borehole records for this group of land parcels.
- 4.2.40 Other features include:
- No designated or under review Geological Conservation Sites/RIGS.
 - No recorded historical landfill sites within the Group 1 land parcel or 250 m buffer zone.
 - Not in a Groundwater Source Protection Zone.
 - Not in a Coal Authority Development High Risk Area.

Group 2 – PV Area 4, PV Area 5, PV Area 6, PV Area 7, PV Area 8

- 4.2.41 Group 2 land parcels predominantly have a cover of Glacial Till superficial deposits. PV Area 7 is also recorded as having localised Glaciolacustrine Deposits, typically laminated silt and clay, commonly rich in organic matter, locally with interbedded peat, in the west. Glacial deposits are shown as absent in PV Area 8 where Head deposits are indicated around the eastern and southern peripheries. Bedrock geology across the extent of the Group 2 land parcels is complex and subject to extensive faulting. Many of the land parcels are located on Carboniferous limestone strata of the Gully Oolite Formation, Black Rock Limestone Group (Friars Point Limestone Formation, Brofiscin Oolite Formation, Barry Harbour Limestone Formation and Lower Limestone Shale Group (Cwmyniscoy Mudstone Formation, Castell Coch Limestone Formation and Tongwynlais Formation (interbedded mudstone and limestone). In PV Area 7, these strata are likely to extend into the sandstones and interbedded conglomerate of the Devonian Quartz Conglomerate Group of the Upper Old Red Sandstone. These overlay sandstones and argillaceous rocks of the Brownstones Formation present beneath superficial cover in PV Area 6. The land parcels forming PV Area 5 lie on bedrock strata of the Mercia Mudstone Group (mainly red-brown blocky mudstones), Marginal facies (conglomerate), mudstones of the Penarth Group and interbedded mudstones of the Blue Lias Formation.
- 4.2.42 The Head and Glacial Till superficial deposits recorded over these land parcels are designated Secondary (undifferentiated) Aquifers and the Glaciolacustrine Deposits are classified as Unproductive. The bedrock strata in this group are either of Secondary A or Principal Aquifer status, the exception being the Mercia Mudstone Group, designated as a Secondary B Aquifer.
- 4.2.43 There is one available BGS borehole record for this group of land parcels, sited in the area identified as Rees, this borehole (ref ST70NE/192) recorded bands of clayey silt and silty and clayey sands, becoming organic silty clay with a little gravel to the base of the boring at 8.70 m below ground level.
- 4.2.44 Other features include:
- No designated or under review Geological Conservation Sites/RIGS.
 - A historical landfill site is recorded approximately 340 m north of PV Area 8.
 - Not in a Groundwater Source Protection Zone.
 - Not in a Coal Authority Development High Risk Area.

Group 3 – PV Area 3

- 4.2.45 The entire group of land parcels has superficial cover of Alluvium (variable components of sand, silt, clay and gravel), Head Deposits (comprises gravel, sand and clay depending on upslope source and distance from source. Locally with lenses of silt, clay or peat and organic material) and Glacial

Till deposits (typically comprising a heterogeneous mix of granular and cohesive deposits). The underlying bedrock comprises strata of the older Jurassic Blue Lias Formation comprising thinly interbedded limestone (laminated, nodular, or massive and persistent) and calcareous mudstone or siltstone across the south-eastern half of the area, Blue Lias Marginal Facies (Shell Limestone) across much of the north-west and Cwmyniscoy Mudstone Formation (Mudstone and Limestone, Interbedded) in the extreme west.

- 4.2.46 The locality of Group 3 represents a geological anticline where the carboniferous strata have been heavily faulted or eroded to expose the underlying Lias strata. The limestone strata are part of a designated Limestone 1 Mineral Safeguarding Area, representing resources of National Importance and the superficial deposits a designated Sand and Gravel 2 Mineral Safeguarding Area, a reserve of local importance and some regional significance.
- 4.2.47 The Alluvium comprises a Secondary A Aquifer, the Head deposits and Glacial Till are designated as Secondary (undifferentiated) Aquifers. The bedrock strata are mainly a Secondary A Aquifer designation, the exception being the Blue Lias Marginal Facies, a Principal Aquifer.
- 4.2.48 Other features include:
- No evidence of artificial or Made Ground within Group 3 land parcels based on published geological mapping.
 - There are no available BGS borehole records for this group of land parcels.
 - No designated or under review Geological Conservation Sites/RIGS.
 - No recorded historical landfill sites within the Group 3 land parcels or 250 m buffer zone.
 - A Groundwater Source Protection Zone 1 is present across the north-west of Group 3 (Newton House Farm).
 - Not in a Coal Authority Development High Risk Area.

Group 4 – PV Area 2

- 4.2.49 Both the northern and southern land parcels identified as PV Area 2 are devoid of superficial cover. Both land parcels are located on outcropping southward dipping bedrock strata of the Lower Limestone Shale Group (Castell Coch Limestone Formation (ooidal limestone), Cwmyniscoy Mudstone Formation (Mudstone and Limestone, Interbedded)) and Black Rock Limestone Group (Barry Harbour Limestone Formation, Friars Point Limestone Formation (Limestone) and Gulley Oolite Formation (ooidal limestone)). The limestone strata are part of a designated Limestone 1 Mineral Safeguarding Area, representing resources of National Importance.
- 4.2.50 The strata of the Lower Limestone Shale Group and Black Rock Limestone Group are primarily Principal Aquifers. Other features include:
- No evidence of artificial or Made Ground within Group 4 land parcels based on published geological mapping.
 - There are no available BGS borehole records for this group of land parcels.
 - No designated or under review Geological Conservation Sites/RIGS.
 - The historical Hollybush Farm landfill site is located approximately 50 m west of Group 4.
 - Not in a Groundwater Source Protection Zone.
 - Not in a Coal Authority Development High Risk Area.

Group 5 – PV Area 1

- 4.2.51 Localised superficial cover of Alluvium and Head are recorded in valleys and pockets of Glaciofluvial Deposits on higher ground. The outcropping bedrock strata in land parcels north-east of Treguff mostly comprises interbedded mudstone and limestone of the St Marys Well Bay Member, part of

the Blue Lias Formation and the older Penarth Group strata composed of grey to black mudstones with subordinate limestones and sandstones. The Land Parcel to the west of Treguff also includes Blue Lias Marginal Facies (Shell Limestone) in the east. Group 5 includes strata forming part of designated Limestone 2 and Sandstone 2 Mineral Safeguarding Areas, representing resources of Local Importance with some regional significance. The superficial deposits identified are also a designated Sand and Gravel 2 Mineral Safeguarding Area.

4.2.52 The Alluvium and Glaciofluvial Deposits comprise Secondary A Aquifers, the Head deposits a Secondary (undifferentiated) Aquifer. The bedrock strata comprise Secondary A (Blue Lias) and Secondary (Undifferentiated) Aquifers with the Blue Lias Marginal Facies a Principal Aquifer.

4.2.53 There is one available BGS borehole record for this group of land parcels, BGS reference ST07SW/4. This recorded Alluvium of silt and gravel to a depth of approximately 2.50 m underlain by bedrock of the Penarth Group (marginal facies) comprising sandstones and sandy oolites to the base of the borehole at 4.26 m depth. Other features include:

- No designated or under review Geological Conservation Sites/RIGS.
- No recorded historical landfill sites within the Group 5 land parcel or 250 m buffer zone.
- Not in a Groundwater Source Protection Zone.
- Not in a Coal Authority Development High Risk Area.

Group 6 – BESS Area

4.2.54 The land parcel at East Aberthaw has superficial cover of Tidal Flat Deposits, typically unconsolidated sediment of mud and/or sand flat deposits (Secondary undifferentiated aquifer).

4.2.55 The land parcel at Aberthaw West is devoid of superficial deposit cover and is located on outcropping bedrock of the Porthkerry Member of the Blue Lias Formation which also underlies the Tidal Flat Deposits on Aberthaw East. Typically, these strata comprise interbedded mudstones and limestones and comprise a Secondary A Aquifer. The limestone strata are part of a designated Limestone 2 Mineral Safeguarding Area, representing resources of Local Importance with some regional significance. Other features include:

- No evidence of artificial or Made Ground within Group 6 based on published geological mapping.
- There are no available BGS borehole records for this group of land parcels.
- No designated or under review Geological Conservation Sites/RIGS.
- Aberthaw Power Station Landfill No 1 is located approximately 135 m east of the Aberthaw East land parcel.
- Not in a Groundwater Source Protection Zone.
- Not in a Coal Authority Development High Risk Area.

Cable Corridor Buffer land

4.2.56 The study area and the baseline conditions for the buffer land can be summarised as follows:

- North of the A48, much of the corridor has superficial cover of Glacial Till and more localised exposures of Alluvium, Peat and Head Deposits. South of the A48 the superficial deposits are more limited to the alluvial deposits associated with the River Thaw and the Tidal Flat Deposits close to the coast. Bedrock geology north of the A48 is predominantly the Carboniferous Limestone series of the Lower Limestone Shale Group and the Pembroke Limestone Group (including the Hunts Bay Oolite Super Group and Black Rock Limestone Subgroup). With progression southwards the bedrock, outcropping over much of the buffer zone is of the Porthkerry Member (typically mudstones/limestones) of the Blue Lias Formation. As with the

land parcel groups, much of the cable corridor buffer land also coincides with designated Mineral Safeguarding Areas for sand and gravel, limestone and sandstone.

- No evidence of artificial or Made Ground within the buffer zone based upon 1:50,000 scale mapping.
- No designated or under review Geological Conservation Sites/RIGS.
- There is a historical landfill site within the buffer land named Llyswerry Quarry, north of the B4265.
- Not in a Groundwater Source Protection Zone.
- Not in a Coal Authority Development High Risk Area.

Potential Impacts and Mitigation Measures

4.2.57 A range of potential impacts on ground conditions have been identified which may occur during the construction and operation, maintenance and decommissioning phases of the Proposed Development. These impacts are summarised below.

Construction

- Loss or partial loss of geological feature/designation.
- Sterilisation of safeguarded mineral reserves.
- Creation of new pathways for existing contamination sources in the area of Proposed Development that could then impact on site neighbours, construction workers and/or controlled waters.
- New sources of contamination such as fuels and oils used by construction plant from spills/leaks impacting upon controlled waters and/or construction workers.
- Contamination of an aquifer from grout or concrete during pile formation.
- Discharge of contaminated groundwater or run-off into surface water from open excavations or stockpiles during construction or leaching into groundwater through changes in infiltration patterns.

Operation

- Potential leaks/spills of oils and fuels from maintenance vehicles or during repair works to infrastructure impacting upon controlled waters and/or maintenance workers.

Decommissioning

- Decommissioning of the Proposed Development is likely to involve temporary formation of compounds as for the construction phase and minor groundworks to remove all solar infrastructure, including any below and above ground equipment. Decommissioning impacts are similar to construction.

Mitigation Measures to be adopted

4.2.58 The following measures relevant to ground conditions will be adopted as part of the project:

Preliminary Risk Assessments

4.2.59 Preparation of a Desktop Survey (DTS) and Preliminary Risk Assessment (PRA) reports for the groups of land parcels described in Table 4.1 in accordance with LCRM guidance. The PRA consists of an appraisal of the source-pathway-receptor 'contaminant linkages' developed from the desk-based research, which is central to the approach used to determine the existence of 'Contaminated Land' as defined in Part 2A of the Environmental Protection Act 1990. For a risk to exist (under Part

2A), all three of the following components must be present to facilitate a potential 'contaminant linkage'.

- Source of contamination (e.g. primary sources – leaking above ground storage tanks; secondary sources – free phase product (typically hydrocarbon contamination present as a discrete product rather than mixed with soil or water) within the ground or soil/groundwater migration).
- Receptor (living organisms, ecological systems or property which may be harmed, e.g. end users of site, groundwater, surface water and fauna and flora).
- Pathway (a route or means by which a receptor can be exposed to or affected by a contaminant) i.e. target mechanism between the source and receptor (e.g. gas/liquid migration through permeable strata).

4.2.60 The baseline conditions for these land parcels will be further developed through further detailed assessment and preparation of a Conceptual Site Model (CSM) following the source-pathway-receptor linkage approach. The CSM will be used to establish the risks posed by the viable pollution linkages and to inform the construction management approach. The DTS will recommend appropriate mitigation measures that can be incorporated within the design of the Proposed Development, to ensure that it minimises potential risk to site users and the wider environment (to be recorded in an Outline CEMP).

4.2.61 A piling risk assessment will be completed for any piled structures.

Mineral Resource Assessments

4.2.62 Preliminary baseline surveys have confirmed that most land parcels are within MSAs recorded on the Vale of Glamorgan Adopted Local Plan 2011-2026. Mineral deposits within MSAs will not be permanently sterilised by the Proposed Development and the minerals and waste policies do not currently identify proposals for mineral extraction in the area. Following decommissioning of the Proposed Development, the mineral resource could be extracted, if required at that time. There are requirements under Planning Policy Wales to demonstrate that the location and quality of the mineral is known and that the environmental constraints associated with extraction, including the potential for extraction of mineral resources prior to undertaking other forms of development, have been adequately considered. This will be demonstrated in the Minerals Resource Assessment that will be prepared and included as an Appendix to the ES.

Mitigation measures to be adopted during construction

4.2.63 Construction and decommissioning activities will be undertaken in accordance with relevant Construction Design Management (CDM) Regulations 2015, best practice measures and in line with a CEMP. Mitigation measures for protection of site workers from soil/groundwater contamination or ground gases would typically be included in the CEMP under existing health and safety legislation and any potential effects will be avoided, prevented and reduced through the implementation of standard mitigation measures (including personal protective equipment, training and toolbox talks). The CEMP would also include measures to be adopted to mitigate against mobilisation of contaminants that could impact on controlled waters or neighbouring land users. These measures should include:

- A discovery strategy to be implemented in the event of discovery of unexpected soil or groundwater contamination during site preparation and construction.
- Storage of stockpiled materials on an impermeable surface to prevent leaching of contaminants and use of covers when not in use to prevent materials being dispersed and to protect from rain.
- The implementation of dust suppression measures during construction to minimise nuisance dust emissions during the works.
- A construction and then operational drainage strategy would be implemented to minimise surface water runoff and pollution.

- Bulk storage areas to be secured and provided with secondary containment (in accordance with the Oil Storage Regulations and best practice).
- Storage of oils and chemicals away from existing watercourses, including drainage ditches or ponds.
- Use of a documented spill procedure and use of spill kits kept in the vicinity of chemical/oil storage.
- The disposal of solid waste, including surplus spoil, would be managed to maximise the environmental and developmental benefits from the use of surplus material and to minimise any adverse effects of disposal. In general, the principles of the waste management hierarchy, reduce-reuse-recycle would be applied.
- Potential waste arising from excavation would be sampled and analysed to determine the waste classification required to establish relevant waste streams, suitability for reuse/recycle and disposal/storage requirements.
- The implementation of suitable measures in line with the Construction Design Management Regulations (2015) would manage any risks posed to human health, particularly with regard to asbestos. These measures should include the provision of suitable Personal Protective Equipment (PPE) and welfare facilities. Other measures to manage risks to human health from the presence of asbestos should be implemented and should include dust suppression measures and air monitoring.

Mitigation measures to be adopted during operation

- 4.2.64 To prevent on-site pollution, regular maintenance will be carried out to ensure the health of the solar PV modules are maintained and that the on-site vegetation is continuing to protect the soil layer. Best practice mitigation methods will be in place such as disposal of solid and liquid waste off-site, the cleaning of vehicles to be carried out off-site and the use of spill kits and absorbent mats to ensure any pollution from maintenance vehicles is minimised.

Mitigation measures to be adopted during decommissioning

- 4.2.65 Management and mitigation measures will be included in a Decommissioning Environmental Management Plan (DEMP) which would be prepared and agreed with relevant authorities at the time of decommissioning, in advance of the commencement of decommissioning.

Summary

- 4.2.66 Table 4.2 summarises the key ground conditions impacts and whether they should be scoped in or scoped out of the assessment in relation to the construction, operation and decommissioning of the Proposed Development.

Table 4.2: Summary of Ground Conditions scoping assessment

Impact	Construction	Operation	Decomm- issioning	Rationale
Ground Conditions- or partial loss of geological feature/designation	Scoped Out	Scoped Out	Scoped Out	The Proposed Development is located outside of any area of geological interest or designation.
Ground Conditions – sterilisation of safeguarded mineral reserves	Scoped Out	Scoped Out	Scoped Out	Mineral deposits within MSAs will not be permanently sterilised by the Proposed Development following decommissioning of the Proposed Development, the mineral resource could be extracted in the future.

Contamination - In the event of disturbance of any potentially contaminated soils or groundwater during Construction (or creation of new contamination), there is a potential for human or controlled water receptors to be affected	Scoped Out	Scoped Out	Scoped Out	The proposed DTS and PRA reports will outline the level of risk and requirements for mitigation measures required for design based on known land usage. The recommendations of the DTS and PRA reports will be used to inform design of the Proposed Development and the management and mitigation measures required for the construction, operation or decommissioning phases. Following the implementation of best practice construction mitigation measures to be included in a CEMP/DEMP, no significant effects are expected in relation to land contamination.
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4.2.67 From the available information reviewed it is concluded that it is unlikely that the Proposed Development will give rise to adverse effects in relation to ground conditions and that subject to the findings of the DTS and PRA reports for the groups of land parcels which will allow a more detailed baseline conditions assessment to be completed.

4.2.68 Ground conditions is therefore proposed to be scoped out of the EIA.

Risk of major accidents

4.2.69 Solar photovoltaic technology is a relatively benign form of electricity generation with very low risk of accident or disaster and will not have a significant environmental effect in this regard. The solar park will be enclosed by appropriately designed security fencing and monitored by CCTV, which will lower the risk of unauthorised access and accidents.

4.2.70 With regards to the BESS facility, the construction, operation and decommissioning phases of the Proposed Development will be managed in line with best practice and the relevant Health and Safety legislation to minimise the risks of accidents. The final design and layout of the BESS will include measures designed to maximise safety and reduce fire risk.

4.2.71 A Battery Safety Management Plan will be produced and will be based on the following four principal aspects:

1. Safety of life (legislative)
2. Protection of the environment (legislative)
3. Continuity of business and safety operations
4. Conservation and protection of property

4.2.72 With the implementation of safety measures contained within a Battery Safety Management Plan, it is not anticipated that the Proposed Development will result in any significant effects in terms of risk of major accidents and disasters.

4.2.73 Risk of major accidents and disasters is therefore proposed to be scoped out of the ES.

Arboriculture

- 4.2.74 A walkover to BS5837:2012 standard and arboricultural appraisal was completed for each of the PV Areas and BESS Area between August and September 2024.
- 4.2.75 In summary, the appraisal points to opportunities associated with the retention of existing trees within the layout of the Proposed Development, the retention of existing hedgerow networks of merit and the safeguarding of mature tree cover and Category A and B stock. The appraisal confirms that by retaining existing vegetation as far as possible, the Proposed Development can:
- create focal points within the layout for place-making and a sense of maturity.
 - maintain continuity of local character and existing green infrastructure.
 - limit the amount of additional mitigation required by adopting mitigation by design.
 - demonstrate compliance with applicable policy objectives.
 - provide social and commercial benefits via increased attractiveness of the Site.
- 4.2.76 Given the nature of the Proposed Development, it is considered that the provision of well-considered development parameters which afford suitable buffers from mature trees and avoids the need for hedgerow removals or ground works in the vicinity of trees for development or re-grading works, then enhancements to the existing arboricultural baseline via management, re-planting and appropriate offsets could lead to beneficial effects with regard to arboricultural matters for the Site.
- 4.2.77 In designing the landscape proposals for the Site, there is an opportunity to improve species diversity and age classes. Species selection can include trees that are suitable for rural environments and help adapt to climate change. New planting will follow the principle of the 'right tree for the right place'. This approach of retaining current tree stock and bolstering existing linear features with a higher variety of species will improve the arboricultural quality of the Site.
- 4.2.78 As per the recommendation of the walkover appraisal, it is the applicant's intention to undertake a full BS5837 tree quality survey and an Arboricultural Impact Assessment as a stand-alone assessment in support of the planning application. Arboriculture is therefore proposed to be scoped out of the ES.

4.3 Content of the Environmental Statement

- 4.3.1 The scope of the EIA takes into account the preliminary environmental information pertinent to the Proposed Development Site and as a result, the issues set out below are considered appropriate for assessment in an ES. It is considered that the Proposed Development may have the potential to give rise to significant environmental effects in these areas:
- Landscape and Visual
 - Ecology and Biodiversity
 - Cultural Heritage
 - Climate Change
 - Hydrology and Flood Risk
 - Noise and Vibration
- 4.3.2 **Table 4.3** below confirms the proposed structure of the ES.

Table 4.3: Structure of the ES

Structure of ES	
Non-Technical Summary	Summary of the ES using non-technical terminology
Volume 1: Text	
	Glossary
Chapter 1	Introduction
Chapter 2	Project Description
Chapter 3	Need and Alternatives Considered
Chapter 4	Environmental Assessment Methodology
Chapter 5	Landscape and Visual
Chapter 6	Ecology and Biodiversity
Chapter 7	Cultural Heritage
Chapter 8	Climate Change
Chapter 9	Hydrology and Flood Risk
Chapter 10	Noise and Vibration
Volume 2: Figures	
Including all figures and drawings to accompany the text.	
Volume 3: Appendices	
Including specialist reports forming technical appendices to the main text.	

- 4.3.3 The following sections provide details for each of the chapters that are proposed to be included in the ES.

5 ES CHAPTERS 1- 4

5.1 Introduction

- 5.1.1 This chapter will provide the introduction to the ES, including details of the application, need for EIA and the structure of the ES.

5.2 Proposed Development Description

- 5.2.1 The ES will include a description of the Proposed Development, which will form the basis of the assessment of effects. The EIA Regulations require an ES to include:

'A description of the development comprising information on the site, design and size and other relevant features of the development.'

- 5.2.2 This Proposed Development description chapter will include details of the Site, together with a description of the key components of the Proposed Development. The description will include the following information, as far as practicable at the time of writing:

- Construction phase – a description of the key works, activities and processes that would be required during the construction phase.
- Operational phase – a description of the completed development and its use.
- Decommissioning phase – a description of the key works, activities and processes that would be required during the decommissioning phase.

- 5.2.3 Where options remain at the time of the assessment (with regard to construction techniques, for example), the ES will provide a clear explanation of the assumptions made. Where applicable, the realistic worst-case scenario will be assessed.

- 5.2.4 Where mitigation measures have been identified and developed through the EIA process and have been incorporated as part of the project, details of these measures will be set out within the Proposed Development description chapter.

5.3 Need and Alternatives Considered

- 5.3.1 This chapter will briefly set out the need for the Proposed Development. In addition, the EIA Regulations require the alternatives considered by the applicant to be set out in the ES:

'A description of the reasonable alternatives studied by the developer, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment.'

- 5.3.2 This chapter will summarise the reasons for the selection of the Site and provide an outline of the alternatives considered during the EIA process, including a description of the alternative design and layout options that have been considered.

5.4 Environmental Assessment Methodology

- 5.4.1 Details of the overall approach to EIA will be set out in this chapter, together with details of the scoping process, consultation undertaken and the overall approach to the assessment of significance. Topic specific methodologies, such as survey methods, will be provided in each topic chapter.

6 LANDSCAPE AND VISUAL

6.1 Introduction

- 6.1.1 Landscape and / or Visual effects, associated with a solar farm and BESS development, are considered to be an important environmental issue. As such, a Landscape and Visual Impact Assessment (LVIA) would form an important part of the wider EIA process.
- 6.1.2 The LVIA chapter, of the ES would consider the potential effects of the Proposed Development upon the physical landscape elements and features, landscape character, views and visual amenity within a 5km radius study area (3km in respect of the BESS), as measured in all directions from the edges of the Site (i.e. the red line boundary).
- 6.1.3 The LVIA would be undertaken with reference to best practice guidance, as detailed within 'Assessment of Effects' section below and would be completed by a suitably qualified and experienced Chartered Landscape Architect (CMLI).

6.2 Legislative, policy context and guidance

- 6.2.1 The LVIA would include a review and summary of relevant legislative, planning policy and other guidance documents, insofar as they relate to landscape and visual matters. This would include the following, correct at the time of writing:
- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3) (Landscape Institute and Institute of Environmental Management & Assessment, 2013).
 - Landscape Character Assessment Guidance for England and Scotland (The Countryside Agency and Scottish Natural Heritage, 2002).
 - An Approach to Landscape Character Assessment (Natural England, 2014).
 - Technical Guidance Note 06/19, Visual Representation of Development Proposals (Landscape Institute, September 2019)
 - Technical Guidance Note 02-21: Assessing landscape value outside national designations.
 - Vale of Glamorgan Local Development Plan 2011- 2026
 - Vale of Glamorgan Local Development Plan Revised Report 2021 – 2036, May 2022
 - Rhondda Cynon Taf Local Development Plan 2006-2021, March 2011
 - Rhondda Cynon Taf Revised Local Development Plan 2022- 2037
 - Planning Policy Wales (Edition 12, 2024).
 - Natural Resources Wales (2016). LANDMAP the Welsh landscape baseline.
 - Natural Resources Wales (2017). National Landscape Character Areas.
 - Vale of Glamorgan County Borough Council Designation of Landscape Character Areas (final report August 2008).
 - Technical Advice Note (TAN): Nature Conservation and Planning (2009).
- 6.2.2 It should be noted that the final list of references and planning policy guidance documents is subject to review and change as part of the LVIA chapter.

6.3 Baseline information and study area

6.3.1 The following provides a summary of the baseline data collated, and work undertaken to inform the landscape and visual element of the EIA Scoping Report and the forthcoming LVIA. Information is illustrated on Figure 6.1: Landscape Planning Designations and Figure 6.2: ZTV (Appendix 6.1).

- Preliminary review of legislative and planning policy context insofar as it relates to landscape and visual matters and / or solar farm developments.
- Review of Landscape Planning Designations.
- Preliminary review of National, Regional and Local Landscape character assessments, as appropriate and / or where available.
- Preparation of preliminary proposed ZTV with barriers and bare earth, including Candidate Viewpoint locations.

Landscape Planning Designations

6.3.2 The Proposed Development is not located within a National Park or an Area of Outstanding Natural Beauty (AONB), i.e. an area designation of national importance for its scenic quality. However, it is noted that several of the PV Areas would be partially or entirely located in or in proximity to several Special Landscape Areas, including Upper & Lower Thaw Valley; Ely Valley and Ridges Slopes; Talygarn Surrounds and Nant Llancarfan. These are local designations designed to protect areas of the Vale of Glamorgan that are important for their geological, natural, visual, historic or cultural significance (refer to Figure 6.1, Appendix 6.1). There would therefore be direct and indirect impacts upon a small part of these SLAs as a result of the Proposed Development.

6.3.3 Within the wider 5km study area, there are a number of other landscape planning designations that would be indirectly impacted by the Proposed Development. These include:

- Listed Buildings
- Conservation Areas (CA)
- Scheduled Monuments
- Registered Common Land
- Historic Landscapes
- Significant Views
- Heritage Coast
- Historic Parks and Gardens

6.3.4 There are a substantial number of individual trees, hedgerows and blocks of woodland across the Site, or immediately adjacent to it. A number of the woodland blocks, to the immediate west and south of the Site, are designated as Ancient Woodland.

National and Local Landscape Character

6.3.5 The relevant published landscape character assessments have been reviewed. Within the LVIA Chapter, particular attention will be paid to the key landscape characteristics of the relevant LANDMAP aspect areas of the Site and the surrounding areas.

6.3.6 National Landscape Character Areas (NLCAs) are countrywide and form the broad scale landscape character assessment of Wales. The Sites and majority of the study area falls within NLCA 36: Bro Morgannwg / Vale of Glamorgan.

6.3.7 LANDMAP is an “all-Wales Geographical Information System (GIS) based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent dataset” (CCW (now NRW), 2011). It is administered by Natural Resources Wales (NRW) and comprises five spatially related datasets or aspect layers as follows:

- Geological Landscape: “considers the physical, primarily geological, influences that have shaped the contemporary landscape and identifies those landscape qualities which are linked to the control or influence exerted by bedrock, surface processes, landforms and hydrology”.
- Landscape Habitats: “Focuses on recording habitat features, characteristics and their spatial relationships within the context of the wider landscape”.
- Visual and Sensory: “Maps landscape characteristics and qualities as perceived through our senses, primarily visually. The physical attributes of landform and land cover, their visible patterns and their interrelationship”.
- Historic Landscape: “Landscape characteristics that depend on key historic land uses, patterns and features. Identifies only those classes of historic land uses, patterns and features that are prominent and contribute to the overall historic character of the present landscape”.
- Cultural Landscape: “Describes the links between landscape and people, from the way in which cultural, or human activity shapes the landscape, to the way in which culture shapes the way we respond to landscape. Focus is on mapping the landscape where it has been, or is being, shaped by a particular cultural activity or process, or where it has been directly represented, depicted or described in art, literature or folklore”.

6.3.8 The Visual and Sensory Dataset (accessed November 2024) locates the majority of the northernmost Site entirely or partially within Aspect Area ‘VLFGGLVS962: Ystradowen / Hensol Area’. The area is described as:

“... a complex landscape of lowland valleys and hills, which form the upper reaches of various tributaries that flow into the Thaw and Ely Valleys. The highest point in the area is approximately 140m AOD near Lillypot in the south-east, and the lowest point approximately 30m AOD where the Nant Tredodridge leaves the area to enter the Ely Valley. The landcover is a mosaic of small-medium pastoral fields with strong hedgerows, often containing trees and scattered woodland. Woodlands tend to be found on steeper hillsides or following water courses, or placed in poorly drained areas. These are both deciduous and coniferous. Farms and villages are scattered throughout and many of these appear to be developed. Several farms are being renovated into housing whilst new building is occurring throughout the area often using inappropriate detailing in parts. A golf course has been developed to the east but this is not widely visible. Several minor roads cross the area and link local settlements. The A4222 crosses the western side of the area. This road links Llantrisant to Cowbridge and affects tranquillity in its vicinity. Tranquillity is also affected to the north of the area from where the M4 can be heard and seen. The landscape can be described as a varied rural landscape of mostly pastoral fields and hedgerows with dispersed woodlands. Change detection 2014: Further developments at Hensol Park - this part is now a separate aspect area.”

6.3.9 Overall, Aspect Area ‘VLFGGLVS962: Ystradowen / Hensol Area’, is evaluated as Moderate.

6.3.10 The BESS Area is located within Aspect Areas ‘VLFGGLVS890: Heritage Coast Hinterland’ and ‘VLFGGLVS998: Thaw Power Station’. The overall evaluation for these Aspect Areas is Outstanding and Low respectively.

6.3.11 Other Visual and Sensory Aspect Areas, within which Application Sites are entirely or partially located include:

- ‘VLFGGLVS146: Central Vale Ridges and Slopes’
- ‘VLFGGLVS271: St Nicholas and Bonvilston Ridge Crest’
- ‘VLFGGLVS139: Mid Thaw Valley’

- 'VLFGLVS110: Lower Thaw Valley Sides'
- 'VLFGLVS952: Nant Tre Golf Valley'
- 'VLFGLVS933: Upper Thaw Valley'
- 'VLFGLVS864: Thaw Valley Floodplain'

Visual Resources

Zone of Theoretical Visibility (ZTV)

- 6.3.12 In order to further determine the geographical extent of potential visibility, a preliminary computer-generated Zone of Theoretical Visibility (ZTV) was generated for each of the 10 Areas (refer to Figure 2 within Appendix 6.1). The ZTV broadly defines the study area for both the landscape character and visual assessment. A 5km radius study area is proposed for the assessment of the PV Areas, with a 3km radius study area proposed for the BESS Areas. Due to the overall size and height of the Proposed Development, a maximum of 3.2m above existing ground level (EGL) for the solar panels and 3m above EGL for the BESS. It is anticipated that any potentially significant landscape and / or visual effects would lie within these radii. Following field survey and analysis of existing barriers, the study area radii may be reviewed.
- 6.3.13 Currently, the Proposed Development would consist of south facing photovoltaic solar panels (PVs) at a finished height of up to 3.2m above existing ground level (EGL) and Battery Energy Storage System (BESS) units at a finished height of up to 3m. The preliminary ZTV was completed to show this, with the origin points at 3.2m above EGL and 3m EGL. The ZTV was compiled assuming observer height as 1.7m at eye level and takes into account the screening effects of local settlements at 9m and existing areas of substantial vegetation (woodland) at a height of 11m. Origin points, from within the Areas, detailed on the ZTVs (refer to Figure 6.2, Appendix 6.1) have been used to establish the likely area from which views to the Proposed Development may be available. These origin points are located within the centre of each of the agricultural fields within the Site which would contain solar panels, and one origin point for the tallest element within the substation.
- 6.3.14 OS Terrain 5 data has been used to generate the ground model for the ZTV.

View Ranges

- 6.3.15 For the purposes of the LVIA Chapter, views would be classified according to three distance 'ranges' as set out in Table 6.1 below.

Table 6.1: View Ranges

Range	Distance Threshold	Reasoning Description
Close	Less than 1 km	At close range the project could appear as a 'prominent' feature and visual receptors could experience high to medium/low magnitude of change when compared to existing views.
Medium	Between 1 km and 3 km	In medium range views the project could appear as 'present' features and visual receptors could experience medium/low to negligible magnitude of change compared to the existing situation.
Long	More than 3 km	In long range views the project would read as part of the landscape and visual receptors would tend to experience a low to negligible or lower magnitude of change compared to the existing situation.

Candidate Viewpoints

- 6.3.16 A number of Candidate Viewpoints have been proposed, which are considered representative of key sensitive visual receptors within the respective study areas. An assessment of potential effects

upon views from each viewpoint, as a result of the Proposed Development, would be completed (refer to Figure 6.2 in Appendix 6.1). These Candidate Viewpoints would be further refined following field work and will form the Representative Viewpoints to be assessed as part of the LVIA Chapter.

- 6.3.17 All Candidate Viewpoints are situated in publicly accessible locations within the ZTV, at a range of distances and orientation to the Proposed Development. They include a range of receptors of varying sensitivity. Photographs would be taken from each of the chosen Representative Viewpoints and illustrated in accordance with the Landscape Institute Technical Guidance Note 06/19, Visual Representation of Development Proposals (Landscape Institute, September 2019). Any additional photographs, taken during field survey, would be included for contextual purposes and / or alternative viewpoint locations as necessary.
- 6.3.18 Photographs would be taken during winter, so far as possible, should the project programme allow, when vegetation is devoid of its leaf cover to show the worst-case scenario. Any assessment of effects upon summer views, or winter views dependant on the timing of site work, would be necessarily made using professional judgement. The locations of the Candidate Viewpoints are shown on the ZTV (refer to Figure 6.2, Appendix 6.1).

6.4 Proposed approach

Baseline studies

- 6.4.1 Baseline information on the landscape will be gathered through a combination of desk studies, consultation and field surveys. Documents used in the assessment may include aerial photographs, Ordnance Survey (OS) maps and published landscape character assessments.
- 6.4.2 Further to the Baseline Information described above, the baseline assessment within the final LVIA Chapter will also include an assessment of the effects of the Proposed Development upon the landscape character of the Areas themselves and the immediate surrounds. It will also include an assessment of the existing landscape character within the wider study area in terms of its value and its sensitivity to the Proposed Development. The studies will identify the landscape resources and character of the surrounding area and examine how the Proposed Development will affect individual landscape features, elements, and characteristics of the wider landscape.
- 6.4.3 Field work will be undertaken to gain a better understanding of the landscape of the Site and surrounding area, to determine its character and condition and to identify visual receptors and the extent of available views. Field work will help to establish those landscape resources which combine to give the area its distinct sense of place. Further consultation would be sought from key statutory organisations/consultees where applicable.

Assessment of effects

- 6.4.4 The LVIA, undertaken as part of the Landscape and Visual Resources chapter, will identify and assess the likely significant effects that would arise as a result of the Proposed Development on the landscape (its fabric, character and elements) and upon views as experienced by receptors (people). The full methodology for the LVIA can be viewed within Appendix 6.2 of this ES Scoping Report. Please note this is written in the present tense as it will be included within the LVIA Chapter.
- 6.4.5 The LVIA will be based on the current published guidelines for landscape and visual assessment provided in:
- Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA) (Landscape Institute and Institute of Environmental Management & Assessment, 2013).
 - An Approach to Landscape Character Assessment, Natural England (2014).
 - Planning Policy Wales LANDMAP Guidance Note 1: LANDMAP and Special Landscape Areas (2016).
 - Planning Policy Wales LANDMAP Guidance Note 3: (2013).

- Technical Guidance Note 06/19, Visual Representation of Development Proposals (Landscape Institute, September 2019).

- 6.4.6 The sensitivity of landscape and visual receptors within the 3 km / 5 km study area would be assessed (through the identification of the landscape resource's susceptibility to the Proposed Development and the susceptibility of the visual receptor to change and value of the landscape resource/view), together with the predicted magnitude of impact on that receptor (through identification of the Proposed Development's size/scale, geographical extent and the duration and reversibility of effect). When combining sensitivity with magnitude of impact, a judgement will be made as to the significance of effect upon the landscape resource and/or view during the construction phase, the operational and maintenance phase, as well as the decommissioning phase of the Proposed Development, where relevant.
- 6.4.7 Where appropriate, mitigation measures will be identified to avoid, where possible, or reduce any potential landscape and / or visual effects as a result of the Proposed Development.
- 6.4.8 The LVIA Chapter would include an assessment of cumulative effects of the Proposed Development in association with other proposed solar farms or BESS within the study areas. Cumulative projects would include those with planning permission but yet to be constructed or within the planning system. It would not include development already constructed and operational, including, but not limited to, Garn Solar Farm and Treguff Farm. Existing operational solar farms would be considered as part of the baseline to the assessment.
- 6.4.9 The LVIA ES chapter would include an assessment of effects of the Proposed Development (as detailed above) during its construction, operation and decommission phases. For the assessment of the operational phase, the LVIA would include an assessment of its likely effects during daytime only, at winter year 1, when all construction and mitigation planting is assumed complete, and during summer year 15 once all mitigation planting is assumed to have reached its design and screening function. Field work would be completed during the next available season, assumed to be late winter 2024/25 and therefore the assessment of effects at summer would be completed using professional judgement.
- 6.4.10 A Glint and Glare Assessment would also be completed separately and reviewed as part of the LVIA process. It will be a standalone assessment but included within the Appendices of the LVIA Chapter and referred to within the assessment of effects section of the chapter. The assessment will have regard to proposal's impact on ground-based receptors and impacts from southern PV areas on nearby airports resulting from potential yellow glare.

Issues proposed to be scoped out

- 6.4.11 It is not proposed to undertake a Residential Visual Amenity Assessment (RVAA) or an assessment of likely night-time effects.

6.5 References

Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA) (Landscape Institute and Institute of Environmental Management & Assessment, 2013).

An Approach to Landscape Character Assessment, Natural England (2014).

Planning Policy Wales LANDMAP Guidance Note 1: LANDMAP and Special Landscape Areas (2016).

Planning Policy Wales LANDMAP Guidance Note 3: (2013).

Technical Guidance Note 06/19, Visual Representation of Development Proposals (Landscape Institute, September 2019).

Landscape Character Assessment Guidance for England and Scotland (The Countryside Agency and Scottish Natural Heritage, 2002).

Technical Guidance Note 02-21: Assessing landscape value outside national designations.

Vale of Glamorgan Local Development Plan 2011- 2026

Vale of Glamorgan Local Development Plan Revised Report 2021 – 2036, May 2022

Rhondda Cynon Taf Local Development Plan 2006-2021, March 2011

Rhondda Cynon Taf Revised Local Development Plan 2022-2037

Planning Policy Wales (Edition 12, 2024).

Natural Resources Wales (2016). LANDMAP the Welsh landscape baseline.

Natural Resources Wales (2017). National Landscape Character Areas.

Vale of Glamorgan County Borough Council Designation of Landscape Character Areas (final report August 2008).

Technical Advice Note (TAN): Nature Conservation and Planning (2009).

7 ECOLOGY AND BIODIVERSITY

7.1 Introduction

- 7.1.1 This chapter outlines the scope and methodology for the assessment of the likely significant effects arising from the Proposed Development, as described in Section 2, in respect to ecology and biodiversity.
- 7.1.2 It sets out ecological and biodiversity receptors of relevance, and the approach to the baseline data gathering and assessment of the Proposed Development's impacts during construction and, operation and decommissioning.
- 7.1.3 The following aspects have been considered as part of the scope and methodology for biodiversity:
- Internationally, nationally and locally designated statutory/non-statutory sites
 - Priority and non-priority habitats
 - Protected and notable species groups
- 7.1.4 In line with the 2017 EIA Regulations, this Scoping Report chapter has been compiled by appropriately qualified, experienced, and competent experts. The author of this chapter is Sara Curtis BSc (Hons) MCIEEM, an ecological consultant with over 10 years of relevant UK consultancy experience. This chapter has been reviewed and approved by Hazel Murrells BSc (Hons) MSc MCIEEM CEnv, Associate Ecologist (11 years of relevant UK experience) and Rachel Chatting BSc (Hons), MSc, MCIEEM, Regional Ecology Director at Tyler Grange (11 years of relevant UK experience).

7.2 Legislative, policy context and guidance

Legislation

Environment Act (Wales) 2016

- 7.2.1 Section 6 of the Environment Act places a duty on public authorities to 'seek to maintain and enhance biodiversity' so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to 'promote the resilience of ecosystems'. Section 7 of the Environment Act requires The Welsh Ministers to publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales. This is known as the S7 list.

The Wildlife and Countryside Act (WCA) 1981 (as amended)

- 7.2.2 In Britain, the WCA 1981 (as amended) is the primary legislation protecting habitats and species. Sites of Special Scientific Interest (SSSI), representing the best examples of our natural heritage, are notified under the WCA 1981 (as amended) by reason of their flora, fauna, geology or other features. All breeding birds, their nests, eggs and young are protected under the Act, which makes it illegal to knowingly destroy or disturb the nest site during nesting season. Schedules 1, 5 and 8 afford protection to individual birds, other animals and plants.

The Conservation of Habitats and Species Regulations 2017 (as amended)

- 7.2.3 The European Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, 1992, often referred to as the 'Habitats Directive', provides for the protection of key habitats and species considered of European importance. Annexes II and IV of the Directive list all species considered of community interest. The legal framework to protect the species covered by the

Habitats Directive has been enacted under UK law through The Conservation of Habitats and Species Regulations 2017 (as amended).

The Countryside and Rights of Way (CRoW) Act 2000

- 7.2.4 The CRoW Act 2000 strengthens the species enforcement provisions of the WCA 1981 (as amended) and makes it an offence to 'recklessly' disturb a protected animal whilst it is using a place of rest or shelter or breeding/nest site.

The Natural Environment and Rural Communities Act (NERC) 2006

- 7.2.5 Provides a list of habitats and species of principal importance for the conservation of biodiversity.

The Hedgerow Regulations 1997

- 7.2.6 The Hedgerows Regulations 1997 were introduced in England and Wales to protect important hedgerows. They require landowners to notify the Local Planning Authority before removing or damaging any hedgerow that meets certain criteria. If the Local Planning Authority determines that the hedgerow is important, they can issue a retention notice, prohibiting removal.
- 7.2.7 The regulations apply to most countryside hedgerows, but do not affect hedges in domestic gardens. They aim to preserve hedgerows for their ecological benefits, such as providing habitat for wildlife and helping to prevent soil erosion.

The Protection of Badgers Act 1992

- 7.2.8 The Protection of Badgers Act 1992 was introduced in the UK to protect badgers and their setts. It makes it illegal to intentionally kill, injure, or capture a badger, or to damage or destroy a badger sett. The Act also prohibits the disturbance of badgers while they are in their setts.
- 7.2.9 The Act aims to conserve badger populations and protect their habitats. It is a criminal offense to violate the provisions of the Act, and offenders can face fines or imprisonment.

The Animal Welfare Act 2006

- 7.2.10 The Animal Welfare Act 2006 is the principal law relating to animal welfare, protecting all vertebrate animals. The act aims to enforce a duty of care to owned animals and prohibits forms of animal cruelty including causing unnecessary suffering, mutilation, and poisoning.

National Planning Policy

Planning Policy Wales (PPW): Edition 12 - February 2024

- 7.2.11 PPW was updated in February 2024 and sets out the Government's planning policies for Wales and how these should be applied. It includes provision for Net Benefits for Biodiversity.
- 7.2.12 Section 6.4 of PPW considers biodiversity and ecological network and states that *"the planning system has a key role to play in helping to reverse the decline in biodiversity and increase the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement."*
- 7.2.13 The Biodiversity and Resilience of Ecosystems Duty (Section 6 Duty) states that *"planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any significant loss of habitats or populations of specie (not including non-native invasive species), locally or nationally and must provide a net benefit for biodiversity and improve, or enable the improvement, of the resilience of ecosystems. A net benefit for biodiversity is the concept that development should leave biodiversity and the resilience of ecosystems in a significantly better state than before, through securing immediate and long term, measurable and demonstrable benefit, primarily on or immediately adjacent to the site. The step wise approach outlined below is the means of demonstrating the steps which have been taken*

towards securing a net benefit for biodiversity. In doing so, planning authorities must also take account of and promote the resilience of ecosystems, in particular the following attributes, known as the DECCA Framework:

- *diversity between and within ecosystems*
- *the extent or scale of ecosystems*
- *the condition of ecosystems including their structure and functioning*
- *the connections between and within ecosystems*
- *adaptability of ecosystems including their ability to adapt to, resist and recover from a range of pressures likely to be placed on them through climate change for example*

7.2.14 In fulfilling this duty, planning authorities must also have regard to:

- the list of habitats and species of principal importance for Wales, published under Section 7 of the Environment (Wales) Act 2016
- the SoNaRR, published by NRW
- any Area Statement, published by NRW, that covers all or part of the area in which the authority exercises its functions and NRW's Nature Network Maps
- guidance given to public authorities by Welsh Ministers under Section 6 of the Environment (Wales) Act

Local Planning Policy

Vale Of Glamorgan Local Development Plan 2011-2026 (Adopted June 2017)

7.2.15 Planning document that sets out the framework for the growth and development of the Borough. It identifies how and where new development and regeneration should take place and thereby promotes and manages the future development of the Borough.

7.2.16 Relevant planning policies from the Statutory Development Plan include:

- Policy SP10 – Built and Natural Environment
- Policy MG19 – Sites and Species of European Importance
- Policy MG20 – Nationally Protected Sites and Species
- Policy MG20 – Sites of Importance for Nature Conservation, Regionally Important Geological and Geomorphological Sites and Priority Habitats and Species
- Policy MD19 – Low Carbon and Renewable Energy Generation

Rhondda Cynon Taf Local Development Plan 2006-2021 (Adopted March 2011)

7.2.17 A small portion of the Site also falls within the Rhondda Cynon Taf administration.

7.2.18 Relevant planning policies from the Statutory Development Plan include:

- Policy CS2 – Development in the South
- Policy AW 8 – Protection And Enhancement Of The Natural Environment
- Policy AW 10 – Environmental Protection and Public Health
- Policy AW 12 – Renewable & Non-Renewable Energy

7.3 Baseline information and study area

- 7.3.1 For each PV Area surveyed, all surveys were undertaken in line with best practice guidelines (see Table 7.2 for references and citations) and undertaken by a suitably qualified and experienced ecologist.
- 7.3.2 All of the Areas have been subject to a UK Habitat Classification survey. Although largely superseded by the UK Habitat Classification survey, the principles of 'extended' phase 1 habitat surveys will also be employed. The 'extended' part of the survey (which UK Habitat Classification does not do) assesses the suitability of habitats for protected/notable species. The UK Habitat Classification survey included habitats on-site and immediately adjacent habitats where access was possible. As part of the 'extended' habitat survey, where access was possible, the red line boundary and 30 m adjacent to the red line boundary was also search for evidence of badger.
- 7.3.3 Data was purchased for each PV Area from Aderyn, Local Environmental Records Centres (LERC) Wales' Biodiversity Information and Reporting Database in August to September 2024. The data search includes nationally and non-statutory designated sites, protected and notable fauna and broad habitats within a 2 km radius around each Area. As part of the data search, waterbodies within the red line boundaries and within 250 m of the red line boundaries of the Proposed Development areas were also identified.
- 7.3.4 Breeding and wintering bird surveys are being undertaken across all of the Areas. The surveys have been conducted to assess the presence and distribution of bird species across the Areas. These include:
- Breeding bird surveys – This method is based on a territory mapping methodology in accordance with published guidance. The identity and activity of all birds, either seen or heard inside the red line boundary or within 50m of its boundary, is then recorded on maps of a suitable scale. Breeding bird surveys were completed between March 2024 to July 2024 with the exception of part of PV Area 1 (Land South of St Mary Church), part of PV Area 3 (Land at New Meads) and part of PV Area 5 (Land at Hensol) where surveys will be undertaken in 2025.
 - Non-breeding (wintering) bird surveys – The survey methodology follows guidance produced by the Bird Survey and Assessment Steering Group for non-breeding bird surveys. The objective of the surveys is to identify the presence or likely absence of the qualifying bird species of any relevant Special Protection Area/Ramsar designations within the potential zone of influence of the Proposed Development red line boundary. Wintering bird surveys have been undertaken across all sites between December 2023 and March 2024 with the remaining surveys being undertaken in October and November 2024. There are three sites where surveys are currently ongoing and include part of PV Area 1 (Land South of St Mary Church), part of PV Area 3 (Land at New Meads) and part of PV Area 5 (Land at Hensol).

PV Area 1

- 7.3.5 The majority of PV Area 1 comprises three land parcels – one approximately 420m south of St Hilary (The Farm, Cowbridge), one just south-east of St Mary Church (Land at Gigman Farm) and one to the north-east of Treguff (Land at Treguff Fach Farm). Two smaller parcels make up the remainder of PV Area 1 (Land South of St Mary Church and Land at Treguff Fach Farm West). Due to the nature of the habitats on each of the sites each parcel has been discussed separately below.
- 7.3.6 A Phase I/UK Habitat Classification Survey of all the PV Area 1 with the exception of Land south of St. Mary's Church was undertaken from the 27 to 29 August 2024 by Vicky King-Cline BSc (Hons), MSc and Qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM), Ecological Consultant at Tyler Grange with 2.5 years' experience in ecological consultancy

and Aaron McFarland BSc (Hons) MSc and Qualifying member of CIEEM with 4 years' experience in ecological consultancy.

- 7.3.7 A Phase I/UK Habitat Classification Survey of Land South of St Mary Church was undertaken on the 21 to 22 August 2024 by Anthony Hiscocks BSc (Hons) MSc, ACIEEM, Senior Ecologist at Tyler Grange with over 10 years' experience in ecological consultancy and Tristan Loughrey-Robinson BSc, MSc, Ecological Consultant at Tyler Grange with 5 years' experience in ecological consultancy.

The Farm, Cowbridge

- 7.3.8 The Farm, Cowbridge primarily comprises modified grassland fields which are either sheep, cattle or horse grazed. Two arable fields (maize) are also present with boundary native hedgerows and scattered mature trees. An area of Ancient Semi-natural Woodland is located within the south of the red line boundary.

Land at Gigman Farm

- 7.3.9 Land at Gigman Farm primarily comprises sheep and cattle grazed modified grassland. One field in the north-east contained extensive coverage of rushes and wetter conditions, with a greater flora species richness. Fields are bounded by native hedgerows with scattered mature trees. Approximately 8 hectares of broad-leaved woodland is located within the central area of the red line boundary and an area of willow carr/scrub/woodland is also present. Both of these areas are designated as Ancient Semi-natural Woodland. The River Thaw runs through part of the north-eastern area of the redline boundary.

- 7.3.10 Two non-statutory designated site - Coed y Gellast Site of Importance for Nature Conservation (SINC) and Coed yr Arglwydd SINC are located within the red line boundary.

Land at Treguff Fach Farm and Land at Treguff Fach Farm West

- 7.3.11 Land at Treguff Fach Farm primarily comprises sheep and cattle grazed modified grassland. Fields are bounded by native hedgerows with scattered mature trees. An area of broad-leaved woodland in the south of the red line boundary is designated as Ancient Semi-natural Woodland. An unnamed tributary of the River Thaw runs through part of the redline boundary.

Land South of St Mary Church

- 7.3.12 Land South of St Mary Church comprises a diverse range of habitats including neutral and rough grassland, dense scrub, hedgerows and wetland grassland. Two dry ditches/watercourses are present within the southern field.
- 7.3.13 The southern field comprises a horse grazed field which is surrounded by wide bands of rough neutral/wetland grass which is fenced to prevent grazing. The other grassland fields which appear to be occasionally grazed also have wide rough grassland margins which are marked with stakes and not subject to regular management. The field margins appear diverse and species-rich and have been managed for biodiversity.
- 7.3.14 The parcel is bound by dense and wide hedgerows the majority of which are species-rich and include mature tree. In places hedgerows are encroaching into adjacent grassland with such areas assessed as mixed scrub.
- 7.3.15 Land South of St Mary Church is not covered by any statutory designated sites for nature conservation, however one non-statutory designated site – Pen Matn SINC is located directly adjacent to the eastern red line boundary which is designated for two poorly drained fields dominated by rush pasture, a priority habitat.

PV Area 2

- 7.3.16 PV Area 2 lies just north of the A48 at Pant Wilkin Farm approximately 1.5km south-east of Aberthin and 0.8km north-east of St Hilary. It comprises two parcels named Hollybush Farm and Pant Wilkin Farm, which are connected via an unnamed road extending approximately 340m.
- 7.3.17 A Phase I/UK Habitat Classification Survey of PV Area 2 was undertaken on the 9 to 11 September 2024 by Tristan Loughrey-Robinson BSc, MSc, Ecological Consultant at Tyler Grange with 5 years' experience in ecological consultancy and Joe Small BSc (Hons), Ecological Consultant at Tyler Grange with 3.5 years' experience in ecological consultancy.
- 7.3.18 PV Area 2 comprises a combination of horse grazed modified grassland and arable fields. All fields have limited field margins and are bounded by native hedgerows, some of which are species-rich and less regularly managed. Several large mature trees are present within the hedgerows. A small area of woodland is present to the north of the PV Area 2.
- 7.3.19 No designated sites for nature conservation have been identified within or immediately adjacent to the red line boundary.

PV Area 3

- 7.3.20 PV Area 3 is located approximately 0.5km north-east of Cowbridge and 0.8km south-west of the smaller Trerhyngyll. This area comprises of four parcels named Newton House Farm, Tyn y Waun Farm, Greathouse Farm and Land at New Meads. These land parcels are discussed and summarised together below.
- 7.3.21 A Phase I/UK Habitat Classification Survey of PV Area 3 was undertaken on the 23 to 25 September 2024 by Lucy Billingham BSc (Hons), Qualifying Member of CIEEM, Ecological Consultant at Tyler Grange with 2 years' experience in ecological consultancy and Joe Small BSc (Hons), Ecological Consultant at Tyler Grange with 3.5 years' experience in ecological consultancy.
- 7.3.22 Wintering and breeding bird surveys have been undertaken across the majority of PV Area 3 with the exception of the southernmost three fields, due to access constraints to these fields.
- 7.3.23 The majority of PV Area 3 comprises cattle grazed modified grassland bounded by native hedgerows. Fields in the south of the red line boundary are more diverse grassland and fall within a NRW Priority Area (Heathland and Grassland). In this area, a number of fields are intensively horse grazed, neutral grassland with an abundance of unfavourable species and evidence of occasional flooding with areas of standing water present at the time of the survey. This area may qualify as the Priority Habitat Coastal and Floodplain Grazing Marsh.
- 7.3.24 A number of ponds are also present alongside willow scrub/woodland. Woodland is present within the red line boundary and adjacent to the Area and scattered trees are located throughout.
- 7.3.25 The River Thaw runs along part of the southern boundary of PV Area 3 and a number of unnamed tributaries runs through the red line boundary. Artificial ditches intersect parts of the Area which are recently excavated with adjacent earth mounds colonised by ruderal vegetation including common nettle *Urtica dioica* and willowherb *Epilobium sp.*. The ditches lack significant aquatic vegetation however the non-native invasive Himalayan balsam was recorded on the margins of the area.
- 7.3.26 Cors Aberthin SSSI lies adjacent to the eastern boundary of the Area and designated for its marshy grassland and species-rich neutral grassland. The SSSI also supports Priority Habitats purple moor-grass and rush pastures, fens and lowland meadows.

PV Area 4

- 7.3.27 PV Area 4 is located directly north of Welsh St Donats which adjoins the PV Area at its southernmost point. The PV Area is located 0.5km south of Ystradowen, and 0.2 and 0.5km east of Prisk and

Maendy, respectively. This Area comprises of two parcels named Caeau Farm and Church Farm. Both parcels are discussed and summarised together below.

- 7.3.28 A Phase I/UK Habitat Classification Survey of PV Area 4 was undertaken on the 9 to 11 September 2024 by Tristan Loughrey-Robinson BSc, MSc, Ecological Consultant at Tyler Grange with 5 years' experience in ecological consultancy and Joe Small BSc (Hons), Ecological Consultant at Tyler Grange with 3.5 years' experience in ecological consultancy.
- 7.3.29 The majority of PV Area 4 comprises cattle and sheep grazed modified grassland fields with several arable fields also present. Fields are bounded by mainly species-rich, intact native hedgerows however a number of these have been damaged by livestock. Scattered large, mature trees are located across the red line boundary including around farm buildings.
- 7.3.30 The eastern area of PV Area 4 comprises a combination of modified grassland, other neutral / rough grassland, heath/gorse and wetland. A small area of woodland is located in the south of the red line boundary and has been identified as Restored Ancient Woodland. Areas in the north and east of the area are more diverse and species rich. Stands of non-native invasive Himalayan balsam *Impatiens glandulifera* and Japanese knotweed *Reynoutria japonica* were identified across the area.
- 7.3.31 A network of streams and wet ditches runs throughout the red line boundary and several ponds/standing water are also present.
- 7.3.32 Seven non-statutory SINC's (South Caercady, West of Ty Mynydd, Land adjacent to Ty'r-Mynydd, North of Welsh St Donats, North Caercady, Welsh St Donats Village Pond and Land north of Ty'r-Mynydd) are located within PV Area 4, mainly associated with habitats in the east of the Area.

PV Area 5

- 7.3.33 PV Area 5 predominantly comprises two parcels each made up of adjoining agricultural fields. At its most westerly point, the PV Area is approximately 1km west of Clawdd Coch and adjoins the Vale Resort to the north-east. The Area also comprises two smaller parcels (0.2ha and 0.1ha) situated between the larger parcels and named Land to the West of Llwynhyddid Farm and Land at Hensol. Both parcels are discussed and summarised together below.
- 7.3.34 A Phase I/UK Habitat Classification Survey of PV Area 5 was undertaken on the 2 to 4 September 2024 by Lucy Billingham BSc (Hons), Qualifying Member of CIEEM, Ecological Consultant at Tyler Grange with 2 years' experience in ecological consultancy and Harry Du Bois-Jones BSc (Hons), Ecological Consultant at Tyler Grange with 3 years' experience in ecological consultancy.
- 7.3.35 The two smaller parcels of PV Area 5 underwent a Phase I/UK Habitat Classification Survey on the 21 to 22 August 2024 by Tristan Loughrey-Robinson BSc, MSc, Ecological Consultant at Tyler Grange with 5 years' experience in ecological consultancy and Anthony Hiscocks BSc (Hons) MSc, ACIEEM, Senior Ecologist at Tyler Grange with over 10 years' experience in ecological consultancy.
- 7.3.36 The majority of PV Area 5 comprises grazed modified grassland fields or temporary grass/clover leys. The smaller parcel fields were being cut for hay or silage at the time of the survey. The fields are bounded by a mix of species-rich and species-poor native hedgerows and individual mature trees are scattered across the area. Woodland blocks border the PV Area which are designated as NRW Priority Area (Woodland – PAWS), Ancient Semi Natural Woodland and Restored Ancient Woodland sites.
- 7.3.37 A network of streams and wet ditches runs throughout the red line boundaries.
- 7.3.38 There are no non-statutory designated sites within the red line boundaries, however four SINC's (West of Newydd Stables, North of Coed Leision, South East of Llwyn-Rhyddid Cottages and Coed Llwyn-Rhyddid) are located adjacent to the red line boundaries of PV Area 5.

PV Area 6

- 7.3.39 PV Area 6 is located approximately 0.7km north-east of PV Area 5 and adjoins the eastern side of the Vale Resort. Hensol lake lies approximately 450m to the north-west. This area comprises one parcel named Bryn Farm.
- 7.3.40 A Phase I/UK Habitat Classification Survey of PV Area 6 was undertaken on the 2 to 4 September 2024 by Lucy Billingham BSc (Hons), Qualifying Member of CIEEM, Ecological Consultant at Tyler Grange with 2 years' experience in ecological consultancy and Harry Du Bois-Jones BSc (Hons), Ecological Consultant at Tyler Grange with 3 years' experience in ecological consultancy.
- 7.3.41 The majority of PV Area 6 comprises a mixture of cattle grazed modified grassland fields and wetter swards of other neutral grassland and rushes, particularly in the north. This Area forms part of a SINC for its Priority Habitat purple moor grass and rush pasture. The Area is bounded by mature treelines and broad leaved woodland block which are also a feature of a number of different SINC's, Ancient Semi Natural Woodland and Restored Ancient Woodland blocks which bisect the Area.
- 7.3.42 A stream corridor flows through the centre of the red line boundaries.
- 7.3.43 Six non-statutory designated sites are located within and immediately adjacent to the red line boundaries (Coed Waunn-Lloff SINC, South West of Castell Bach SINC, Land West of Hensol Mill SINC, Land near Hensol Mill SINC, Land South of Hadod Y Wennol SINC, Hafod Y Wennol SINC and Coed Ffos-Ceibr SINC).

PV Area 7

- 7.3.44 PV Area is located approximately 165m north-west of PV Area 5 at its closest point and comprises an irregularly shaped parcel of land made up of adjoining fields. This area comprises one parcel named Keepers Lodge Farm.
- 7.3.45 A Phase I/UK Habitat Classification Survey of PV Area 7 was undertaken on the 2 to 4 September 2024 by Lucy Billingham BSc (Hons), Qualifying Member of CIEEM, Ecological Consultant at Tyler Grange with 2 years' experience in ecological consultancy and Harry Du Bois-Jones BSc (Hons), Ecological Consultant at Tyler Grange with 3 years' experience in ecological consultancy.
- 7.3.46 PV Area 7 comprises cattle grazed modified grassland fields. The fields are bounded by species-rich hedgerows with individual mature trees scattered across the Area. Grassland fields in the south west of the Area falls within a NRW Priority Area (Lowland Wetland) and grassland fields in the north fall within a NRW Priority Area (Heathland and Grassland). The Area is bounded by broad leaved woodland block which are also a feature a number of different SINC's and Ancient Semi Natural Woodland and Restored Ancient Woodland blocks which bisect the Area.
- 7.3.47 The Nant Dyfrgi River runs along the western boundary of the Area with unnamed tributaries across the Area.
- 7.3.48 Two non-statutory designated sites are located immediately adjacent to the red line boundaries (Coed Wern-Fawr SINC and Coed Cattwg-Glas SINC).

PV Area 8

- 7.3.49 PV Area 8 is a singular parcel comprising adjoining agricultural fields located 0.7km south-west of the M4. This Area comprises one parcel named Llwyn Nwydog Farm.
- 7.3.50 A Phase I/UK Habitat Classification Survey of PV Area 8 was undertaken on the 2 to 4 September 2024 by Lucy Billingham BSc (Hons), Qualifying Member of CIEEM, Ecological Consultant at Tyler Grange with 2 years' experience in ecological consultancy, Paul Webb BSc (Hons), Senior Ecological Consultant at Tyler Grange with 10 years' experience in ecological consultancy and Harry

Du Bois-Jones BSc (Hons) Ecological Consultant at Tyler Grange with 3 years' experience in ecological consultancy.

- 7.3.51 The majority of PV Area 8 comprises sheep grazed modified grassland fields with a number of other neutral grassland fields typically associated with steeply sloped areas. The fields are bounded by a mixture of species-poor and species-rich hedgerows and several tree lines. A small area of woodland block is located within the red line boundary and two larger woodland blocks are located adjacent to the north and west of the red line boundary, both of which are Ancient Semi Natural Woodland.
- 7.3.52 No designated sites for nature conservation have been identified within or immediately adjacent to the red line boundary.

PV Area 9

- 7.3.53 The PV Area is comprised of one roughly triangular shaped parcel of agricultural land which lies directly south of Degar Farm and the M4 corridor, beyond which lies Llanharry. This Area comprises one parcel named Degar Farm.
- 7.3.54 A Phase I/UK Habitat Classification Survey of PV Area 9 was undertaken on the 16th to 18th September 2024 by Lucy Billingham BSc (Hons), Qualifying Member of CIEEM, Ecological Consultant at Tyler Grange with 2 years' experience in ecological consultancy.
- 7.3.55 The majority of PV Area 9 comprises large, modified grassland fields which are cattle and sheep grazed with a poor species diversity. Rougher areas of grassland are located adjacent to the farm. A former green lane crosses the centre of area between hedgerows with central vegetation neglected and comprising dense bracken and common nettle.
- 7.3.56 A large waterbody to west of the area extends off-site to the west. At the time of the survey, the waterbody was enlarged by floodwater with no vegetation recorded. However it was not fenced and likely to be poached by livestock.
- 7.3.57 No designated sites for nature conservation have been identified within or immediately adjacent to the red line boundary.

BESS Area

- 7.3.58 The BESS Area comprises two irregularly shaped land parcels named Land to the West of Aberthaw Farm and Land to the south-east of Aberthaw Farm.
- 7.3.59 A Phase I/UK Habitat Classification Survey of the BESS Area was undertaken on the 21 to 22 August 2024 by Anthony Hiscocks BSc (Hons) MSc, ACIEEM, Senior Ecologist at Tyler Grange with over 10 years' experience in ecological consultancy and Tristan Loughrey-Robinson BSc, MSc, Ecological Consultant at Tyler Grange with 5 years' experience in ecological consultancy.
- 7.3.60 The majority of the western BESS Area comprises a large arable field which is subject to intensive management and had been recently tilled at the time of the survey. The field is bounded by a narrow (c. 1m wide) field margin comprising species-poor grass. A small derelict gravel parking area is present to the east which is being colonised by grass and ruderal species. Adjacent to this Area is a bank with dense ruderal vegetation. A small group of trees classified as block of woodland and comprising poor condition elm trees is also present north of this Area. The arable field is bound by dense native hedgerows, the majority of which are species-poor although some are species-rich. The western boundary comprises a gappy native hedgerow which has been removed in places by adjacent gardens.
- 7.3.61 The majority of the eastern BESS Area comprises a single sheep grazed field which is also grazed by cattle on occasion. The grassland is species-poor with a very short sward being grazed intensively. Occasional areas of rough grassland are present below electricity pylons and adjacent to the eastern boundary. The western and south boundaries comprises species-poor hedgerows

and with a short section of species-rich hedgerow on the northern boundary. An off-site area of woodland is present with trees overhanging and a stone wall along the northern boundary.

- 7.3.62 All of the eastern field and the majority of the western field falls under a NRW Priority Area (Coastal Saltmarsh).
- 7.3.63 No designated sites for nature conservation have been identified within or immediately adjacent to the red line boundary.

Cable route

- 7.3.64 At this stage, easement options are being considered to accommodate the cable route. No ecological surveys of the easement options has currently been undertaken and therefore the following is a very high level overview and detailed surveys including a Phase I/UK Habitat Classification Survey will be required.
- 7.3.65 The easement options for the cable route are currently:
- Option 1: entirely soft dig via third-party easements.
 - Option 2: a combination of easements on third-party land and installation in the highway under Section 50 of the New Roads and Street Works Act 1991.
 - Option 3: entirely installation in the highway under Section 50 of the New Roads and Street Works Act 1991.
- 7.3.66 From a high level ecological perspective, Option 3 with the entirety of the installation in the highways is the preferred option. Developed land; sealed surfaces including highways, have negligible ecological importance and limited opportunities for protected and notable species. Options 1 and 2 have the potential to cross habitats of ecological importance, including Priority Habitats, designated site and watercourses, all of which are likely to have potential to support protected and notable species.

7.4 Proposed approach

Baseline studies – PV Areas 1 to 9 and BESS Area

Habitats

- 7.4.1 Where habitats, including grassland have been identified as diverse and/or species rich, further botanical surveys, such as a National Vegetation Classification (NVC) may be required to classify the habitat. Botanical and/or NVC surveys should be undertaken by a suitability qualified and experienced ecologist between May – August inclusive for grassland and mid-April – August inclusive for woodlands. Details of the PV Areas recommended for further NVC surveys are provided in Table 7.1 below.

Data Search

- 7.4.2 A full data search including interrogating the data purchased from the local records centre and available online sources has been undertaken for each Proposed Development areas to inform the scope of protected and notable species surveys and the assessment of effects. This process identified the presence of protected sites and protected/notable fauna and flora in the surrounding landscape. The data returned from this exercise will inform the scope of this assessment and is referenced throughout this assessment where relevant. Where applicable, further investigations will be undertaken, which may require additional interrogation with regards to the designated features of the nearby non-statutory designated sites, to confirm potential impact pathways. The aim of the

data search is to collate existing ecological records for the Proposed Development and adjacent areas to inform the scope of survey effort and potential impacts on protected/notable species.

Protected and Notable Species

- 7.4.3 With the exception of part of PV Area 1 (Land South of St Mary Church), part of PV Area 3 (Land at New Meads) and part of PV Area 5 (Land at Hensol) breeding and wintering bird surveys have been undertaken across the PV Areas. Wintering bird surveys are currently ongoing at outstanding sites.
- 7.4.4 Within all PV Areas, the hedgerows, woodland, rougher grassland, watercourses and scattered trees have the potential to support foraging, commuting and roosting bats. The hedgerows, woodland, scrub and trees have the potential to support hazel dormouse. Rough grassland and field margins have the potential to support foraging and sheltering common species of reptiles with the woodland, hedgerow and scrub bases also providing hibernation opportunities.
- 7.4.5 Where watercourses are present onsite, particularly those connected to the River Thaw, water vole and otter could potentially be present. Details of which PV areas require these surveys are provided in Table 7.1 below.
- 7.4.6 If habitats with the potential to support protected and/or notable species or individuals themselves are being impacted by the proposals, further surveys will be required in line with best practice and guidance. All surveys should be undertaken by a suitably qualified and experienced ecologist with relevant licences where applicable. All surveys and assessments will be undertaken in accordance with best practice standard guidance (see Table 7.2 for full citations). This will likely include the following surveys:
- Ground Level Tree Assessment (GLTA) – Undertaken on trees to be impacted by the Proposed Development to determine trees suitability to support roosting bats. These can be undertaken at any time of year.
 - Preliminary Roost Assessment (PRA) – External and internal building inspection survey to assess potential of buildings within the Site to support roosting bats. These surveys can be undertaken at any time of year.
 - Further emergence/re-entry/aerial inspection surveys undertaken on tree/structures/buildings to be impacted by the Proposed Development identified during the GLTA. These surveys are weather and seasonally dependent and can be undertaken between the optimal period of May – August with September being sub-optimal depending on the suitability of the tree to support roosting bats.
 - Daytime Bat Walkover – Walkover of the Proposed Development to assess potential bat activity including foraging areas and potential commuting routes This can be undertaken at any time of year.
 - Activity and Automated Static Detector Deployment Surveys – Undertaken across the Proposed Development to determine the use of the Site by foraging and commuting bats. These can be undertaken between April – October inclusive.
 - Great Crested Newt Surveys – Presence/likely absence/populations size class surveys and/or environmental DNA (eDNA) surveys of onsite and off-site ponds/waterbodies within 500m of the redline boundaries to determine whether great crested newt are present/likely absent on the Site. These surveys are weather dependent. Presence/likely absence/populations size class surveys can be undertaken between March and early June inclusive and eDNA surveys between mid-April and June.
 - Hazel Dormouse Surveys – Presence/likely absence surveys to determine whether a population of dormouse is present/likely absent on the Site. These surveys can be undertaken between April and November inclusive.

- Reptile Surveys - Presence/likely absence surveys of suitable habitat to determine whether a population of reptile is present/likely absent on the Site. These surveys are weather dependent and can be undertaken between April and October with optimal months being April, May and September.
- Otter Surveys – Habitat suitability assessment of watercourses to determine whether watercourses have suitability to support otter and subsequent systematic search for evidence of otter presence. These surveys can be undertaken at any time of year.
- Water Vole Surveys - Habitat suitability assessment of watercourses to determine whether watercourses have suitability to support water vole and subsequent systematic search for evidence of water vole presence. These surveys can be undertaken at any time of year.
- Invertebrate Surveys – Undertake invertebrates surveys on suitable habitat to determine whether the Site has the potential to support invertebrate populations of significance and the species composition. These surveys are weather dependent and can be undertaken between May and mid-September.
- Badger Surveys – Walkover survey to search for evidence of badger activity. Should a sett be identified, subsequent sett monitoring surveys maybe required to classify the sett and determine the use of the sett. These surveys can be undertaken at any time of year.

7.4.7 Consultation will be undertaken with NRW to discuss the approach and scope of protected and priority species surveys for the Proposed Development.

Biodiversity Net Gain

7.4.8 Alongside the botanical and protected and notable species surveys, the Proposed Development will undertake a Biodiversity Net Gain (BNG) Assessment with the aim of delivering a 10% net gain for habitats, hedgerows and watercourses, where applicable. Although BNG is not a mandatory requirement in Wales, it can be used to show measurable net gains and contribute to Net Benefits for Biodiversity. The Proposed Development will be assessed against the latest Defra's Statutory Biodiversity Metric to demonstrate a 10% net gain.

7.4.9 Where a watercourse is present onsite or within 10m of the red line boundary, a River Condition Assessment undertaken by an accredited surveyor will be undertaken to complete the watercourse module of the BNG Assessment.

Evaluation

7.4.10 The evaluation of habitats and species is defined in accordance with published guidance (see Table 7.2). The scale of importance of each ecological feature is assigned within a defined geographical context, namely international and European, national, regional, county, and local. Below these are features considered to be of negligible importance.

7.4.11 Consideration will also be given to legally protected or controlled species which are 'important features' in the context of this assessment, for which mitigation measures are required to ensure legal compliance, regardless of their geographic scale of importance. Thus, it is possible for a feature of negligible ecological importance to be legally protected and hence require mitigation.

7.4.12 Evaluation is based on various characteristics that can be used to identify ecological features likely to be important in terms of biodiversity. These include site designations (such as SSSIs, or for undesignated features, the size, conservation status (locally, nationally or internationally), and the quality of the ecological feature. In terms of the latter, quality can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats) or species populations or assemblages.

Impact Assessment

- 7.4.13 The assessment of impacts arising from the Proposed Development will be undertaken in accordance with CIEEM's Ecological Impact Assessment Guidelines, taking into account the type/duration of impact and the importance of the ecological receptor in question.
- 7.4.14 When describing impacts, the CIEEM Ecological Impact Assessment (EclA) Guidelines identifies the following characteristics which will be considered in the assessment:
- Positive (beneficial) or negative (adverse) – if an impact will improve or reduce the quality of the environment.
 - Extent – the spatial or geographical area over which the impact/effect may occur.
 - Magnitude – refers to size, amount, intensity and volume. If an impact is deemed to be significant then its magnitude, in quantitative terms, should be assessed.
 - Duration – the time for which an impact is expected to last.
 - Timing and frequency – whether impacts occur during critical life- stages or seasons.
 - Reversibility – an irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.
- 7.4.15 The assessment only needs to describe the characteristics relevant to understanding the ecological effect of the impacts as a result of the Proposed Development and to determine the significance of the impacts.
- 7.4.16 A summary of the PV Area habitats, likely further surveys required, and ecological constraints and opportunities are summarised in Table 7.1.

Table 7.1: Table summarising habitats, likely further surveys required and ecological constraints and opportunities.

PV Area	Habitats	Likely Further Surveys Required (if impacted)	Ecological Constraints	Ecological Opportunities
1	- Modified grassland - Arable - Rough neutral/wetland grass - Native hedgerows - Mature trees - Broad leaved woodland - Willow carr/scrub - Mixed scrub - Ancient Semi-natural Woodland - River Thaw	- Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static - Hazel dormouse - Reptiles - Badger - Otter - Water vole - Botanical/NVC	- Ancient Semi-natural Woodland - Protected and notable species - Non-statutory designated sites - River Thaw	- Biodiversity net gain (BNG) - Protection and buffering of retained habitats and designated sites - Habitat creation - Enhancement of retained habitats

PV Area	Habitats	Likely Further Surveys Required (if impacted)	Ecological Constraints	Ecological Opportunities
		River Condition Assessment (RCA)		
2	- Modified grassland	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static	Ancient Semi-natural Woodland	Biodiversity net gain (BNG)
	- Arable			Protection and buffering of retained habitats
	- Native hedgerows		Protected and notable species	Habitat creation
	- Mature trees			
	- Woodland	Hazel dormouse		Enhancement of retained habitats
		Badger		
		Great crested newt		
3	- Modified grassland	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static	NRW Priority Area (Heathland and Grassland)	Biodiversity net gain (BNG)
	- Neutral grassland			Protection and buffering of retained habitats and designated sites
	- Native hedgerows		Potential Priority Habitat Coastal and Floodplain Grazing Marsh	Habitat creation
	- Waterbodies	Hazel dormouse		
	- Mature trees			
	- Broad leaved woodland	Badger	Protected and notable species	Enhancement of retained habitats
	- Ancient Semi-natural Woodland	Great crested newt	Non-statutory designated site	
	- River Thaw and tributaries	Botanical/NVC	River Thaw	
	- NRW Priority Area (Heathland and Grassland)	Otter	Cors Aberthin SSSI	
	- Potential Priority Habitat Coastal and Floodplain Grazing Marsh	Water vole	Non-native invasive species	
		RCA		
4	- Modified grassland	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static	Restored Ancient Woodland	Biodiversity net gain (BNG)
	- Neutral grassland			Protection and buffering of retained habitats and designated sites
	- Arable		Protected and notable species	
	- Native hedgerows		Non-statutory designated site	Habitat creation
	- Mature trees	Hazel dormouse		

PV Area	Habitats	Likely Further Surveys Required (if impacted)	Ecological Constraints	Ecological Opportunities
	- Heath/gorse			Enhancement of retained habitats
	- Woodland	Reptiles	Non-native invasive species	
	- Restored Ancient Woodland	Badger		
	- Stream	Great crested newt		
		Otter		
		Water vole		
		RCA		
5	- Modified grassland	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static	NRW Priority Area (Woodland – PAWS)	Biodiversity net gain (BNG)
	- Temporary grass/clover leys		Ancient Semi Natural Woodland	Protection and buffering of retained habitats and designated sites
	- Native hedgerows			Habitat creation
	- Mature trees	Hazel dormouse	Restored Ancient Woodland	Enhancement of retained habitats
	- Streams and ditches	Badger		
		Great crested newt	Protected and notable species	
		Otter	Non-statutory designated site	
		Water vole		
		RCA		
	6	- Modified grassland	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static	Priority Habitat purple moor grass and rush pasture
- Neutral grassland			Ancient Semi-natural Woodland	Protection and buffering of retained habitats and designated sites
- Priority Habitat purple moor grass and rush pasture				Habitat creation
- Tree lines		Hazel dormouse	Restored Ancient Woodland	Enhancement of retained habitats
- Native hedgerows		Badger		
- Mature trees		Great crested newt	Protected and notable species	
- Ancient Semi-natural Woodland		Botanical/NVC	Non-statutory designated site	
		Invertebrates		

PV Area	Habitats	Likely Further Surveys Required (if impacted)	Ecological Constraints	Ecological Opportunities
	- Restored Ancient Woodland - Stream	Otter Water vole RCA		
7	- Modified grassland - Native hedgerows - NRW Priority Area (Lowland Wetland) - NRW Priority Area (Heathland and Grassland) - Mature trees - Broad leaved woodland - Ancient Semi-natural Woodland - Restored Ancient Woodland - Nant Dyfrgi River	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static Hazel dormouse Badger Great crested newt Otter Water vole RCA	NRW Priority Area (Lowland Wetland) NRW Priority Area (Heathland and Grassland) Ancient Semi-natural Woodland Restored Ancient Woodland Protected and notable species Non-statutory designated site Nant Dyfrgi River	Biodiversity net gain (BNG) Protection and buffering of retained habitats and designated sites Habitat creation Enhancement of retained habitats
8	- Modified grassland - Neutral grassland - Native hedgerows - Tree lines - Ancient Semi-natural Woodland	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static Hazel dormouse Badger Great crested newt	Ancient Semi-natural Woodland Protected and notable species	Biodiversity net gain (BNG) Protection and buffering of retained habitats Habitat creation Enhancement of retained habitats
9	- Modified grassland - Green lane - Native hedgerows - Bracken - Waterbody	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static Hazel dormouse	Protected and notable species	Biodiversity net gain (BNG) Protection and buffering of retained habitats Habitat creation

PV Area	Habitats	Likely Further Surveys Required (if impacted)	Ecological Constraints	Ecological Opportunities
		Badger		Enhancement of retained habitats
		Reptiles		
		Great crested newt		
BESS Area	- Arable	Bats – GLTA, emergence/re-entry/ aerial inspection, activity and static	NRW Priority Area (Coastal Saltmarsh)	Biodiversity net gain (BNG)
	- Modified grassland			Protection and buffering of retained habitats
	- Rough grassland		Protected and notable species	
	- Gravel area			Habitat creation
	- Ruderal vegetation	Hazel dormouse		
	- Woodland			Enhancement of retained habitats
	- Native hedgerows	Badger		
	- NRW Priority Area (Coastal Saltmarsh)	Reptiles		

Assessment of effects

- 7.4.17 The results of the surveys will be used to determine the assessment of effects as a result of the Proposed Development. The assessment of effects will include the impacts of the Proposed Development during the pre-construction, construction, operational and decommissioning phases and mitigation, compensation and enhancement to be implemented. Consultation with NRW will be undertaken at the earliest opportunity to discuss the approach for mitigation, compensation and enhancement measures to be implemented across the Proposed Development. Based on the data gathered so far, however, it is anticipated that broad mitigation principles will be required as set out below.
- 7.4.18 The following four-point scale will be used to express the degree of confidence in the prediction of impact significance, for residual impacts this scale will also indicate the reliability of mitigation proposals:
- Certain/ near certain
 - Probable
 - Possible
 - Extremely unlikely
- 7.4.19 Once an impact has been described it is necessary to determine if the effect is 'significant'. In the context of the CIEEM Guidelines a 'significant' effect is one that either 'supports or undermines biodiversity conservation objectives for important ecological features'. A significant effect is therefore an effect that is 'sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project'. Significant effects can include impacts on the structure and function of sites and habitats or the conservation status of habitats and species (i.e., the extent, distribution or abundance). The decision on

significance is made irrespective of the geographical scale of importance of the receptor; if an effect is found not to be significant at the level at which the receptor has been valued, it may be significant at a more local level. A significant negative effect is not necessarily one that would make the Proposed Development unacceptable. A significant effect is simply an effect that is sufficiently important to require assessment and reporting to establish the environmental consequences of permitting proposals.

- 7.4.20 The CIEEM Guidelines make reference to an alternative approach which is not based on a matrix of 'importance' (or value) and 'magnitude' but can be used for categorising significant residual effects if required within an ES. The significance of impacts on ecology will be determined in accordance with CIEEM Guidelines. However, where residual ecological effects are identified through the assessment, the significance of these effects at the geographical scale (in accordance with the CIEEM Guidelines) will be converted into effects deemed to be significant at the minor, moderate, major and substantial level, in order to be consistent with the remainder of the ES. The below provides a framework that will be used for transposing the significance of residual ecological effects.
- International/national (positive or negative) = Substantial/Major (beneficial or adverse)
 - County/District (positive or negative) = Moderate (beneficial or adverse)
 - Local (positive or negative) = Minor (beneficial or adverse)
 - Not significant/below local significance (positive or negative) = Neutral
- 7.4.21 The evolving design of the Proposed Development will incorporate the Step-Wise Approach as outlined in Section 6 of Planning Policy Wales to minimise adverse impacts as a result of the Proposed Development. The Step-Wise Approach requires avoidance of impacts and proposals in statutory designated sites which also extends to those sites containing protected species and habitat which are irreplaceable. All new proposals should avoid damage to biodiversity with biodiversity and ecosystems impacts minimised. Where, after measures to minimise impacts, biodiversity and ecosystems could still be damaged, or lost through residual impacts, the proposals should mitigate the data and must be in place to limit the negative effects of the development. Effective mitigation or restoration measures should be incorporated into the design proposal following earlier steps have been considered.
- 7.4.22 When all the steps above have been exhausted, and where modifications, alternative sites, conditions or obligations are not sufficient to secure biodiversity outcomes further on-site /immediately proximate, as a last resort off-site compensation for unavoidable damage must be provided. This must be of significant magnitude to fully compensate for any loss. Each stage of the step-wise approach must be accompanied by a long-term management plan of agreed and appropriate avoidance, minimisation, mitigation/restoration and compensation measures alongside the agreed enhancement measures.
- 7.4.23 As part of the evolving design and through implementation of the mitigation hierarchy, habitats of highest ecological importance, namely statutory and non-statutory designated sites, watercourses, woodlands (including Ancient Semi-natural Woodland), hedgerows, trees and species-rich grasslands will be retained, protected and buffered to avoid and minimise impacts.
- 7.4.24 Where possible, access onto the Proposed Development will use existing gaps within hedgerows to minimise habitat losses. Through the implementation of an Arboricultural Method Statement and CEMP including best practice pollution prevention guidance, retained habitats will be protected as a result of the Proposed Development. The above measures will also ensure that protected and notable species are not adversely impacted as a result of the Proposed Development and the species can continue to use habitats across the Proposed Development.
- 7.4.25 Where habitat loss is proposed, appropriate compensation will be required. This will be measured using the BNG Assessment with the aim of delivering a minimum of 10% net gain for habitats, hedgerows and watercourses, where applicable across the Proposed Development. This may include enhancement of retained habitat through species planting, seeding with local provenance mixes, changes in management practices to create more naturalised habitats, creating and

enhancing wildlife corridors through the Proposed Development and providing connectivity to the wider landscape.

Scope of assessment

- 7.4.26 The full scope of assessment will be undertaken once the full data search, botanical and protected and notable species surveys have been completed. However, the anticipated scope of assessment during the pre-construction and construction phase and the operational phase based on the surveys undertaken to date and the Proposed Developments potential to support protected and notable species has been included below.

Construction Phase

Designated Sites

- 7.4.27 The following items are anticipated to be scoped into this assessment in relation to potential impacts on designated sites arising from the construction phase of development:
- Disturbance of and degradation to habitats/species associated with statutory and non-statutory designated sites as a result of pollution, including run-off and changes to the hydrological regime of the Proposed Development.
- 7.4.28 Whilst buffers between the statutory and non-statutory designated sites and the Proposed Development will be embedded into the layout, the extent of the buffer is unknown at this stage and will be determined primarily based on technical assessment work, and inputs from discussion with NRW.
- 7.4.29 A Habitat Regulation Assessment (HRA) may be required to assess potential impact pathways on statutory designated sites. Although no Natura 2000 sites have been identified within 10 km of the Proposed Development areas, the details assessments for each Proposed Development will include a full assessment of effects on statutory designated sites.

Habitats

- 7.4.30 The following items are anticipated to be scoped into this assessment in relation to potential impacts on habitats arising from the construction phase of development:
- Habitat loss or gain associated with changes in land use resulting from the Proposed Development.
 - Loss of ecological connectivity through severance of habitats resulting in fragmentation, arising from habitat loss and/or the creation of partial or complete barriers to the movement of species.
 - Habitats considered to be potentially impacted by the construction phase of the Proposed Development include grassland, hedgerows, lines of trees, scrub, scattered trees, broadleaved woodland, waterbodies and watercourses.
- 7.4.31 It is anticipated that arable habitat will be scoped out of this assessment from an ecological perspective, due to the overall insignificance within the context of similar habitat locally. However, an ALC Survey will be undertaken for the Proposed Development and submitted as part of the application.

Fauna

- 7.4.32 The following items are anticipated to be scoped into this assessment in relation to potential impacts on protected species arising from the construction phase of development:
- Disturbance and displacement of fauna from a change in normal conditions (light, noise, human activity) resulting in indirect loss of foraging and commuting habitat or resting and/or breeding sites.

- Death or injury of fauna associated with construction activity and the movement of construction vehicles.
- Protected species considered to be potentially impacted by development include amphibians (great crested newt, smooth newt, palmate newt, common frog, common toad), badgers, bats, birds (breeding and non-breeding), otter, water vole, reptiles and hedgehogs.

Operational Phase

Designated Sites

7.4.33 The following items are anticipated to be scoped into this assessment in relation to potential impacts on designated sites arising from the operational phase of development:

- Disturbance of and degradation to habitats/species associated with statutory and non-statutory designated sites resulting from potential impact pathways including changes to hydrological regime and habitat degradation from the Proposed Development.

Habitats

7.4.34 The following items are anticipated to be scoped into this assessment in relation to potential impacts on habitats arising from the operational phase of development:

- The introduction of new or improved habitats associated with the establishment of new areas of habitat across the Site.
- Lack of management of created and retained habitats leading to overall decline and degradation of existing and newly created habitats.
- Retained habitats considered to be potentially impacted by the operational phase of development include broadleaved woodland, waterbodies and watercourses.

7.4.35 Arable habitats are likely to be scoped out of this assessment from an ecological perspective, due to its overall insignificance within the context of similar habitat locally, and such habitat would be removed as part of the construction phase of the Proposed Development and not feature in the operational phase. An ALC Survey will be undertaken for the Proposed Development and submitted as part of the application.

Fauna

7.4.36 The following items are anticipated to be scoped into this assessment in relation to potential impacts on protected species arising from the construction phase of development:

- Disturbance associated with maintenance of the Proposed Development, including the use of artificial lighting, increased noise and general habitat degradation.

7.4.37 Protected species considered to be potentially impacted by development include amphibians (great crested newt, smooth newt, palmate newt, common frog, common toad), badgers, bats, birds (breeding and non-breeding), otter, water vole, reptiles and hedgehogs.

Issues proposed to be scoped out

7.4.38 Consultation will be undertaken with NRW is undertaken to discuss the overall approach in relation to statutory and non-statutory designated sites, habitats and protected and notable species. This will include associated mitigation. As the data is gathered and as part of the design development process, however, the need for mitigation will be identified and agreed through consultation with the relevant consultees (NRW and the LPA).

- 7.4.39 Based on the information gathered to date, any sub-topics to be scoped out is currently unknown and will be updated as consultation and further surveys are undertaken.

Potential cumulative effects

- 7.4.40 Cumulative effects as a result of the Proposed Development on other developments within the zone of influence will be assessed once consultation with NRW and the LPA and further surveys have been undertaken. This will be undertaken for all aspects which are scoped into the assessment. Therefore, the assessment will consider cumulative effects.

Cable Route

Baseline studies

- 7.4.41 At this stage, easement options are being considered to accommodate the cable route. No ecological surveys of the easement options have currently been undertaken and therefore the following is a very high level overview

Habitats

- 7.4.42 As a minimum, 'extended' Phase I/UK Habitat Classification surveys will be undertaken along the entirety of the cable route. If the 'extended' Phase I/UK Habitat Classification identified a diverse and/or species-rich sward, or the cable route lies within a NRW Priority Area, further botanical surveys, such as a National Vegetation Classification (NVC) may be required to classify the habitat. Botanical and/or NVC surveys should be undertaken by a suitability qualified and experienced ecologist.

Data Search

- 7.4.43 A full data search including interrogating the data purchased from the local records centre and available online sources will be undertaken for the cable route to inform the scope of protected and notable species surveys and the assessment of effects. This process identified the presence of protected sites and protected/notable fauna and flora in the surrounding landscape. The data returned from this exercise will inform the scope of this assessment and is referenced throughout this assessment where relevant. Where applicable, further investigations will be undertaken, which may require additional interrogation with regards to the designated features of the nearby non-statutory designated sites, to confirm potential impact pathways. The aim of the data search is to collate existing ecological records for the cable route option and adjacent areas to inform the scope of survey effort and potential impacts on protected/notable species.

Protected and Notable Species

- 7.4.44 Dependent on the results of the 'extended' Phase I/UK Habitat Classification surveys, further protected and notable species surveys may be required if impacts to these species cannot be avoided. As with the PV Areas, hedgerows, woodland, rough grassland, watercourses and scattered trees have the potential to support foraging, commuting and roosting bats. Hedgerows, woodland, scrub and trees have the potential to support hazel dormouse. Rough grassland and field margins have the potential to support foraging and sheltering common species of reptiles with the woodland, hedgerow and scrub bases also provide hibernation opportunities.
- 7.4.45 Where watercourses are present onsite, water vole and otter could potentially be present.
- 7.4.46 If habitats with the potential to support protected and/or notable species or individuals themselves are being impacted by the proposals, further surveys will be required in line with best practice and guidance. All surveys should be undertaken by a suitable qualified and experienced ecologist with relevant licences where applicable. All surveys and assessments will be undertaken in accordance

with best practice standard guidance (see Table 7.2 for full citations). This will likely include the following surveys:

- Breeding and wintering bird surveys – Undertake breeding and wintering bird surveys for removal or disturbance of habitats with suitability to support breeding and wintering birds.
- Ground Level Tree Assessment (GLTA) – Undertaken on trees to be impacted by the Site to determine trees suitability to support roosting bats. These can be undertaken at any time of year.
- Preliminary Roost Assessment (PRA) – External and internal building inspection survey to assess potential of buildings within the Site to support roosting bats. These surveys can be undertaken at any time of year.
- Further emergence/re-entry/aerial inspection surveys undertaken on tree/structures/buildings to be impacted by the Proposed Development identified during the GLTA. These surveys are weather and seasonally dependent and can be undertaken between the optimal period of May – August with September being sub-optimal depending on the suitability of the tree to support roosting bats.
- Daytime Bat Walkover – Walkover of the Site to assess potential bat activity including foraging areas and potential commuting routes This can be undertaken at any time of year.
- Activity and Automated Static Detector Deployment Surveys – Undertaken across the Site to determine its use by foraging and commuting bats. These can be undertaken between April – October inclusive.
- Great Crested Newt Surveys – Presence/likely absence/populations size class surveys and/or environmental DNA (eDNA) surveys of onsite and off-site ponds/waterbodies within 500m of the redline boundaries to determine whether great crested newt are present/likely absent on the Site. These surveys are weather dependent. Presence/likely absence/populations size class surveys can be undertaken between March and early June inclusive and eDNA surveys between mid-April and June.
- Hazel Dormouse Surveys – Presence/likely absence surveys to determine whether a population of dormouse is present/likely absent on the Site. These surveys can be undertaken between April and November inclusive.
- Reptile Surveys – Presence/likely absence surveys of suitable habitat to determine whether a population of reptile is present/likely absent on the Site. These surveys are weather dependent and can be undertaken between April and October with optimal months being April, May and September.
- Otter Surveys – Habitat suitability assessment of watercourses to determine whether watercourses have suitability to support otter and subsequent systematic search for evidence of otter presence. These surveys can be undertaken at any time of year.
- Water Vole Surveys – Habitat suitability assessment of watercourses to determine whether watercourses have suitability to support water vole and subsequent systematic search for evidence of water vole presence. These surveys can be undertaken at any time of year.
- Invertebrate Surveys – Undertake invertebrates surveys on suitable habitat to determine whether the Site has the potential to support invertebrate populations of significance and the species composition. These surveys are weather dependent and can be undertaken between May and mid-September.
- Badger Surveys – Walkover survey to search for evidence of badger activity. Should a sett be identified, subsequent sett monitoring surveys maybe required to classify the sett and determine the use of the sett. These surveys can be undertaken at any time of year.

- 7.4.47 Consultation with NRW will be undertaken to discuss the approach and scope of protected and priority species surveys for the cable route.

Biodiversity Net Gain

- 7.4.48 Alongside the botanical and protected and notable species surveys, the cable route option will undertake a BNG Assessment with the aim of delivering a 10% net gain for habitats, hedgerows and watercourses, where applicable. Although BNG is not a mandatory requirement in Wales, it can be used to show measurable net gains and contribute to Net Benefits for Biodiversity. The cable route option will be assessed against the latest Defra's Statutory Biodiversity Metric to demonstrate a 10% net gain.
- 7.4.49 Where a watercourse is present onsite or within 10m of the red line boundary, a River Condition Assessment undertaken by an accredited surveyor will be undertaken to complete the watercourse module of the BNG Assessment.
- 7.4.50 It is anticipated that impacts along any cable route option will be temporary and reinstated once the cable is installed. Within the BNG Metric, temporary impacts to habitats, hedgerows and watercourses, will be inputted as retained, however a 10% net gain will also be required.

Evaluation

- 7.4.51 The evaluation of habitats and species is defined in accordance with published guidance (see Table 7.2). The scale of importance of each ecological feature is assigned within a defined geographical context, namely international and European, national, regional, county, and local. Below these are features considered to be of negligible importance.
- 7.4.52 Consideration will also be given to legally protected or controlled species which are 'important features' in the context of this assessment, for which mitigation measures are required to ensure legal compliance, regardless of their geographic scale of importance. Thus, it is possible for a feature of negligible ecological importance to be legally protected and hence require mitigation.
- 7.4.53 Evaluation is based on various characteristics that can be used to identify ecological features likely to be important in terms of biodiversity. These include site designations (such as SSSIs, or for undesignated features, the size, conservation status (locally, nationally or internationally), and the quality of the ecological feature. In terms of the latter, quality can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats) or species populations or assemblages.

Impact Assessment

- 7.4.54 The assessment of impacts arising from the Proposed Development will be undertaken in accordance with CIEEM's Ecological Impact Assessment Guidelines, taking into account the type/duration of impact and the importance of the ecological receptor in question.

Assessment of effects

- 7.4.55 The results of the surveys will be used to determine the assessment of effects as a result of the cable route option. The assessment of effects will include the impacts of the Proposed Development during the pre-construction, construction, operational and decommissioning phases and mitigation, compensation and enhancement to be implemented. It is recommended that consultation with NRW is undertaken at the earliest opportunity to discuss the approach for mitigation, compensation and enhancement measures to be implemented across the cable route option. Based on the data gathered so far, however, we anticipate the need for the following broad mitigation principles outline below.

- 7.4.56 The following four-point scale will be used to express the degree of confidence in the prediction of impact significance, for residual impacts this scale will also indicate the reliability of mitigation proposals:
- Certain/ near certain
 - Probable
 - Possible
 - Extremely unlikely
- 7.4.57 Once an impact has been described it is necessary to determine if the effect is 'significant'. In the context of the CIEEM Guidelines a 'significant' effect is one that either 'supports or undermines biodiversity conservation objectives for important ecological features'. A significant effect is therefore an effect that is 'sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project'. Significant effects can include impacts on the structure and function of sites and habitats or the conservation status of habitats and species (i.e., the extent, distribution or abundance). The decision on significance is made irrespective of the geographical scale of importance of the receptor; if an effect is found not to be significant at the level at which the receptor has been valued, it may be significant at a more local level. A significant negative effect is not necessarily one that would make the Proposed Development unacceptable. A significant effect is simply an effect that is sufficiently important to require assessment and reporting to establish the environmental consequences of permitting proposals.
- 7.4.58 The CIEEM Guidelines make reference to an alternative approach which is not based on a matrix of 'importance' (or value) and 'magnitude' but can be used for categorising significant residual effects if required within an ES. The significance of impacts on ecology will be determined in accordance with CIEEM Guidelines. However, where residual ecological effects are identified through the assessment, the significance of these effects at the geographical scale (in accordance with the CIEEM Guidelines) will be converted into effects deemed to be significant at the minor, moderate, major and substantial level, in order to be consistent with the remainder of the ES. The below provides a framework that will be used for transposing the significance of residual ecological effects.
- International/national (positive or negative) = Substantial/Major (beneficial or adverse)
 - County/District (positive or negative) = Moderate (beneficial or adverse)
 - Local (positive or negative) = Minor (beneficial or adverse)
 - Not significant/below local significance (positive or negative) = Neutral
- 7.4.59 The evolving route of the cable will incorporate the Step-Wise Approach as outlined in Section 6 of Planning Policy Wales to minimise adverse impacts as a result of the Proposed Development. This includes a first priority for planning authorities to avoid damage to biodiversity and ecosystem functioning. The Step-Wise Approach also includes avoiding impacts and proposals in statutory designated sites which also extends to those sites containing protected species and habitat which are irreplaceable. All new proposals should avoid damage to biodiversity with biodiversity and ecosystems impacts minimised. Where, after measures to minimise impacts, biodiversity and ecosystems could still be damaged, or lost through residual impacts, the proposals should mitigate the data and must be in place to limit the negative effects of the development. Effective mitigation or restoration measures should be incorporated into the design proposal following earlier steps have been considered.
- 7.4.60 The installation of the cable route is anticipated to involve temporary impacts and reinstatement of the habitats once the cable is installed. The evolving route of the cable will incorporate the mitigation hierarchy to minimise adverse impacts as a result of the cable route option. The mitigation hierarchy provides a framework for developments by trying to initially avoid biodiversity losses. If avoidance is

not possible, then minimisation of those losses, then restoration of areas within the development and offsetting either onsite or offset as a last resort.

- 7.4.61 As part of the evolving route and through implementation of the mitigation hierarchy, habitats of highest ecological importance, namely statutory and non-statutory designated sites, watercourses, woodlands (including Ancient Semi-natural Woodland), hedgerows, trees and species-rich grasslands will be retained, protected and buffered to avoid and minimise impacts.
- 7.4.62 Where possible, existing fields entrances will be used to minimise impacts to retained habitats. Where this is not possible, directional drilling beneath hedgerows, watercourses and woodland will be undertaken to avoid impacts to retained habitats of ecological importance. Through the implementation of an Arboricultural Method Statement and CEMP including best practice pollution prevention guidance, retained habitats should be protected as a result of the cable route. The above measures will also ensure that protected and notable species are not adversely impacted as a result of the cable route and the species can continue to use habitats across the cable route.
- 7.4.63 Where habitat loss is proposed, appropriate compensation will be required. This can be measured using the BNG Assessment with the aim of delivering a minimum of 10% net gain for habitats, hedgerows and watercourses, where applicable across the cable route. This may include enhancement of retained habitat through species planting, seeding with local provenance mixes, changes in management practices to create more naturalised habitats, creating and enhancing wildlife corridors through the cable route and providing connectivity to the wider landscape.

Scope of assessment

- 7.4.64 The full scope of assessment will be undertaken once the full data search, botanical and protected and notable species surveys have been completed. However, the anticipated scope of assessment during the pre-construction and construction phase and the operational phase based on the surveys undertaken to date and the cable route potential to support protected and notable species has been included below. Where possible, the cable route will avoid habitats of highest ecological importance, statutory and non-statutory designated sites and Priority Habitats, utilising developed land; sealed surface highways, arable and low diversity modified grassland where possible.

Construction Phase

Designated Sites

- 7.4.65 The following items are anticipated to be scoped into this assessment in relation to potential impacts on designated sites arising from the construction phase of development:
- Disturbance of and degradation to habitats/species associated with statutory and non-statutory designated sites as a result of pollution.
- 7.4.66 Whilst buffers between the statutory and non-statutory designated sites and the cable route will be embedded into the layout, the extent of the buffer is unknown at this stage and will be determined primarily based on technical assessment work, and inputs from discussion with NRW.
- 7.4.67 A Habitat Regulation Assessment (HRA) may be required to assess potential impact pathways on statutory designated site.

Habitats

- 7.4.68 The following items are anticipated to be scoped into this assessment in relation to potential impacts on habitats arising from the construction phase of development:
- Loss of ecological connectivity through severance of habitats resulting in fragmentation, arising from habitat loss and/or the creation of partial or complete barriers to the movement of species.

- Habitats considered to be potentially impacted by the construction phase of the cable route include grassland, hedgerows, lines of trees, scrub, scattered trees, broadleaved woodland, waterbodies and watercourses.

7.4.69 During construction, it is anticipated that impacts will be temporary and habitats will be reinstated once the cable is installed.

Fauna

7.4.70 The following items are anticipated to be scoped into this assessment in relation to potential impacts on protected species arising from the construction phase of development:

- Disturbance and displacement of fauna from a change in normal conditions (light, noise, human activity) resulting in indirect loss of foraging and commuting habitat or resting and/or breeding sites.
- Death or injury of fauna associated with construction activity and the movement of construction vehicles.
- Protected species considered to be potentially impacted by development include amphibians (great crested newt, smooth newt, palmate newt, common frog, common toad), badgers, bats, birds (breeding and non-breeding), otter, water vole, reptiles and hedgehogs.

Operational Phase

Designated Sites

7.4.71 The following items are anticipated to be scoped into this assessment in relation to potential impacts on designated sites arising from the operational phase of development:

- Disturbance of and degradation to habitats/species associated with statutory and non-statutory designated sites resulting from potential impact pathways including changes to hydrological regime and habitat degradation from the cable route.

Habitats

7.4.72 The following items are anticipated to be scoped into this assessment in relation to potential impacts on habitats arising from the operational phase of development:

- The introduction of new or improved habitats associated with the establishment of new areas of habitat across the cable route.
- Lack of management of created and retained habitats leading to overall decline and degradation of existing and newly created habitats.
- Retained habitats considered to be potentially impacted by the operational phase of development include broadleaved woodland, waterbodies and watercourses.

Fauna

7.4.73 The following items are anticipated to be scoped into this assessment in relation to potential impacts on protected species arising from the construction phase of development:

- Disturbance associated with maintenance of the cable route, including the use of artificial lighting, increased noise and general habitat degradation.

7.4.74 Protected species considered to be potentially impacted by development include amphibians (great crested newt, smooth newt, palmate newt, common frog, common toad), badgers, bats, birds (breeding and non-breeding), otter, water vole, reptiles and hedgehogs.

Issues proposed to be scoped out

7.4.75 Consultation with NRW will be undertaken to discuss the overall approach in relation to statutory and non-statutory designated sites, habitats and protected and notable species. This will include associated mitigation. As the data is gathered and as part of the design development process, however, the need for mitigation will be identified and agreed through consultation with the relevant consultees (NRW and the LPA).

7.4.76 Based on the information gathered to date, any sub-topics to be scoped out is currently unknown and will be updated as consultation and further surveys are undertaken.

Potential cumulative effects

7.4.77 Cumulative effects as a result of the cable route on other developments within the zone of influence will be assessed once consultation with NRW and the LPA and further surveys have been undertaken. This will be undertaken for all aspects which are scoped into the assessment. Therefore, the assessment will consider cumulative effects.

7.5 References

7.5.1 The below table summarises the relevant standards and guidance to the ecological assessment of the Proposed Development.

Table 7.2: Standards and guidance of relevance to the assessment.

Standards and Legislation	Relevance to Assessment
<i>Ecological Impact Assessment (EcIA)</i> Guidelines for Preliminary Ecological Appraisal, 2nd edition (2017). Chartered Institute of Ecology and Environmental Management (CIEEM) CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.	The guidelines provide a structured approach for identifying and assessing potential ecological impacts of development projects.
<i>Habitat Regulations Assessment</i> Habitats Regulations Assessments: Protecting a European site (2021) issued jointly by the Department for Environment, Food & Rural Affairs (Defra), Natural England, Welsh Government, and Natural Resources Wales Nationally Significant Infrastructure Projects: Advice on Habitats Regulations Assessments (2024), issued by the Planning Inspectorate	Provides guidance on how to conduct Habitats Regulations Assessments (HRAs) for nationally significant infrastructure projects in the United Kingdom.
<i>Habitats</i> Joint Nature Conservation Committee (2010). Handbook for Phase 1 habitat survey - a technique for environmental audit. JNCC, Peterborough	These guidelines provide a resource for conducting ecological assessments and environmental audits. It provides a standardised methodology for identifying and classifying habitats in the UK.

Standards and Legislation	Relevance to Assessment
Butcher, B., Carey, P., Edmons, R., Norton, L. and Treweek, J. (2023). UK Habitat Classification – Habitat Definitions. Version 2.0 Rodwell, J.S. (2006) NVC Users' Handbook, JNCC, Peterborough, ISBN 978 1 86107 574 1.	
Amphibians English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough. Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (<i>Triturus cristatus</i>). <i>Herpetological Journal</i> 10(4), 143-155. ARG UK (2010) ARG UK Advice Note 5, Great Crested Newt Habitat Suitability. Available at: https://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file NatureMetrics (2023) GCN eDNA testing. Available at: https://www.naturemetrics.com/wildlife-services/gcn-edna/ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt <i>Triturus cristatus</i> environmental DNA. Freshwater Habitats Trust, Oxford.	These resources provide guidance for developers and landowners on how to minimise the impact of their projects on Great Crested Newt populations. They provide a standardised methodology for amphibian surveys and provide advice on best practices for Great Crested Newt conservation, including habitat management and monitoring.
Badgers Harris S., Cresswell, P., Jefferies, D. (1989) Surveying Badgers. The Mammal Society, London. Wilson, G., Harris, S., McLaren, G. (1997) Changes in the British badger population 1988 to 1997. People's Trust for Endangered Species, London. Cresswell, P., S. Harris, D. J. Jefferies (1990) The history, distribution, status and habitat requirements of the badger in Britain. Nature Conservancy Council, Peterborough, England. Natural England (2022) Badgers: surveys and mitigation for development projects, Natural England standing advice, Available at: https://www.gov.uk/guidance/badgers-surveys-and-mitigation-for-development-projects Andrews, R. (2013). The Classification of Badger (<i>Meles meles</i>) Setts in the UK: A Review and Guidance for Surveyors. Chartered Institute of Ecology and Environmental Management - In Practice 82: 27-31 McDonald, P. J., Allen, T. P (2011) Provision of artificial badger setts and use of remote camera monitoring to determine Eurasian badger <i>Meles meles</i> sett occupancy, Suffolk, England. <i>Conservation Evidence</i> 8, 107-110	These resources provide a comprehensive overview of badger surveying and mitigation practices in the UK, including legal requirements and best practices for badger surveys in the context of development projects.
Bats Reason, P.F. and Wray, S. (2023). UK Bat Mitigation	These guidelines provide comprehensive information on bat

Standards and Legislation	Relevance to Assessment
Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Chartered Institute of Ecology and Environmental Management, Ampfield. Mitchell-Jones, A.J. & McLeish, A.P. (eds). (2004) 3rd Edition Bat Workers' Manual., JNCC, Peterborough, ISBN 1 86107 558 8 Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6 Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edition. Bat Conservation Trust, London. Bat Tree Habitat Key (2018) Bat Roosts in Trees: a guide for identification and assessment for tree-care and ecology professionals. Pelagic Publishing, Exeter.	surveys, mitigation, and habitat assessment in the UK.
<i>Birds</i> Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747 Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H. (2000) Bird census techniques. Academic Press, London. Gilbert, G., Gibbons, D.W., & Evans, J. (1998) Bird Monitoring Methods: A Manual of Techniques for UK Key Species. The Royal Society for the protection of Birds, Sandy, Bedfordshire, England. Bird Survey and Assessment Steering Group. (2023). Bird Survey Guidelines for assessing ecological impacts, v.1.1.0. Available at: https://birdsurveyguidelines.org	These resources provide information on bird populations, census techniques, and survey methodologies in the UK.
<i>Hazel Dormouse</i> Bright, P., Morris, P., and Mitchell-Jones, T. (2006). The Dormouse Conservation Handbook – 2nd Edition. English Nature, Peterborough. Chanin, P. and Woods, M. (2003). Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project. Natural England. (2015). Hazel or Common Dormice: Surveys and Mitigation for Development Projects. [online] Available at https://www.gov.uk/guidance/hazel-or-common-dormice-surveys-and-mitigation-for-development-projects Accessed January 2021	These resources offer a range of information on hazel dormouse ecology, survey methods, and conservation practices in the UK.
<i>Otter</i> Garcia de Leaniz, C., Forman, D. (2006) Non-intrusive monitoring of otters <i>Lutra lutra</i> using infrared technology. Journal of Zoology 270(4):577-584.	These resources offer a range of information on otter ecology, survey methods, and conservation practices in the UK.

Standards and Legislation	Relevance to Assessment
Natural England standing advice on otters at https://www.gov.uk/guidance/otters-advice-for-making-planning-decisions Kruuk, H., Carss, D.N., Conroy, J.W.H. and Durbin, L. (1993). Otter (<i>Lutra lutra</i>) Numbers and Fish Productivity in Rivers in North East Scotland. Symposium of the Zoological Society, 65, 171-191. Chanin P (2003). Monitoring the Otter <i>Lutra lutra</i>. Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterborough. Findlay, M. A., Briers, R. A. & White, P. J. C. (2020) Component processes of detection probability in camera-trap studies: understanding the occurrence of false-negatives. <i>Mammal Research</i>, 65, 167—180.	
Reptiles Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice sheet 10. Froglife, Halesworth. Natural England (2022) Reptiles: advice for making planning decisions. Available at: https://www.gov.uk/guidance/reptiles-advice-for-making-planning-decisions#:~:text=This%20is%20Natural%20England's%20standing,standing%20advice%20for%20protected%20species.	These resources provide information on conducting reptile surveys and making planning decisions related to reptiles in the UK.
Water Vole Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Mammal Society, London. Dean, M. (2021) Water Vole Field Signs and Habitat Assessment A Practical Guide to Water Vole Surveys. Pelagic Publishing, London Strachan, R., Moorhouse, T. and Gelling, M. (2011) Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit, Oxford	These resources provide information on water vole surveys, mitigation, and conservation in the UK.
Biodiversity Net Gain The Statutory Biodiversity Metric User Guide (2024) Department for Environment, Food & Rural Affairs (Defra)	Guidance regarding the use of the Statutory Metric in the assessment of Biodiversity Net Gain.

8 HISTORIC ENVIRONMENT

8.1 Introduction

- 8.1.1 This section of the Scoping report identifies the historic environment resources of relevance to the Proposed Development and considers the potential impacts from its construction, operation and maintenance and decommissioning.
- 8.1.2 This scoping chapter describes the assessment methodology, the baseline conditions currently existing within the Site and in the surrounding areas and also sets out further survey work likely to be necessary in order to fully determine the potential impacts on heritage assets should it proceed. It also identifies potential mitigation to reduce any adverse effects of the Proposed Development.

8.2 Legislative, policy context and guidance

- 8.2.1 The Cultural Heritage assessment would include a review and summary of relevant legislative, planning policy and other guidance documents, insofar as they relate to the cultural heritage and the assessment of impact upon historic assets. This would include the following:
- The Historic Environment (Wales) Act 2016 (whilst it still remains in force)
 - The Historic Environment (Wales) Act 2023
 - Ancient Monuments and Archaeological Areas Act (1979) amended by the National Heritage Acts (1983 and 2002)
 - Planning Policy Wales (Edition 12, February 2024)
 - Hedgerow Regulations 1997
 - Technical Advice Note (TAN) 12: Design (2016)
 - Technical Advice Note (TAN) 24: The Historic Environment (2017)
 - Conservation Principles for the Sustainable Management of the Historic Environment in Wales (Conservation Principles) (2011)
 - Heritage Impact Assessment in Wales (May 2017)
 - Setting of Historic Assets in Wales (May 2017)
- 8.2.2 The Historic Environment (Wales) Act 2023 is intended to replace the Historic Environment (Wales) 2016, and should come in to force late in 2024, but at the time of writing has not yet done so.

8.3 Baseline information and study area

Study Area

- 8.3.1 The study area for the assessment of historic environment impacts in the ES ('the Historic Environment Study Area') will be informed by the number and extents of the Areas taken forward to planning and the routes of the cable routes chosen following the optioneering process.
- 8.3.2 Exact Study areas have yet to be determined and will be subject to agreement of the archaeological advisors at Heneb, and also Cadw, in principle, however, the intention is to include a Study area of 1km beyond the extent of Area boundaries and cable routes for undesignated assets to allow an accurate assessment of the archaeological potential of the land directly affected by the Proposed Development.

- 8.3.3 Assessment of designated assets (World Heritage Sites, Registered Historic Landscapes, Scheduled Monuments, Listed Buildings, Registered Parks and Gardens, Registered Battlefields and Conservation Areas) will be informed by a computer-generated Zone of Theoretical Visibility (ZTV), and will consider potential impacts on all designated assets within 1km of cable routes and 3km of areas of solar panels and the BESS battery station.

Baseline information

- 8.3.4 The Vale of Glamorgan is one of the archaeologically richest areas in South Wales. A lowland landscape with fertile soils and gently rolling hills formed on a gently rolling limestone plateau dissected by shallow valleys, it has long been favoured for agricultural settlement, and there are a rich and diverse array of archaeological sites and historic assets in the area stretching from the Palaeolithic through to the modern period.
- 8.3.5 The Proposed Development Areas, along with the cable routes and buffer areas stretch almost from the Bristol Channel in the south as far north as the M4 at Llanharry, a transect completely across the Vale of Glamorgan. There is much evidence for prehistoric evidence locally, from findspots of mesolithic flint at Llanccarfan, Cowbridge and Welsh St Donats, numerous findspots of Neolithic worked flint, a causewayed enclosure in Ewenny, and a chambered tomb at Tinkinswood, to numerous Bronze Age barrows and enclosures. There is similarly plenty of evidence for Iron Age and Romano-British settlement across the Vale of Glamorgan. The modern settlement pattern has its origins in the early Medieval and Medieval periods and evolved and became increasingly enclosed in the post-medieval period, which also saw the development and enclosure of a number of landed estates. As a result of this, there is a potential for prehistoric and Romano-British remains across the Areas of the Proposed Development, with further potential for localised medieval and post-medieval activity, likely to be predominantly agricultural in origin. Detailed desk-based studies covering each of the proposed Areas and the chosen cable routes will be required to further articulate this potential, supported as appropriate by archaeological surveys in the form of geophysical surveys and targeted trial trenching.
- 8.3.6 There are numerous designated assets both within areas identified as part of the Proposed Development and within a wider 3km study area.
- 8.3.7 The PV Areas (the redline boundaries) partially overlay three designated assets – the Grade II* Registered Parks and Gardens at Talygarn and the Grade II Registered Hensol and the Talygarn conservation area. As the project progresses every effort will be made to minimise impacts on these designated historic assets through the design process. If, following that process there are any remaining impacts, those will be assessed using the methodology outlined below.

Table 8.1: Designated assets affected by the PV Areas

Registered Parks and Gardens		
<i>Record number</i>	<i>Name</i>	<i>Grade</i>
PGW(Gm)8(RCT)	Talygarn	II*
PGW(Gm)41(GLA)	Hensol Castle	II

Conservation Areas
Talygarn

- 8.3.8 The proposed cable route alignments and associated buffer areas also affect a small number of designated assets including the Llanccarfan Registered Landscape of Outstanding Historic Interest, the Hensol Castle and Talygarn Registered Parks and Gardens (Grade II and Grade II* respectively), the Llanquian Wood Camp (GM182) and the Llanccadle Conservation Area. At present the routes of the cables are not fixed, and it may be possible to design out impacts on these assets.

Once the routes are finalised. Should it not be possible to avoid impacts on designated assets through the design process, these impacts will be assessed as set out below.

- 8.3.9 If, once the optioneering process is completed, there are still potential impacts upon the Llacarfan Registered Landscape, discussions will be had with Cadw over whether an ASIDOHL2 assessment is required to assess the impact of the scheme on the Registered Landscape. If such an assessment is required, it will form an Appendix to the ES Chapter.

Table 8.2: Designated assets affected by the proposed cable routes/corridors and buffer areas.

The Registered Landscapes of Outstanding and of Special Interest in Wales	
Record Number	Name
HLW (SG) 1	Llacarfan, Vale of Glamorgan

Registered Parks and Gardens		
Reference	Site Name	Grade
PGW(Gm)8(RCT)	Talygarn	II*
PGW(Gm)41(GLA)	Hensol Castle	II

Scheduled Monuments		
SAM Number	Name	Period
GM182	Llanquian Wood Camp	Prehistoric

Conservation Areas	
Llancardle	

- 8.3.10 There are a considerable number of designated assets within 3km of the Site which, whilst unlikely to be physically impacted by the Proposed Development, have the potential to be impacted by development within its setting. In addition to the Llacarfan Landscape of Outstanding Historic Interest, these comprise seven Registered Parks and Gardens, 47 Scheduled Monuments, 298 Listed Buildings, 18 Conservation Areas and two Registered Battlefields. It is anticipated that once the optioneering process has identified preferred cable routes, and the extents of the PV Areas and BESS Areas are confirmed, that a final study area, containing fewer designated assets, can be identified.

- 8.3.11 Not all of these assets are likely to be impacted by the Proposed Development. The computer generated ZTV will be used in combination with site visits and visits to the assets to determine whether there is any intervisibility between the Proposed Development and the assets, whilst the baseline studies will be used to identify any historical associations between them. Assets with no intervisibility and no historic associations will be scoped out of further assessment, whilst those with potential impacts will be assessed in accordance with the staged process set out in Cadw's guidance on Setting of Historic Assets in Wales (2017).

Table 8.3: Designated assets within the 3km study area.

The Registered Landscapes of Outstanding and of Special Interest in Wales	
Record Number	Name
HLW (SG) 1	Llacarfan, Vale of Glamorgan

Registered Parks and Gardens		
Reference	Site Name	Grade
PGW(Gm)8(RCT)	Talygarn	II*
PGW(Gm)34(GLA)	Llanmihangel Place	II*

PGW(Gm)43(GLA)	Llantrithyd Place	II*
PGW(Gm)9(RCT)	Miskin Manor	II
PGW(Gm)38(GLA)	Old Beaupre	II
PGW(Gm)39(GLA)	Fonmon Castle	II
PGW(Gm)41(GLA)	Hensol Castle	II

Scheduled Monuments		
<i>SAM Number</i>	<i>Name</i>	<i>Period</i>
GM001	Old Beaupre Castle	Medieval
GM032	Summerhouse Camp	Prehistoric
GM070	Caer Gwanaf	Prehistoric
GM071	Castle Ditches	Prehistoric
GM075	LLanancarfan Monastery (Site of)	Early Medieval
GM076	Mynydd Bychan	Prehistoric
GM079	Y Gaer	Prehistoric
GM080	Llanilid Castle Mound	Medieval
GM081	Gadlys	Medieval
GM082	East Orchard Manor House	Medieval
GM083	West Orchard Manor House	Medieval
GM094	Llanblethian Castle	Medieval
GM100	Caer Dynnaf hillfort	Prehistoric
GM104	Round Barrows N of Breach Farm	Prehistoric
GM136	South Gate	Medieval
GM182	Llanquian Wood Camp	Prehistoric
GM189	Domen Fawr Round Barrows	Prehistoric
GM225	Llanquian Castle	Medieval
GM228	Ystradowen Castle Mound	Medieval
GM229	Penmark Castle	Medieval
GM230	Stalling Down Round Barrow	Prehistoric
GM251	Walterston ringwork	Medieval
GM257	Llantrithyd Camp	Prehistoric
GM282	Medieval House Site, Llantrithyd	Medieval
GM292	Round Barrow 800m SE of Malborough Grange	Prehistoric
GM293	Llanvithyn Camp	Prehistoric
GM297	West Aberthaw Medieval Site	Medieval
GM298	Castell Moel	Prehistoric
GM300	Fleminston Deserted Village	Medieval
GM307	Deserted Medieval Village North East of Rock Farm	Medieval
GM318	Early Cement Works, Aberthaw	Post Medieval / Modern
GM321	Maes-y-Hwyaid Round Barrow	Prehistoric
GM337	Llandough Castle, Remains of Hall	Medieval
GM346	Two Round Barrows, Naboth's Vineyard	Prehistoric
GM365	Two Cooking Mounds E of Ty'n-y-Pwll	Prehistoric
GM370	Felin Isaf Castle Mound	Medieval

GM388	Horseland moated homestead	Medieval
GM390	Two Round Barrows 300m North of Tair Onnen	Prehistoric
GM421	Castell Tal-y-Fan	Medieval
GM442	Medieval Chapel of Talygarn	Medieval
GM534	Llancadle Deserted Medieval Village	Medieval
GM555	Llantrithyd Place: remains of house, relict gardens and wells	Post Medieval / Modern
GM591	Miskin Roman fort	Roman
GM598	East Orchard Wood Pillbox	Post Medieval / Modern
GM601	Limpert Bay Anti-invasion Defences	Post Medieval / Modern
GM604	Treguff RAF Airfield Decoy Control Centre	Post Medieval / Modern
GM626	Llanmaes Castle (Malefant Castle)	Medieval

Listed Buildings		
<i>Record Number</i>	<i>Name</i>	<i>Grade</i>
13136	Llanmihangel Place	I
13137	Llansannor Court	I
13144	Church of St John the Baptist	I
13162	Church of St. Senwyr	I
13166	Church of St Athan	I
13171	Old Beaupre Castle	I
13187	Church of the Holy Cross	I
13482	Hensol Castle (Including attached Courtyard Ranges to N)	I
13597	Fonmon Castle	I
13605	St Cadoc's Parish Church	I
13641	Church of St Donat	I
13130	Flemingston Court Farmhouse	II*
13131	Gileston Manor	II*
13132	Great House (Ty Mawr), Aberthin	II*
13134	Llanmaes House	II*
13140	Castleton Farmhouse	II*
13141	Parish Church of St Michael and All Angels	II*
13142	Church of St Brise	II*
13143	Church of St Giles	II*
13146	St Quintin's Castle (Llanblethian Castle)	II*
13160	Church of St Cattwg	II*
13164	Church of St. Brynach	II*
13170	Parish Church of St Hilary	II*
13172	Old Beaupre Farmhouse	II*
13181	Town Walls	II*
13183	South Gate (Porth y Felin)	II*
13185	Cowbridge Grammar School	II*

13200	The Town Hall	II*
13221	The Great House	II*
13408	Llandough Castle	II*
13421	The Gatehouse (including attached boundary walls)	II*
13424	Great House with Forecourt Walls & Gatepiers	II*
13436	Barn and Stable to E of Llanmihangel Place	II*
13511	Talgarn	II*
13592	Garnllwyd Farmhouse	II*
13593	Treguff Farmhouse	II*
13606	Trewallter Fawr Farmhouse	II*
13609	St Illtyd's Parish Church	II*
13613	Church of St Cadoc (St Cattwg)	II*
13614	The Blue Anchor Inn PH	II*
13617	Church of St Mary	II*
81305	Walls, Gatepiers and Gates of Llanmaes House	II*
83115	Church of St Michael the Archangel	II*
83166	Watchtower at Fonmon Castle	II*
2211	Cae'rwigau Uchaf	II
2212	Dyffryn Mawr Farmhouse	II
3026	Llwyn Rhyddid	II
3027	Ty Fry Lodge	II
13133	Old Rectory	II
13135	Plaisted House	II
13139	Penllyn Castle	II
13145	Roadside Cross	II
13152	Parish Church of St Dochdwy	II
13153	Parish Church of St Mary	II
13154	Fishweir Farmhouse	II
13159	Church of SS Ilid and Curig	II
13167	West Orchard Farmhouse	II
13168	West Farmhouse	II
13182	,6 & 7, Church Street, Cowbridge,, SOUTH GLAMORGAN,	II
13184	The Boot House at Grammar School	II
13186	Gate Piers & End Piers, Walls, Railings & Gates at W Entrance to Churchyard	II
13188	S, SE & NW Churchyard Walls	II
13190	71 & 73 Eastgate	II
13191	East House	II
13192	Ancient Druid	II
13193	The Armoury	II
13194	East Villa	II
13195	Heath House	II
13196	Nos 56 & 58 Eastgate	II
13197	,70, Eastgate, Cowbridge,, SOUTH GLAMORGAN,	II

13198	The Old Brewery Building	II
13199	Glanthaw, including forecourt wall and railings	II
13201	Water Pump against SE Elevation of No 23 High Street	II
13202	,23,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13203	Mounting Block attached to Nos 25 & 27 High Street	II
13204	,27,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13205	Nos.35,35a & 35b High Street	II
13206	Xantippe	II
13207	Lloyds Chemist	II
13208	,43,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13210	The Bear Hotel	II
13211	Llwyn Celyn	II
13212	,81,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13213	Woodstock House	II
13214	NW Boundary Wall To No 83 High Street	II
13215	,16,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13216	,18,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13217	,20,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13218	,22,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13219	Principality Building Society	II
13220	Ogmore Vale Bakery	II
13222	Woodcocks and W G Davies	II
13223	Etcetera and Threshers	II
13224	Duke of Wellington PH including Rear Wing to Church Street	II
13225	,50,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13226	,52,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13227	Farthings Old Wine House	II
13228	,58,High Street,Cowbridge,,SOUTH GLAMORGAN,	II
13229	High Street Garage	II
13230	The Old Hall	II
13231	Ye Olde Mason's Arms PH	II
13232	Rose Cottage, including forecourt garden walls	II
13233	NW Garden Wall to Rose Cottage and SW Garden Walls to Old Hall & Grammar School Garden at SE	II
13235	The Poplars, including garden walls and gate	II
13236	,1 & 3,Westgate,Cowbridge,,SOUTH GLAMORGAN,	II
13237	,21,Westgate,Cowbridge,,SOUTH GLAMORGAN,	II
13238	United Free Church (Ramoth Chapel)	II
13239	National Westminster Bank	II
13242	Bethesda'r Fro Chapel with attached mounting block	II
13299	Batslays Farmhouse	II
13409	Myrtle Cottage, including attached outhouses	II
13413	The Cottage	II

13420	Great House	II
13433	Lodge Cottage	II
13434	Penllyn Cottage	II
13435	Gatepiers, Gates and Boundary Walls at entrance to Penllyn Castle Main Drive	II
13437	Barn at Garnllwyd	II
13438	Telephone Call-box between the Parish Hall and the bridge	II
13439	Telephone Call-box on the road verge to the north of the Church of St Michael the Archangel	II
13440	Telephone Call-box to N of parish Church	II
13442	Telephone Call-box opposite Village Farm	II
13450	Telephone Call-box in centre of Village at junction with Croft John	II
13451	Telephone Call-box at road junction in centre of Gileston village	II
13452	Telephone Call-box north of the parish church	II
13454	Telephone Call-box	II
13461	Barn at Court Farm	II
13462	Former Cartshed and Granary at Court Farm	II
13464	Combination Farm Building at Flemingston Court	II
13465	The Manor	II
13466	No 1 Manor Cottages	II
13467	Hafod Lodge to Hensol Castle (Also known as Bottom Lodge)	II
13473	Pendoylan Cottages	II
13474	Telephone Call-box Beside Eastgate Mews	II
13475	Telephone Call-box Outside Royal Mail Delivery Office	II
13476	Telephone Call-box Outside No 23 High Street	II
13477	Telephone Call-box Outside Hill View & The Haven	II
13478	Telephone Call-Box Near Brook Cottage	II
13479	Telephone Call-box Outside Farmers Arms	II
13483	Bridge on main drive to Hensol Castle	II
13487	Barn at Fishweir	II
13488	Village Farmhouse	II
13502	Miskin Manor, including one-storey range to N	II
13512	Garden wall, gates and gate piers bounding S garden at Talygarn	II
13513	Llechau	II
13514	Bridge at Adam's Pond in woods S of Talygarn	II
13533	Mwyndy House	II
13594	Ruins of Llantrithyd Place	II
13595	Llanfythin Farmhouse	II
13596	Cae'rwigau Isaf	II
13598	Llanwensan Fawr Farmhouse	II
13610	Garehouse at Llanfythin Farmhouse	II
13611	Llanfythin Mill	II

13615	Marsh House, with attached garden wall	II
13616	Stable Block at Fonmon Castle	II
13642	Great House	II
14070	Walterstone Fach	II
15655	Chapel House	II
15763	Llandough Castle Flats	II
15764	NE, SE and SW Walls, Gatepiers and Railings enclosing Landough Castle and Gatehouse	II
15915	The Sweetings (Including attached Barn and Stable Range to W)	II
16410	Cliff Farmhouse	II
16411	Llanfytthin Millhouse	II
16412	Circular Pigsty at the Meadows	II
16413	Barn at Trewallter Fawr	II
16414	Village Hall	II
16415	The Rectory	II
16416	Former Hall Range to S of Old Beaupre Castle	II
16417	Old Beaupre Barn	II
16418	Churchyard Cross at Parish Church of St Hilary	II
16419	Bassett Family Tomb Enclosure in Churchyard of Parish Church of St Hilary	II
16420	The Bush Inn PH	II
16421	Pigsty at Church Cottage	II
16422	No 2 Manor Cottages	II
16423	Village Farm	II
16424	New Beaupre	II
16461	Two flights of steps up to Terrace and Yew Tree Pleasance	II
16462	St Anne's Well	II
16463	Rectory Farm	II
19227	Ty-draw Farmhouse	II
19228	Agricultural Range at Ty-draw Farm	II
19653	Easternmost Salmon Well	II
19654	Central Salmon Well	II
19655	Westernmost Salmon Well	II
22283	,1-3,The Butts,Cowbridge,,,	II
22284	SE Wall To former Grammar School Garden	II
22285	,77,Eastgate,Cowbridge,,,	II
22286	Colours	II
22287	,29,High Street,Cowbridge,,,	II
22288	Lloyds Bank	II
22289	Vale of Glamorgan Public House	II
22290	Roddam Travel & Watts Morgan	II
22291	,56,High Street,Cowbridge,,,	II
22292	,34,Westgate,Cowbridge,,,	II
22293	Police Station	II

22294	HSBC (Midland Bank)	II
22295	Building to rear of Town Hall	II
22296	Citizens' Advice Bureau	II
22298	Gate House and bridge at Ty Mawr	II
22299	War Memorial in front of Town Hall	II
22300	26	II
22301	Barclays Bank	II
22302	Glamorgan Yeomanry War Memorial	II
22303	Water Pump near Police Station	II
22304	Eastfield	II
22305	Llanblethian House and No2, including Forecourt walls and railings	II
22306	Kingscombe	II
22307	Pen-y-Bryn	II
22308	Range of buildings at Court Farm	II
22309	,49,Eastgate,Cowbridge,,,	II
22310	Eastgate Gallery	II
22311	Former Coach House to rear of Nos 34 & 36	II
22312	,31,High Street,Cowbridge,,,	II
23078	Church of St Illtyd	II
23222	Former Barn at Castleton Farm	II
23913	Miskin War Memorial	II
23914	Church of St David	II
23915	Boiler stack of former lead mine NW of Cefn-parc Farm	II
23916	Pantyquesta House	II
23917	Church of St Ann	II
23918	Sundial in S garden at Talygarn	II
23919	Lower terrace wall in S garden at Talygarn	II
23920	Upper terrace wall in S garden at Talygarn	II
23921	Balustrade to sunken garden at Talygarn	II
23923	Upper terrace wall and pavilion on W side of Miskin Manor	II
23924	Lower terrace wall on W side of Miskin Manor	II
23925	Kitchen garden walls N of Miskin Manor	II
23926	Miskin Arms	II
23927	Pair of King's Beasts at W entrance to Miskin Manor	II
23928	Pair of King's Beasts at E entrance of Miskin Manor	II
23929	Bench on W side of sunken garden at Talygarn	II
23930	Bench on N side of sunken garden at Talygarn	II
23931	Bench on E side of sunken garden at Talygarn	II
23932	Gateway and gate to W boundary at Talygarn	II
23933	Telephone Call-box	II
24369	Dolau Primary School	II
24537	Rose Cottage	II

25605	Yr Hen Fferm Dy	II
26947	Road Bridge over Nant Criafol	II
81299	Barn at Great House Farm	II
81300	Cross in Churchyard of Church of St Cattwg	II
81301	Dovecote at Llanmaes House	II
81302	Picketston	II
81303	Plaisted Cottage	II
81304	Railed Tomb to Nicholl family to east of Chancel of Church of St Cattwg	II
82683	Church of St. John the Evangelist	II
82684	Church of St. Owain	II
82685	Churchyard Wall and Gates of Church of St. Owain	II
82686	Cross base in Churchyard of Church of St. Brynach	II
82687	Cross in Churchyard of Church of St. Senwyr	II
82688	Is-y-coed Farmhouse	II
82689	Llansannor House	II
82690	Llwynhelig House	II
82691	The Cottage	II
82692	The Old Rectory	II
82693	The Old School House	II
82694	West Wing of Llansannor Court	II
83108	Aderyn	II
83109	Anonymous Monument with railings in Churchyard of St Athan	II
83110	Bakehouse and Donkey Stable at Castleton Farmhouse	II
83111	Barn at West Aberthaw Farm	II
83112	Bullhouse (Old Chapel) at West Aberthaw Farm	II
83113	Cart Shed at West Aberthaw Farm	II
83114	Cheesehouse at Gileston Manor	II
83116	Cross in Churchyard of Church of St Giles	II
83117	Detached Kitchen at Flemingston Court	II
83118	Dovecote at East Orchard	II
83119	Garden wall and House Ruins at Flemingston Manor	II
83120	Garden Wall of West Aberthaw Farmhouse	II
83121	Garden Walls along roadside at Gileston Manor	II
83122	Heavy Horse Stable at West Aberthaw Farm	II
83123	Kitchen Garden Wall of Gileston Manor	II
83124	Pigsty at Gileston Manor	II
83125	Retainers' Hall at East Orchard	II
83126	St Athan War Memorial	II
83127	Stable Block of Gileston Manor	II
83128	The Old Rectory (aka Balfour House)	II
83129	Walls, and attached Summerhouse, of Walled Garden at Gileston Manor	II
83130	West Aberthaw Farmhouse	II

83144	Aberthaw Lime and Cement Works	II
83145	Aberthaw Signal Box	II
83146	Casberd Family Tomb in the Churchyard of the Church of St Mary	II
83148	Cross in Churchyard at Church of St Mary	II
83151	East Hall (aka Rosedene)	II
83152	East Kilns at Aberthaw Lime and Cement Works	II
83153	Fonmon Well	II
83154	Kenson Bridge	II
83156	Memorial to John and Mary Jenkins in Churchyard of Church of St Mary	II
83159	Retaining Walls of South Garden at Fonmon Castle	II
83161	Sarah Elizabeth Jones Memorial Cross in the Churchyard of the Church of St Mary	II
83162	The Granary	II
83164	Walls of Walled Gardens at Fonmon Castle	II
83165	Walls surrounding Fonmon Pond including the Bridge and Weir and Well at Fonmon	II
83388	Forecourt and Graveyard Gates, Gatepiers and Walls of Bethesda'r Fro Chapel	II
83401	Summerhouse Fort	II
83402	Summerhouse Tower	II
83405	Churchyard Wall of Church of St Donat	II
83406	Pigsty at Ty-draw	II
87647	Memorial at St Athan Boys' Village	II

Conservation areas
Aberthin
Cowbridge
East Aberthaw
Flemingston
Gileston
Llanbethery
Llanblethian
Llancadle
LLlancarfan
Llanharry
Llanmaes
Llanmihangel
Llantrithyd
Miskin
Pendoylan
Penmark
St Hilary
Talygarn

Registered Battlefields
Battle of Llanancarfan, AD 988 (NPRN 545066)
Battle of Llan Cwywan, AD 1041 (NPRN 545088)

- 8.3.12 There are a small number of designated assets with the potential to be physically impacted by the Proposed Development. The intention is to design any physical impacts out wherever possible. In addition to these, there are numerous designated assets within 3km of the PV Areas, and more yet within 1km of the proposed cable routes/cable buffer areas. Finally, although detailed desk-based studies have yet to be undertaken on the selected PV Areas, there is sufficient evidence within the vicinity of the Areas to indicate that there is a potential that they could contain prehistoric or Romano-British remains settlement and burial remains or medieval or post medieval remains, most likely agricultural in origin.

Surveys

- 8.3.13 In order to determine the archaeological potential of the PV Areas, it will be necessary to undertake extensive areas of geophysical surveying, supported by a subsequent programme of targeted trial trenching. The purpose of the geophysical survey will be to determine whether any of the areas of Proposed Development contain geophysical anomalies likely to be archaeological in origin. The purpose of the trial trenching will be to investigate these anomalies, and where possible to define the nature, extent, date and significance of any archaeological remains encountered. The requirement for these surveys and their scope will be determined through discussions with the archaeological advisor at Heneb.

8.4 Proposed approach

- 8.4.1 The scope of all work relating to the Historic Environment will be informed by discussions with Cadw and with the archaeological planning advisors at Heneb.
- 8.4.2 An historic environment Desk Based Assessment (DBA), compiled in line with the Standard & Guidance for historic environment desk-based assessment (ClfA, 2020) will be prepared for each of the PV Areas and to cover the selected cable routes joining them. These will form appendices to the subsequent EIA. These will assess impacts on both designated and undesignated archaeological and built heritage assets and will incorporate the results of walkover surveys of each site/area, along with a detailed assessment of available records, maps, and aerial survey data.
- 8.4.3 Geophysical survey and targeted trial trenching will also be undertaken to characterise the potential for each area/cable route

Baseline studies

- 8.4.4 The data sources used to inform the baseline assessment will be a combination of published material and site visits by competent experts. An initial desk-study of each of the Proposed Development Areas and will include the following data sources:
- Evidence held by Heneb on the regional Historic Environment Record (HER)
 - Available published and unpublished reports within the relevant Study Areas
 - National data sets held by Cadw and the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW)
 - Aerial photographs held by the RCAHMW and the Central Registry of Aerial Photographs for Wales (CRAPW)
 - Relevant maps and documents held by the Glamorgan Archives
 - LiDAR data available on Data Map Wales

- Historic maps available online and in local and national archives
- Conservation area character appraisals, where available.

8.4.5 A review of relevant documentary and archival material held in libraries and archives will be undertaken. An iterative approach will be adopted during this process to determine the scope of the above consultations/searches.

8.4.6 In addition, site visits will be undertaken to survey cable corridors, PV Areas and the BESS Areas to verify the documented historic environment baseline, to determine whether they contain hitherto unrecorded historic features, to assess intervisibility with nearby designated heritage assets and to select and photograph viewpoints.

Assessment of effects

8.4.7 The assessment of the likely effects on the historic environment will include the following activities:

- Identification of all heritage assets that could be affected by the Proposed Development, along with provision of a description of the significance (importance) of those assets including the contribution made by their setting.
- Identification of the likely effects of the Proposed Development on heritage assets within the Site and an appropriate study area centred on it.
- Assessment of significance of effects, taking into account measures proposed to avoid, reduce or offset adverse effects.

8.4.8 Assessment will be in the form of a matrix-based approach that examines the importance or value of the heritage asset against the magnitude of impact on that asset, leading to an identified significance of effect. This approach will be underpinned by a suitable narrative that explains how the importance or value of the asset has been appraised and how the magnitude of impact has been assessed.

Scope of assessment

8.4.9 Impacts will be assessed against all known designated and undesignated assets within the redline boundaries and selected cable routes, against impacts on potential archaeological remains within the redline boundaries and cable routes, and upon designated assets within 3km of PV Areas and 1km of cable routes. Assets will be scoped in for assessment using a combination of a bare earth ZTV and site visits to determine intervisibility.

Issues proposed to be scoped out

8.4.10 Different potential impacts are likely during construction, operation and decommissioning. It is not anticipated that any historic environment issues can be scoped out of assessment.

Potential cumulative effects

8.4.11 Potential cumulative effects will be assessed against an agreed set of other developments to determine whether there will be cumulative effects upon designated assets through development within their setting.

8.5 References

Cadw, 2017, Setting of Heritage Assets in Wales

Chartered Institute for Archaeologists, 2020, Standard & Guidance for historic environment desk based assessment 2014, updated 2020.

9 CLIMATE CHANGE

9.1 Introduction

- 9.1.1 This section of the scoping report considers the assessment of potential impacts on and due to climate change. Climate change here is considered in terms of the impact of greenhouse gas (GHG) emissions caused directly or indirectly by the Proposed Development, which contribute to climate change. The potential impact of changes in climate to the Proposed Development, which could affect it directly or could modify its other environmental impacts, are proposed to be scoped out of the assessment, with the exception of the likely changes to cloud cover over its expected lifetime (explained in greater detail in Section 9.4).

9.2 Legislative, policy context and guidance

National Planning Policy and Legislation

- 9.2.1 The Climate Change Act 2008, as amended (2019), created a framework for setting a series of interim national carbon budgets and plans for national adaptation to climate risks. The Act requires the UK government to set carbon budgets for the whole of the UK.
- 9.2.2 At present, the Third, Fourth, Fifth and Sixth Carbon Budgets, set through The Carbon Budget Orders 2009, 2011, 2016, and 2021 are 2.54 giga tonnes carbon dioxide equivalent (GtCO_{2e}) for 2018-2022, 1.95 GtCO_{2e} for 2023-2027, 1.73 GtCO_{2e} for 2028-2032 and 0.97 GtCO_{2e} for 2033-2037 respectively. The Sixth Carbon Budget is the first Carbon Budget that is consistent with the UK's net zero target, requiring a 78% reduction in GHG emissions by 2035 from 1990 levels.
- 9.2.3 The UK's nationally determined contribution (HM Government, 2020) under the Paris Agreement to the United Nations Framework Convention on Climate Change (UNFCCC), submitted in December 2020, commits the UK to reducing economy-wide GHG emissions by at least 68% by 2030, compared to 1990 levels.
- 9.2.4 Following the 2024 UK Election, the new Government has confirmed its commitment to renewable energy. This includes a commitment to making Britain a clean energy superpower by 2030, as set out in the Great British Energy founding statement (DESNZ, 2024). The new Government are aiming for a fully decarbonised power system by 2030 and aim to become net zero by 2050.
- 9.2.5 Planning Policy Wales (Welsh Government, 2024) states that the importance of tackling climate change and introducing new sources of renewable and low carbon energy is essential for meeting this commitment. The report sets out the goal of generating at least 70% of its electricity consumption from renewable sources by 2030.
- 9.2.6 Future Wales: The National Plan 2040 (Welsh Government, 2021) includes key national priorities such as achieving decarbonisation and climate-resilience. This plan addresses the climate emergency and shows strong support for the development of renewable and low carbon energy, stating that "The Welsh Government will support regional and local energy planning to identify opportunities for all types of renewable projects". It also emphasises that the construction of renewable and low carbon energy projects should be resource efficient, sustainable and reflect the principles of a circular economy.
- 9.2.7 The Environment (Wales) Act (2016) provides Welsh ministers with powers to put in place statutory emissions reduction targets, including an aspiration to achieve net zero GHG emissions by 2050.
- 9.2.8 The Climate Change (Carbon Budgets) (Wales) (Amendment) Regulations 2021 regulates two carbon budgetary periods; the period of 2021-2025 limits GHG emissions to an average of 37% lower than the 1990 baseline (this is updated from 33% as stated within the 2018 Regulations), and the period of 2026-2030 limits GHG emissions to an average of 58% lower than the baseline.

Local Planning Policy

- 9.2.9 Vale of Glamorgan Local Development Plan (2017) states its objective of ensuring that “development within the Vale of Glamorgan makes a positive contribution towards reducing the impact of and mitigating the adverse effects of climate change”. Policy MD19, ‘Low Carbon and Renewable Energy Generation’, states that where appropriate, low carbon and renewable energy schemes will be favoured.
- 9.2.10 Vale of Glamorgan Council Climate Change Challenge Plan 2021-2030 sets out a framework for achieving the council’s commitment of becoming carbon neutral by 2030.
- 9.2.11 Rhondda Cynon Taf Local Development Plan identifies climate change as a key strategic issue for sustainability. Policy AW 12 - Renewable & Non-Renewable Energy permits renewable energy installations where it can be demonstrated that there is no unacceptable effect upon the interests of soil conservation, agriculture, nature conservation, wildlife, natural and cultural heritage, landscape importance, public health and residential amenity.
- 9.2.12 Rhondda Cynon Taf Council ‘Working with our Communities’ Plan sets out a framework for achieving the council’s commitment of becoming carbon neutral by 2030.

Guidance

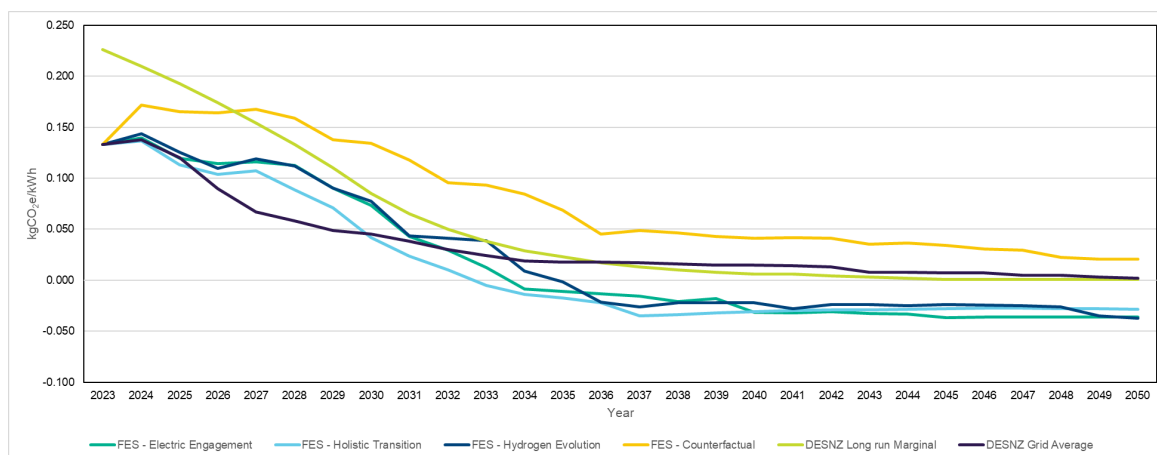
- 9.2.13 The main guidance used for the assessment of GHG emissions in EIA is the Institute of Environmental Management and Assessment (IEMA) guide ‘Assessing Greenhouse Gas Emissions and Evaluating their Significance’ (IEMA, 2022).
- 9.2.14 Additional guidance used for the quantification of GHG emissions includes the Greenhouse Gas Protocol suite of documents (World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), Revised Edition 2004).

9.3 Baseline information and study area

- 9.3.1 The current baseline for land that would be taken by construction of the Proposed Development is the existing agricultural land-use. However, installing solar panels and battery storage above ground would likely not cause significant disturbance to soil or vegetation carbon stocks.
- 9.3.2 There is potential for an increase in carbon sequestration in both soils and plants underneath the solar panels due to changes in landscape design (including wildflower planting) and reduction in soil disturbance (for example, there would be no ploughing). However, the magnitude of carbon sequestration through this practice would likely be insignificant compared to the magnitudes of GHGs emitted and avoided during the construction and operational phase of the Proposed Development (Bai and Cotrufo, 2022). As such, these emissions are proposed to be scoped out of this assessment.
- 9.3.3 The current baseline for electricity generation in the operational phase of the Proposed Development, with regard to GHG emissions, is the equivalent level of electricity generation from alternative sources connected to the electricity grid. The current average carbon intensity of electricity generation on the UK National Grid is 0.20705 kgCO₂e/kWh in the present-day baseline, taken from UK Government GHG conversion factors for company reporting (DEZNZ, 2024).
- 9.3.4 Potential scenarios for the future baseline of electricity generation are shown in Figure 9.1, which displays the carbon intensity of future marginal electricity generation projected by BEIS (as generated from alternative sources, in the absence of generation capacity provided by the Proposed Development) (BEIS, 2021). For means of comparison, the figure also displays the projected grid-average carbon intensity and the National Grid’s ‘Future Energy Scenarios’ projected grid carbon intensities (National Grid ESO, 2024).

- 9.3.5 In most of these scenarios a rapid and sustained decarbonisation of baseline electricity generation is projected; in certain scenarios, negative values are projected in this sector (i.e. from carbon capture and storage) in order to deliver 'net zero' for the UK economy as a whole.

Figure 9.1: Carbon intensity of future marginal electricity generation projected by BEIS



9.4 Proposed approach

- 9.4.1 GHG emissions would contribute to the effect of global climate change. Assessment guidance from the Institute of Environmental Management and Assessment (IEMA, 2022) describes five levels of significance for emissions resulting from a development, each based on how the proposed development contributes towards achieving a net zero and 1.5°C-aligned reduction trajectory. To aid in considering whether effects are significant, the guidance recommends that GHG emissions should be contextualised against pre-determined carbon budgets, or policy and performance standards where a budget is not available. It is a matter of professional judgement to integrate these sources of evidence and evaluate them in the context of significance.
- 9.4.2 The proposed approach for assessing the impacts on climate change from the Proposed Development will take a life-cycle approach, considering the manufacturing-stage emissions and the benefits of renewable energy generation in operation compared to the baseline. The manufacturing-stage emissions will be caused directly and indirectly from sources at a variety of locations, including on-site and from the upstream supply chain of the materials used.
- 9.4.3 The embodied carbon of the Proposed Development will be assessed using published literature values from lifecycle assessments (LCAs) and Environmental Product Declarations (EPDs). This is likely to include manufacturing, transport and installation for the photovoltaic (PV) modules and balance of system (BoS) components (primarily inverters, transformers and cabling) and BESS.
- 9.4.4 GHG emission reductions from operation of the PV system will be assessed based on the carbon intensity of the alternative source of generation that is displaced, i.e., the generator that would have been supplying the grid with electricity in the business-as-usual baseline without the Proposed Development.
- 9.4.5 Hence, the emissions savings would be compared with appropriate sources, including both present-day average carbon intensity of electricity generation on the UK National Grid at the time of the assessment and future marginal generation intensity predictions, calculated by DESNZ (BEIS, 2021). Both are shown in Figure 9.1. Both baselines would be used since, on the one hand, the carbon intensity of electricity generation is expected to decrease in line with government policy, and so the intensity of the marginal generation source that the Proposed Development would displace would also reduce. However, this reduction in carbon intensity would only be possible through the

approval and construction of projects such as the Proposed Development, and government policy relies on projects such as these to be approved.

- 9.4.6 As set out below, no significant adverse effects due to climate risks to the Proposed Development are considered likely, with the potential exception of flooding. Assessment of climate risks is therefore proposed to be scoped out of the assessment. However, the potential effect on power generation from changes in sunlight hours or cloud cover will be considered based on the UKCP18 projections.
- 9.4.7 Consideration would be given towards the end-of-life treatment of the Proposed Development and associated GHG emissions by assessed using published literature values from lifecycle assessments (LCAs) and Environmental Product Declarations (EPDs) where available.

Baseline studies

- 9.4.8 The sources of data concerning the present and future baseline have been described above, and no baseline surveys will be required.
- 9.4.9 Other data sources that will be used include the Digest of UK Energy Statistics (DUKES) to provide statistics on UK renewable energy and electricity generation (BEIS, 2022), and any published national or local carbon budgets against which the GHG emissions of the Proposed Development would be contextualised. These would be taken either from legislation or from published research such as the Tyndall Centre for Climate Change (Tyndall Centre, 2022). The latest edition of all relevant data sources would be used.

Assessment of effects

- 9.4.10 The magnitude of impact will be expressed as tonnes of carbon dioxide equivalent (tCO₂e), using 100-year global warming potential values for non-CO₂ GHGs from the Intergovernmental Panel on Climate Change's Sixth Assessment Report or as otherwise defined in published emissions factors and literature sources used (IPCC, 2021).
- 9.4.11 The sensitive receptor will be defined as the global atmospheric concentration of GHGs and it will be characterised as having a 'high' sensitivity, given the severe consequences of climate change and cumulative contributions of other sources.
- 9.4.12 The IEMA guidance referenced above (IEMA, 2022) states that a development's GHG impacts should be contextualised, for example on a sectoral basis, compared to the UK's national carbon budget or compared to policy requirements and performance standards. These comparisons would be used to determine whether a project's carbon footprint will support or undermine a 1.5°C compatible trajectory towards net zero.
- 9.4.13 It is considered that broadly speaking, the significance of the Proposed Development's GHG emissions can be contextualised in the following ways:
- With reference to the absolute magnitude of net GHG emissions as a percentage of applicable carbon budgets at the UK and local authority scale.
 - Through considering any increase/reduction in absolute GHG emissions and GHG intensity compared with baseline scenarios, including projections for future changes in those baselines.
 - With reference to whether the Proposed Development contributes to and is in line with the UK's national carbon budget goals and existing or emerging policy that supports for GHG emissions reduction consistent science-based commitments to limit global climate change to an internationally agreed level.

- 9.4.14 Taking these factors into account, effects may be described as: major adverse, moderate adverse, minor adverse, negligible, or beneficial. Minor adverse and negligible effects are considered to be non-significant; the remaining levels of effect (major adverse, moderate adverse and beneficial) are all considered to be significant. The evaluation of significance will be carried out in accordance with the guidance, which will include the application of professional judgement to contextualise and determine levels of significance in a way that makes clear the relationship between the Proposed Development's carbon footprint and a reduction trajectory consistent with measures required in the UK to meet our nationally-determined contribution towards the Paris Agreement's 1.5°C target (HM Government, 2022).

Scope of assessment

- 9.4.15 The scope of the assessment is the impact of life cycle GHG emissions from the Proposed Development, relative to the baseline of displaced alternative electricity generation and set within the context of national carbon budgets and other relevant local or national policy requirements.
- 9.4.16 Potential changes in generating capacity of the system due to climatic changes during the Proposed Development's operational lifetime (i.e. cloud cover or sunlight hours) will also be considered using UKCP18 projections.

Issues proposed to be scoped out

- 9.4.17 Risks to the Proposed Development from climate change are proposed to be scoped out of the assessment, as these are not considered likely to be significant during the Proposed Development's operating lifetime of 40 years.
- 9.4.18 Increased ambient temperatures as a result of climate change are proposed to be scoped out, as the manufacturing standards for PV modules IEC TS 63126:2020, IEC 62548 and IEC 61215-1:2021 require modules to be functional over a wide range of temperatures, humidity and UV radiation. As such, the potential for small system efficiency losses due to hotter temperatures during the Proposed Development's lifetime are not considered to have any potential to significantly affect the lifecycle GHG emissions and thus significantly reduce the environmental effect of the renewable electricity generation.
- 9.4.19 Extreme weather events such as storms with high winds are also possible in the existing and future baseline and the Proposed Development's design will need to account for this. Manufacturing standards for PV modules (listed above) require consideration for extensive weathering (such as from hailstorms) and extreme thermal fluctuations. As such, extreme weather events are not considered to cause significant environmental effects to the proposed development
- 9.4.20 Flood risk will be assessed, with appropriate climate change allowance, in the Flood Consequences Assessment for the Proposed Development and no separate assessment is proposed within the climate change chapter.
- 9.4.21 GHG emissions resulting from land-use change during construction are likely to be insignificant. This is due to the current agricultural land use and minimal disturbance during installation of solar PV modules and BESS components. Carbon sequestration through biogenic growth during the operational period of the Proposed Development would also likely be insignificant compared to the magnitudes of GHGs emitted and avoided during the construction and operational phase of the Proposed Development (Bai and Cotrufo, 2022). As such the impact of land-use changes on the carbon sequestration potential of the land is proposed to be scoped out.
- 9.4.22 The GHG emissions associated with the decommissioning of the Proposed Development are also proposed to be scoped out. This is because the vast majority of emissions associated with solar PV developments arises in the construction stage, from the embodied carbon of the PV modules and BESS components (International Energy Agency, 2021).

Potential cumulative effects

- 9.4.23 All developments which emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change. Consequently, cumulative effects due to other specific local developments are not individually identified but would be taken into account when evaluating the impact of the Proposed Development by defining the atmospheric mass of GHGs as a high sensitivity receptor.

9.5 References

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10 HYDROLOGY AND FLOOD RISK

10.1 Introduction

- 10.1.1 This chapter reports on the assessment of the effects of the Proposed Development with regards to hydrology and flood risk. This assessment focuses on the likely effects of the Proposed Development on local flood risk and water resources, including water quality and flow regimes.
- 10.1.2 This chapter describes the assessment methodology, the baseline conditions currently existing at the Site and in the surrounding area. It also looks at any potential impacts of the development and discusses whether further reporting is required to mitigate and reduce any significant adverse effects.

10.2 Legislative, policy context and guidance

- 10.2.1 The main legislative drivers for the assessment are set out below. All assessment work and surveys should be cognisant of relevant policy, legislation and guidance.

National Planning Policy and Legislation:

- Planning Policy Wales, Edition 12 (Welsh Government, 2024)
- Technical Advice Note (TAN) 15: Development and Flood Risk (Welsh Government, 2004) (and consideration of the draft updated TAN15)
- The National Strategy for Flood and Coastal Erosion Risk Management in Wales (Welsh Government, 2020)
- Sustainable Urban Drainage Systems (SuDS) Statutory Guidance (Welsh Government, 2019)
- The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017)

Local Policy and Legislation:

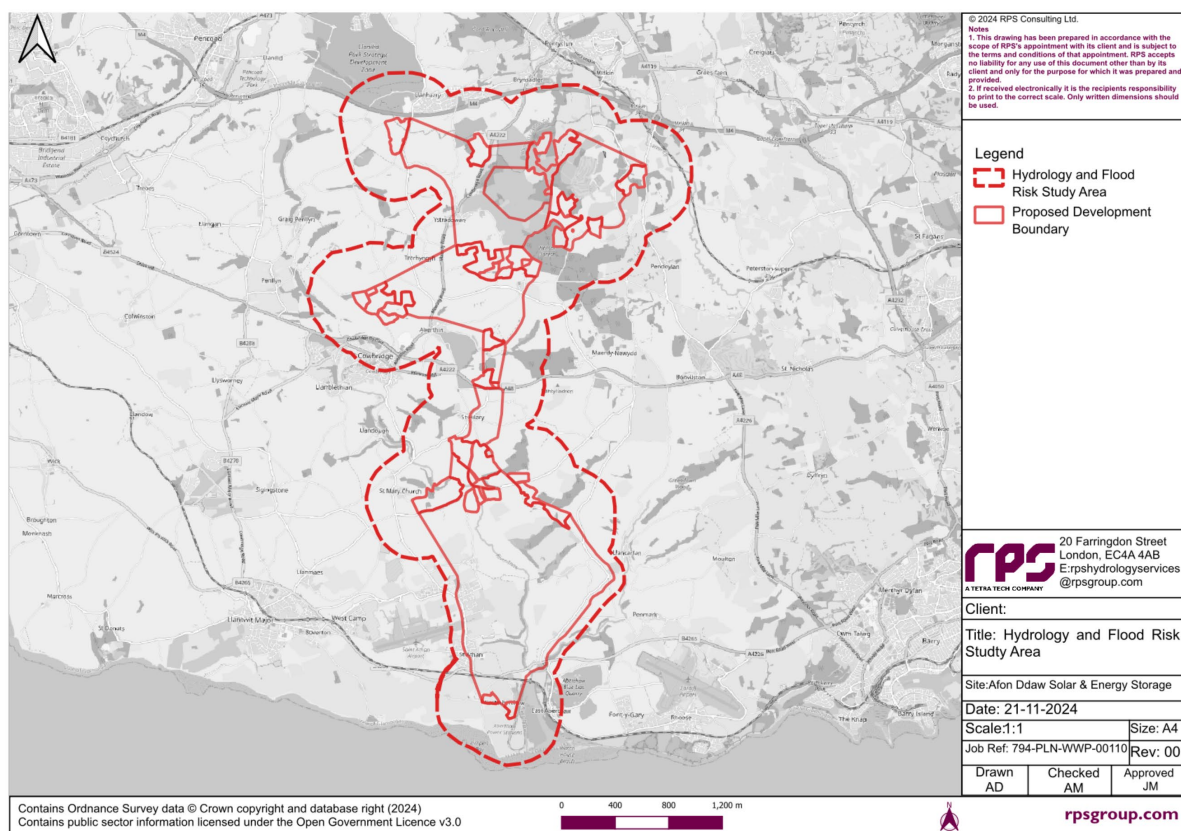
- Vale of Glamorgan Local Development Plan 2011- 2026
- Vale of Glamorgan Local Development Plan Revised Report 2021 – 2036, May 2022
- Rhondda Cynon Taf Local Development Plan 2006-2021, March 2011
- Rhondda Cynon Taf Revised Local Development Plan 2022- 2037

10.3 Baseline information and study area

- 10.3.1 The Hydrology and Flood Risk Study Area is displayed in Figure 10.1. This encompasses the cable corridor buffer land with an additional buffer of 250m, the 10no. PV Areas and BESS Areas with a 1-kilometre (km) buffer around each parcel of land. All references to the 'Hydrology and Flood Risk Study Area' on this document henceforth encompasses these elements.
- 10.3.2 The 250m buffer around the cable corridor buffer land is deemed to be sufficient for the hydrological receptors data collection of this electrical infrastructure.
- 10.3.3 The 1km buffer around the land parcels is considered appropriate for data collection considering the nature of the Proposed Development and likely zone of influence on hydrological receptors. Given the landscape at an extended distance from the Proposed Development it would be difficult to determine the specific source of impacts to flood risk and water quality beyond this distance.

- 10.3.4 The hydrology and flood risk study area will be reviewed and altered, if necessary, in response to refinements made to the design of the Proposed Development and/or any additional environmental and/or design constraints identified during the EIA process.

Figure 10.1. Hydrology and Flood Risk Study Area



10.4 Data Sources

- 10.4.1 An initial desk-based review of publicly available literature, mapping, and other data sources to support this Scoping Report is presented below in **Table 10.1**.

Table 10.1. Hydrology and Flood Risk Data Sources

Data	Author	Year	Data source
British Geological Society Geology of Britain Viewer 1:50,000 Geological Mapping	British Geological Society (BGS)	2024	https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/
Data Map Viewer Wales	Welsh Government	2024	https://datamap.gov.wales/maps/new#/
Development Advice Map (DAM)	Welsh Government	2024	https://gisgeoext.cyfoethnaturiolcymru.gov.uk/Geocortex/Viewers/Html5Viewer_4145/index.html?viewer=FloodRisk
Data Catalogue Wales	Welsh Government	2024	https://datamap.gov.wales/search/?limit=20&offset=0
OS Mapping	Ordnance Survey (OS)	2024	https://maps.the-hug.net/
Water Framework Directive Catchments Cycle 3	Data Map Wales	2021	https://datamap.gov.wales/layers/geonode:nrw_wfd_management_catchments_c3

- 10.4.2 In addition to the above data sources, site-specific hydrological data will be obtained via consultation with NRW, Lead Local Flood Authority (LLFA) of Vale of Glamorgan and Rhondda Cynon Taf; Envirocheck/Groundsure and site reconnaissance.

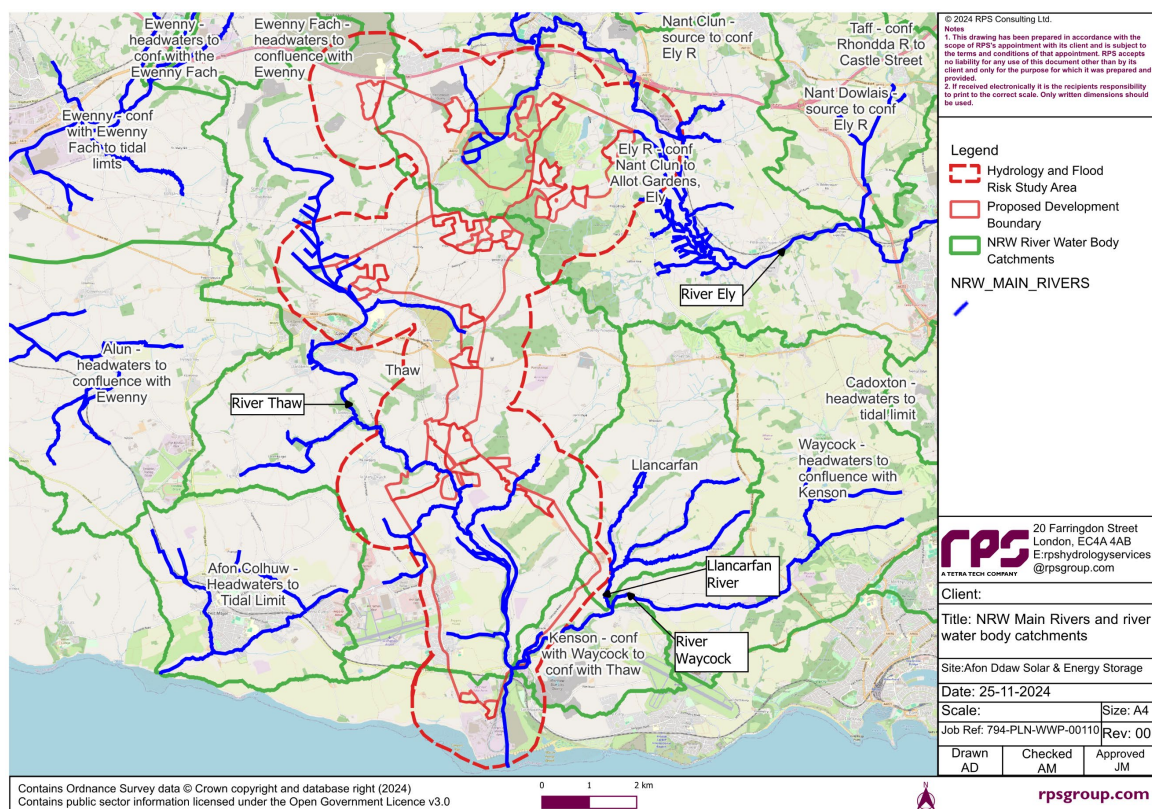
Baseline studies

- 10.4.3 NRW River Basin District Mapping indicates that the study area is within the Severn River Basin District. River water body catchments within this River Basin District are presented within **Table 10.2** and **Figure 10.2**. Key Main Rivers within the surroundings of the Hydrology and Flood Risk Study Area are also presented within **Figure 10.2**.
- 10.4.4 Under the Water Framework Directive (WFD), hydrological features contribute either directly or indirectly to the overall framework designation. Surface water bodies and associated classification within the Hydrology and Flood Risk Study Area are provided in **Table 10.2**.

Table 10.2. Surface Water Body Catchments Cycle 3 2021

Management Catchment	Water body name	Type	Water body ID	Overall Classification (2021)
Tawe to Cadoxton	Bristol Channel Inner North	Coastal	GB641008660000	Moderate
	Thaw	River	GB110058026430	Moderate
	Kenson - conf with Waycock to conf with Thaw	River	GB110058021000	Moderate
	Llancarfan	River	GB110058026410	Poor
South East Valleys	Ely R - conf Nant Clun to Allot Gardens, Ely	River	GB109057027260	Poor

Figure 10.2. Watercourses within the Hydrology and Flood Risk Study Area



Main Rivers

10.4.5 The publicly available (online) NRW data is presented within **Figure 10.2** and shows key Main Rivers labelled. Additional Main Rivers within the Hydrology and Flood Risk Study area include:

- Rhydhalog
- Nant Dyfrgi
- Ely R - conf Nant Clun to Allot Gardens, Ely
- Nant Coslech
- Nant Tynyplancau
- Pendoylan Moors 1
- Ely
- Ystradowen Moor Drains A
- Thaw
- Penllyne Moors H
- Nant Aberthin
- Nant Llantridddy
- Nant Y Creek
- Nant Y Stepsau
- Kenson
- Aberthawe Aqueduct

Ordinary Watercourses

10.4.6 Ordinary watercourse are defined as a watercourse that does not form part of a Main River. This includes streams, drains, culverts, dikes, ditches and passages through which water is conveyed. Each LLFA is responsible for the regulation of ordinary watercourses within their council area.

Flood Risk

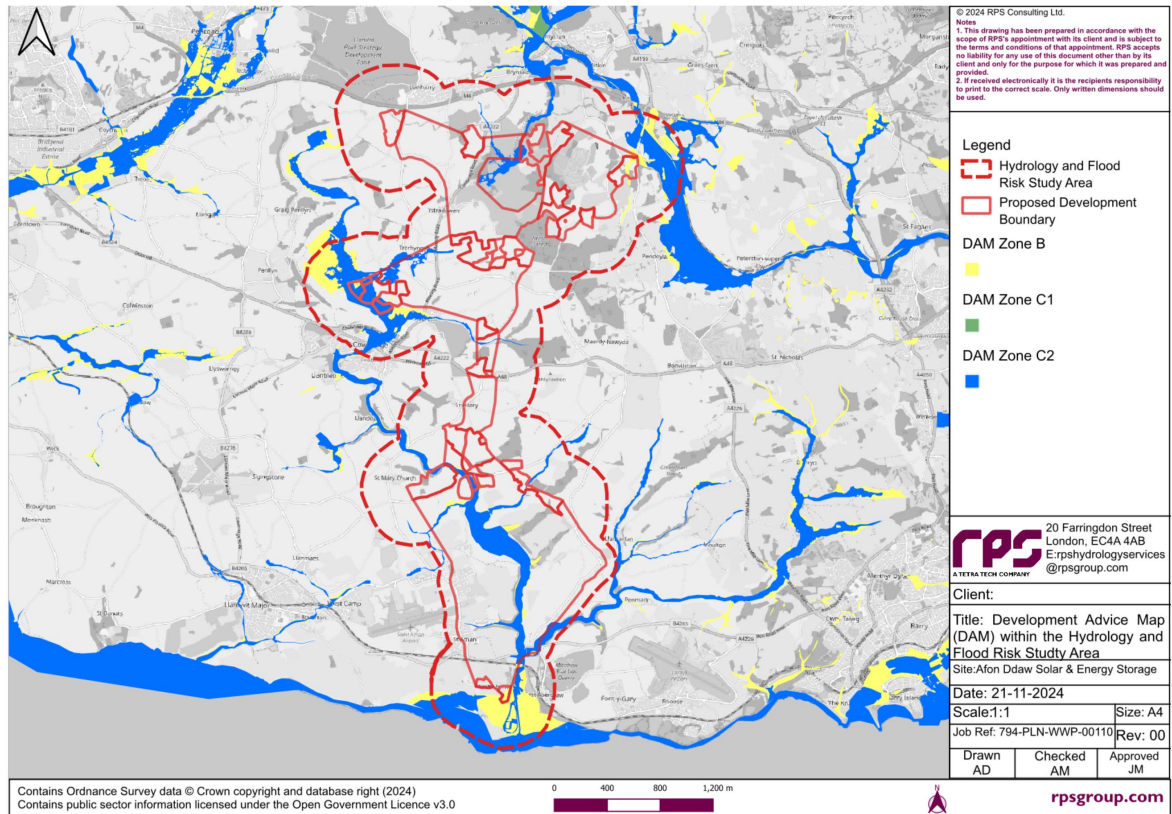
Development Advice Map

10.4.7 The Development Advice Map (DAM) distinguishes specific areas of land into Zones relating to flood risk to encourage new development away from areas at higher risk of flooding and is used in conjunction with the Tan15. The definitions of the zones within the DAM are outlined below:

- Zone A- “considered to be at little or no risk of fluvial or coastal/tidal flooding”; and
- Zone B- “areas known to have been flooded in the past evidenced by sedimentary deposits”; and
- Zone C1- “areas of the floodplain which are developed and served by significant infrastructure, including flood defences”; and
- Zone C2- “*areas of the floodplain without significant flood defence infrastructure*”.

- 10.4.8 The DAM is presented below in **Figure 10.3** The DAM indicates most of the Flood Risk Study Area is located within NRW Zone A (indicated as clear on the map); and crosses through Zone C2 along the coast at East and West Aberthaw; and remains in zone C1 and C2 along the course of the River Thaw north/north westwards through the Site to just below the Llanharri Rhondda Cynon Taf (M4).

Figure 10.3. Development Advice Map



Emerging TAN15 Flood Map for Planning

- 10.4.9 The emerging NRW Flood Map for Planning (Rivers and Seas merged) is presented within **Figure 10.4** and **Figure 10.5** and classifies areas into the following zones with the inclusion of climate change:

- Flood Zone 1 is defined as areas with an annual probability of flooding of up to 0.1% (1 in 1,000), including the effects of climate change.
- Flood Zone 2 is defined as areas with an annual probability of flooding of between 0.1% to 1% (1 in 1,000 to 1 in 100), including the effects of climate change.
- Flood Zone 3 is defined as areas with an annual probability of flooding of over 1% (1 in 100), including the effects of climate change.

Figure 10.4: NRW Flood Map for Planning 1 / 2

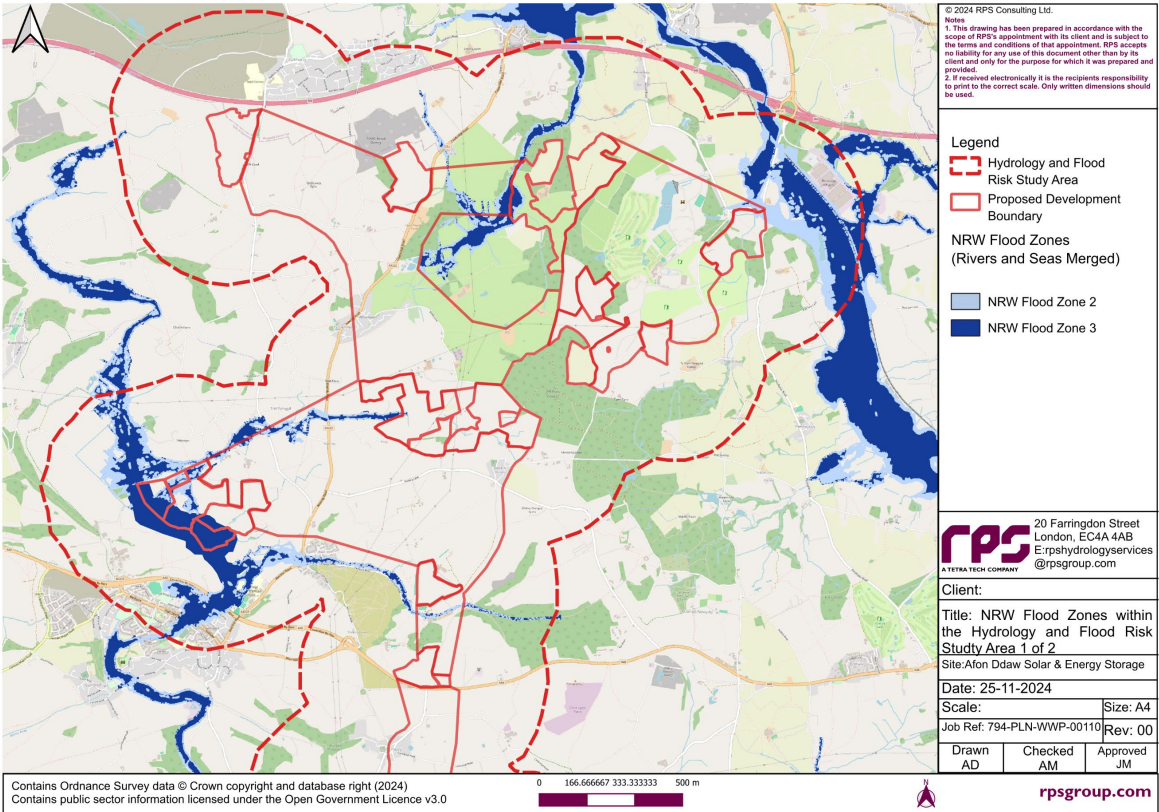
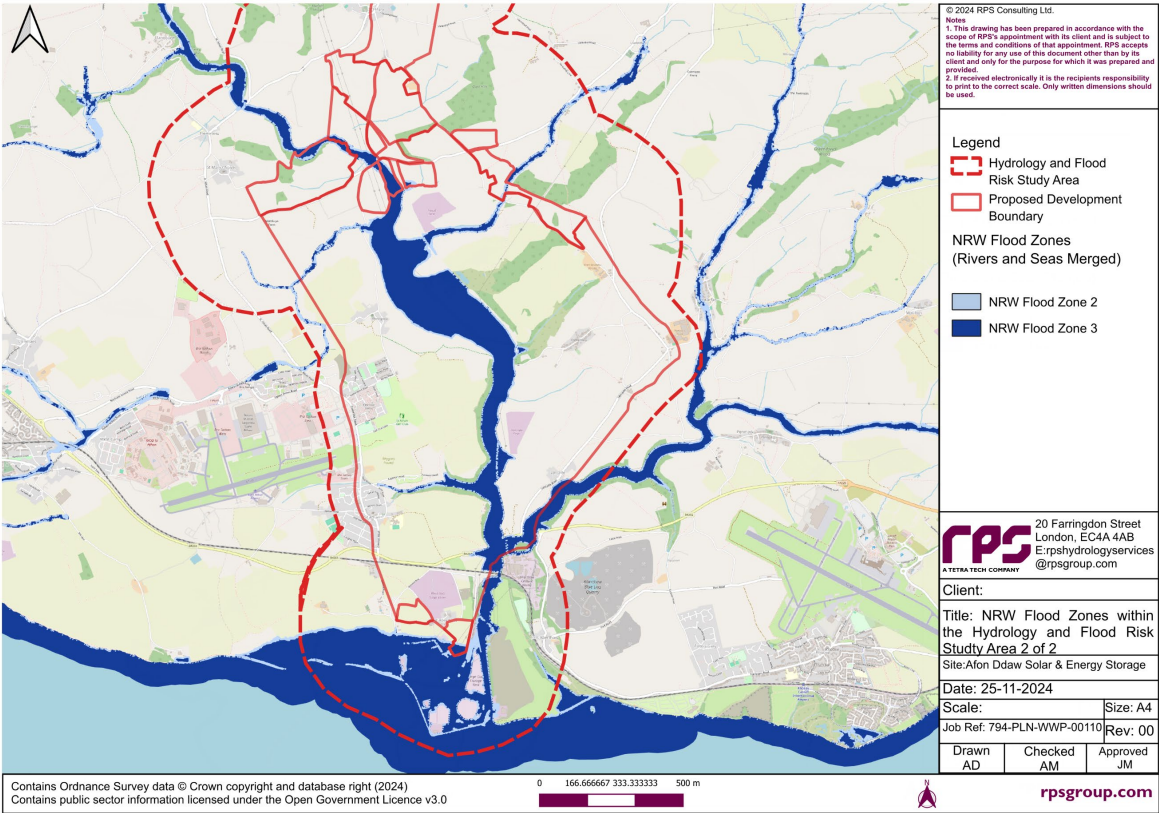


Figure 10.5 NRW Flood Map for Planning 2/2



Flooding from Rivers and Sea

- 10.4.10 The emerging NRW Flood Map for Planning for Rivers and Sea shows that the majority of the Flood Risk Study Area is within Flood Zone 1.
- 10.4.11 The following aspects of the Flood Risk Study Area are within NRW Coastal Flood Zone 2 and/or 3:
- BESS Area
 - PV Area
- 10.4.12 The following aspects of the Flood Risk Study Area are within NRW Rivers Flood Zone 2 and/or 3, and mostly follow the course of the River Thaw:
- PV Area 2
 - PV Area 3
 - PV Area 4
 - PV Area 6
 - PV Area 7

Flooding from Surface Water and Small Watercourses

- 10.4.13 The emerging NRW Flood Map for Planning for Surface Water and Small Watercourses shows that most of the Hydrology and Flood Risk Study Area is within Flood Zone 1.
- 10.4.14 The following aspects of the Hydrology and Flood Risk Study Area are within NRW Zone for Surface Water and Small Watercourses:
- BESS Area
 - PV Area 1
 - PV Area 2
 - PV Area 3
 - PV Area 5
 - PV Area 6
 - PV Area 7
 - PV Area 8
 - PV Area 9

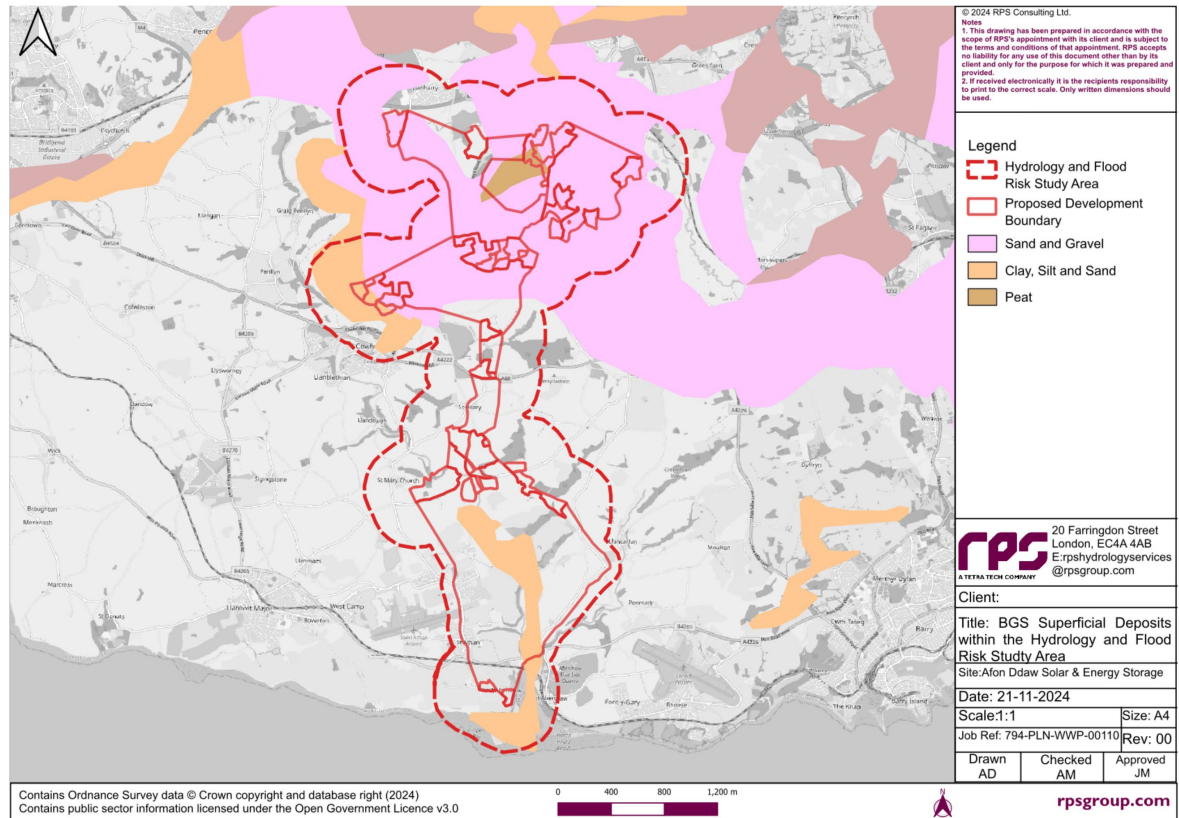
Geology and Hydrogeology

Superficial Geology

- 10.4.15 The following superficial deposits is present within the Hydrology and Flood Risk Study Area is outlined below and presented within **Figure 10.6**:
- Marine Beach Deposits comprised of Sand (along the coast)
 - Tidal Flat Deposits comprised of Sand, Silt and Clay (along the coast)
 - Blown Sand comprised of Sand (along the coast)
 - Alluvium comprised of Clay, Silt, Sand and Gravel (central-west of the Flood Risk Study Area)
 - Head deposits of Clay, Silt, Sand and Gravel (central-west of the Flood Risk Study Area)

- Till Devensian comprised of Diamicton (central-east and the north of the Flood Risk Study Area)
- Peat Deposits comprised of peat (central)

Figure 10.6: Superficial Deposits



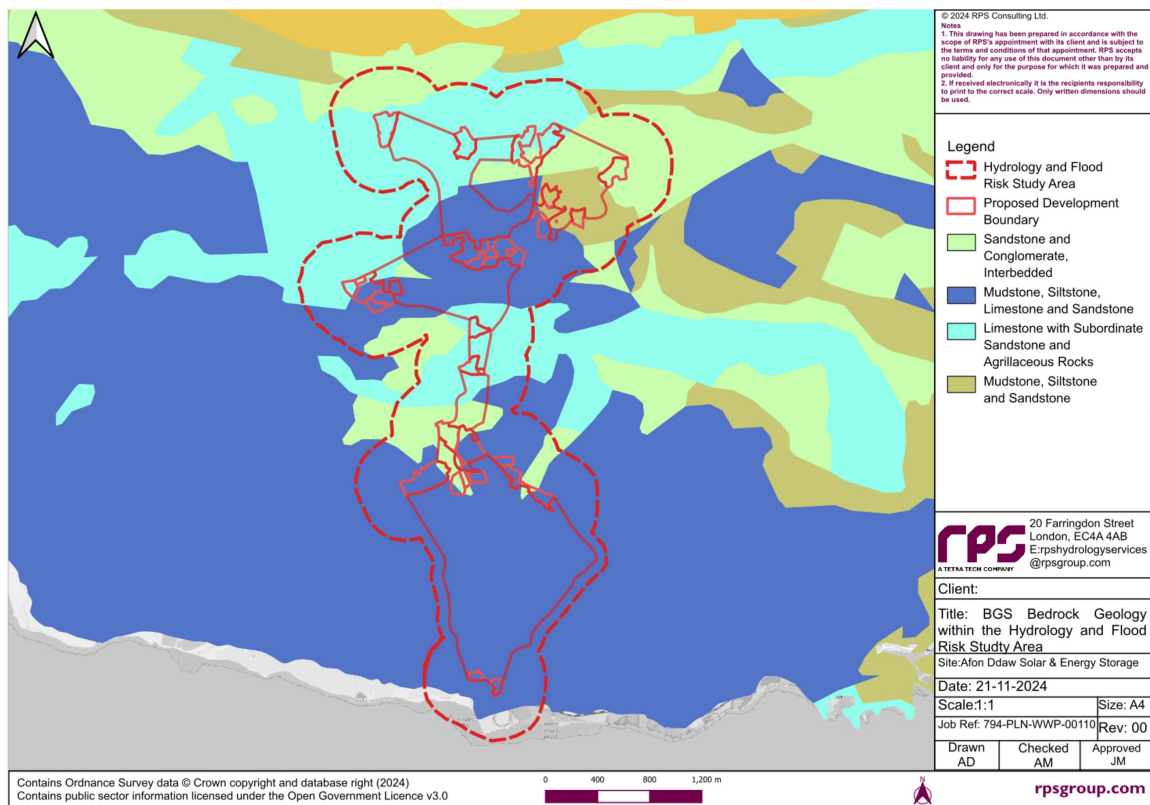
Bedrock Geology

10.4.16 The bedrock strata within the Hydrology and Flood Risk Study Area is highly variable and is outlined below and its approximate location, and presented within **Figure 10.7**:

- Portthkerry Member comprised of interbedded Limestone and Mudstone (along the coast)
- Lavernock Shales Member comprised of mudstone (central)
- Penarth Group comprised of Mudstone (central)
- Penarth Group (Marginal Facies) comprised of Sandstone (central)
- Mercia Mudstone Group (Marginal Facies) comprised of conglomerate (central and central-west)
- Blue Lias Formation (Marginal Facies) Shell comprised of Limestone (central)
- High Tor Limestone Formation comprised of Limestone (central)
- Friars Point Limestone Formation comprised of Limestone (central)
- Barry Harbour Limestone Formation comprised of Limestone (central)
- Brofiscin Oolite Formation comprised of Limestone Oodial (central)
- Castell Coch Limestone Formation comprised of Limestone Oodial (central)
- Upper Old Red Sandstone and Siltstone Interbedded (central west)

- St Mary's Well Bay Member comprised of interbedded Limestone and Mudstone (central-east)
- Brownstones Formation comprised of Sandstone and argillaceous interbedded rocks (north east)
- Blue Anchor Formation comprised of Mudstone (north east)
- Llanishen Conglomerate comprised of conglomerate and interbedded Sandstone (north east)
- Cwrt-Yr-Ala Formation comprised of Sandstone and Siltstone (north east)
- Tongwynlais Formation comprised of Limestone and interbedded Mudstone (central east)
- Gully Oolite Formation comprised of Limestone Oodial (north central)
- Castwell Bay Mustone Formation comprised of Limestone and mudstone interbedded (north central)
- Cornelly Oolite Formation comprised of Limestone Oodial (north)
- Stormy Limestone Formation comprised of Limestone (north)
- Oxwich Head Limestone Formation comprised of Limestone (north and north west)

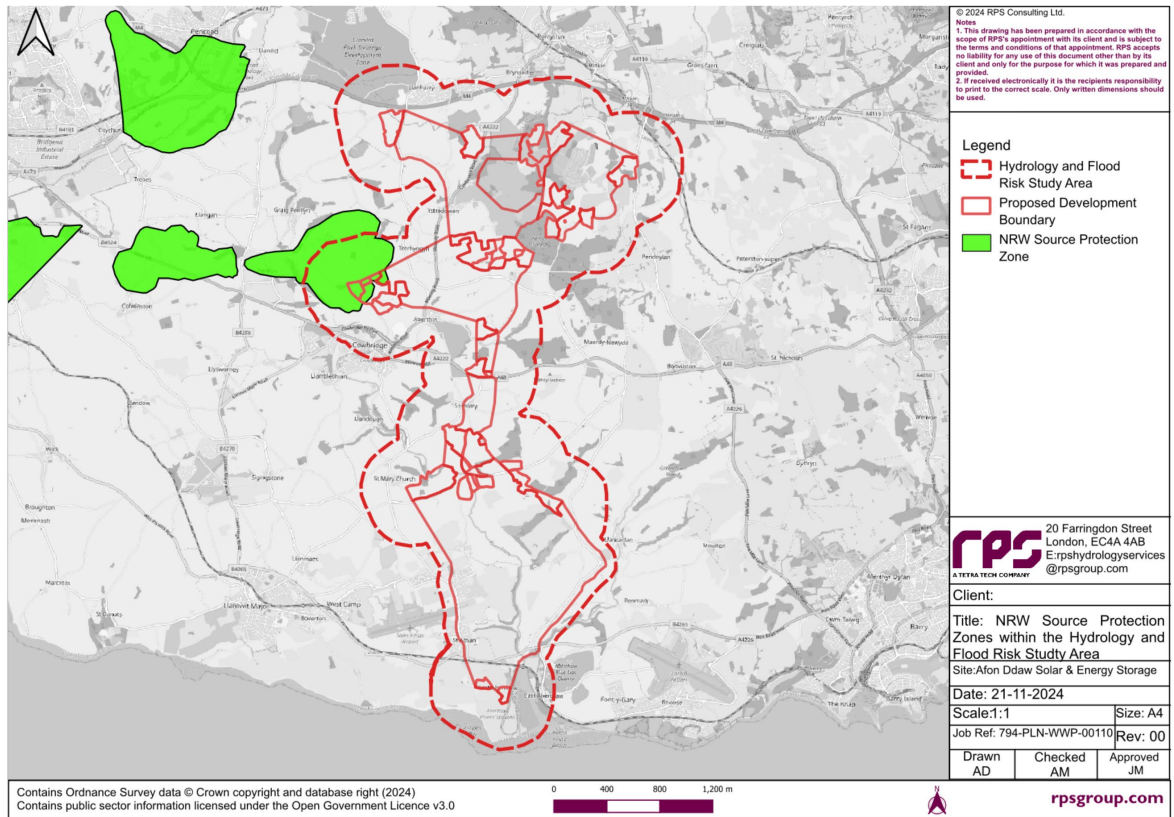
Figure 10.7: Bedrock Geology



Source Protection Zones

- 10.4.17 PV Area 3 and the far eastern extent of the cable corridor buffer land in proximity to this PV Area is classified to be within a Source Protection Zone (SPZ). and the remainder of the Proposed Development is outside an SPZ. SPZs within the Hydrology and Flood Risk Study Area are shown within **Figure 10.8**.

Figure 10.8: SPZ Mapping

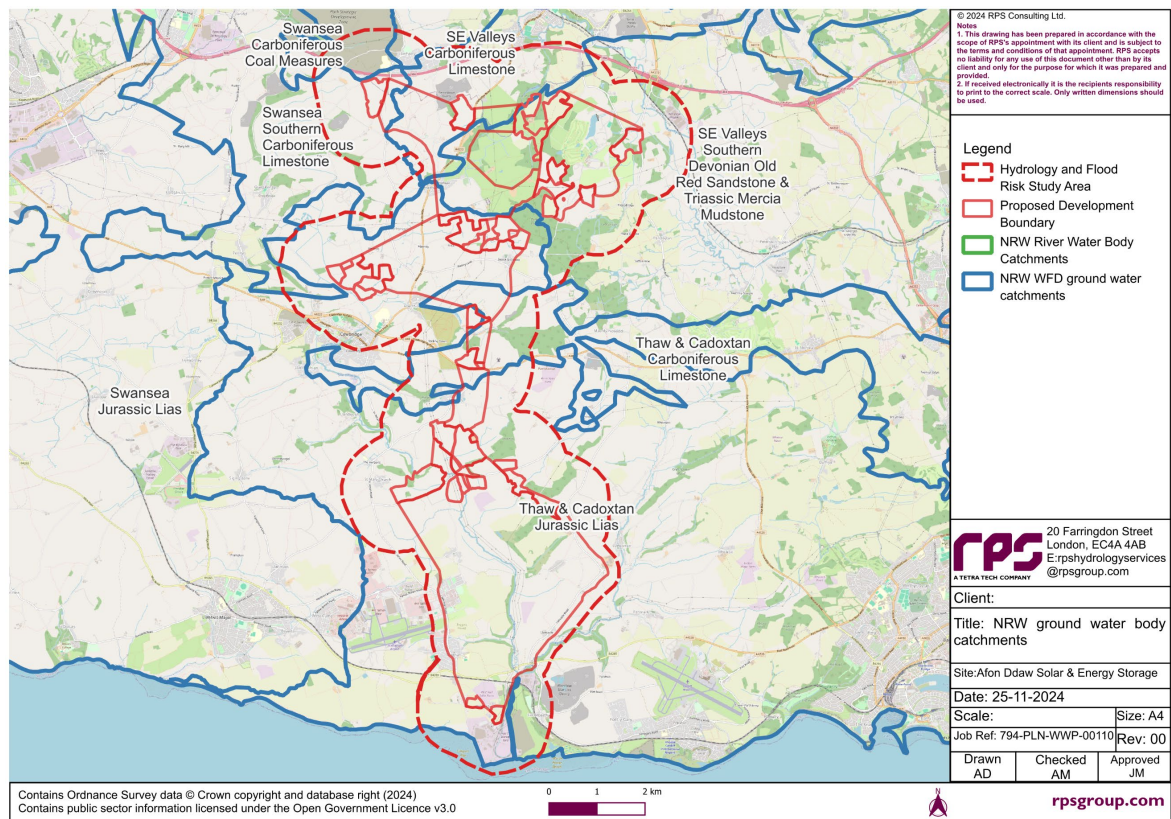


WFD for ground water bodies

- 10.4.18 Ground water WFD catchments and associated classification within the Hydrology and Flood Risk Study Area are provided within **Table 10.3** and **Figure 10.9**.

Table 10.3 Ground Water Body Catchments Cycle 3 2021

Waterbody name	Waterbody ID	Status
Swansea Carboniferous Coal Measures	GB41002G201000	Overall: Poor
Swansea Southern Carboniferous Limestone	GB41001G201300	Overall: Poor
SE Valleys Carboniferous Coal Measures	GB40902G201900	Overall: Poor
SE Valleys Carboniferous Limestone	GB40901G203600	Overall: Good
SE Valleys Southern Devonian Old Red Sandstone & Triassic Mercia Mudstone	GB40902G201500	Overall: Good
Thaw and Cadoxtan Jurassic Lias	GB41002G201400	Overall: Good
Thaw & Cadoxtan Carboniferous Limestone	GB41002G201600	Overall: Good

Figure 10.9: Ground Water Body Catchments

Designated Sites

10.4.19 The Hydrology and Flood Risk Study Area intersects with the following SSSIs:

- East Aberthaw Coast (along the coast)
- Cors Aberthin (Central)
- Pysgodlyn Mawr (North east)
- Ely Valley (North east)

10.4.20 No sites designated as Special Protection Areas (SPA) or Special Areas of Conservation (SAC) are located within the Hydrology and Flood Risk Study Area.

10.5 Assessment of effects

Scope of Assessment

10.5.1 The assessment of potential effects on water resources takes account of the impacts of the Proposed Development on the prevailing hydrological, surface water drainage, flood risk and water quality environments in order to determine whether there are likely to be significant effects, and whether further assessment should be scoped in or out.

Associated guidance

- National Highways et al (2020) DMRB LA104 Environmental assessment and monitoring
- CIRIA (C532; 2001) Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors

- CIRIA (C649D; 2006) Control of water pollution from linear construction projects. Site guide
- CIRIA (C753; 2015a) SuDS Manual
- CIRIA (C741; 2015b) Environmental good practice on site guide
- NRW et al (2020) Guidance for Pollution Prevention (GPP) 1: A general guide to preventing pollution
- NRW et al (2017a) GPP 2: Above ground oil storage tanks
- NRW et al (2017b) GPP 4: Treatment and disposal where there is no connection to the public foul sewer
- NRW et al (2018a) GPP 5: Works and maintenance in or near water
- NRW et al (2017c) GPP 8: Safe storage and disposal of used oils
- NRW et al (2000) Pollution Prevention Guidelines (PPG18): Managing Fire Water and Major Spillages
- NRW et al (2018b) GPP 20: Dewatering of underground Ducts and Chambers
- NRW et al (2017d) GPP 21: Pollution incident response Plans
- NRW et al (2018c) GPP 22: Dealing with spills
- NRW et al (2018d) GPP 26: Safe storage of drums and Intermediate Bulk Containers (IBCs)

Flood Consequence Assessment

- 10.5.2 Flood risk will be assessed in line with Planning Policy Wales, TAN15 as well as local planning policy through a Flood Consequence Assessment (FCA) for the Proposed Development. This will consider the impact that the Proposed Development may have on the surface water run-off regime. This will look at the vulnerability to flooding from other sources as well as from river and sea flooding, the potential of the Proposed Development increasing flooding risk elsewhere and the effects of climate change.

Issues to be scoped in

- 10.5.3 The identification and evaluation of likely significant impacts to be scoped into the assessment are discussed below, the phase of the Proposed Development in which these impacts may potentially occur and the data required to refine the outline of the baseline environment in relation to this. This is presented below in **Table 10.4**.
- 10.5.4 The potential likely significant impacts of the Proposed Development during decommissioning are likely to be similar and not worse as those experienced during the construction phase, thus the issues to be scoped in (**Table 10.4**) are essentially being assessed as the worst-case scenario.

Table 10.4: Hydrology and Flood Risk Impacts Scoped into the assessment.

Impact	Justification	Data collection and analysis required to characterise the baseline environment
The impact of increased flood risk arising from additional surface water runoff during the construction phase and operational phase of the Proposed Development.	Activities required to facilitate the construction of the Proposed Development (e.g. temporary construction compounds, removal of surface vegetation, compaction of soils, excavations, dewatering) may alter drainage patterns and surface water runoff rates onsite, increasing the risk of flooding posed to the surrounding area.	Baseline flood risk within the Hydrology and Flood Risk Study Area for the Proposed Development will be determined by undertaking an FCA using desk-based analysis of flood risk mapping data published by NRW and site-specific data obtained to inform the FCA.

	The operation of the Proposed Development will result in a minor increase in the total area of impermeable land as a result of the installation of the PV Areas and BESS Areas. An increase in impermeable area may alter drainage patterns and surface water runoff rates onsite increasing the risk of flooding posed to the surrounding area.	To ensure flood risk is not increasing during the operation of the Proposed Development, a Surface Water Drainage Strategy will be developed featuring SuDS to ensure surface water runoff arising from new impermeable areas is restricted to the greenfield runoff rate, in consultation with the LLFA. The drainage strategy will also include an outline inspection and maintenance of SuDS features.
The impact of the deterioration of water quality of waterbodies (surface water and groundwater) during the construction phase of the Proposed Development.	Activities required to facilitate the construction of the Proposed Development (e.g. temporary construction compounds, removal of surface vegetation, compaction of soils, excavations, dewatering) may cause direct impacts to water quality via accidental spillages / contaminant release.	Baseline water quality will be determined through a review of the NRW catchment data explorer to identify the WFD classification of watercourses plus review of water abstractions, pollution incidents and water discharges within the study area.

Issues to be scoped out

- 10.5.5 The identification and evaluation of significant impacts to be scoped out of the assessment are discussed below in **Table 10.5**. This encompasses impacts which are deemed to be unlikely to occur that would affect the Proposed Development and impacts in which are not expected to arise due to the presence of the Proposed Development.

Table 10.5 Hydrology and Flood Risk Impacts to be scoped out of the assessment.

Impact	Justification
The impact of increased flood risk arising from additional surface water runoff during the decommissioning phase of the Proposed Development.	It is expected decommissioning phase activities are to be similar to the construction and in reverse sequence. A Decommissioning Environmental Management Plan will be developed prior to decommissioning in a timely manner and will be in line with the latest relevant available guidance.
The impact of the deterioration of water quality of waterbodies (surface water and groundwater) during the operation phase and decommissioning phase of the Proposed Development	Activities associated with the operation phase of the Proposed Development are unlikely to require the transport or storage of harmful substances. Therefore, the potential impact of spills/contaminant releases on the quality of surface water receptors during the operation phase is unlikely to result in significant effects and is proposed to be scoped out of the assessment for hydrology and flood risk. Solar panels and BESS components may contain hazardous materials including heavy metals. However, during normal operational conditions, it is expected infrastructure is to be fully sealed to prevent leaching of heavy metals to the water environment. There is a residual risk of contamination from infrastructure if it is damaged during the operation phase. It is expected regular inspection and maintenance of solar panels will prevent the release of pollutants to the surrounding environment. It is expected decommissioning phase activities are to be similar to the construction and in reverse sequence. A Decommissioning Plan will be developed prior to decommissioning in a timely manner and will be in line with the latest relevant available guidance.

10.6 Embedded Mitigation

- 10.6.1 Measures adopted as part of the Proposed Development will include:

- Preparation of a FCA and Surface Water Drainage Strategy due to the overall size of the Site being in excess of 1 ha, to accompany the planning application.

- Consultation with NRW, Rhondda Cynon Taf Council and Vale of Glamorgan County Borough Council to obtain any flood risk and water quality information required to inform the baseline of the hydrology and flood risk chapter.
- Relevant permits and consents will be obtained from NRW, Rhondda Cynon Taf Council and Vale of Glamorgan County Borough Council prior to construction, these would include land drainage consents, as required.
- Development of construction and operation mitigation measures. Construction phase mitigation would be implemented through the CEMP. A drainage strategy will ensure surface water runoff arising from new impermeable areas is attenuated and discharged at the greenfield runoff rate to prevent an increase in flood risk downstream. SuDS will also be utilised to provide pollution treatment of flows prior to discharge. Routine inspection and maintenance of the Proposed Development will be undertaken to prevent pollutants from being released from solar panels and the BESS components.
- A Decommissioning Environmental Management Plan would be produced and agreed with the relevant authorities prior to decommissioning works and will be in line with the latest relevant available guidance. The Decommissioning Environmental Management Plan would consider in detail all potential environmental risks on the Site and contain guidance on how risks can be removed or mitigated. This would include details of how surface water drainage should be managed during the decommissioning, and measures to prevent pollution, including emergency spill response procedures, and clean up and remediation of contaminated soils, where identified.

10.6.2 The requirement and feasibility of additional measures will be dependent on the significant effects on hydrology and flood risk.

10.7 Mitigation Measures

10.7.1 All construction work would be undertaken in accordance with the CEMP and good practice documentation including, some of which have been withdrawn, but still provide a useful guidance and principles:

- Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C532; 2001).
- CIRIA – SuDS Manual (C753; 2015a).
- CIRIA (C741; 2015b) Environmental good practice on site guide.
- Prevent surface water being affected during earthwork operations. No discharge to surface watercourses would occur without permission from NRW (SuDS Manual).
- Wheel washers and dust suppression measures to be used as appropriate to prevent the migration of pollutants (SuDS Manual).
- Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual).
- A CEMP to be submitted for approval by the responsible planning authority (SuDS Manual).

10.7.2 All construction will also include the following:

- Construction drainage systems to ensure that discharge from the Proposed Development is controlled in quality and volume during construction.
- Construction techniques and processes to ensure the protection of surface and ground waterbody quality and flow and to prevent an increase in flood risk, such as dust prevention techniques, location of construction compounds, storage of materials (including storage of hazardous materials) in relation to water bodies.
- Best practice construction techniques and design would be used for any excavations during the installation of foundations, dewatering to be undertaken when required, and should

contamination be encountered during excavation, work would be stopped until appropriate measures are in place to prevent mobilisation.

- Pollution Prevention Measures to prevent spillages and contamination of surface and ground waterbodies during construction. This includes appropriate storage/containment of materials (including hazardous substances), plant in addition to appropriate refuelling methodology. The Pollution prevent plan (contained within the CEMP) will also detail information regarding spill kits and actions to be undertaken if a spillage were to occur.

10.8 Potential cumulative effects and inter-relationships

- 10.8.1 There is potential for cumulative effects to occur on receptors between the Proposed Development and other developments. The potential cumulative effects of the Proposed Development together with other developments with respect to hydrology and flood risk will be considered within the EIA report.
- 10.8.2 The assessment of inter-relationships will be considered within the water quality and flood risk section of the EIA. It will include consideration of Proposed Development lifetime effects and receptor-led effects, in line with the approach outlined in the EIA Methodology section of this EIA Scoping Report. There are potential inter-relationships with other topics, relating to the pollution of watercourses during construction, albeit the impacts are likely to be not significant owing to embedded mitigation measures.

10.9 References

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11 NOISE AND VIBRATION

11.1 Introduction

- 11.1.1 This section of the Scoping Report sets out the approach to the assessment of noise and vibration. The baseline conditions are first established with an overview of baseline surveys followed by the proposed assessment methodology. The potential effects are then presented which form the basis of the issues proposed to be scoped in and out in the following sub-section. The consultation undertaken to date and proposed further consultation is then set out.
- 11.1.2 Note that the scope of this section considers noise and vibration effects on human receptors and excludes assessment of noise and vibration on ecological or heritage receptors.

11.2 Legislative, policy context and guidance

- 11.2.1 The assessment methodology is based on the following relevant legislation and guidance:
- National Policy Statement (NPS) for Energy (EN-1) – including the relevant technology specific NPS, National Policy for Renewable Energy Infrastructure (EN-3) and the NPS for Electricity Networks Infrastructure (EN-5).
 - Welsh Government, Planning Policy Wales (2024);
 - Planning Guidance (Wales), Technical Advice Note 11: Noise (TAN 11) – including Revised planning guidance in relation to air quality, noise and soundscape currently in review;
 - Vale of Glamorgan Local Development Plan 2011- 2026
 - Vale of Glamorgan Local Development Plan Revised Report 2021 – 2036, May 2022
 - Rhondda Cynon Taf Local Development Plan 2006-2021, March 2011
 - Rhondda Cynon Taf Revised Local Development Plan 2022- 2037
 - British Standard 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures (BS7445-1);
 - British Standard 5228: 2009+A1: 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2 (BS5228);
 - World Health Organization Guidelines for Community Noise (WHO 1999);
 - World Health Organization Environmental Noise Guidelines for the European Region (WHO 2018);
 - British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233);
 - British Standard 4142: 2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS4142);
 - Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 111 Noise and Vibration Revision 2 (including the Wales National Application Annex to LA 111);
 - Calculation of Road Traffic Noise, 1988 (CRTN)

11.3 Baseline information and study area

- 11.3.1 The proposed BESS is located by the villages of West Aberthaw and Gileston, residences here will be the nearest noise sensitive receptors (NSR).
- 11.3.2 Baseline noise surveys were undertaken in August 2024 at two locations representative of the NSRs for the BESS in West Aberthaw and Gileston. The existing dominant sound sources are distant and local road traffic as well as natural sounds. It is noted that the Aberthaw B Power Station to the south will have formed part of the sound climate until its closure in 2020.
- 11.3.3 The receptors surrounding the PV Areas are mostly isolated receptors, it is not proposed that further monitoring will be undertaken at these receptors.
- 11.3.4 Consultation will be undertaken with Vale of Glamorgan Council, Rhondda Cynon Taf Borough Council and other key stakeholders to determine confirm further monitoring is not required.

11.4 Proposed approach

Baseline studies

- 11.4.1 Subject to consultation with Vale of Glamorgan Council and Rhondda Cynon Taf Borough Council no further monitoring is required.

Assessment of effects

Determining Significance of Effect

Receptor Sensitivity

- 11.4.2 In accordance with the principles of EIA, the sensitivity of receptors (existing and proposed) to noise or vibration impacts during either construction or operational phases have been defined in Table 11.1, below.

Table 11.1: Sensitivity/Value of Receptor

Sensitivity/Value of Resource/Receptor	Description	Examples of Receptor Usage
Very High	Receptors where noise or vibration will significantly affect the function of a receptor	Auditoria/studios; and Specialist medical/teaching centres, or laboratories with highly sensitive equipment;
High	Receptors where people or operations are particularly susceptible to noise or vibration. Sensitive ecological receptors known to be vulnerable to the effects of noise or vibration.	Residential; Quiet outdoor areas used for recreation; Conference facilities; Schools/educational facilities in the daytime; Hospitals/residential care homes; Libraries; and Ecologically sensitive areas for example Special Protection Areas (SPAs)
Medium	Receptors Moderately sensitivity to or vibration where it may cause some distraction or disturbance	Offices; Restaurants; and

		Sports grounds when spectator or noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf).
Low	Receptors where distraction or disturbance of people from noise or vibration is minimal	Residences and other buildings not occupied during working hours; Factories and working environments with existing high noise levels; and Sports grounds when spectator or noise is a normal part of the event.

Characterisation of Effect

Construction Phase

- 11.4.3 The effects of construction noise and vibration from the Proposed development site onto existing sensitive receptors will be assessed based on guidance contained within BS5228. Any impacts associated with the construction of the Proposed Development are likely to be short-term and temporary in nature.
- 11.4.4 Construction noise levels will be predicted at nearby existing sensitive receptors based on a typical construction plant list for a development of this size and nature, and following the methodology set out in Annex F of BS 5228-1. The effects of construction noise will be assessed in line with the BS 5228-1 'ABC' method, it is proposed all NSRs will be assumed to have low existing ambient sound levels and so be assigned 'category A'.
- 11.4.5 Construction vibration levels will be predicted at nearby existing sensitive receptors based on a typical construction plant list for a development of this size and nature, and following the methodology set out in BS 5228-2.
- 11.4.6 Where significant effects are likely to occur due to road traffic noise associated with the construction phase, these will be considered within the ES. These will be assessed following the principles of DMRB LA111, referencing Table 3.17.
- 11.4.7 The focus of the construction assessment will be on the identification of any significant effects, and consequently any mitigation measures that will need to be included in a Construction Environmental Management Plan (CEMP).

Operational Phase

- 11.4.8 Operational noise associated with the Energy Storage Site will be assessed in accordance with BS4142. The rating levels due to proposed operations will be compared with the typical background sound levels established through the noise surveys. BS4142 requires a context assessment to be undertaken before determining final potential impacts, which will be undertaken by drawing on other Standards and guidance, where applicable. Any impacts associated with the operational phase of the Proposed Development are likely to be long-term in nature.
- 11.4.9 A tranquillity assessment will be undertaken. Although various approaches have been put forward in the past to determine the impact of a development on tranquillity, there is no industry standard approach. Therefore, it is proposed to develop a methodology drawing on multiple sources such as local open space policies, BS8233, WHO Guidelines (1999), and any web-based tranquillity tools. Areas such as open spaces, public rights of way, local nature reserves etc. will be considered within any assessment. It is also considered that reference will be given to soundscape guidance, where deemed appropriate.

Significance of Effect

- 11.4.10 The significance of effect resulting from each individual potential impact type above is derived from the magnitude of the impact and the sensitivity or value of the affected receptor using the matrix presented in Table 11.2, below.

Table 11.2: Classification of Effects

Sensitivity/Value of Resource/Receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
Very High	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible

- 11.4.11 With respect to the Classification of Effects outcomes from Table 11.2, effects of Negligible and Minor are considered to be insignificant, whereas effects of Moderate and Major are considered to be significant, in EIA terms.

Scope of assessment

- 11.4.12 The scope of the assessment:

- Construction phase – Noise and Vibration from Onsite Activities
- Construction phase – Development Generated Road Traffic Noise
- Operational phase – Effect of Noise from Energy Storage Site
- Operational phase – Tranquillity Assessment

Issues proposed to be scoped out

Operational Vibration

- 11.4.13 Based on experience of similar recent installations, the plant likely to be used at the Project, when operational, would generate negligible levels of vibration at the boundary of the Project. Therefore, operational vibration impacts are scoped out of the EIA.

Operational Noise of PV Areas

- 11.4.14 Based on experience of similar recent installations, the plant likely to be used at the PV Areas, when operational, would generate low levels of noise at the boundary of the Project. Therefore, operational vibration impacts are scoped out of the EIA.

Operational Traffic Noise and Vibration

- 11.4.15 Vehicular movements during the operational phase of the Proposed Development, related to routine servicing and maintenance, would be very limited and unlikely to be associated with any significant noise effects. Operational traffic noise and vibration impacts are therefore scoped out of the EIA.

Decommissioning Phase Noise and Vibration

- 11.4.16 As well as the construction and operation of The Project, decommissioning will also be considered. It is likely traffic data associated with the decommissioning phase will not increase compared to the traffic data associated with the construction phase. The assessment of noise from road traffic over

the construction period will be worst-case compared to the decommissioning period. Therefore, an assessment of road traffic noise impacts during the decommissioning phase will not be undertaken.

- 11.4.17 Similarly, it is not anticipated that the noise and vibration impacts from onsite activity associated with decommissioning will be any worse than those associated with construction. Furthermore, a Decommissioning Environmental Management Plan (DEMP) will be produced to ensure that noise and vibration are controlled, where appropriate, taking a similar approach to the CEMP. On this basis, decommissioning phase noise and vibration has been scoped out.

Potential cumulative effects

- 11.4.18 There is potential for cumulative effects to occur on receptors between the Proposed Development and other developments. The potential cumulative effects of the Proposed Development together with other developments with respect to noise will be considered within the EIA report.

11.5 References

National Policy Statement (NPS) for Energy (EN-1) – including the relevant technology specific NPS, National Policy for Renewable Energy Infrastructure (EN-3) and the NPS for Electricity Networks Infrastructure (EN-5).

Welsh Government, Planning Policy Wales (2024);

Planning Guidance (Wales), Technical Advice Note 11: Noise (TAN 11) – including Revised planning guidance in relation to air quality, noise and soundscape currently in review;

Vale of Glamorgan Local Development Plan 2011- 2026

Vale of Glamorgan Local Development Plan Revised Report 2021 – 2036, May 2022

Rhondda Cynon Taf Local Development Plan 2006-2021, March 2011

Rhondda Cynon Taf Revised Local Development Plan 2022- 2037

British Standard 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures (BS7445-1);

British Standard 5228: 2009+A1: 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2 (BS5228);

World Health Organization Guidelines for Community Noise (WHO 1999);

World Health Organization Environmental Noise Guidelines for the European Region (WHO 2018);

British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233);

British Standard 4142: 2014+A1:2019 Method for rating and assessing industrial and commercial sound (BS4142);

Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 111 Noise and Vibration Revision 2 (including the Wales National Application Annex to LA 111);

Department for Transport Calculation of Road Traffic Noise, 1988 (CRTN)