Llandyfaelog Substation

Pre-application Report

On behalf of **National Grid**

Project Ref: 331201429 | Date: April 2024

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Document Control Sheet

Project Name: **Llandyfaelog Substation**
Project Ref: **331201429**
Report Title: **Pre-application Report**
Doc Ref: **001**
Date: **April 2024**

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Revision	Date	Description	Prepared	Reviewed	Approved
-	24/10/2023	Draft for client review	BP	MC	AS

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1 Introduction

1.1 Pre-Application Report

1.1.1 Stantec UK Limited ('Stantec') has been appointed by National Grid Electricity Transmission ('NGET') to obtain Pre-application Advice from Carmarthenshire County Council regarding the delivery of a new 400kV substation.

1.1.2 This report highlights the nature of the proposal, sets out the planning policy applicable, and outlines technical aspects, including technical studies which have been undertaken to date.

1.1.3 This report is accompanied by a pre-application form which will be submitted online and an accompanying fee. The appendices of this report include:

- Appendix A – Site Location Plan
- Appendix B – Indicative Site Plan
- Appendix C – Siting Study
- Appendix D – Preliminary Ecological Appraisal Technical Note
- Appendix E – Outline Flood Consequence Assessment
- Appendix F – Archaeology and Heritage Level 1 Assessment
- Appendix G – View Location Plan for LVA

1.2 Background

1.2.1 NGET owns and operates the high voltage electricity transmission system in England and Wales and is also responsible for the operation of parts of the transmission system in Scotland. The system operates mainly at 400kV and 275kV parcel connecting the electricity generators to substations where the high voltages are transformed to lower voltages, enabling the power to be distributed to homes and businesses by Distribution Network Operators ('DNO') who operate at a maximum of 132kV.

1.2.2 NGET is reviewing infrastructure options to meet an increase in estimated electrical demand resulting from multiple customer connections required to come into the national electricity transmission network.

1.2.3 A new substation is required to accommodate both generation and demand connections due to there being limited capacity at existing substations in south Wales.

1.3 EIA Screening

1.3.1 An EIA screening request has been prepared concurrently with the Pre-Application submission which sets out where there is the potential for significant environmental effects to occur as a result of the proposed development and, where necessary, how these effects will be addressed as part of the planning application.

1.3.2 The Proposed Development is not directly identified within Schedule 2 of the relevant EIA Regulations; however, due to the Proposed Development being over 0.5 hectares (ha) in area and the nature of the development, it could be considered as development of a nature which could fall within Schedule 2 of the Regulations. The project has therefore been screened to

determine whether there is likely to be significant environmental effects and the need for an EIA.

1.3.3 Overall, considering the characteristics, location and type/characteristics of the potential impacts of the Proposed Development after mitigation, it is considered that the Proposed Development should not be considered to be EIA development in accordance with the EIA Regulations and does not require an ES to be prepared.

1.3.4 The EIA screening opinion request should assist CCC in reaching a decision on whether the planning application should be accompanied by an EIA. We would be grateful if CCC could provide a formal screening opinion within three weeks of the date of receiving the request in accordance with Regulation 5 (5) and (6) of the EIA Regulations.

1.4 Consenting Regime

1.4.1 NGET will submit a planning application under the Town and Country Planning Act (1990) to Carmarthenshire County Council for the development of the proposed substation. Planning permission will not be sought from the Council for the overhead line works required to connect the proposed substation to the existing 400kV overhead line as a different consenting route applies for such works.

1.4.2 Section 37 of the Electricity Act 1989 establishes the statutory consenting process to install, and keep installed, overhead electric lines. Depending on the final design of the overhead line modification works, they will either require Section 37 consent from the Secretary of State or confirmation that they are exempt from the need for Section 37 consent. In the event that a Section 37 exemption is being sought then an updated request for a screening opinion is also likely to need to be sought from Carmarthenshire County Council, prior to confirmation being sought from the Secretary of State.

1.4.3 Whilst the proposed substation and the overhead line works fall under different consenting regimes, they are interrelated. All elements are therefore considered in this Pre-application Report to ensure that robust consideration is given to the potential for the proposal as a whole to result in likely significant environmental effects.

1.5 Engagement and Consultation

1.5.1 NGET believes that early and meaningful community engagement in planning can improve the quality and relevance of new developments; give people a voice and build their confidence to influence decisions affecting their local area; and build understanding between developers, planning authorities and communities.

1.5.2 In the summer of 2023, in relation to the Proposed Development, NGET started its pre-application engagement with political stakeholders receiving an initial introduction letter on 8th August 2023 and an end-of-year follow up letter on 12 December 2023. In January 2024, key stakeholders (Llandyfaelog Community Council, Cllr Tyssul Evans, CCC, Cllr Meinir James, CCC and Cllr Ann Davies, CCC) were contacted by NGET to ask for their feedback on the proposed mail-out-zone of near neighbours for the Proposed Development's public launch in February 2024.

1.5.3 NGET has, to date, undertaken meetings with the following politicians and organisations:

- 12/07/2023 – Introductory meeting with CCC
- 01/08/2023 – Briefing with CCC
- 29/08/2023 – Briefing with Llandyfaelog Community Council

- 02/10/2023 – Briefing with Cefin Campbell, MS
- 18/10/2023 – Briefing with Cllr Ann Davies, CCC
- 15/11/2023 – Briefing with Adam Price, MS

1.5.4 NGET is planning a pre-application community consultation (PACC) on the Proposed Development in summer 2024. It will follow the best practice guidance of CCC and the Welsh Government on PACCS.

2 The Site and Surrounding Area

2.1 Site Description

2.1.1 The Site, centred on E:241868 N:213542, lies c.6km south of Carmarthen. The site is made up of 12 agricultural fields and shares a borders a further 15. The Site is accessible from a narrow country road roughly 600 meters long that branches off the A484.

2.1.2 In its current iteration, the Site is formed of two parcels, one measuring 13.6ha (for the substation) and the second measuring 0.24ha (for the tower connection to the overhead line).

2.1.3 The elevation profile of the Site is fairly flat with slight changes in elevation occurring the further south you travel. To the east of the Site there is an existing wooded area providing screening to the Site.

2.1.4 The Site is screened by a range of natural landscaping including trees and large hedges. There are two existing National Grid Over Head Lines (OHL) that run parallel to one another. The furthest west of these OHL runs directly through the red line boundary of the proposal Site.

2.1.5 There are 6no isolated residential properties in close proximity to the Site, 2no properties face the Site, which are located 150m east and 360m south of the Site.

2.1.6 Wales Coastal Path (and NCN Route 4) is located approximately 1.4km to the west however views from this receptor are limited.

2.1.7 Small parts of the Site are crossed by a drainage ditch and associated areas are identified at risk of flooding from surface water and small watercourses. Edges of the southern part of the site are also identified at risk of flooding and will require appropriate mitigation to demonstrate no increase of flood risk elsewhere. The entirety of the Site is however free from flood constraint areas.

2.1.8 Whilst there is BMV Agricultural Land (Grade 3a) and Ancient Woodland to the west of the Site they will not be directly impacted by the Proposed Development.

2.1.9 A Scheduled Monument (Castell y Domen, Gwempa) comprising the remains of a motte and ditch is located approximately 1.6km southeast of the Site.

2.1.10 The Site Location Plan is shown on **Appendix A**.

2.2 Site Designations

2.2.1 The Site is subject to the following national and adopted Development Plan designations:

- DAM Zone A – Considered to be at little or no risk of fluvial or tidal/coastal flooding.
- 6.no Grade II Listed building (including 2 bridges) within 3 km of the sites redline boundary.
- 2.no Scheduled monuments within 6km of the sites redline boundary.
- Agricultural Land Classification 3b.

2.3 Siting Study

2.3.1 The Siting Study for Pre-App (September 2023) identified that the Site is the most appropriate Site for the substation. The evidence-based Draft Siting Study (**Appendix C**) assessed several potential sites and determined the preferred Site. As the Site is immediately adjacent to the existing OHL its development to accommodate a substation will minimise environmental, landscape and visual effects as well as technical issues and will reduce potential cost implications.

2.3.2 The Site is also crossed by an existing 132kV OHL. Ensuring that the NGED connection has reduced effects through the use of existing infrastructure.

2.3.3 Further detailed information is included within the Siting Study to demonstrate why the Site is the preferred option. The Siting Study also includes details of NGET's statutory duties under the Electricity Act. NGET has a statutory duty under Section 9 (2) of the Electricity Act 1989:

- "(…) to develop and maintain an efficient, coordinated and economical system of electricity transmission; and
- (…) to facilitate competition in the supply and generation of electricity."

2.3.4 The Siting Study also covers the guidance the National Grid follows when searching for sites that area suitable to accommodate substations, including the following:

- Section 38 of the Electricity Act 1989 including Schedule 9 (1) (a) and (b);
- Section 9 (2) of the Electricity Act 1989;
- Section 6(1)(b) of the Electricity Act 1989;
- Future Wales: The National Plan 2040;
- Planning Policy Wales Edition 11;
- Local Policy Context.

3 Description of the Proposed Development

3.1 Introduction

3.1.1 Substations are an integral part of the UK electrical transmission system. They are a method of controlling power flows and voltages around the transmission and distribution systems and are used to connect sources of electricity generation to those systems.

3.1.2 Substations will generally comprise elements such as transformers and switchgear. A transformer within a substation will change (or “transform”) the level of a voltage from one value to another value. Switchgear is used to provide operational safety and flexibility to the network to enable efficient power flows and ensure the network operates safely and reliably.

3.1.3 Substations can take the form of either an Air Insulated Switchgear (AIS) Substation, or a Gas Insulated Switchgear (GIS) Substation. An AIS solution is the preferred NGET option; a GIS solution is only considered should an AIS be undeliverable, for example due to site constraints.

3.2 AIS Substation Footprint

3.2.1 The approximate area of the AIS Substation compound (255m x 530m). However, the actual layout of the substation may be amended during detailed design, but it should remain within these parameters.

3.3 Indicative Site Plan

3.3.1 An Indicative Site Plan is attached at **Appendix B** which shows the equipment the substation compound is likely to include and the likely modifications to the existing OHL.

3.3.2 Short sections of new 400kV OHL and associated equipment, together with possible underground cabling, will be required to connect the new substations to the existing OHL network. Existing 132kV OHLs crossing the site will be re-routed by (SSE / NGED).

3.3.3 The Proposed Development is likely to include:

- Up to two new additional and one replacement 400kV towers circa 45 – 55m tall to connect into the existing OHL to allow the diversion of existing lines into the new substation and / or adaptations to existing towers, as well as any temporary OHL works as required;
- Control buildings;
- Substation access from public highway, main gate and pedestrian gate. Access is explained further in the ‘Access’ section below;
- An electrified security fence (typically 3.4m in height), passive infra-red security lighting and closed-circuit television security cameras would surround the equipment and create a secure compound which would be surfaced with grey stone chippings. The equipment would be lit for maintenance purposes and any lighting solution will be prepared in accordance with the current Design Standards for Exterior Lighting;
- A metalled internal access road of approximately 5.5m wide with adjacent hard standing within which the substation equipment would be sited; and
- Diesel generators for backup power supply.

3.3.4 The equipment within the substation will consist of a variety of vertical structures supporting overhead busbars with ancillary equipment. The maximum height of the equipment would be approximately 15m.

3.3.5 The substation would not be manned during operation although small welfare/office facilities will be included for maintenance workers who would visit the site periodically.

3.3.6 In addition to the substation infrastructure itself, the following is also likely to be required:

- Areas to the north, south and east of the site for landscaping and biodiversity enhancement mitigation measures; and
- Installation of new fresh water, sewage, drainage, telecommunications equipment, and low voltage power supplies to the site.

3.4 Access

3.4.1 Permanent and construction access to the substation site would be taken from the A484 which lies some 600m to the west.

3.4.2 Permanent vehicular access is required to enable regular inspection and maintenance of the substation equipment. There may also be a need in the future to replace or upgrade the substation components. No staff will be based at the substation site.

3.4.3 Construction access will need to facilitate delivery of the largest substation components to site. NGET have indicated that (subject to final substation design) seven or eight transformers with nett weights of up to 220te will need to be brought to site plus associated ancillary equipment. These components will be transported as Abnormal Indivisible Loads (AILs). The largest AIL is anticipated to be a 24-axle girder frame trailer in combination with two drive units. The total combined weight (vehicle and load) is approximately 390te. The approximate dimensions of the AIL are 77m length, 5m width and 5m height. In tandem with the AIL one or more mobile cranes will also need to attend site to perform the lift operation and place the transformer in situ at the substation.

3.4.4 It is anticipated that the transformers will arrive at Pembroke Dock via ship and the AILs will travel to site via the A4139, A477, A40 and A484 to the junction with an unnamed road in Upland Arms. This route and any identified structural challenges along its length are subject to ongoing discussions with South Wales Trunk Road Agency (SWTRA).

3.4.5 To reach the Site from the A484, Stantec are exploring access options that are subject to further investigation to identify the space envelope that is required to allow for the movement to and from the Site location for AILs.

3.4.6 The unnamed road (including the junction with the A484) could be widened and strengthened to facilitate the required vehicle movements. Alternatively, a new access route could be created utilising land to the north or south of the unnamed road or the unnamed road could be used in part and a new route created from a suitable point along its length utilising land to the north or south subject to further route alignment work. It is anticipated that the access road would need to be up to 6m wide with a suitable bell mouth junction arrangement to allow for the AIL turning movement and oversail.

3.4.7 Depending on the preferred access route it could be used be solely for construction purposes or it could be retained for operational/maintenance purposes. Route optioneering is being undertaken considering a variety of factors including land ownership, road construction consent, road safety, road buildability and cost, vehicle manoeuvring (swept path analysis), alignment, topography, ecology, drainage, heritage, air quality and noise.

3.4.8 The route alignment options will be refined considering all the variables to determine the optimum route.

3.5 Landscape Mitigation

3.5.1 The Site occupies an elevated plateau within is an area of relatively flat landform, which affords some far-reaching views across the surrounding generally open largely unspoilt agricultural landscape which has a high degree of scenic quality.

3.5.2 When considering the landscape baseline, the area is described as one of a rolling and undulating nature with medium to large scale fields bounded by well-defined and intact hedgerows (with limited trees). Woodland presence is generally limited but these features are present and contribute to the landscape visually. Settlement pattern is mainly one of many dispersed farmsteads.

3.5.3 Given the nature of the Proposed Development, a range of landscape mitigation measures will be required to integrate it into the landscape, minimise its visual intrusion and reduce harm as much as is reasonably practicable.

3.5.4 The Proposed Development would be a perceptible feature within the surrounding landscape resulting in the loss of some field bounding hedgerows and lower quality agricultural land. Whilst the presence of the existing electrical infrastructure in the locality is a detracting feature, it is considered an approach focused of positioning of screening features to the perimeter of the Proposed Development would not be appropriate because the screening vegetation would appear out of character with no direct relationship to the historic landscape pattern and the prevailing baseline features such as hedgerows and intermittent woodland blocks.

3.5.5 It is therefore considered the placement of well-considered vegetation blocks which respond to the field pattern and connect with existing woodland and vegetation groups would be a more appropriate solution. These would provide a degree of visual mitigation which would respond positively to the prevailing landscape character and support conservation and enhancement of the surrounding semi natural habitats.

3.5.6 In addition to the introduction of woodland features, the introduction of new hedgerows to the perimeter of the development would provide habitat connectivity around the development and mitigate for any loss of existing features. The introduction of hedgerow trees to existing field boundaries would also support visual screening of the proposed development.

3.5.7 A more detailed mitigation strategy for landscaping will be determined following consultation with CCC and stakeholders.

4 Policy Overview

4.1 Introduction

4.1.1 The Proposed Development has been assessed in terms of compliance with national and local plan policies. The relevant development plans are as set out below:

- Future Wales: The National Plan 2040
- Planning Policy Wales Edition 11
- Carmarthenshire Adopted Local Development Plan 2006-2021

4.2 Future Wales: The National Plan 2040

4.2.1 Future Wales: The National Plan is Wales' national development framework ('Future Wales'), setting the direction for development in Wales to 2040. It has development plan status and provides a strategy for addressing key national priorities through the planning system, including sustaining, and developing a vibrant economy, and achieving decarbonisation and climate resilience.

4.2.2 Policy 17 of Future Wales supports new strategic grid infrastructure that is designed to minimise visual impact on nearby communities. The Welsh Government has stated it will work with stakeholders including National Grid to transition into a multi-vector grid network and reduce the barriers to the implementations of new grid infrastructure.

4.3 Planning Policy Wales Edition 11

4.3.1 Planning Policy Wales ('PPW') sets out the land use planning policies of the Welsh Government and is a material consideration in the consideration of planning applications and preparation of development plans. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental, and cultural well–being of Wales, as required by the Planning (Wales) Act 2015, the Well–being of Future Generations (Wales) Act 2015 and other key legislation.

4.3.2 PPW confirms the importance of supporting adequate and efficient infrastructure, including electricity utilities, as they are crucial for economic, social, and environmental sustainability. PPW also confirms that this objective underpins economic competitiveness and opportunities for households and businesses to achieve socially and environmentally desirable ways of living and working.

4.3.3 PPW recognises the aim of decarbonising the energy and transport sectors will create challenges on the Welsh energy distribution network. PPW has identified an approach to overcoming this challenge through encouraging proposals which promote low carbon developments and are located close to areas of deployment of renewable energy.

4.3.4 As of 18th October 2023, several changes have been made to Chapter 6 of PPW, aiming to keep the momentum of fulfilling the COP15 obligations and Deep Diver aspirations. The main changes to policy are summarised under the titles; 'Green Infrastructure', 'Net Benefit for Biodiversity and the Step-wise Approach', 'Protection for Sites of Special Scientific Interest', and 'Trees and Woodlands'.

4.3.5 Paragraph 5.7.2 of PPW has outlined an expected growth in energy demand because of the growing electrification of transport and heat. To ensure future demand can be met, PPW has

highlighted that significant investment should be made into energy generation, transmission, and distribution infrastructure.

4.3.6 Paragraph 5.7.7 of PPW sets out the approach for the planning system in delivering renewable and low carbon energy, indicating it should integrate development with the provision of additional electricity grid network infrastructure and optimisation of new developments on a location basis to allow for efficient use of resources.

4.3.7 PPW stipulates in paragraph 5.7.11 that planning authorities and the energy industry (including National Grid) should engage with one another to ensure development plans take grid infrastructure issues into account. Furthermore, they should ensure investment plans for transmission and distribution align with the identified potential for renewable and low carbon energy as well as the future challenges of increasing electrification of transport and heat.

4.4 Local Policy Context

Adopted Development Plan

4.4.1 The current Local Development Plan (LDP) for Carmarthenshire County Council was adopted on 10th December 2014. The LDP sets out the spatial vision for the future of Carmarthenshire (excluding that area within the Brecon Beacons National Park) and a framework for the distribution and delivery of growth and development.

Carmarthenshire Local Development Plan 2006-2021

4.4.2 In developing the emerging proposals for the substation, the strategic, general, transport, environmental qualities and environmental protection policies that are set out in the Carmarthenshire Local Development Plan have been taken into account.

Local Development Plan Review

4.4.3 In 2018, Carmarthenshire County Council resolved to prepare a revised LDP for Carmarthenshire. The timetable for the preparation of the Revised LDP is set out within the Delivery Agreement (DA) which was agreed by the Welsh Government. Once adopted the Revised LDP will be used as the basis for determining planning applications.

4.4.4 However, the production of the Revised LDP has been delayed due to the publication of new targets by Natural Resources Wales (NRW) which seek to reduce river phosphate levels in Special Areas of Conservation (SAC) across Wales. In response to these new targets and the challenges they present the Council have been working to re-assess the implications of the new targets for the LDP and the development allocations within phosphate sensitive catchments. In addition to NRW's new targets, several other matters have arisen since their publication which will affect the LDP and need further consideration.

4.4.5 It was therefore agreed at a meeting of the Full Council in 2022 to allow amendments to the Revised Delivery Agreement timetable to prepare a second Deposit Revised LDP. This is to allow time to evaluate the implications and for essential evidence and data to be gathered and mitigation options to be developed to address the phosphate issue, amongst other considerations.

4.4.6 Until the Revised LDP is adopted, the 2006-2021 LDP will remain in place for all planning decisions, in line with advice issued by the Welsh Government.

5 Technical Assessment

5.1 Introduction

5.1.1 This section sets out the technical work that has been undertaken to date in order to inform the current proposals for the new substation. A number of the technical reports are appended.

5.2 Landscape

5.2.1 The Site is not located within a designated landscape; however, the Tywi Valley Special Landscape Area (SLA) is located approximately 1.8km to the west.

5.2.2 At the national scale, the Site is located within the National Landscape Character Area (NLCA) 33: Gwendraeth Vales which is described as an area of rolling hills, ridges and minor valleys, the area between the coastal and valley parts of the Tywi, the South Wales valleys and the black mountain part of the Brecon Beacons. No local landscape character studies cover the Site.

5.2.3 The character of the Site is described as agricultural, comprising medium sized fields of an irregular pattern which are bounded by hedgerows of varying heights and densities. The Site is elevated when in context of the wider landscape, occupying an elevated plateau which is an area of relatively flat landform.

5.2.4 The Site's elevated position affords some far-reaching views with views across a generally open largely unspoilt agricultural landscape which has a high degree of scenic quality. The site is however considered to be well contained visually due to hedgerows along existing field boundaries and local highways.

5.2.5 The site is located immediately adjacent to the existing OHL which is a dominating existing visual feature in the landscape.

5.2.6 The landscape character of the wider area is described as being of a rolling and undulating nature with medium to large scale fields bounded by well-defined and intact hedgerows (with limited trees). Woodland presence is generally limited but these features are occasionally present and contribute to the scenic quality of the landscape. Settlement pattern is mainly one of many dispersed farmsteads.

5.2.7 The Site is located within the following LANDMAP aspect layers:

- **Visual and Sensory**: Areas (CRMRTVS960) Middleton Hills with an overall evaluation of Moderate, & (CRMRTVS936) LLansaint Coastal Hills with an overall evaluation of High;
- **Landscape Habitats**: Area (CRMRTLH042) Llansaint North with an overall evaluation of High;
- **Historic Landscape**: Area (CRMRTHL39492) Llandyfaelog, Llangyndeyrn with an overall evaluation of Outstanding;
- **Cultural Landscape Services**: Areas (CRMRTCLS235) Middleton Hills with an evaluation of over 75% High or Outstanding, & (CRMRTCLS231) LLansaint Coastal Hills with an evaluation of over 75% High or Outstanding;
- **Geological Landscape**: Area (CRMRTGL201) Llansaint North with an overall evaluation of Moderate;

5.2.8 Visual receptors include users of the local roads adjacent and users of the PRoW to the east. Residential receptors include nearby farmsteads and isolated properties.

5.2.9 There is a PRoW located approximately 300m to the east with open views towards the Site and isolated residential receptors in proximity of the Site, the closest being circa 150m to the east.

5.2.10 The Site benefits from a high degree of visual containment in most directions as a result of vegetation and landform, with views limited predominantly to local and medium distance receptors including residences and footpaths, and occasional glimpses from roads.

5.2.11 The Wales Coastal Path (and NCN Route 4) are located approximately 1.4km to the west, however views from this receptor are limited. Views from the Coastal Path are focused toward the Tywi Estuary to the west.

5.2.12 As a result of the Proposed Development, a range of effects on the landscape resource and visual receptors and visual amenity are expected, these ranging from reversible short term to permanent long term effects. These are however not expected to be significant given the context of the existing baseline including existing infrastructure in the surrounding landscape. As part of the planning application a robust Landscape and Visual Appraisal (LVA) will be undertaken. This will ensure landscape and visual matters are appropriately considered. The approach and methodology will be based on the Guidelines for Landscape and Visual Assessment, Third Edition (GLVIA3) (Landscape Institute and Institute of Environmental Management & Assessment) combined with professional experience for similar types of development.

5.2.13 A Design and Access Statement will also be submitted with the application to demonstrate how the Proposed Development has been designed to respond to its surrounding context. The Design and Access Statement and the LVA will identify how the design and layout of the Proposed Development responds to its context and clearly sets out the mitigation approaches to height, scale and design quality.

5.2.14 The proposed development is in accordance with policy EQ1 AND GP1 of the local plan, that considers landscaping and protecting the visual amenities of the landscape. The submitted landscaping scheme will illustrate due regard that ensures a minimal visual impact is inflicted on the surrounding area through a range of soft landscaping.

5.2.15 Attached at appendix G is a plan showing the proposed locations of the viewpoints to include within the LVA. Stantec would welcome the LPA's opinion on these proposed locations.

5.3 Transport and Access

Highway Network

5.3.1 The Site is bordered to the west by the A484, which runs from Swansea to Cardigan, via Llanelli and Carmarthen. Despite the length of the A484, and the relative importance of some of the settlements along its route, the A484 is of non-primary status throughout.

5.3.2 The A484 connects to the A40 and A48 at Pensarn Roundabout. Speed limits along the section of the A484 in relatively close proximity to the Site vary between 40mph and 50mph, with a section of 30mph when entering the built-up area of Cwmffrwd to the north of the Site. The A48 is part of the trunk road network and runs from Carmarthen, Wales to Highnam, Gloucester. The A40 runs between London and Goodwick, Wales and connects to the M40 and M5.

5.3.3 The Site is accessible from a narrow unnamed single lane road roughly 650m long that connects to the A484 via a priority junction in Upland Arms. This unnamed road is currently an

access road from the A484 to Bwlch Y Gwynt Farm, Fforest Isaf Farm and Bancycapel village. The road is subject to the national speed limit, lowering to 50mph when approaching Bancycapel village. The road is closely boarded by hedgerows, approx. 1m – 2m tall.

5.3.4 Other roads surrounding the Site mainly consist of rural and agricultural roads with intermittent road markings. Many of these roads are boarded by hedgerows and fencing onto agricultural land.

5.3.5 As there will be no permanent workers associated with the site upon its completion, the impact on traffic will be minimal. In accordance with Policy TR1 of the LDP, the substation will not restrict traffic movements or safety for vehicle users around the Site.

5.4 Ecology

5.4.1 This section summarises pertinent results from the Preliminary Ecological Appraisal Technical Note carried out by Stantec in relation to the proposed development (**Appendix D**).

Designated Sites

5.4.2 There are two internationally designated areas within a 5km radius:

- River Tywi / Afon Tywi Special Area of Conservation (SAC) – 4.6km north from Site
- Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC – 2.0km west from Site

5.4.3 There are four nationally designated areas within a 5km radius:

- Afon Tywi Site of Special Scientific Interest (SSSI) – 2.0km northwest from Site
- Coed Gwempa SSSI – 2.1km southeast from Site
- Coedydd Capel Dyddgen SSSI – 4.7km East from Site
- Glan Pibwr Stream Section SSSI - 4.5km northeast from Site

5.4.4 There are no non-statutory designated areas within 5km of the Site.

Habitats

5.4.5 The Site is comprised primarily of neutral grassland fields separated by native hedgerows. Semi-natural broadleaved woodland is located just outside the Site boundary.

5.4.6 Semi-natural broadleaved woodland and native hedgerows are priority habitats. It is recommended that a CEMP be prepared and implemented during any construction activities to prevent adverse impacts on notable habitats present on Site and immediately adjacent. This CEMP will include best practice measures to control noise, dust, and pollution.

5.4.7 The desk study revealed Eurasian Otter (*Lutra lutra*) recorded most recently in March of 2021, Eurasian Badger (*Meles meles*) recorded most recently in March of 2022, Hazel dormouse (*Muscardinus avellanarius*) recorded most recently in March of 2022, Polecat (*Mustela putorius*) recorded most recently in June of 2022, and several species of bat and birds recorded within 5km of the Site within the last 10 years. However, these sightings have not been reviewed and are therefore unconfirmed. During the field survey habitat was confirmed as having little potential to support these species beyond commuting and foraging.

5.4.8 The hedgerow has low potential to support badger setts and no evidence of badger presence was observed during the survey except for a single mammal path which did not have sufficient features to be attributable to any single UK mammal species. The hedgerow does provide valuable foraging habitat for badgers. Open fields are favourable for use by commuting and foraging badgers therefore a pre-works badger check must be conducted prior to works commencing.

5.4.9 The hedgerows on Site and nearby woodland have low to moderate suitability to support reptiles.

5.4.10 Mature trees on and around the Site have been noted as having potential to support bats. Specifically, two mature oak trees were noted with high potential for roosting bats.

5.4.11 Hedgerows on Site and nearby woodland has moderate to high potential to support nesting birds.

5.4.12 Grassland on Site has high potential to support ground nesting birds, and evidence of Eurasian skylark (*Alauda arvensis*) breeding behaviour in the form of song was observed on Site.

5.4.13 Hedgerows on Site may have low potential to support commuting Hazel dormice.

5.4.14 It is recommended that hedgerows are retained wherever possible.

5.4.15 There are 62 species of fungi in England and Wales with some level of protection, one of which is solely protected by Welsh law namely, *Clavaria zollingeri*. None of the habitats observed on site during the Preliminary Ecological Appraisal were deemed likely to support rare or protected fungal species. In addition, no evidence of any rare or protected fungal species was observed during the appraisal.

5.4.16 No protected bird species were observed while on Site, except for common bird assemblages and Eurasian skylark (*Alauda arvensis*).

Summary

5.4.17 The Site is sufficiently distant from any designated sites (national and international) so no impacts are anticipated from the works. Protected habitats on Site consist of hedgerows with some semi-natural broadleaved woodland adjacent or nearby. A suitable CEMP will be required to ensure that habitats are protected from impact. In addition, if any hedgerows on site are classed as ‘important’ under The Hedgerows Regulations 1997, then the local planning authority most be consulted before removal. No hedgerows on site are classed as ‘important’ for ecological reasons (they may still be important for historical reasons). The Site has low to moderate potential for UK mammals, badger and dormouse in particular, with further potential in the surrounding areas. A pre-works check for mammal signs will be required and an ecologist should be present to supervise the removal of any hedgerows, A pre-works check will be required for works in nesting season (March to August) for ground nesting birds (Eurasian skylark and other wild birds and their nesting places are protected under The Wildlife and Countryside Act 1981). The proposal is therefore in accordance with the requirements of policy EQ4 of the Local development Plan.

5.5 Flood Risk and Drainage

5.5.1 This section summarises pertinent results from the Outline Flood Consequences Assessment (FCA) (**Appendix E**) carried out by Stantec in relation to the Proposed Development.

5.5.2 According to the Flood Risk from Rivers Map provided by Natural Resources Wales (NRW), the Site is located entirely within DAM Zone A, meaning that there is little or no risk of fluvial or

tidal/coastal flooding. Under TAN15, this means that a justification test is not applicable for this development, and the full FCA will only be required to demonstrate that there is no increase in flooding elsewhere.

5.5.3 The Site is located at the top of the catchment. Any groundwater present beneath the Site is likely to be deep and the effect of flooding from groundwater would be insignificant in comparison to the effect of surface water at the Site. The risk of flooding from groundwater is, therefore, not considered further.

5.5.4 The Proposed Development is currently greenfield, so no sewers are, or will be present at the Site. The risk of flooding from sewers is, therefore, not considered further.

5.5.5 Under the TAN15 guidance, utilities infrastructure is usually classed as “Less Vulnerable” development. However, as the Proposed Development is for a NGET substation, it is prudent to consider the development as “Especially vulnerable industrial development (e.g., power stations, chemical plants, incinerators)” which falls within the “Highly Vulnerable” category. Highly Vulnerable Development is appropriate for DAM Zone A, subject an assessment of the acceptability of flood consequences.

5.6 Flood Risk Considerations

5.6.1 The Site is shown to have some risk of flooding from surface water and small watercourses. Surface water ponding is particularly dangerous at electrical substations due to the high voltage equipment involved. To mitigate the impacts of surface water ponding, all equipment will be constructed on concrete slabs that are surrounded by extensive areas of stone chippings. A Site Suds Strategy will be developed that will demonstrate that surface water will be sustainably managed, and that ponding will not occur.

5.6.2 The Proposed Development is not located in an area at risk of flooding from rivers, so there is no anticipated net loss of floodplain storage.

5.6.3 The Proposed Development is not located in an area at risk of flooding from rivers, so there is no anticipated impediment to flood water flows.

5.6.4 Despite the risk of flooding being identified as ‘minimal’, the proposed substation will put in place the appropriate measure to ensure it is resilient to flooding.

5.6.5 In summary, while there is a low risk of flooding from Rivers at the site, the site will be designed to accommodate existing surface water flow pathways at the site and will utilise SuDS measures to ensure there is no increase in downstream flood risk. A full FCA and drainage strategy will be prepared for the Proposed Development, which will include details of the drainage strategy, which will demonstrate the site design’s compliance with TAN15 guidance on flood risk. The flood resilient design of the proposal will therefore ensure compliance with policy SP2 of the Local development Plan.

5.7 Heritage and Archaeology

5.7.1 This section summarises the key information provided in the Archaeology and Heritage Level 1 Survey that is appended to this report (**Appendix F**). Initial heritage consultation with Dyfed Archaeological Trust has established the need for a study area of 3km to consider potential impacts on designated historic assets, and a 1km study area for potential impacts on non-designated historic assets.

5.7.2 Stantec would also value confirmation of any assets that the Council’s Conservation Officer feels should be included in the assessment that will accompany the planning application.

Designated Historic Assets

5.7.3 There are no designated heritage assets within the Site. There are eight designated historic assets within a 3km study area of the Site, including the following six listed buildings (including two bridges), all of which are listed at Grade II:

- Glanrhydw (Georgian rubble stone house) located c.1.3km east of the Site (26769);
- Pont Anwyn (rubble stone bridge) located *c.*2km east of the Site (82287)
- Church of St Maelog located c.1.3km south of the Site (26768);
- Pont Rhydyronnen (rubble stone bridge), located *c.*1.8km south of the Site (82400)
- Upland (Georgian, three storey house) and Former Stables at Upland, located c.1.4km west of the Site (21456 and 21457)

5.7.4 There are two scheduled ancient monuments within the 3km study area comprising:

- Castell y Domen, Gwempa, the remains of a motte and ditch of medieval date, located c.1.7km south-east of the Site (CM240); and
- Pen Celli Standing Stone, the remains of a standing stone of probable Bronze Age date and assumed to be of funerary and / or ritual function, located c.1.7km east of the Site (CM122)

5.7.5 The nearest Registered Park and Garden is the Grade II Llechdwnni, located just over 3km south of the Site (PGW(Dy)21(CAM)) associated with the Grade II listed Old House at Llechdwnni (14553). The most proximate conservation areas to the Site comprise Llansteffan c.7km to the west and Carmarthen Town Conservation Area c.6km to the north.

Registered Landscapes

5.7.6 The Site does not fall within a registered landscape. Registered Historic Landscapes, a non-statutory advisory register compiled by Cadw, are defined as landscapes of outstanding or special historic interest. Tywi Valley Registered Landscape passes through the north-western extent of the 1km Study Area of the Site.

Previous Archaeological Events and Non-designated Historic Assets

5.7.7 Data was requested from Dyfed Archaeological Trust in Dec 2022 to inform the Level 1 Survey. This is discussed briefly below with associated reference numbers.

5.7.8 There are two previous archaeological events recorded within the Site, both relating to Pontyates to Bancyfelin Gas Pipeline and comprising a Desk-Based Assessment (40762) and an Archaeological Assessment which included fieldwalking but no intrusive works (42706) and both undertaken by Cambria Archaeology in 2000. No previous intrusive archaeological investigations are recorded.

5.7.9 Only one record for a non-designated historic asset falls within the Site, comprising an undated field boundary (40851). A further undated field boundary is recorded c.50m south of the Site (40849). An undated field boundary is highly unlikely to preclude or constrain the development of the Site.

5.7.10 A record for a possible standing stone of prehistoric date is recorded immediately west of the Site (11288). The record notes that the Site is based on place name evidence (Cae Maen / Stone Field), but that no standing remains were observed during the Site visit and the field

known as Cae Maen is *c.*480m north-east of the Site and recorded here again by Dyfed (11287). It would appear therefore that the stone recorded to the west of the Site (11288) is a duplicate record.

5.7.11 A Romano-British road is depicted on a broadly north-south alignment in the north-east of the 1km study area for non-designated heritage assets, terminating c.120m north-east of the Site, though the reason for the termination at this location is unclear and would thus likely relate to a lack of visible evidence for its continuation rather than an actual termination. Given the projection of a Romano-British road through the Site, there is some potential for Romano-British remains within the Site itself either consisting of or relating to it.

5.7.12 Most of the records within the 1km study area are of post-medieval date and relate to features common of this period and indicate a sparsely occupied landscape dotted with cottages and homesteads with associated chapels and public houses, resources such as wells and orchards and indicators of local industry such as quarries, kilns and blacksmiths. The local economy is likely to have been predominantly agrarian, as evidenced by the Dyfed records for farmsteads, post-medieval field boundaries and records for associated features such as pounds. The Site likely formed part of the agricultural land of proximate and known settlement including Carmarthen, for which limited archaeological remains would be anticipated such as infilled boundary ditches and plough furrows.

Summary

5.7.13 In summary, the Site does not contain any designated heritage assets which would preclude or constrain its development. The Site does have some potential for archaeological remains, namely associated with the projected Romano-British road recorded within its vicinity. However, the presence or absence of such remains is uncertain based on current information. Regarding the setting of heritage assets, limited material change is anticipated in relation to designated historic assets. However, the proposed development will likely result in a material change to setting of proximate non-designated historic farmsteads and thus result in an impact on their significance. The proposed development is therefore complaint with the requirements of policies GP1, EQ1 and SP13.

5.8 Air Quality

5.8.1 Carmarthenshire County Council (CCC) has investigated air quality within its administrative boundary as part of its responsibilities under the Local Air Quality Management (LAQM) regime. Three Air Quality Management Areas (AQMAs) have been declared due to exceedances of the annual mean nitrogen dioxide (NO_2) objective. The Site is located approximately 6 km from the nearest AQMA, which encompasses an area within the centre of Carmarthen.

5.8.2 Estimated background concentrations for the Site have been obtained from the latest 2018-based national maps provided by DEFRA. The background concentrations are all well below the relevant NAQOs.

Year	Location	Annual Mean (µg/m3)		
		NO_2	PM_{10}	$PM_{2.5}$
2023	241_213	3.4	10.2	6.2
NAQOs		**40**	**40**	**20**

Table 5-1: Site Background Concentrations

5.8.3 During construction, dust from on-Site activities and off-Site trackout by construction vehicles has the potential to impact on sensitive human receptors within the study area; the main potential impacts are loss of amenity (because of dust soiling) and deterioration of human health (because of concentrations of PM_{10}) and harm to sensitive ecological receptors.

5.8.4 There is also the potential for impacts on air quality because of emissions of NO_2, PM_{10} and $PM_{2.5}$ from construction traffic associated with the Proposed Development. These impacts have the potential to occur at sensitive existing receptors (e.g., residences) that are close to roads along which the construction traffic will travel.

5.8.5 During operation, the Proposed Development is not anticipated to generate additional traffic movements sufficient to result in significant air quality impacts to local receptors. There would be no routine air emissions from the development.

5.8.6 Air quality concentrations within the vicinity of the Site are considered to be good, with no exceedances of the NAQOs. A construction dust assessment will be undertaken to ensure appropriate mitigation measures are recommended for the construction phase. Where details are available on additional temporary construction traffic, they will be assessed where there are locations exceeding the traffic change screening criteria in EPUK/IAQM Planning Guidance. With the implementation of appropriate mitigation measures the Proposed Development is considered to be in accordance with policy EP2 of the local plan and the relevant national policies.

5.9 Noise

5.9.1 Potential noise impacts could occur during the construction and operational stages of the development.

5.9.2 Plant noise from on-site construction activities could impact on nearby receptors. Operational noise from the development could also impact on receptors.

5.9.3 An environmental sound survey will be undertaken to determine the baseline sound level at nearby receptors. Assessments will be undertaken of the construction and operational phases to ensure appropriate mitigation measures are recommended to minimise impacts on nearby noise sensitive receptors.

5.9.4 To accord with policy, the appropriate mitigation measures will be taken to address the requirements of policy EP2 of the local plan.

5.10 Geology

5.10.1 The Site and the surrounding land predominantly comprise agricultural fields and small farms, and as such the Site is considered to have a very low potential for significant contamination. The Tier 1 Preliminary Risk Assessment using the Stantec methodology concludes that the worst-case estimated risk in relation to potential contaminant linkages is classified as ‘Very Low’.

5.10.2 The published geology indicates the Site is underlain by the Milford Haven Group across the majority of the Site with the Senni Formation Sandstone outcropping at the south of the Site. An absence of superficial deposits is indicated across the majority of the Site, however a small outcrop of the Devensian Till is indicated to be present on the far western edge of the Site.

5.10.3 The geotechnical constraints to the development of the Site associated with the ground conditions, potential geological hazards and the historical and present land uses is generally considered to be’ Low’ to ‘Very Low’.

5.10.4 A ground investigation will be required in due course to determine the extent and nature of strata present, confirm the ground conditions and provide geotechnical parameters for design and it is considered that this can be secured by a relevant planning condition.

6 Next Steps

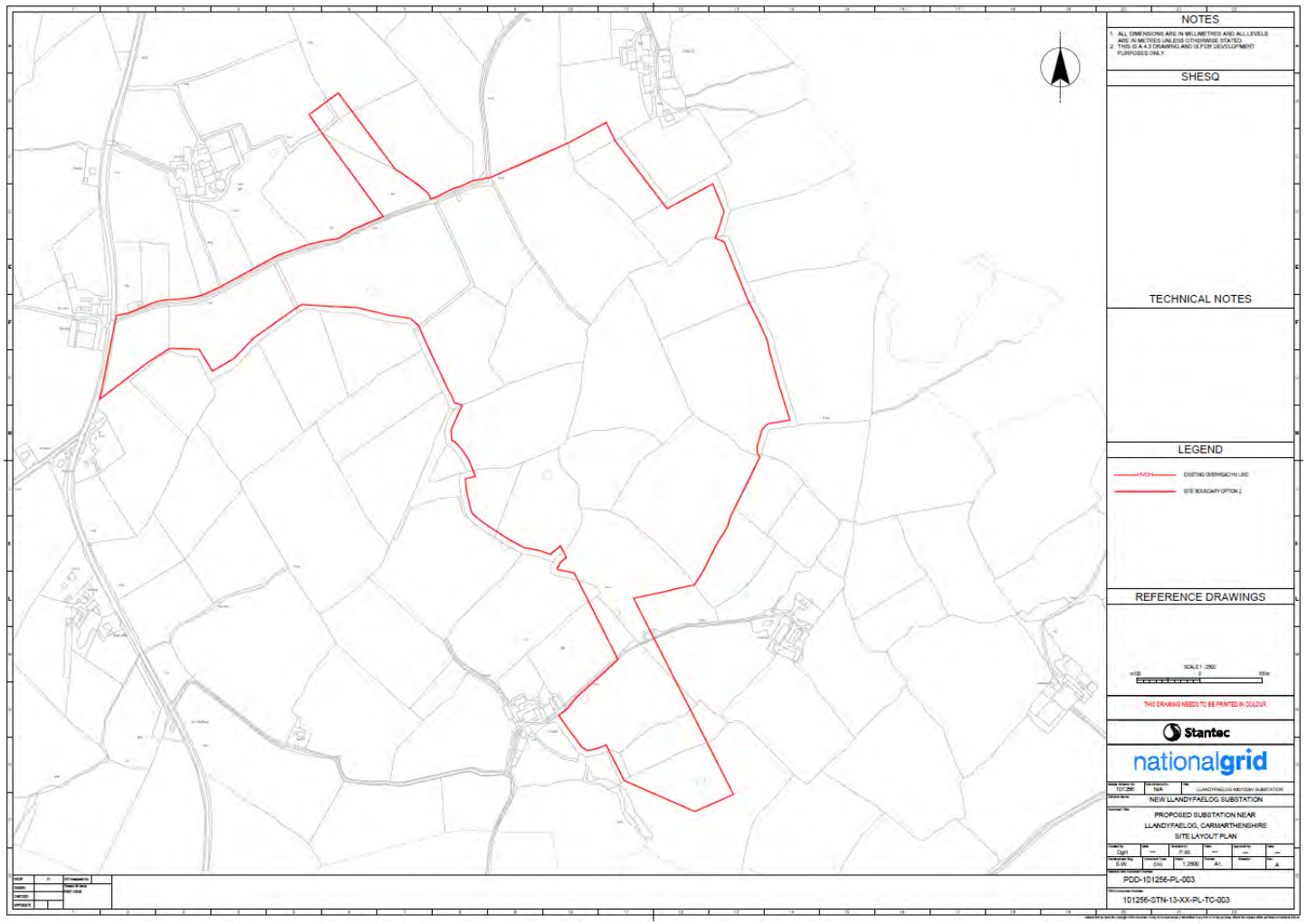
6.1.1 This Pre-Application Report sets out proposals for a new NGET substation to meet identified demand in the locality. We anticipate receipt of a Pre-Application Response from Carmarthenshire County Council which will inform the preparation of the full planning application to support the Proposed Development.

6.1.2 We seek confirmation from the County Council that the information set out below will be required to support a full planning application. As part of the Pre-Application Response, we anticipate that the County Council will advise if any additional information other than this will be required. This will ensure that the application submitted in due course will be validated and will provide all the information required in order for the County Council to make an efficient determination.

- Application form including ownership certificates and Agricultural land classifications
- Application Fee
- Site Location Plan (1:1250 or 1:2500)
- Existing and Proposed Layout Plans (1:200 or 1:500)
- Proposed Floor Plans (1:50 or 1:100)
- Proposed Elevations (1:50 or 1:100)
- Site Sections
- Proposed Access Plan / Highways Layouts / Sections / Tracking Plans
- Planning Statement
- Design and Access Statement
- Ecological Impact Assessment (EcIA)
- Preliminary Ecological Appraisal (PEA) / Desktop Study including the study of Trees
- Biodiversity Net Gain (BNG) Assessment
- Flood Consequences Assessment
- Drainage Strategy
- Noise Impact Assessment
- Air Quality Assessment
- Landscape & Visual Appraisal (LVA)
- Heritage Environmental Desk-Based Assessment (HEDBA)
- Phase 1 Ground Condition Assessment
- Transport Statement

- Outline Construction Traffic Management Plan (CTMP)
- Outline Construction Environmental Management Plan (CEMP)
- Pre-application Consultation (PAC) Report

Appendix A Site Location Plan



Appendix B Indicative Site Plan

INDICATIVE AREA FOR NGET SUBSTATION.

INDICATIVE AREA FOR CONSTRUCTION ACCESS, SUBSTATION ACCESS AND FUTURE SCREENING.

INDICATIVE AREA FOR OHL CONSTRUCTION ENABLING WORKS.

INDICATIVE AREA FOR NGED SUBSTATION.

INDICATIVE AREA FOR CONSTRUCTION COMPOUNDS, ACCESS AND FUTURE SCREENING.

INDICATIVE AREA FOR GREEN GEN CYMRU SUBSTATION.

INDICATIVE AREA FOR CONSTRUCTION COMPOUNDS, CONSTRUCTION ACCESS AND FUTURE MAINTENANCE ACCESS.

INDICATIVE AREA FOR CONSTRUCTION STORAGE, CONSTRUCTION ACCESS, FUTURE SCREENING AND ECOLOGY NET GAIN.

INDICATIVE AREA FOR TEMPORARY OHL TOWERS, NEW OHL TOWERS, CONSTRUCTION ACCESS AND SUDS DRAINAGE.

INDICATIVE AREA FOR OHL CONSTRUCTION ENABLING WORKS.

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES UNLESS OTHERWISE STATED.
2. THIS IS A 4.3 DRAWING AND IS FOR DEVELOPMENT PURPOSES ONLY.

SHESQ

TECHNICAL NOTES

LEGEND

HVOH — EXISTING OVERHEAD HV LINE

SITE BOUNDARY OPTION 1

REFERENCE DRAWINGS

SCALE 1 : 2500

m100 0 100m

THIS DRAWING NEEDS TO BE PRINTED IN COLOUR

Stantec

nationalgrid

Master Scheme No:	Sub-Scheme No:	Site:
101256	N/A	LLANDYFAELOG 400/132 KV SUBSTATION

Scheme Name: NEW LLANDYFAELOG SUBSTATION

Document Title:

PROPOSED SUBSTATION NEAR LLANDYFAELOG, CARMARTHENSHIRE INDICATIVE LAYOUT PLAN

Created by:	Date:	Checked by:	Date:	Approved by:	Date:
DgH	---	P.W.	---	---	---

Development Eng:	Document Type:	Scale	Format:	Sheet(s):	Rev:
S.W.	(DG)	1:2500	A1.		B

National Grid Document Number:

PDD-101256-PL-002

FEED Document Number:

331201448-STN-13-XX-PL-TC-002

ISSUE	-	NG Investment No.	
DRAWN		Reason for Issue	-
CHECKED			
APPD/DATE			

Appendix C Siting Study for Pre-app

South Wales Substation

Siting Study

September 2023

DRAFT for pre-application advice

On behalf of **National Grid**

Project Ref: 331201082 | Date: September 2023

Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire, HP11 1JU
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Document Control Sheet

Project Name: **South Wales Substation**

Project Ref: **331201429**

Report Title: **400 kV Substation Siting Study**

Version: **DRAFT**

Date: **September 2023**

	Name	Position	Signature	Date
Prepared by:	Josie Edwards	Assistant Environmental Consultant	JE	06.09.23
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Approved by:	Natalie Maletras	Director	NJM	08.09.2023
For and on behalf of Stantec UK Limited				

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Appendices

1 Introduction

1.1 This Report

1.1.1 Stantec UK Limited ('Stantec') has been appointed by National Grid Electricity Transmission ('National Grid') to undertake a Siting Study identifying potential options for the location of a new National Grid 400kV plus 132kV substation in between Pont Abraham to the west of the M4 and Carmarthen.

1.1.2 This Siting Study identifies potentially suitable sites for the development of the new substation, using constraints mapping, which are then assessed in relation to environmental and socio-economic constraints as well as technical considerations.

1.1.3 This Siting Study has been produced to inform the siting decision for the substation and relies on publicly available information, data and records supplemented by site-based surveys viewed from publicly accessible locations.

1.2 Background

1.2.1 National Grid owns and operates the high voltage electricity transmission system in England and Wales and is also responsible for the operation of parts of the transmission system in Scotland. The system operates mainly at 400kV and 275kV connecting the electricity generators to substations where the high voltages are transformed to lower voltages, enabling the power to be distributed to homes and businesses by Distribution Network Operators ('DNO') who operate at a maximum of 132kV.

1.3 Need

1.3.1 National Grid is reviewing infrastructure options to meet an increase in electrical demand resulting from multiple customer connections required to come into the national electricity transmission network.

1.3.2 A new substation is required in the study area to accommodate both generation and demand connections due to there being limited capacity at existing substations in South Wales.

1.4 Siting Study Area

1.4.1 The Siting Study Area is located mainly within the local administrative boundary of Carmarthenshire County Council, whilst proportionally smaller parts of the study area fall within the administrative boundary of the City and County of Swansea.

1.4.2 The Siting Study Area consists of an area of 2km from the existing 4YV 400kV overhead line ('OHL') between towers 4YV139 south of Llangynog and 4YV226 to the west of Llanedi. A 10% buffer zone has been applied to account for any potential sites that may fall on the border of the Siting Study Area.

1.4.3 The Siting Study Area is presented below in **Figure 1.1**.

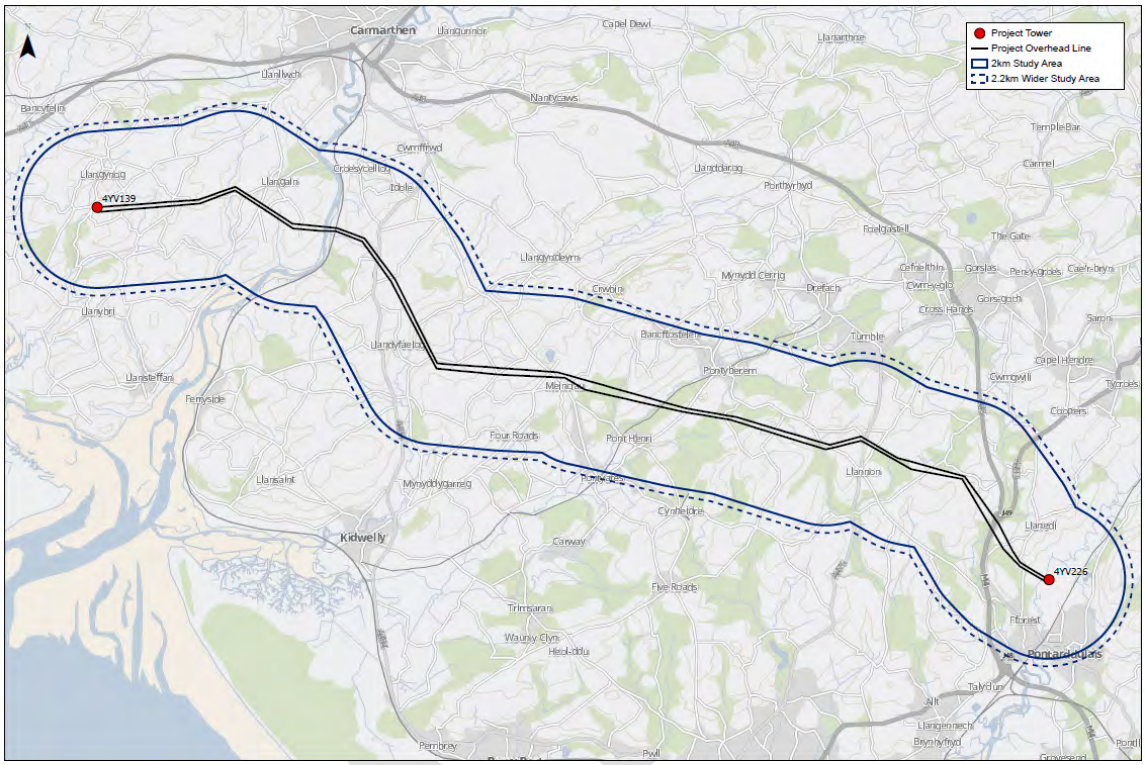

Figure 1.1: South Wales Substation Siting Study Area

1.4.4 Proximity to the OHL is a key consideration and determines the 2km Siting Study Area in order to minimise the length of additional infrastructure required, including new towers and OHL to connect back into the existing OHL.

1.4.5 This Siting Study has been prepared independently of any information of the potential customers infrastructure and connection requirements.

1.4.6 A planning history search of the Siting Study Area has been undertaken (based on the records available on Carmarthenshire Council's website). There are no extant planning permissions that would have a bearing upon the siting of the proposed substation.

1.5 Report Structure

1.5.1 The Siting Study undertakes a comprehensive assessment of sites within the Siting Study Area, identifying potential sites and going on to assess these against defined criteria to a shortlist of sites. The shortlisted sites are then assessed in detail to identify the optimum site.

1.5.2 As part of the assessment, a desktop mapping exercise was undertaken by Stantec to identify environmental and socio-economic constraints pertaining to the Siting Study Area via digitised layers included in an online GIS database.

1.5.3 The report focuses on environmental effects, including landscape and visual, ecology, cultural heritage, transport, planning and socio-economic impacts, which have been considered based mainly on information collected through desk studies. A high-level appraisal in terms of potential technical issues has been included by Stantec engineers supporting the Front End Engineering for the project.

1.5.4 The stages of the report are as below in **Figure 1.2.**

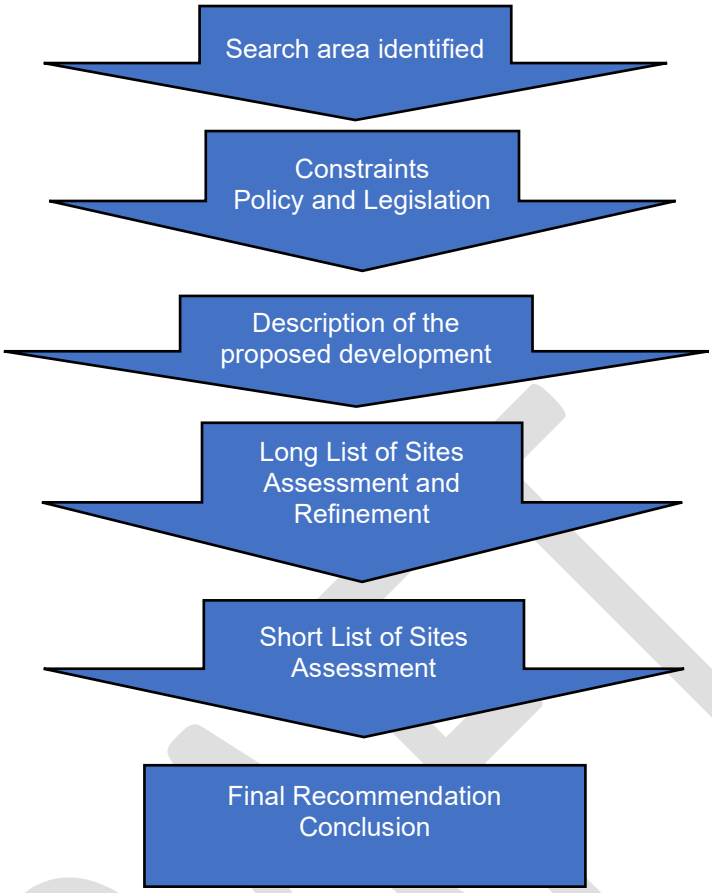

Figure 1.2 – Report Stages

1.6 Siting Study Limitations

1.6.1 At this stage of the project, specific design details and the layout of the key project components have yet to be defined. Whilst preliminary design parameters give a good indication of likely effects, these cannot be determined in detail until the proposed design is developed and further analysis is undertaken.

1.6.2 Further site-specific surveys, investigations and assessment will be required to allow the optimum site to be considered suitable to be progressed as part of any application for planning permission. This includes further ecological assessment in the form of a Phase 1 habitat survey, in order to accurately determine potential effects.

1.6.3 As stated previously, the aim of this Siting Study has been to identify a site that is preferred on environmental and landscape and visual grounds, whilst accounting for access, technical and cost implications as far as reasonably possible at this stage (acknowledging that detailed engineering and costing information is not currently available). The Siting Study is, therefore, set out so that the preferred option can be taken forward for detailed siting and design as well as external engagement.

1.6.4 The Study has been undertaken using publicly available datasets and requested additional datasets from respective authorities. Some of the publicly available datasets used are not mapped with the precision that would be needed if National Grid proceeded with detailed design and an application for planning permission. However, the data is considered to be appropriate for the purposes of this Siting Study.

1.6.5 National Grid's '*Our Approach to Options Appraisal'* guidance requires an evaluation of corridors and/or final alignment/siting options to follow a High-Level Options Appraisal. This

Siting Study has included a high-level consideration of potential route distances. Route measurements assume that the shortest distance would be used and that the technical complexity of rerouting the OHL correlates to the distance.

1.6.6 It is assumed that the substation will serve the customer clients of National Grid and that once the substation and connection to the National Grid network is established, the customer client will need to construct a local network connection from the substation to their own infrastructure.

2 Description of the Proposed Development

2.1 Introduction

2.1.1 Substations are an integral part of the UK electrical transmission system. They are a method of controlling power flows and voltages around the transmission and distribution systems and are used to connect sources of electricity generation to those systems.

2.1.2 Substations will generally comprise elements such as transformers and switchgear. A transformer within a substation will change (or "transform") the level of voltage from one value to another value. Switchgear is used to provide operational safety and flexibility to the network to enable efficient power flows and ensure the network operates safely and reliably.

2.1.3 Substations can take the form of either an Air Insulated Switchgear (AIS) substation, or a Gas Insulated Switchgear (GIS) substation.

2.1.4 An AIS solution is the preferred National Grid option; a GIS solution is only considered should an AIS be undeliverable, for example due to site constraints.

2.2 AIS Substation

2.2.1 The starting point for the Siting Study was to use a 300m by 300m AIS substation compound. However, as initial design work progressed the approximate area of the AIS Substation compound required was amended to 235m x 520m as shown in **Figure 2.1** below. The actual layout of the substation may be amended during detailed design but should be within these parameters.

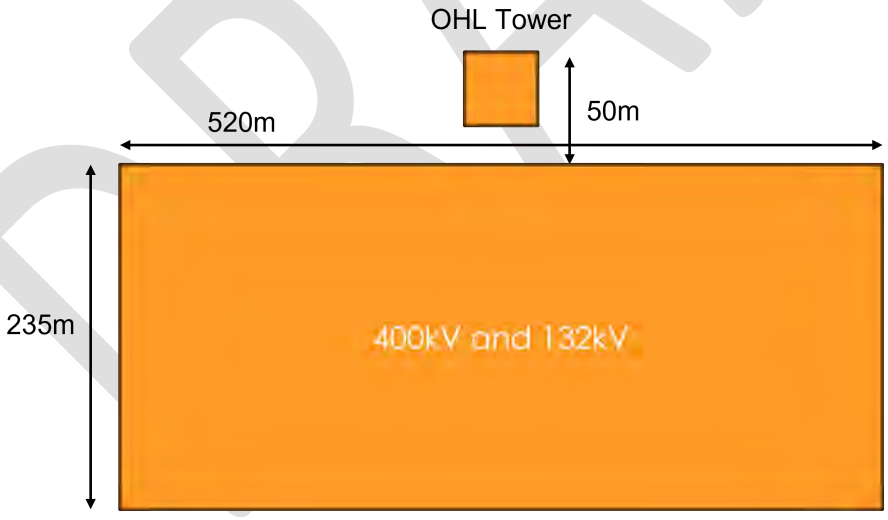

Figure 2.1 – AIS Substation Compound

2.2.2 The equipment associated with the substation compound is likely to include:

- One new additional tower circa 45 – 55m tall to connect into the OHL (with more additional towers to be required the further away the substation is located from the existing OHL).
- Substation access from public highway, main gate and pedestrian gate;

- An electrified security fence (typically 3.4m in height), passive infra-red security lighting and closed-circuit television security cameras would surround the equipment and create a secure compound which would be surfaced with grey stone chippings. The equipment would be lit for maintenance purposes and any lighting solution will be prepared in accordance with the current Design Standards for Exterior Lighting.
- A metalled internal access road of approximately 5.5m wide with adjacent hard standing within which the substation equipment would be sited;
- Busbars, switchgear and associated control and protection equipment;
- Diesel generators for backup power supply; and
- Installation of new fresh water, sewage, drainage, telecommunications equipment and low voltage power supplies to the substation.

2.2.3 The equipment would consist of a variety of vertical structures supporting overhead busbars with ancillary equipment. The maximum height of the equipment would be approximately 15m.

2.2.4 The substation would not be manned during operation (i.e. no additional traffic/employee numbers expected at this stage), although small welfare/office facilities will be included for maintenance workers.

2.1 Access

2.1.1 Permanent vehicular access would be provided to the substation compound to enable regular inspection and maintenance of the substation equipment. Access would be via existing roads wherever possible or by creating new accesses from the local or trunk road network, if necessary.

2.1.2 A permanent metalled road of up to 5m in width (with passing places) would typically need to be constructed from the existing road network (or suitable existing tracks available or capable of upgrade) into the compound to allow for installation and maintenance.

2.1.3 As a number of transformers will be required at site, a route suitable to site for delivering any Abnormal Indivisible Loads (AILs) to the substation is required. The A roads in the siting area offer the best routes for this.

2.1.4 A solution to delivering AILs can be achieved in most instances but will require time and cost. The cost is likely to escalate the further the substation is from main roads.

2.2 Land Rights

2.2.1 National Grid will require land ownership and/or rights over land to construct and thereafter operate the substation site. This would also include obtaining suitable land on a temporary basis for construction working/laydown areas.

2.2.2 It is expected that land would be able to be obtained through negotiations with landowners. However, National Grid is also able to seek the use of compulsory acquisition powers, if necessary, to obtain rights over land to deliver its energy infrastructure.

2.2.3 Land ownership has not been considered as a differentiating factor in the outcome of this study.

3 Policy and Legislation

3.1 National Grid's statutory responsibilities

3.1.1 National Grid is the only company licenced to transmit electricity in England and Wales. National Grid's Transmission Licence was granted under the Electricity Act 1989, Section 6(1)(b).

3.1.2 When developing proposals for new network infrastructure, National Grid has a duty under the Electricity Act 1989 to do so in an efficient, co-ordinated and economical way. National Grid is also required, under Section 38 of the Electricity Act 1989, to comply with the provisions of Schedule 9 of the Act. Schedule 9 requires licence holders, in the formulation of proposals to transmit electricity, to:

- Schedule 9(1)(a) "have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest"; and
- Schedule 9(1)(b) "do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects".

3.1.3 National Grid also has a statutory duty under Section 9 (2) of the Electricity Act 1989:

- "(…) to develop and maintain an efficient, coordinated and economical system of electricity transmission; and
- (…) to facilitate competition in the supply and generation of electricity."

3.1.4 National Grid's statutory responsibilities have been adhered to from the outset of this Siting Study.

3.2 National Grid's Approach to Consenting

3.2.1 In addition to the statutory requirements imposed by the Electricity Act 1989, National Grid has its own project development and delivery process that it follows for its infrastructure projects, as set out in their report titled 'Our Approach to Consenting', dated April 2022.

Approach to Consenting

3.2.2 The above-mentioned guidance describes the process of how National Grid develops electricity transmission projects. It includes an explanation of how National Grid identifies the most appropriate locations and technologies for any new transmission route and/or infrastructure site and the approach taken to mitigate the impact of transmission infrastructure through careful routeing/siting, planting and undergrounding as appropriate.

The Holford Rules

3.2.3 The Holford Rules provide specific guidance on routeing OHLs which are applied by National Grid when undertaking routeing studies. Additional rules relating to the siting of substations are described below, however, substation siting can also influenced by the ability to appropriately route OHL connection infrastructure to those locations. The Holford Rules were reviewed by National Grid in 1992 and is accepted within the electricity industry as the basis for OHL routeing.

The Horlock Rules

3.2.4 National Grid published guidance[1] sets out their approach towards substation developments and provides guidelines on their siting and design to both mitigate environmental effects and meet overarching policy requirements and objectives.

3.2.5 The 'Horlock Rules' comprise a series of criteria applicable to new substations, substation extensions and modifications which cover the following considerations:

1) Overall System Options and Site Selection

In the development of system options including new (or replacement) substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.

2), 3) Amenity, Cultural or Scientific Value of Sites

The siting of new (or replacement) National Grid substations, cable sealing end (CSE) compounds and line entries should as far as reasonably practicable seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections.

Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas should be protected as far as reasonably practicable.

4), 5), 6) Local Context, Land Use and Site Planning

The siting of substations, extensions and associated proposals should take advantage of the screening provided by landform and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.

The proposals should keep the visual, noise and other environmental effects to a reasonably practicable minimum.

The land use effects of the proposal should be considered when planning the siting of substations or extensions.

7) Design

In the design of new substations or line entries, early consideration should be given to the options available for terminal towers, equipment, buildings and ancillary development appropriate to individual locations, seeking to keep effects to a reasonably practicable minimum.

Space should be used effectively to limit the area required for development consistent with appropriate mitigation measures and to minimise the adverse effects on existing land use and rights of way, whilst also having regard to future extension of the substation.

The design of access roads, perimeter fencing, earth shaping, planting and ancillary development should form an integral part of the site layout and design to fit in with the surroundings.

[1] https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf

3.2.6 Application of the above assists the achievement of environmentally acceptable siting and design solutions for substation developments and has been adhered to throughout the preparation of this Siting Study.

3.2.7 A copy of the Horlock Rules is provided in **Appendix A**.

Approach to Options Appraisal

3.2.8 National Grid's '*Our Approach to Options Appraisal*'[2] reflects its statutory duties by underpinning a set of overarching principles which assist in decision making and help to achieve an appropriate balance between competing interests that must be taken into account in options appraisal. Options are considered to have an advantage if:

- They can use or adapt existing infrastructure, or where National Grid can negotiate different commercial arrangements with its customers to achieve a need, rather than building new infrastructure;
- They are shorter, compared with longer routes;
- They are financially less expensive compared to other more expensive options;
- They avoid or mitigate environmental or socio-economic impacts.

3.2.9 Options appraisal is therefore a robust and transparent process used to compare options and to assess the positive and adverse effects they may have across a wide range of criteria including environmental, socio-economic, technical and cost factors.

3.2.10 The topics and subtopics considered are presented in **Table 3.1** below.

Topic	**Subtopic**
Environmental	Landscape and Visual Amenity; Ecology; Historic Environment; Local Air Quality; Noise and Vibration; Soils and Geology; Water.
Socio-economic	Local Economic Activity; Traffic and Transport.
Cost	Approximate capital cost of connecting from the new NGET substation back to the existing Main Interconnected System.

Table 3.1 - Options Appraisal Topics and their constituent sub-topics

3.2.11 One of the guiding principles in the Options Appraisal guidance document, states that: "Options which avoid or minimise and mitigate impacts on environmental or socio-economic constraints will generally be of benefit/advantage compared with those which have likely significant residual effects".

3.2.12 Other detailed environmental aspects (e.g. local air quality, noise and vibration, soils and geology, local economic activity) have not been assessed at this stage but will require consideration and as the preferred option progresses to the planning application stage.

3.3 Future Wales: The National Plan 2040

3.3.1 Future Wales: The National Plan is Wales' national development framework ('Future Wales'), setting the direction for development in Wales to 2040. It has development plan status and provides a strategy for addressing key national priorities through the planning system,

[2] https://www.nationalgrid.com/uk/electricity-transmission/document/96531/download

including sustaining and developing a vibrant economy, and achieving decarbonisation and climate resilience.

3.4 Planning Policy Wales Edition 11

3.4.1 Planning Policy Wales ('PPW') sets out the land use planning policies of the Welsh Government and is a material consideration in the consideration of planning applications and preparation of development plans. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental, and cultural well–being of Wales, as required by the Planning (Wales) Act 2015, the Well–being of Future Generations (Wales) Act 2015 and other key legislation.

3.4.2 PPW confirms the importance of supporting adequate and efficient infrastructure, including electricity utilities, as they are crucial for economic, social and environmental sustainability. PPW also confirms that this objective underpins economic competitiveness and opportunities for households and businesses to achieve socially and environmentally desirable ways of living and working (paragraph 3.61).

3.5 Local Policy Context

3.5.1 The Siting Study Area, as shown in **Figure 1**, is mainly within the administrative boundary of Carmarthenshire County Council, although the most south eastern extent lies within the boundary of the City and County of Swansea.

3.5.2 This report focuses on Carmarthenshire County Council on the basis that no potential sites have been identified within the administrative boundary of the City and County of Swansea.

Adopted Development Plan

3.5.3 The current Local Development Plan (LDP) for Carmarthenshire County Council was adopted on 10th December 2014. The LDP sets out the spatial vision for the future of Carmarthenshire (excluding that area within the Brecon Beacons National Park) and a framework for the distribution and delivery of growth and development.

3.5.4 Where relevant local policies or core planning documents have a bearing on site selection, these have been referenced in **Section 6** of this report in relation to specific sites.

Local Development Plan Review

3.5.5 In a Council meeting on 10 January 2018, Carmarthenshire County Council resolved to prepare a revised LDP for Carmarthenshire. The timetable for the preparation of the Revised LDP is set out within the Delivery Agreement (DA) which was agreed by the Welsh Government on the 28 June 2018. Once adopted (completed) the Revised LDP will be used as the basis for determining planning applications and will assist in guiding future investment programmes in areas such as infrastructure as well as plans and strategies including those of partner organisations.

3.5.6 However, the production of the Revised LDP has been delayed due to the publication of new targets by Natural Resources Wales (NRW) which seek to reduce river phosphate levels in Special Areas of Conservation (SAC) across Wales. In response to these new targets and the challenges they present the Council has been working to re-assess the implications of the new targets for the Revised LDP and the development allocations within phosphate sensitive catchments. In addition to NRW's new targets, several other matters have arisen since their publication which will affect the Revised LDP and need further consideration (including updated flood risk guidance as provided within Technical Advice Note 15, subject to consultation outcomes).

3.5.7 It was therefore agreed at a meeting of the Full Council on 9 March 2022 to allow amendments to the Revised Delivery Agreement timetable to prepare a second Deposit Revised LDP. This is to allow time to evaluate the implications and for essential evidence and data to be gathered and mitigation options to be developed to address the phosphate issue. The second Deposit Revised LDP will incorporate previously agreed Focussed Changes (where they remain relevant). It will also reflect and respond to Covid-19 recovery, the net zero carbon and decarbonisation agenda, the new TAN15 and Revised Flood Maps, and Future Wales: The National Plan 2040.

3.5.8 Until the Revised LDP is adopted, the 2006-2021 LDP will remain in place to inform planning decisions, in line with advice issued by the Welsh Government.

4 Constraints Mapping

4.1 Constraints Maps

4.1.1 An initial identification and appraisal of site options was undertaken using Geographic Information Systems (GIS) mapping, which identified areas of potential environmental and land use constraints within the Siting Study Area.

4.1.2 Mapping was used to exclude areas in the Siting Study Area (as far as reasonably possible) in order to minimise potential direct effects upon key environmental receptors.

4.2 Hard Constraints

4.2.1 Key receptors with the following attributes were excluded:

Ecology

- National Nature Reserves (NNRs)
- Biological Sites of Special Scientific Interest (SSSIs)
- Special Areas of Conservation (SACs)
- Ramsar Sites
- Ancient Woodland
- Special Protection Areas (SPAs)
- Local Nature Reserves (LNRs)

Historic Environment

- Scheduled Monuments
- Grade I and Grade II* Listed Buildings
- Registered Historic Parks and Gardens

Water and Flood Risk

- Areas not benefitting from Flood Defences
- Development Advice Map (DAM) Flood Zone C (high probability of flooding; equal or greater than 0.1%)

Socio-Economic

- UK Built-up Areas
- National Cycle Network
- Public Rights of Way

- A-Roads and Motorways
- National Trust Inalienable Land
- Carmarthenshire LDP data, including the following:
  - Residential Allocations;
  - Residential Open Space;
  - Proposed Recreational Areas;
  - Existing Employment Areas;
  - Proposed Employment Areas;
  - Mixed Use Areas;
  - Mineral Site Buffers; and
  - Local Authority Gypsy and Traveller Sites.

4.3 LANDMAP Data

4.3.1 In addition to the constraints above, NRW also provides 'LANDMAP' datasets, which consist of five, nationally consistent, quality assured spatial datasets covering:

- Geological Landscape;
- Landscape Habitats;
- Visual and Sensory;
- Historic Landscape; and
- Cultural Landscape.

4.3.2 LANDMAP is a whole landscape approach that covers all landscapes, designated and non-designated, it covers the natural, rural, peri-urban and urban areas. As considered in relevant guidance:

"LANDMAP describes and evaluates the physical, ecological, visual, cultural and historic aspects of the landscapes of Wales, and provides the basis of a consistent, quality assured national approach to landscape assessment. LANDMAP assessments can help to inform green infrastructure assessments, SPG on landscape, development management decisions, landscape character assessment, special landscape areas (SLAs), local distinctiveness, design, and landscape sensitivity studies." (6.3.20. Planning Policy Wales, 2021).

4.3.3 For each dataset, aspect areas are defined and quality assured evaluations that are informed by evaluation criteria specific to each dataset, are provided. Higher evaluations indicate higher landscape value with potentially greater landscape or visual sensitivity, depending on the nature and level of change from the development.

4.3.4 NRW LANDMAP datasets have been used to aid the sitting study process with reference to '*NRW GN46 Using LANDMAP in Landscape and Visual Impact Assessments*'.

4.3.5 For the purposes of identification of the least constrained sites within the Siting Study Area, the following approach has been taken with regard to each of the five datasets:

- **Geological Landscape** - Areas with an Overall Evaluation of High and Outstanding have been identified as constrained land and used to inform the identification of the long list of sites.
- **Landscape Habitat** - Areas with an Overall Evaluation of High and Outstanding have been identified as constrained land and used to inform the identification of the long list of sites.
- **Visual Sensory** - Given the Siting Study Area includes substantial areas of High and Outstanding overall evaluation, for the purposes of the identification of the long list of sites only areas evaluated as Outstanding have been identified as constrained land. Further consideration to Visual Sensory will aid selection of the short list and identification of the preferred site.
- **Historic Landscape** - The Historic Landscape dataset has not been used to identify constrained land, given the Siting Study Area only includes areas with an overall evaluation of High and Outstanding. It is considered that for the purposes of the Siting Study it does not provide a material consideration/differential in determination of the selection of the long list of sites. Therefore, following selection of the long list of sites further consideration to Historic Landscape will be used to support selection of the short list and identification of the preferred site.
- **Cultural Landscape** - As this dataset does not include an evaluation, it has not informed the constraints analysis used to define selection of the long list of sites. Further consideration to Cultural Landscape will aid selection of the short list and identification of the preferred site.

4.4 Topography

4.4.1 The Siting Study Area comprises varied landscapes and presents topographical challenges.

4.4.2 Level ground (as far as possible) is preferred, although gently sloping sites where earthworks could create a suitably level development platform are also acceptable. Mapping was used to demonstrate areas of sloping landform – areas with significant change were viewed as a constraint and therefore excluded as a possible location.

4.4.3 Whilst in relation to topography, the above preference has been considered, a detailed assessment of topography and ground conditions has not been undertaken as part of this study.

4.5 Constraints Mapping Results

4.5.1 The GIS analysis and mapping was used to identify constrained land and discount areas in the Siting Study Area. Constrained land was considered to be land covered by LANDMAP allocations as set out in **Section 4.3** above. It also included land that was subject to the environmental and socio-economic 'Hard Constraints' identified in **Section 4.2**, as well as land with significant topographical level changes.

4.5.2 The following maps represent the specific constraints applied, in order to identify the long list of sites. **Figure 4.1** shows the Hard Constraints (Ecology, Historic Environment, Water/Flood Risk and Socio-Economic), **Figure 4.2** shows the LANDMAP areas, and **Figure 4.3** shows the topography.

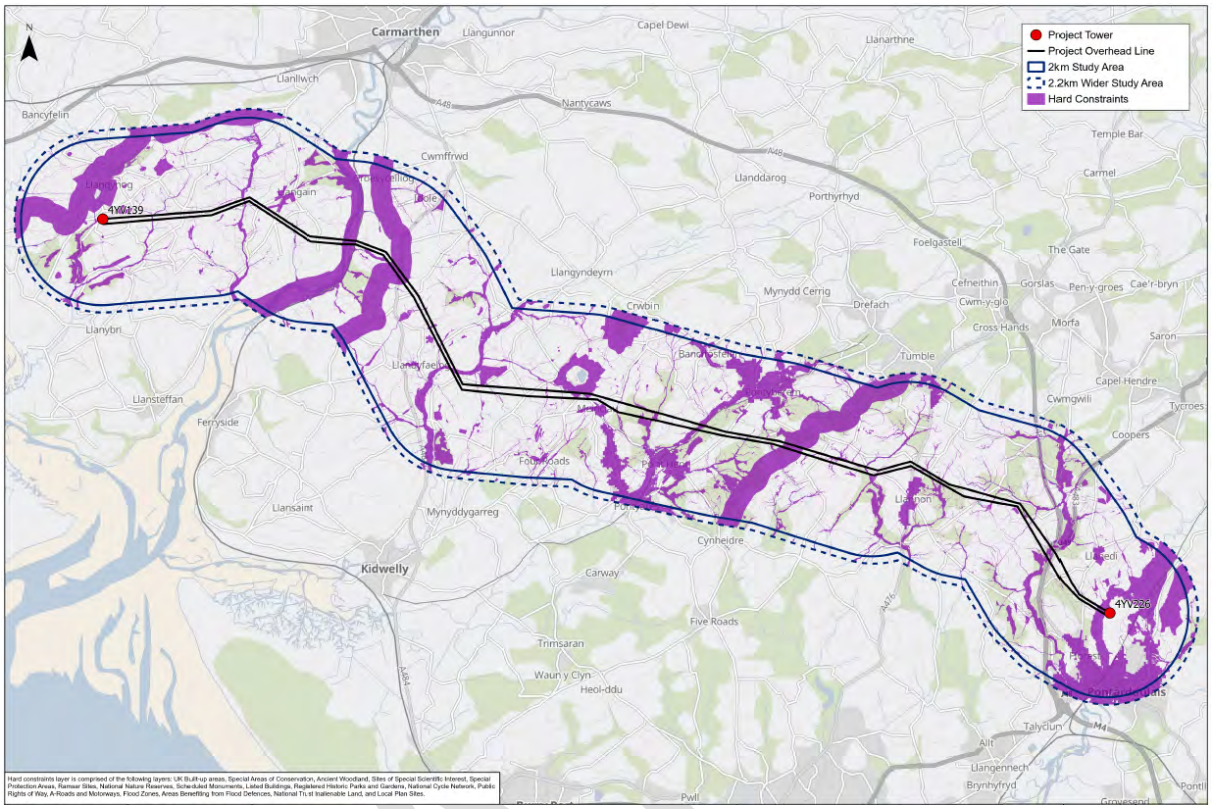

Figure 4.1 – Hard Constraints

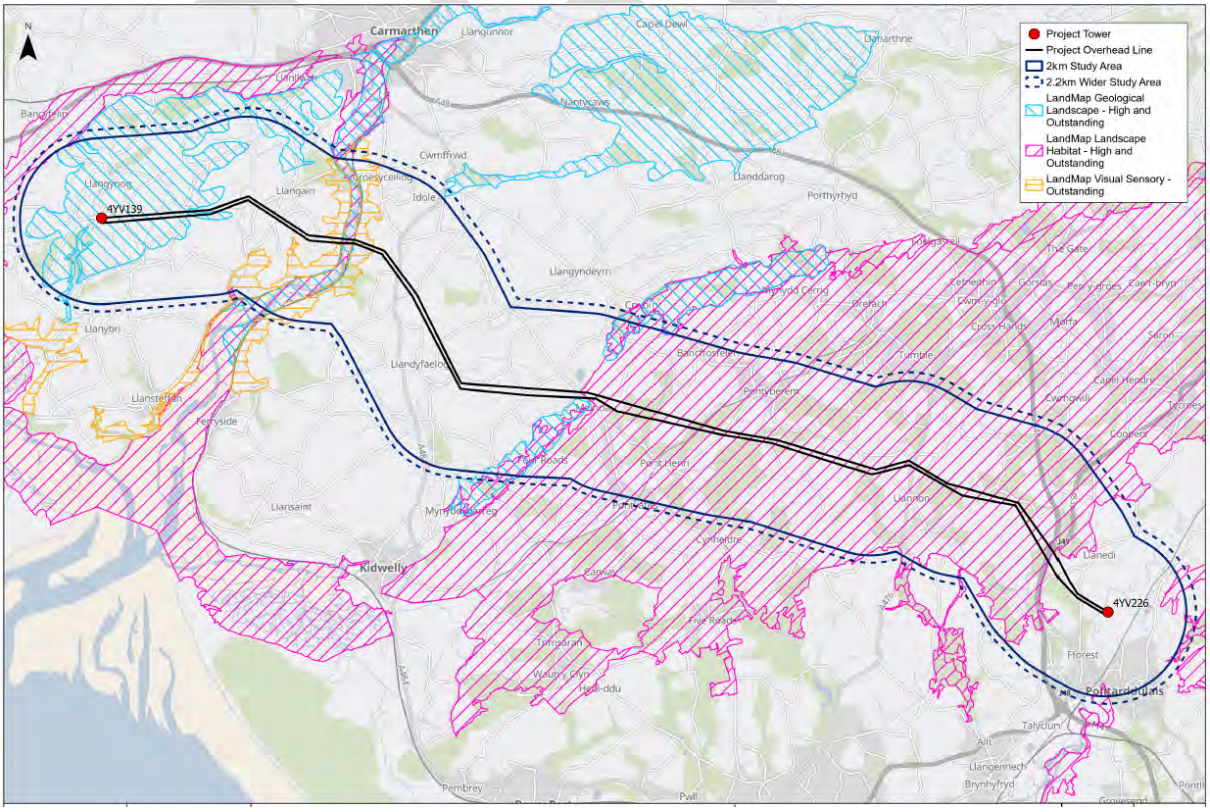

Figure 4.2 – LANDMAP

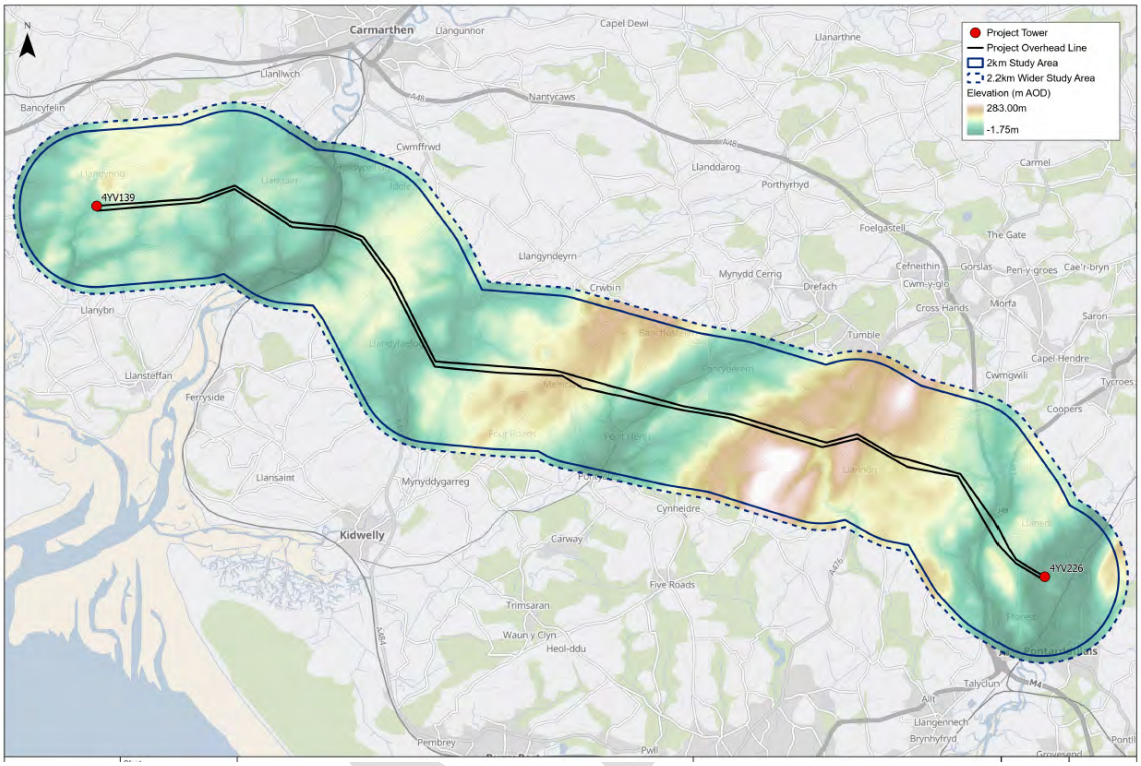

Figure 4.3 – Topography

4.5.3 **Figure 4.4** shows the outcome of this analysis overall, with the Long List Sites identified within **Figure 4.5**.

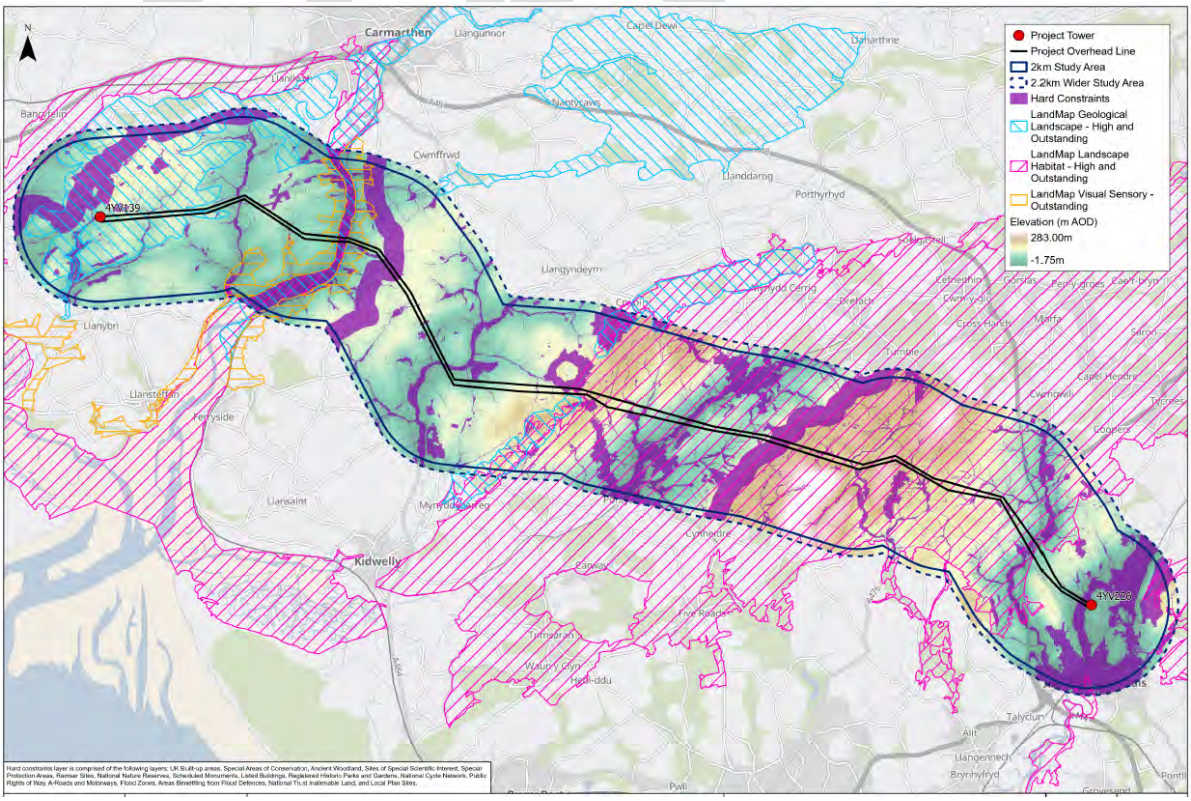

Figure 4.4 – Hard Constraints and LANDMAP designations and Topography

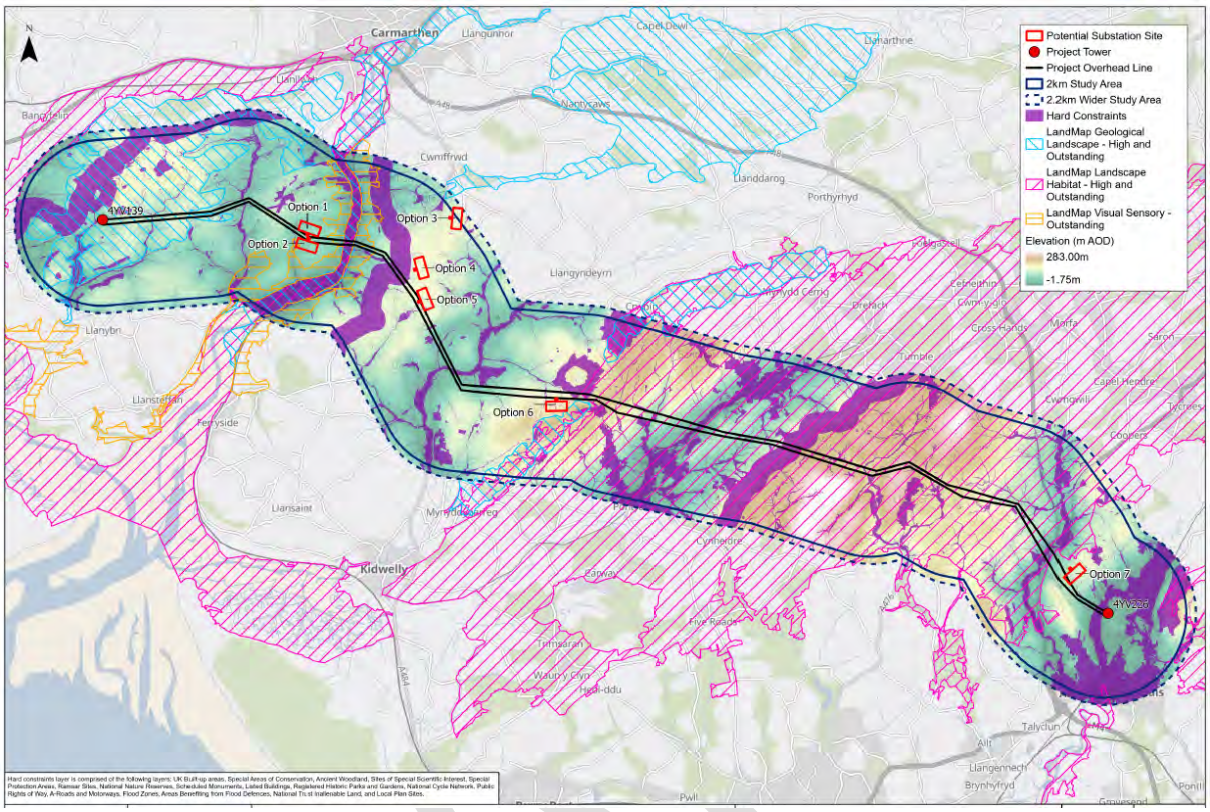

Figure 4.5 – Constrained / Unconstrained Land and Long List of Sites

5 Long List of Sites

5.1.1 The site selection process involved screening initial sites against a range of criteria that assessed their suitability, feasibility, and acceptability, based on the existing data and evidence from previous investigations.

5.1.2 Following this process, a total of 7 potential long list sites were considered. These are listed below:

- Option 1
- Option 2
- Option 3
- Option 4
- Option 5
- Option 6
- Option 7

5.1.3 **Figure 5.1** shows the location of the long-list of 7 site options identified within the Siting Study Area.

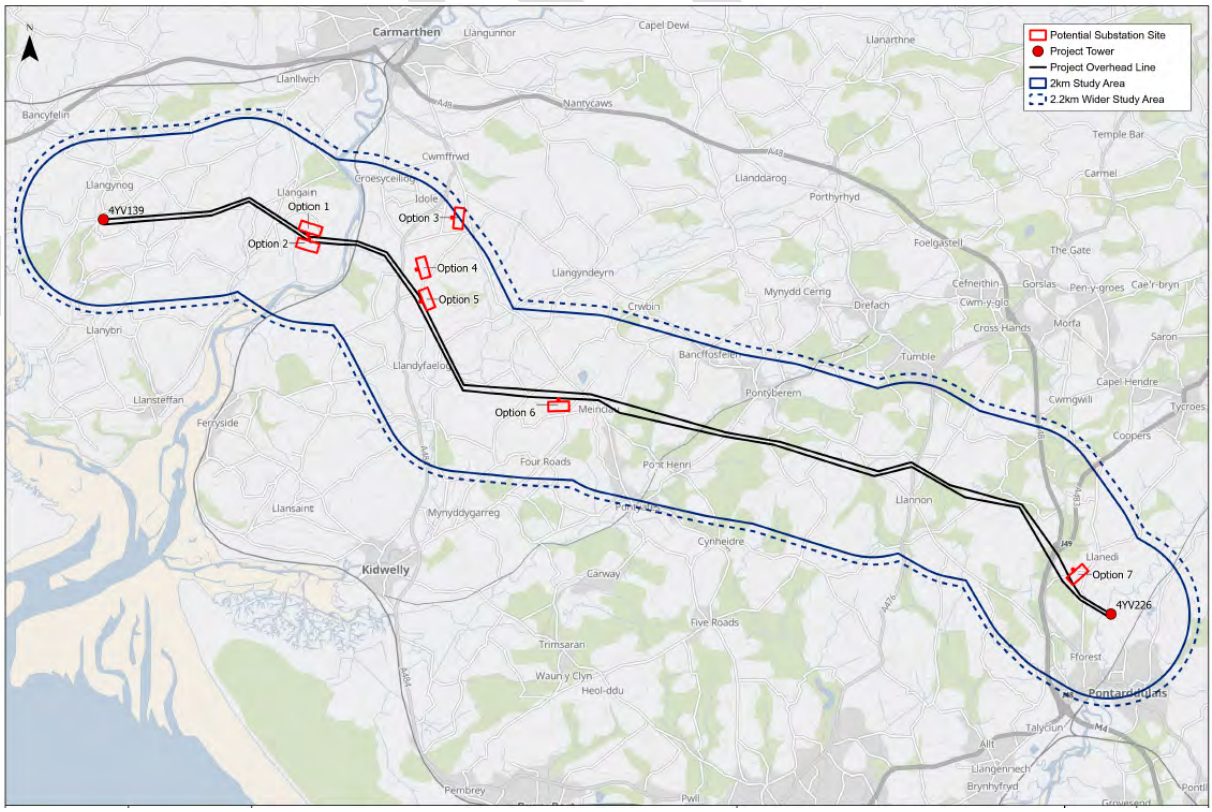

Figure 5.1 – Siting Study Area and 7 Long List Sites

5.2 Refinement of the Long List

5.2.1 Following the identification of the 'Long List' sites above, each site was examined using the criteria identified in **Table 3.1** in **Section 3**. This then allowed the sites to be compared against each other.

5.2.2 Once the investigation was complete, each site was determined as either having beneficial attributes against other sites or as not showing any benefit over other sites.

5.2.3 In accordance with National Grid's '*Our Approach to Options Appraisal*', options are considered to be able to have an advantage if they can use or adapt existing infrastructure, are shorter (compared with longer routes), they are financially less expensive compared to other more expensive options, and they avoid or mitigate environmental or socio-economic effects.

5.2.4 Key criteria used in assessing the sites were:

- The proximity to settlements and more rural isolated dwellings, and the degree to which existing features (e.g. woodland belts) contribute to visual containment;
- The presence of any rights of way, access routes or other recreational receptors;
- Ease of access for general construction traffic based on any access restrictions;
- Known designated or non-designated heritage assets within the approximate site boundary;
- Agricultural land classification;
- The presence or absence of designated or non-designated ecological sites within the approximate site boundary;
- The presence of waterbodies such as ponds within 500m of the approximate site boundary;
- The extent of the site (including access routes) within DAM Flood Zone C;
- LANDMAP constraints;
- LDP policy designations and planning history;
- Landform and topographic constraints; and
- Potential 400kv overhead line work required to connect the site to the existing OHL

5.3 Conclusions

5.3.1 The appraisal of the 7 long list sites resulted in 4 of them being ruled out.

5.3.2 The sites which were ruled out and the specific technical reason for doing so is shown below in **Table 5.1.**

5.3.3 Further detail on the three sites that have been progressed to the Short List is provided within the Options Appraisal Summary Tables (OAST) in **Section 6.3.**

Table 5.1 – Sites not being progressed to the Short List and the reasoning

Long List Site	Reasoning not progressed to Short List
Option 1	Absence of existing access routes presents access constraints due to narrow and unsuitable road conditions. General construction traffic would therefore struggle to access the site. The technical complexity and cost of providing appropriate access to Option 1 is considered high due to its length. Option 1 is also located in close proximity (around 600m) from the Afon Tywi Site of Special Scientific Interest (SSSI). SSSIs are statutorily protected under the Wildlife & Countryside Act 1981 (as amended by the Countryside & Rights of Way Act 2000). There is potential for residual effects on protected species (if present) through direct loss of habitat. Option 1 would therefore be more likely to have a greater effect or significant impact on ecological receptor than other site options.
Option 2	Absence of existing access routes presents access constraints due to narrow and improper road conditions. General construction traffic would therefore struggle to access the site. The technical complexity and cost of providing appropriate access to Option 2 is considered high due to length and the associated constraints of sensitive priority habitats and achievability of access with significant mitigation requirements. Option 2 is also located in close proximity (around 600m) from the Afon Tywi Site of Special Scientific Interest (SSSI). SSSIs are statutorily protected under the Wildlife & Countryside Act 1981 (as amended by the Countryside & Rights of Way Act 2000). There is potential for residual effects on protected species (if present) through direct loss of habitat. Option 2 would therefore be more likely to have a greater effect or significant impact on ecological receptor than other site options.
Option 4	There is a PRoW to the north east and east. It is likely that users of the PRoW, in terms of visual and amenity, will be impacted by the substation due to the close proximity. The location of the site is in close proximity to a small number of residential properties – there is 9no isolated residential properties within 500m of the site. Other sites are considered to offer similar or better opportunities in terms of technical and cost aspects or environmental and socio-economic considerations. Option 4 is located in close proximity to Option 5, however, it was concluded that, due to the above, Option 4 was sub-optimal particularly when compared with Option 5.
Option 6	Option 6 is located in close proximity to the Blaen-y-fan Limestone Quarry. As shown on the Hard Constraints Map in **Figure 4.1**, Mineral Buffer Zones are put in place for the purpose of protecting the land around quarries.

Long List Site	Reasoning not progressed to Short List
	The Minerals Technical Advice Note 1 – Aggregates (March, 2004) allocates these areas, with the dual purpose of protecting both the mineral extraction operations as well as the amenity of potentially sensitive non-mineral development that border the quarry. As such, planning permission will only be granted in specific circumstances within such buffers. The existing group of residential properties in Meinciau village directly overlook Option 6. There is also a PRoW, located directly adjacent to the sites western boundary, running from the Heol Meinciau Mawr road to the isolate farm property at the end of the road. There is an opportunity to provide boundary planting to provide screening to the residential properties and PRoW, however, a clear level of residual visual impact would be likely to remain for some of these properties due to the existing landform. Land within the site and in the surrounding area is within the extent of high surface water flood risk. This is due to the Gwendraeth Fach watercourse and associated tributaries. Although a Flood Consequence Assessment and Drainage Strategy could likely recommend some mitigation measures, adjusting the site location or micro-siting the boundary of Option 6 is unlikely due to the high risk of surface water flooding. The Site therefore can't be micro-sited to avoid the flood risk areas.

6 Short List of Sites

6.1 Introduction

6.1.1 This section provides a comparison and analysis of the shortlisted sites.

6.2 Short List of Sites

6.2.1 Following the long list assessment, 3 locations were taken forward to the short list. These are as follows:

- Option 3
- Option 5
- Option 7

6.2.2 **Figure 6.1** below shows the location of these 3 Sites in relation to the Siting Study Area.

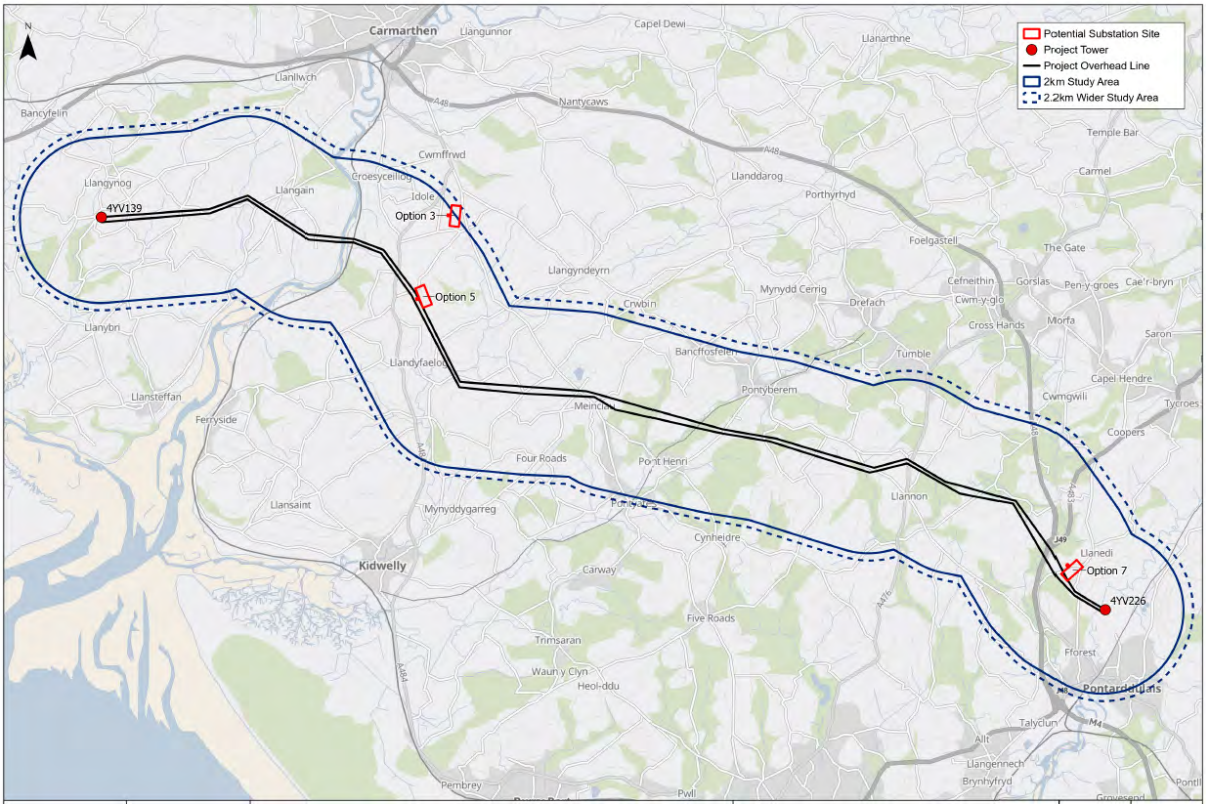

Figure 6.1 – Short List of Sites

6.3 Options Appraisal Summary Tables (OAST)

6.3.1 Option 3, 5 and 7 were taken forward for further analysis using Options Appraisal Summary Tables (OAST tables).

6.3.2 The OAST tables examine environmental, socio economic and technical information related to the sites in further detail and how they might be affected by construction and operation of the substation.

6.3.3 A summary of the key considerations and constraints explained within the OAST tables is provided in **Section 6.7 'Comparison of Shortlisted Sites'**.

6.3.4 In accordance with Horlock Rule 1, consideration will be given to the likely environmental issues early on to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.

6.3.5 The following topics are discussed in each OAST table:

- **Landscape and Visual Amenity** - The landscape sensitivity of each site was determined by assessing how the proposed substation would affect the landscape and visual character of each site. In particular, the introduction of a new 45 to 55m high tower is considered in the assessment.
- **Landform and Topography** - Site topography and landform can be a significant constraint, and can influence cost. Although none of the short-listed sites present challenging topography, it has been considered within the OAST tables in terms of any intervening topography which may suitably screen the site from unacceptably impacting upon neighbouring residential amenity standards.
- **Ecology** - In line with Horlock Rules 2 and 3, all sites taken forward for the shortlist avoid internationally and nationally designated sites and nature conservation areas. Proximity to ecological receptors (National Nature Reserves, Biological Sites of Special Scientific Interest (SSSIs) etc) have therefore been considered. Sites likely to have residual effects on ecology as a result of proposed development are viewed less favourably.
- **Historic Environment -** Horlock Rule 2 states that the siting of infrastructure should seek to avoid, where practicable, effects upon designated areas of the highest cultural value (including their settings). None of the shortlisted sites directly affect any heritage assets, including Registered Parks and Gardens, Listed Buildings, Scheduled Monuments or World Heritage Sites. The following OAST tables therefore considers the proximity of the sites to these receptors.
- **Water, Geology and Soils** - The assessment for water, geology and soils, and noise focused on the proximity of receptors, assessing the flood zone the site is in and examining the classification of the land.
    - It is noted that locating some type of sustainable drainage system (SuDS) features and using the land for appropriate flood alleviation will help make the best use of all sites.
- **Noise** – During operation, noise from the substation will adhere to requirements specified by the Local Authority in order to minimise noise break out from the facility. As such, it is expected that the effect on noise sensitive receptors will not be significant. However, there may be a need to provide acoustic screening during construction works to limit impacts on noise sensitive receptors. The noise section considers the proximity of the site to noise sensitive receptors.
- **Traffic and Transport** - All sites would require the construction of some new temporary and permanent accesses across fields.

- **Public Rights of Way (PRoW)** - There are no National Trails within the Siting Study Area, however a range of recreational routes and local PRoWs are present. The potential for each site to affect PRoWs is therefore considered.

- **Technical Complexity (Proximity to Existing OHL)** - Increased distance from the existing OHL is considered to increase potential technical and cost constraints. Therefore, as set out within the scope, a preference for sites more closely located to the OHL will be applied unless outweighed by other potential environmental effects.

6.4 Option 3

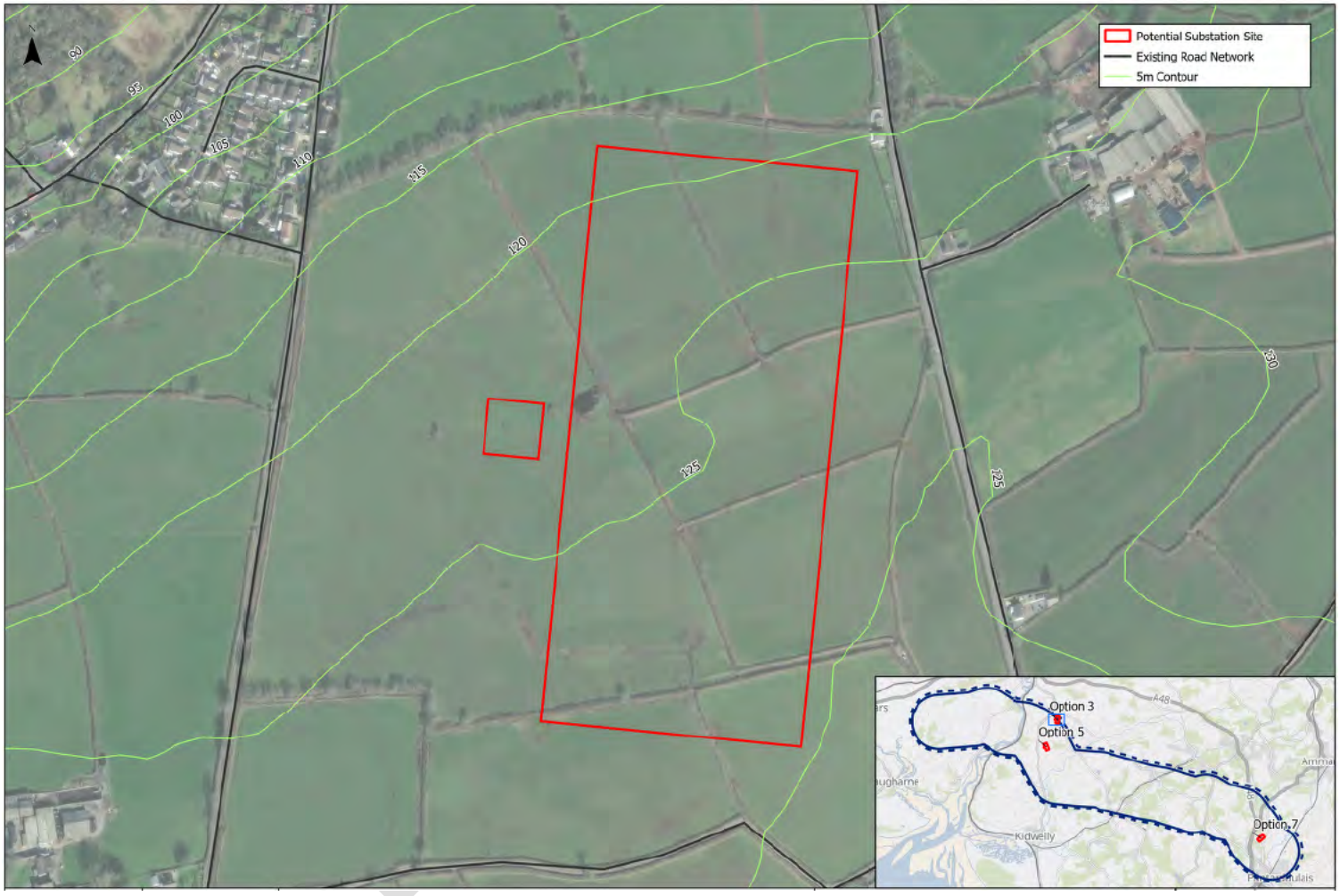

Figure 6.2 – Option 3 Site Boundary

Table 6.1 – OAST Table for Option 3

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
Environment			
Landscape and Visual Amenity	Option 3 is located immediately south east of the small village, Idole. The site is currently a greenfield, undeveloped plot of pastoral land with limited views to and from the surrounding area. The nearest publicly accessible points are the rural lanes to the south and west and the B4309 to the east, all of which benefit from continuous hedgerows along their entirety, providing some level of visual screening. The landform of the site and surrounding area is also relatively flat, meaning there are no elevated views of the site from the immediate surroundings. The site is generally flat with a gentle slope to the southwest. Based on LIDAR information available the site is considered to range from 120AOD to 125AOD. The villages of Idole and Bancycapel are located within 0.2km of the site. Desk-study and aerial review identified 10 residential properties within 500m of the site. There are two isolated properties 100m to the north. Visual receptors would also include users of the B4309 to the east, the rural lanes to the south and west and a PRoW between Lan House and Fforest Bowen. However, due to the landform and field boundary hedgerows, views of the site from these receptors are expected to be limited.	There is an opportunity for shrub and tree planting around the periphery of the substation to screen the development from local properties. However, extensive planting would be uncharacteristic of the local landscape. Planting should be relatively wide and include a mix of plants to afford screening all year round. Planting could be tied into the existing hedgerows along field boundaries.	There may be visual effects on nearby residents in Idole and Bancycapel, and isolated properties. There are no elevated views of the site from the immediate surroundings, due to the fact the landform is relatively flat and not elevated. Wider visibility is therefore limited. The proposed site is considered more suitable from a landscape and visual perspective, particularly given the landform, limited visual receptors, and available land to provide screening.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
Landform and Topography	Option 3 is generally flat with a gentle slope to the south west. Based on LIDAR information available, the Site is considered to range from 120AOD to 125AOD.	Flatter topography means less earthworks is required for construction, as it reduces the need for excavation, embankment, and levelling of the land surface.	The site has less visual prominence due to the flat landform. The topography therefore means the proposed site is considered more suitable from a landscape and visual perspective.
Ecology	Option 3 primarily sits within an area of agricultural arable land and therefore the ecological potential for supporting protected species is likely to be limited. NRW Terestrial Habitats Phase 1 data indicate a historic assessment of the ecological potential on the site as Improved Grassland B4. The boundaries of fields are delineated by strong hedgerows. Isolated trees are located outside of the site boundary. One isolated waterbody (Pond) is located within the site. Datamap Wales WOM21 data does not indicate any potential presence of protected species or priority habitat within or immediately adjacent the site. A large area of potential habitat for Great Crested Newts is located approximately 850m south west of the site near Fforest Isaf Farm. There are no designated ecological sites within 1km of the site. Option 3 is located furthest from the existing OHL and as a result connecting to the OHL is	Further surveys required for Phase 1 Habitat Survey. The site currently includes a waterbody (pond) but it is considered that micro siting could avoid direct impacts on the waterbody. Biodiversity enhancements in the form of boundary planting etc would be required to achieve National Grid policy of biodiversity net gain. Utilisation of efficient routing minimising the number of new towers required to connect the site to the existing OHL.	There is potential for residual effects on protected species (if present) through direct loss of habitat but these are considered likely to be limited given the agricultural use of the site.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	considered likely to have more ecological effects than sites closer to the OHL.		
Historic Environment	Option 3 is located approximately 1.4km from the Registered Historic Landscape 'Tywi Valley'. At this distance it is considered that there would not be an unacceptable impact on the Tywi Valley Registered Historic Landscape.	A detailed landscape and visual impact assessment would include consideration of the impact on Tywi Valley Registered Historic Landscape. In terms of archaeological impacts, a desk-based assessment would be required to provide a more detailed understanding. This may then need to be supplemented with intrusive investigations.	Any anticipated direct archaeological impacts would be mitigated through advance excavation and recording ('preservation by record') and through the development of a Written Scheme of Investigation ('WSI').
Water, Geology and Soils	Option 3 is located primarily within DAM Zone A. The Site includes an existing small waterbody (pond). This may need consideration in the Flood Consequences Assessment and Drainage Strategy. Option 3 is located wholly within a Secondary A Bedrock and medium simplified groundwater vulnerability area according to NRW Aquifer Maps, comprising permeable layers that can support local water supplies, and may form an important source of base flow to rivers. Site is not within a Nitrate Vulnerable Zone (NVZ) or Source Protection Zone.	Generic pollution control mitigation would be adopted as part of a CEMP. A Flood Consequence Assessment and Drainage Strategy will be required.	No residual effects anticipated on hydrology, geology and agricultural land.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	Option 3 is evaluated as 'Moderate' quality of Geological Landscape within LANDMAP. The site is not located on agricultural land of grades 1, 2 and 3a of the Agricultural Land Classification (ALC) system (i.e. best and most versatile (BMV) land).		
Noise	The nearest noise sensitive receptors are in Idole and Bancycapel and are within 0.3km of the Site. There are also isolated properties within 0.4km to the west and south, as well as 2no properties within 0.3km to the east on the other side of the B4309.	During operation, noise from the substation will adhere to requirements specified by the Local Authority in order to minimise noise break out from the facility.	It is expected that the impact on noise sensitive receptors will not be significant. It is assumed that standard construction control measures or Best Practical Means would be adhered to within a CEMP which would reduce construction noise effects.
Socio-economic			
Traffic and Transport	Option 3 is approximately. 500m from a 2-lane single carriageway road (B4309). In order to provide suitable access to the site, a new access road of 290m will be required. Operational access would be either from the B4309to the north which links to the A484 and then to the A48 (a 4-lane dual carriageway) at Pensarn or from the A484 via Heol-Y-Lan, which is a single track road with residential properties fronting the road. Construction access could be provided by the introduction of a one-way system utilising Heol-Y-Lan and Lon-Yr-Ysgol with the site access located at the junction of these two roads.	Sensitive hedge removal and re-planting for access road. A Construction Traffic Management Plan will be developed for the construction of the substation.	There are potential effects caused by traffic disturbance to local residences. However, based on the assumption that no regular HGV or notable load traffic will be required during operation this is not likely to be significant as it will be for the duration of construction only.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
PRoWs	There is a PRoW situation southwest of Option 3, approximately 300m away. This will not be directly affected by the substation in this location, however, users of the PRoW will likely experience the visual impact during both construction and operation.	Mitigation during construction could include providing screening, such as a fence or hoarding around the Site boundary, or planting trees, shrubs or hedges along the PRoW to create a natural buffer.	No likely significant residual effects.
Technical and Cost			
OHL	Option 3 is located approximately 1.65km from the existing 400kV OHL.	Option 3 is considered to require the highest amount of potential re-routing of the existing OHL in comparison to the other shortlisted sites. This will need to be achieved with the minimal amount of environmental impact as reasonable practicable.	Potential for additional environmental effects and technical and cost implications. An additional 1.65km of OHL would have significant cost implications.

6.5 Option 5

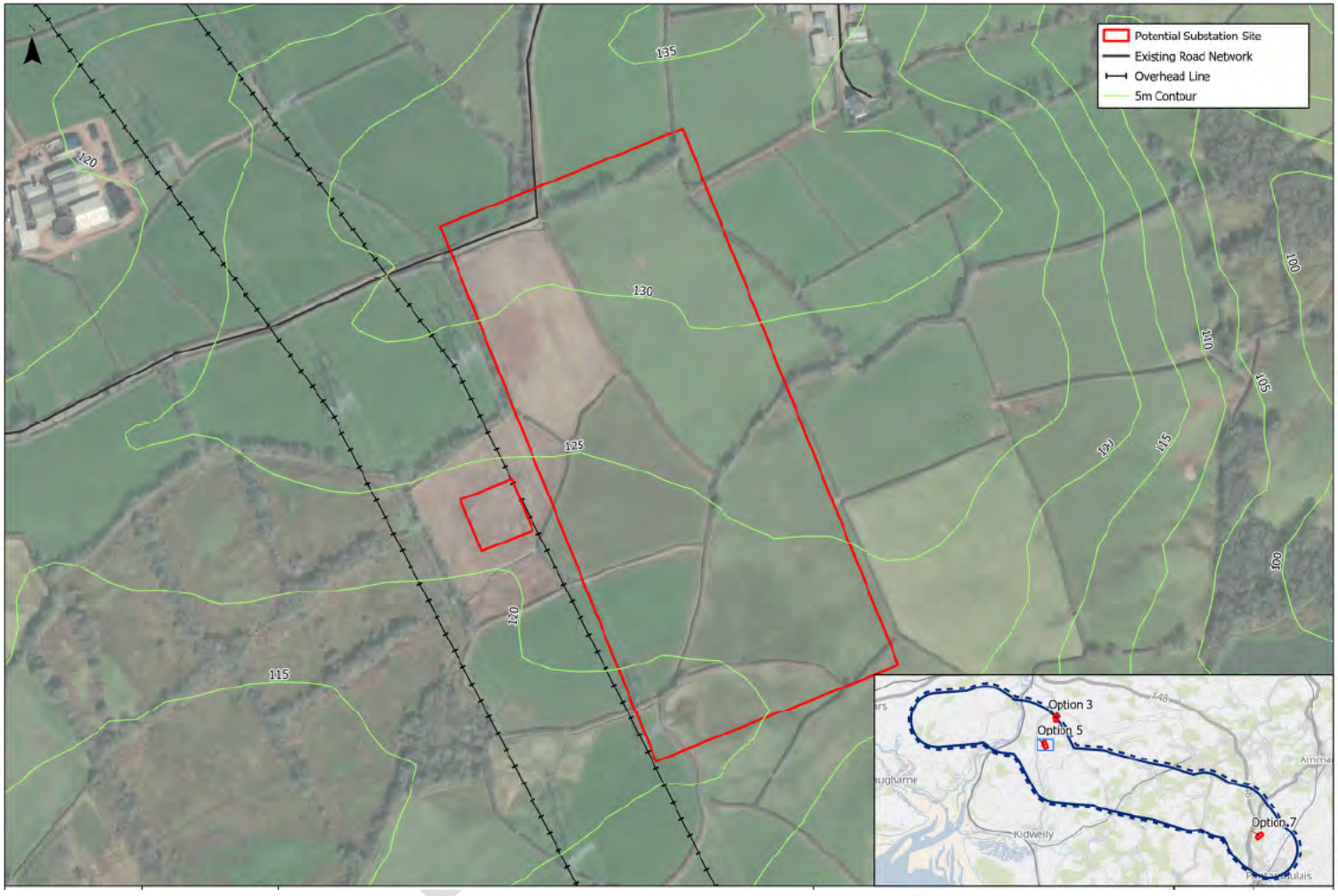

Figure 6.3 – Option 5 Site Boundary

Table 6.2 – OAST Table for Site Option 5

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
Environment			
Landscape and Visual Amenity	Option 5 is located 1.3km south west of Idole. The site comprises medium sized fields of an irregular pattern which are bounded by hedgerows of varying heights and densities. The site is well contained visually due to hedgerows along existing field boundaries and local highways. The site is elevated in the landscape but comprises relatively flat landform. The site is located immediately adjacent to the existing OHL which is a dominating visual feature in the landscape. Wales Coastal Path (and NCN Route 4) are located approximately 1.4km to the west, however views from this receptor are limited. Views from the Coastal Path are focused toward the Tywi estuary to the west. There is a PRoW located approximately 300m to the east with open views towards the site and isolated residential receptors in proximity of the site, the closest being circa 150m to the east. Visual receptors for the site include users of the local road adjacent and users of the PRoW to the east. Residential receptors include nearby farmsteads and isolated properties. Desk-Study review indicates 6no residential properties located within 500m of the site.	There is an opportunity to utilise existing field boundary features and for shrub and tree planting around the periphery of the substation to screen the development from local properties. Planting should be relatively wide and include a mix of plants to afford screening all year round. Planting could be tied into the existing hedgerows and vegetation on field boundaries.	There may be visual effects from the isolated local properties and the PRoW located east. However, LIDAR data suggests isolated residential properties to the south are screened from views via the intervening elevated landform at 125AOD whilst residential properties located east and west of the site have limited visibility due to existing intervening woodlands. Despite its elevated position, there are few visual receptors identified and the substation would sit in context with the immediately adjacent OHL with available land to provide screening.
Landform and Topography	Option 5 comprises relatively flat landform. Based on LIDAR information available the site ranges from 120AOD to 130AOD	Flatter topography means less earthworks is required for construction, as it reduces the need for excavation, embankment, and levelling of the land surface.	The site has less visual prominence due to the flat landform. The topography therefore means the proposed site is considered more suitable from a landscape and visual perspective.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
Ecology	NRW Terestrial Habitats Phase 1 data indicate a historic assessment of the ecological potential on the site primarily as improved Grassland (B4) and partly semi improved grassland (B2.2). Therefore the ecological potential for supporting protected species or habitats on site is likely to be limited. Field boundaries west of the site include tree planting and a small triangular area is identified as semi-natural broadleaved woodland, however NRW Terestrial Habitats Phase 1 data indicates no sensitive habitat west of the site. Ancient Woodland is located approximately 425m east of the site within and enclosed by other, undesignated woodland. Priority Habitat 'Purple Moor Grass and Rush Pastures' is located outside of the site boundary approximately 250m to the east.	Phase 1 Habitat Survey Required. Biodiversity enhancements in the form of boundary planting etc would be required to achieve National Grid policy of biodiversity net gain.	There is potential for residual effects on protected species (if present) through direct loss of habitat although potential impact is considered limited.
Historic Environment	A Scheduled Monument (Castell y Domen, Gwempa) comprising the remains of a motte and ditch is located approximately 1.6km southeast. Desk-study review indicates views to this asset will be limited. The monument is of national importance for its potential to enhance knowledge of medieval defensive practices, the significance of which will not be affected by the siting of the substation in this location. The site is not considered to be within crucial proximity of designated heritage assets and no evidence of archaeological significance have been identified as part of this study	A detailed landscape and visual impact assessment would include consideration of the impact on Tywi Valley Registered Historic Landscape. In terms of archaeological impacts, a desk-based assessment would be required to provide a more detailed understanding. This may then need to be supplemented with intrusive investigations.	Any anticipated direct archaeological impacts would be mitigated through advance excavation and recording ('preservation by record') and through the development of a Written Scheme of Investigation ('WSI').
Water, Geology and Soils	Option 5 is located within Flood Zone A (low flood risk) on the Development Advice Map which supports TAN15.	Generic pollution control mitigation would be adopted through a Construction Environmental Management Plan	No residual effects on hydrology, geology and agricultural land are anticipated.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	Option 5 does contain small areas of risk of flooding from surface water which will need to be factored into the detailed design. Option 5 is evaluated as 'Moderate' quality of Geological Landscape within LANDMAP. The site is not located within agricultural land of grades 1, 2 and 3a of the Agricultural Land Classification (ALC) system so is not BMV land.	(CEMP). Realignment of field drainage ditches where present may be required. A Flood Consequence Assessment and Drainage Strategy will be required.	
Noise	The nearest noise receptors include a number of residential and agricultural buildings, all located within 300m of the site. The closest of which is an isolated residential property located 150m to the east.	During operation, noise from the substation will adhere to requirements specified by the Local Authority in order to minimise noise break out from the facility.	It is expected that the impact on noise sensitive receptors will not be significant. It is assumed that standard construction control measures or Best Practical Means would be adhered to within a CEMP which would reduce construction noise effects.
Socio-economic			
Traffic and Transport	Option 5 is approximately 550m from a 2-lane single carriageway road (A484) and would require a new access road of circa 550m length. There is however an existing single lane track that runs close to the site. An exercise to consider the merits of improving the existing track against constructing a dedicated new access route is required. The length of both potential routes are similar.	Sensitive hedge removal and re-planting for access road. A Construction Traffic Management Plan will be developed for the construction of the substation.	There are potential effects caused by traffic disturbance to local residences during the construction period as a result of routing construction traffic. Based on the assumption that no regular HGV or notable load traffic will be required during operation, this is not likely to be significant as it will be for the duration of construction works only
PRoWs	Option 5 is located 300m from an existing PRoW (Code: 29/14/2) east of the site. The PRoW begins at a single track road in Uplands Arms and	The PRoW would not be directly affected during construction or operation.	No likely significant residual effects.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	follows farmstead access routes towards existing woodland to the east of the site.	Visual screening via shrub and tree planting around the periphery of the substation would serve to screen the substation when viewed from the ProW.	
Technical and Cost			
OHL	Option 5 is located immediately adjacent to the existing 400kV OHL. The site is also crossed by an existing 132kV (distribution) OHL.	Minimal environmental, landscape and visual impact required.	Minimal potential for additional environmental effects and technical and cost implications.

6.6 Option 7

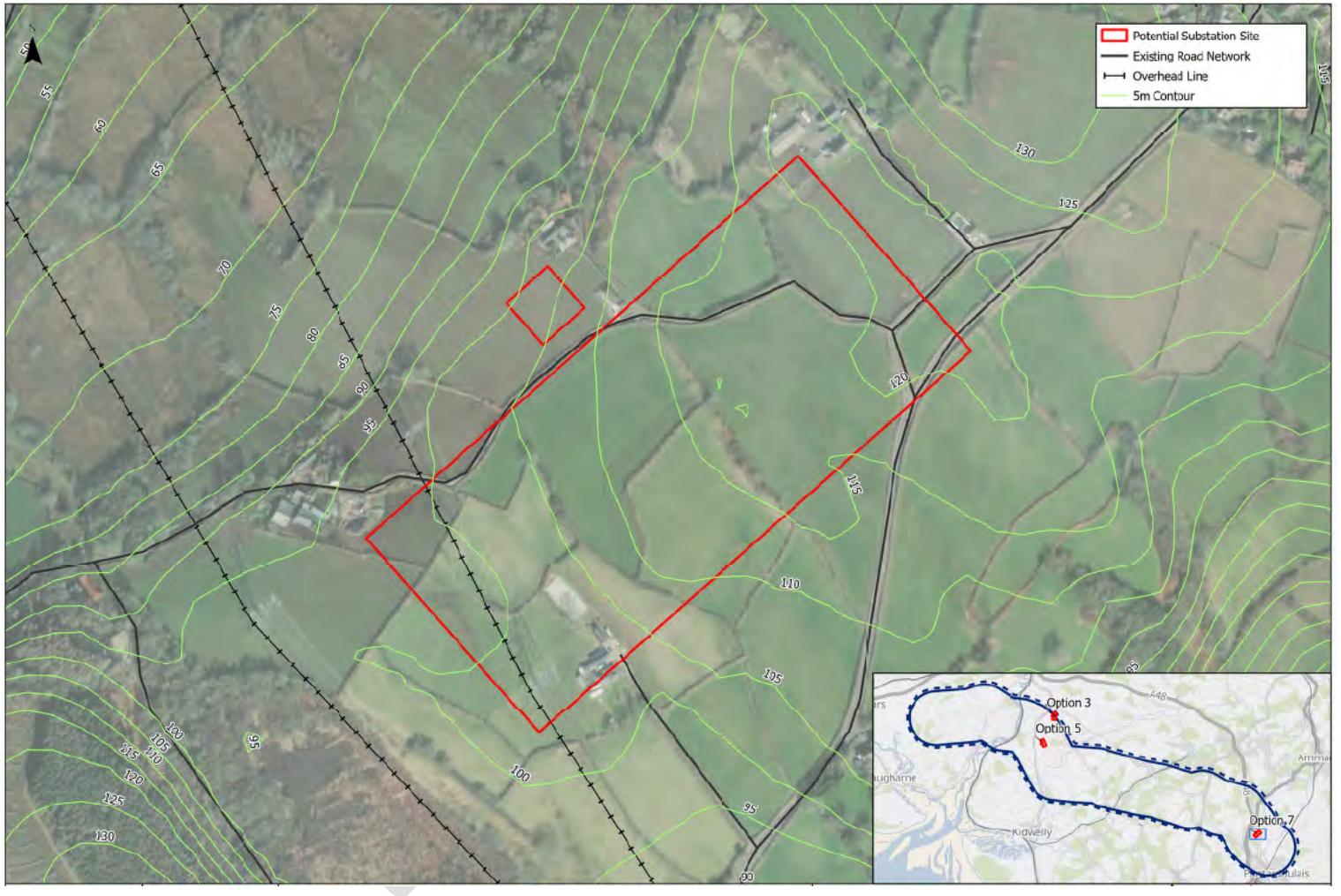

Figure 6.4 – Option 7 Site Boundary

Table 6.3 – OAST Table for Option 7

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
Environment			
Landscape and Visual Amenity	Option 7 is located 0.4km south west of Llanedi. The site comprises medium sized fields off an irregular pattern which are bounded by hedgerows of varying heights and densities. The site is also bounded by B4297 to the east and a narrow unnamed lane to the north. The M4 corridor is located 0.6km to the west. The site is located immediately adjacent to the existing OHL which is a dominating visual feature within the landscape. The site and surrounding area has an undulating landform and the site itself rises from the west to east. There are several isolated farmsteads and properties in the surrounding area as well as the settlement of Llanedi to the north east and the amalgamated settlements of Hendy, Fforest and Pontarddulais to the south. There is a PRoW that runs in close proximity to the site, through the adjacent farmyard. Desk-study and aerial review identified 9no isolated residential properties within 500m of the site. The site is located approximately 490m from the closest settlement. The closest isolated residential property is located 20m from the site.	There is an opportunity for shrub and tree planting around the periphery of the substation to screen the substation from properties. Planting should be relatively wide and include a mix of plants to afford screening all year round. Planting could be tied into the existing hedgerows and vegetation on field boundaries.	There may be visual effects upon the isolated properties, and users of the PRoW. There may also be visual effects for residential receptors in Hendy, Fforest and Pontarddulais to the south, however the effect will be lessened due to the distance from the site. The site is considered suitable from a landscape and visual perspective, particularly given the landform (which screens and contains the site), the fact that there are few visual receptors in close proximity, the context that the adjacent existing OHL provides and the availability of land to provide screening.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	Visual receptors for the site include users of the B4297 and users of the lane to the north and PRoW to the west. Residential receptors include nearby farmsteads and isolated properties. The substation also has the potential to be visible from the aforementioned settlements to the northwest and south, although the landform is likely to partially limit views from these areas.		
Landform and Topography	Option 7 consists of a typically gently sloping landform falling to the south and south west. Based on LIDAR information available the Site ranges from 105AOD to 120AOD.	Flatter topography means less earthworks is required for construction, as it reduces the need for excavation, embankment, and levelling of the land surface.	The site has less visual prominence due to the flat landform. The topography therefore means the proposed site is considered more suitable from a landscape and visual perspective.
Ecology	NRW Terestrial Habitats Phase 1 data indicate a historic assessment of the ecological potential on the site primarily as improved Grassland (B4), therefore the ecological potential for supporting protected species and habitats is likely to be limited. There is a Potential Habitat for protected species via the Wildlife Countryside Act 1981 (Water Voles) 200m south west of the site. Designated Ancient Woodland is located approximately 400m south of the site.	Further surveys required for Phase 1 Habitat Survey. Biodiversity enhancements in the form of boundary planting etc would be required to achieve National Grid policy of biodiversity net gain.	There is potential for residual effects on protected species (if present) through direct loss of habitat although potential impact is considered limited.
Historic Environment	The site is not within close proximity of any designated heritage assets and no	A detailed landscape and visual impact assessment would include consideration	Any anticipated direct archaeological impacts would be mitigated through

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	evidence of archaeological significance has been identified as part of this study. Option 7 is evaluated as 'High' quality of historic landscape within LANDMAP. All sites identified within the longlist are evaluated at 'High' or above in terms of LANDMAP Historic Landscape datasets and therefore Option 7 performs comparative to other sites assessed as 'High'.	of the impact on Tywi Valley Registered Historic Landscape. In terms of archaeological impacts, a desk-based assessment would be required to provide a more detailed understanding. This may then need to be supplemented with intrusive investigations.	advance excavation and recording ('preservation by record') and through the development of a Written Scheme of Investigation ('WSI').
Water, Geology and Soils	Option 7 is located within Flood Zone A on the Development Advice Map. However, it does contain localised areas Flood Risk from Surface Water. Option 7 is located wholly within a Secondary A Bedrock area and covered by both medium and high simplified groundwater vulnerability areas. Option 7 is evaluated as 'Moderate' quality of Geological Landscape within LANDMAP. The Site is not located within agricultural land of grades 1, 2 and 3a of the Agricultural Land Classification (ALC) system. The Site is located within Local Plan Policy MPP3 Mineral Safeguarding Area	Generic pollution control mitigation would be adopted through a Construction Environmental Management Plan (CEMP). Realignment of field drainage ditches where present may be required. A Flood Consequence Assessment and Drainage Strategy will be required. Although the MPP3 Mineral Allocation stresses the importance of safeguarding access to mineral resources that society may need in the future, this does not necessarily indicate a presumption in favour of working the deposits, merely that the location of the mineral is known.	No residual effects on hydrology, geology and agricultural land are anticipated.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	for High specification Aggregate (Sandstone and Igneous Rocks).		
Noise	The nearest noise receptors include a number of residential and agricultural buildings, all located within 300m of the Site.	During operation, noise from the substation will adhere to requirements specified by the Local Authority in order to minimise noise break out from the facility.	It is expected that the impact on noise sensitive receptors will not be significant. It is assumed that standard construction control measures or Best Practical Means would be adhered to within a CEMP which would reduce construction noise effects.
Socio-economic			
Traffic and Transport	Option 7 is approx. 200m from a 2-lane single carriageway road. In order to provide suitable access to the site, a new access road of 200m will be required. The site is located to the east of the M4 adjacent to the B4297. The B4297 is a two lane single carriageway roads and links to the M4 junction 49 via the A48. An access road would be required of approximately 100m from the B4297. Requirement to divert existing country road providing isolated residential properties access to the B4297 anticipated. Whilst road access to 1no residential property and 1no agricultural building to the west would be retained to	Sensitive hedge removal and re-planting for access road. A Construction Traffic Management Plan will be developed for the construction on the Proposed Development.	There are potential effects caused by traffic disturbance to local residences. However, based on the assumption that no regular HGV or notable load traffic will be required during operation this is not likely to be significant as it will be for the duration of construction only. The diversions required may also impact of existing properties in the area - the diversion of traffic and pedestrians during construction may affect amenity.

Subtopics	Subtopics Main potential effects (adverse and beneficial)	Key mitigation requirement	Residual effects and implications
	the A48, 2no properties immediately to the north would lose road access and require consideration for diverted access routing or consideration for alternative substation repositioning.		
PRoWs	Option 7 is crossed by an existing PRoW (34/32) on the western part of the site. The PRoW begins at the B4297 following the access road to the farmland property adjacent to the site and terminates at the existing country road north of the site.	It is likely that the PRoW will require permanent diversion. Such diversions are made under via applications submitted under section 257 of the Town and Country Planning Act 1990.	It is likely an application will need to be made under section 257 of the Town and Country Planning Act 1990, with a consultation process carried out that may result in objections to the proposed order. However, an application may not need to be made if the diverted route is more or equally commodious than the current route. At this stage, the route of the diversion is unknown.
Technical and Cost			
OHL	Option 7 is located approximately 100m from the existing OHL.	Option 7 is considered to have low technical and cost implications resulting from OHL re-routing (approx. 100m) and length of potential access route (approx. 200m).	Option 7 is not anticipated to result in high technical and cost implications due to the proximity to the OHL.

6.7 Comparison of Shortlisted Sites

Option 3

- Consists primarily of agricultural land of which ecological potential for supporting protected species and habitats is likely to be limited.
- Option 3 is primarily unconstrained in terms of environmental and socio-economic factors, however there are existing residential receptors nearby.
- The site can be micro-sited to avoid the isolated small waterbody (pond) and small patches identified at risk of flooding are considered to be able to be mitigated.
- Due to the proximity of Option 3 to existing residential properties and the visual effects on the nearby villages of Idole and Bancycapel, there is a high potential for objections at the consenting stage from neighbouring residents.
- There is a risk that potential for objections could either make it difficult to obtain consent for the final scheme and/or that mitigating these potential effects could significantly increase the cost.
- Option 3 is also considered to require the highest amount of potential re-routing of the existing OHL in comparison to the other shortlisted sites due it its distance from the OHL.

Option 5

- Situated immediately adjacent to the existing OHL representing minimal environmental, landscape and visual impact from connection to the substation.
- The site is well contained visually due to hedgerows along existing field boundaries and local highways.
- The site is elevated in the landscape but comprises relatively flat landform. Despite its elevated position, there are few visual receptors identified and the substation would sit in context with the immediately adjacent OHL with available land to provide screening.
- The site is not subject to notable environmental constraints and it is not anticipated that there would be any significant residual socio-economic effects at the nearest sensitive receptors and the PRoW.
- Whilst there are some neighbouring residential properties, the separation distances involved together with intervening topography and hedgerows/woodland suitably screen the site from unacceptably impacting upon neighbouring residential amenity standards.

Option 7

- There is a Potential Habitat for protected species via Schedule 5 of the Wildlife Countryside Act 1981 (Water Voles) 200m south west of the site. Further surveys would be required in the form of a Phase 1 Habitat Survey, however the substation development could cause habitat loss or fragmentation and pollution disturbance to the Water Voles.
- Visual receptors include users of the B4297 and users of the lane to the north and PRoW to the west.
- Residential receptors include nearby farmsteads and isolated properties, which form the main consideration in terms of visual amenity.

- Option 7 is located within a Mineral Safeguarding area, whereby planning permission will only be granted in specific circumstances.
- At present, the site marginally avoids three existing isolated buildings. It was considered at the Long List stage that impacts on these isolated residential buildings could be avoided through micro-siting the exact location of the redline boundary for the site, however this is not possible due to the other combined technical constraints, including the road, topography, the Mineral Safeguarding Area and other residential settlements.
- There is a risk that potential for objections could either make it difficult to obtain consent for the final scheme and/or that mitigating these potential effects could significantly increase the cost.
- It is also anticipated that there will be likely residual socio-economic effects related to Option 7 due to the requirement to divert the existing country road, meaning 2no properties immediately to the north would lose road access, and as there is a need to permanently divert the PRoW, which will require a separate application, and may result in objections.
- Option 7 is anticipated to result in a high cost and complexity associated with diversions of the existing country road.

7 Conclusions

7.1 Summary of Siting Study

7.1.1 The aim of this Siting Study is to identify a site that offers a preferred location for a new 400kV substation that can be taken forward for optioneering of deliverability, detailed siting and design, external engagement and successfully through the consenting process.

7.1.2 Constraints data was incorporated into GIS and formed a basis for comparative analysis of siting options. Key principles as set out in the Horlock Rules and National Grid's '*Our Approach to Options Appraisal'* were used to identify an initial 7 Sites, which formed the 'long list'. The 'long list' was essentially formed by identifying areas considered free from designations and constraints. A desk-based study was then conducted on each site to determine the existing conditions, benefits and limitations.

7.1.3 That analysis led to the identification of 3 'Short List' sites. The shortlisted sites were then assessed in detail to identify the optimum site, using the OAST analysis method.

7.2 Conclusion

7.2.1 The OAST tables within Chapter 6 set out the assessment of the Short List sites against a number of criteria. The outcome was that Option 5 is the preferred site for the substation.

7.3 Summary of Option 5

7.3.1 In respect of the 6no isolated residential properties adjacent to the site, 2no properties front/face the site, which are located 150m east and 360m south of the site. LIDAR data suggests isolated residential properties to the south are screened from views via the intervening elevated landform at 125AOD whilst residential properties located east and west of the site have limited visibility due to existing intervening woodlands.

7.3.2 The site is immediately adjacent to the existing OHL so minimises environmental, landscape and visual, technical and cost implications for connection to the substation. The site is also crossed by an existing 132kV OHL.

7.3.3 Wales Coastal Path (and NCN Route 4) is located approximately 1.4km to the west however views from this receptor are limited. Views from the Coastal Path are focused toward the Tywi estuary to the west. The landform and existing woodland west of the site function as suitable screening.

7.3.4 Small parts of the site are crossed by what appears to be a drainage ditch and associated areas identified at risk of flooding from surface water and small watercourses and edges of the southern part are also identified at risk of flooding, which will require appropriate mitigation to demonstrate no increase of flood risk elsewhere. The entirety of the site is however free from flood constraint areas including Flood DAM Zone C1, Zone C2 and Zone B.

7.3.5 Whilst there is BMV Agricultural Land (Grade 3a) and Ancient Woodland to the west of the site they will not be directly impacted by the substation.

7.3.6 A Scheduled Monument (Castell y Domen, Gwempa) comprising the remains of a motte and ditch is located approximately 1.6km southeast of the site. Again, however, it is not considered that the substation will have a direct impact on this heritage asset.

7.4 Micro Siting

7.4.1 Micro siting is a design and planning process through which the specific location for the substation is determined during the detailed design stage.

7.4.2 It is considered that the preferred site (Option 5) can be micro sited to avoid or reduce effects associated with existing constraints during the detailed design stage. This will minimise any adverse effects as far as reasonably practicable.

7.5 Consenting

7.5.1 The delivery of the substation will require appropriate planning consent as the scale of the works fall outside of permitted development parameters.

7.5.2 All sites fall within Carmarthenshire County Council and will require a detailed planning application to be submitted and approved in accordance with the Town and Country Planning (Development Management Procedure) (Wales) Order 2012 in order for development to be able to take place.

7.5.3 It is considered that the preferred site (Option 5), subject to detailed design and further environmental assessment work, provides an option that can be brought forward for consent.

Appendix A Horlock Rules

Appendix D Preliminary Ecological Appraisal Technical Note

TECHNICAL NOTE

Job Name: Pont Abraham 4.2 stage FEED design

Job No: 331201429

Date: 10th July 2023

Prepared By: Amy Freeland, Graduate ecologist

Checked By: Zak Mitchell, Senior ecologist

Reviewed by: David Macknay, Principal ecologist

Subject: Preliminary Ecological Appraisal Technical Note

1. Overview

1.1. Stantec UK was commissioned by National Grid to undertake a Preliminary Ecological Appraisal (PEA) of an area of land which will form the new Port Abraham substation within Carmarthenshire in West Wales, hereafter referred to as "the Site".

1.2. The Site is located at Carmarthenshire, Wales, nearest postcode SA17 5NH (central grid reference: SN 41881 13391).

1.3. The Site comprised of several neutral grassland fields. Outside the site boundary, there are further areas of neutral grassland and patches of semi-natural broadleaved woodland. There are several fields to the east of the Site which based on aerial imagery, likely consist of more valuable habitat, but they were outside the survey area and not recorded on any of Natural Resources Wales (NRW)'s datasets. The Site has an approximate area of 10 hectares (ha).

1.4. The purpose of the PEA is to assess ecological constraints to inform a planning application for a proposed new Pont Abraham substation, a new 16 bay 400kV substation consisting of four feeder bays, two bus couplers, two bus sections and seven Supergrid Transformer (SGT) bays and possibly additional generator bays. The ecological considerations outlined in this Technical Note should feed into the evolving development process.

1.5. This Technical Note summarises the results of a desk study, a field survey and any key ecological considerations for the current proposed development, including recommendations in relation to further ecological survey(s). This Technical Note can also form the basis of early consultation with relevant key stakeholders e.g., Local Planning Authority (LPA) Ecologist.

1.6. This Technical Note is not intended to form part of a planning submission for which an Ecological Assessment Report should be prepared, which will present the findings of any necessary further surveys, and fully assess the ecological impacts of the final commercial scheme design. Please note that this report does not purport to provide detailed, specialist legal advice.

2. Methods

2.1. This PEA was informed by:

- A desk study (review of existing ecological baseline information available in the public domain and information held by relevant third parties) namely; data available from NRW and a review of ecological records obtained from the Aderyn Local Environmental Records Center (LERC) in December 2022.
- An extended UK Habitat Classification (UKHAB) survey

2.2. For detailed methodology please refer to **Appendix A**.

3. Results

3.1. This section summarises pertinent results from the desk study and field survey in relation to the proposed development. Full results for the entire survey area are detailed in **Appendix B to Appendix G**.

Designated Sites

3.2. There are two internationally designated areas within a 5km radius:

- River Tywi / Afon Tywi Special Area of Conservation (SAC) – 4.6km north from site
- Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd SAC – 2.0km west from site

3.3. There are four nationally designated areas within a 5km radius:

- Afon Tywi Site of Special Scientific Interest (SSSI) – 2.0km northwest from site
- Coed Gwempa SSSI – 2.1km southeast from site
- Coedydd Capel Dyddgen SSSI – 4.7km East from site
- Glan Pibwr Stream Section SSSI - 4.5km northeast from site

3.4. There are no non-statutory designated areas within 5km of the Site.

3.5. Designated areas and habitat lists are provided in **Appendix B** and **Appendix C.**

Habitats

3.6. The locations and extent of habitats recorded during the extended UKHAB survey are shown on **Figure 1**. The Site comprised primarily of neutral grassland fields separated by native hedgerows. Semi-natural broadleaved woodland is located just outside the site boundary.

3.7. Semi-natural broadleaved woodland and native hedgerows are priority habitats. It is recommended that a CEMP be prepared and implemented during any construction activities to prevent adverse impacts on notable habitats present on Site. This CEMP will include best practice measures to control noise, dust, and pollution.

3.8. The desk study revealed the following priority habitats within a 5km radius of The Site;

- Ancient semi-natural woodland – Several parcels located to the east and south of the site, with the closest area approx. 0.4km to the east.
- Restored ancient woodland site – Several parcels located to the east and south of the site, with the closest area approx. 0.6km to the south.
- Plantation on ancient woodland site – One parcel approx. 1.9km North-west of the site
- Ancient woodland site of unknown category – One parcel approx. 3.6km South of the site
- Coastal saltmarsh priority area – One parcel approx. 2.0km West of the site
- Woodland – Plantation on Ancient Woodland Sites priority area – approx. 1.7km North-west of the site

- Heathland and grassland priority area – approx. 3.9km North-east of the site
- Hedgerows – priority area – Within the site area

Protected and Notable Species

3.9. The desk study revealed Eurasian Otter (*Lutra lutra*) recorded most recently in March of 2021, Eurasian Badger (*Meles meles*) recorded most recently in March of 2022, Hazel dormouse (*Muscardinus avellanarius)* recorded most recently in March of 2022*,* Polecat (*Mustela putorius*) recorded most recently in June of 2022, and several species of bat and birds recorded within 5km from The Site within the last 10 years. However, these sightings have not been reviewed and are therefore unconfirmed. During the field survey habitat was confirmed as having little potential to support these species beyond commuting and foraging. A full list of protected and notable species recorded within 5km is given in **Appendix D.**

3.10. Following a review of Ordnance Survey (OS) mapping and online satellite/aerial imagery, two ponds were identified within 500m of the Site. In addition, semi-natural broad-leaved woodland and hedgerows can support amphibian species outside the breeding season; therefore amphibians may be present.

3.11. The hedgerow has low potential to support badger setts, however no evidence of badger presence was observed during the survey with the exception of a single mammal path (Target note 3 - within **Figure 1**) which did not have sufficient features to be attributable to any single UK mammal species. The hedgerow does provide valuable foraging habitat. Open fields are favourable for use by commuting and foraging badgers therefore a pre-works badger check must be conducted prior to works commencing.

3.12. The hedgerow on Site and nearby woodland have low to moderate suitability to support reptiles. If works require hedgerow or woodland removal, this should be carried out under an ecological watching brief.

3.13. Mature trees on and around the Site have been noted as having potential to support bats. Specifically two mature oak trees were noted with high potential for roosting bats (Target note 2 - within **Figure 1**) If any mature trees are to be felled or trimmed, a full bat roost potential assessment must be conducted prior to the works, with the possibility for further survey required if roosting potential is identified.

3.14. Hedgerow on Site and nearby woodland has moderate to high potential to support nesting birds. If hedgerow or woodland requires clearing between March-August, a pre-works check must be conducted no more than 24 hours prior to works. Additionally, Eurasian Skylark (*Alauda arvensis*) song was heard on site, so ground-nesting bird checks will also be required no more than 24 hours prior to works commencing.

3.15. Grassland on Site has high potential to support ground nesting birds, and evidence of Eurasian skylark (*Alauda arvensis*) breeding behaviour in the form of song was observed on Site (approx. location at Target note 1 - within **Figure 1**). If works are carried out between March-August, a pre-works check must be conducted no more than 24 hours prior to works.

3.16. Hedgerows on Site may have low potential to support commuting Hazel dormice. It is recommended that hedgerows are retained wherever possible. If hedgerows require removal, then this should be done under ecological supervision.

3.17. There are 62 species of fungi in England and Wales with some level of protection, one of which is solely protected by Welsh law namely, *Clavaria zollingeri.* A full list of protected Fungi species is provided in **Appendix E** with likelihood of occurrence on Site. An Autumn Site walkover would be preferable to confirm absence of fungi protected species but is not required, as the habitats on site are not known to be favourable for any of the 62 species. If clearance of any woodland habitat is required, this should be re-assessed.

3.18. No Protected species were observed while on site, except for common bird assemblages and Eurasian skylark.

3.19. A list of invasive species recorded within 5km is given in **Appendix E**.

4. Ecological Constraints, Opportunities and Recommendations

4.1. Although the exact development proposals are unconfirmed, this section outlines key ecological issues for consideration and recommendations for further survey and assessment work and ecological enhancements where appropriate. Any recommended further surveys are needed to demonstrate that any development will be in-keeping with National and Local planning policies.

4.2. The key relevant National and Local Planning policies and legislation are presented in **Appendix H**, with a key overarching aim of protecting and enhancing the natural environment. Any proposed development scheme will need to be considered against National and Local Planning policies in addition to any relevant wildlife legislation.

4.3. To enable the proposed development to be demonstrably compliant with planning policy and legislation and to protect features of ecological value within and around the Site, the 'Mitigation Hierarchy' needs to be applied to the scheme design. This is a set of principles, in sequential order of preference which can be defined as follows (Adapted from Business and Biodiversity Offsets Programme):

- **Avoidance**: measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to avoid impacts on certain components of biodiversity.
- **Minimisation**: measures taken to reduce the duration, intensity and / or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided, as far as is practically feasible.
- **Rehabilitation/restoration**: measures taken to rehabilitate/ restore degraded habitats/ ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised.
- **Compensation**: measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and / or rehabilitated or restored.

4.4. The ecological constraints and opportunities associated with the whole Site, and whether further ecological survey is likely to be required based on the current proposed development is set out below in **Table 1**. **Table 1** is colour coded as follows:

- **High Constraint (colour coded red)** - Features which are identified as a 'High' constraint should be retained wherever possible, as these are either sites of recognised ecological value (designated sites), or habitats/ features which support European protected species, such as great crested newts within ponds, known bat roosts. Should these habitats/ features be affected by the proposals, significant mitigation/ compensation is likely to be required. Such constraints could include significant impacts on European protected species, requiring substantial mitigation to be implemented with onerous licensing implications. If there is an impact on a site of considerable nature conservation value, this constraint may result in part of a site being precluded from developed.
- **Moderate Constraint (colour coded amber)** - Every effort should be made to retain habitats or features considered to be of moderate value to nature conservation, but where this is not possible, mitigation will be required to minimise the impacts of the loss. Generally, this is straightforward mitigation, and is likely to include appropriate habitat translocation, creation and/ or enhancement measures. In addition, where the potential for habitats or features to support protected species have been recorded, these have also been identified as a 'Moderate' constraint.

- **Low Constraint (colour code green)** - Other areas of habitat have been marked as 'Low' constraint. Although they are not recognised as nature conservation priorities, they are still of some conservation value, and should be retained, if possible, within the masterplan layout. These include the areas of habitat for example which may provide nesting habitat for birds or places of shelter for amphibians.

4.5. High level considerations for either scheme design or implementation are also provided within **Table 1**. General guiding principles are set out in **Appendix I**. Details regarding survey seasonality requirements is set out in **Appendix J**. Legislation and planning policy relevant to protected areas, habitats and species relevant to the Site is summarised in **Appendix H**.

Table 1. Summary of ecological constraints and opportunities and recommendations

Ecological feature	Constraints	Opportunities	Further Survey Required	Design Stage Considerations	Implementation Stage Considerations
High (Red) Constraint					
No high constraints					
Moderate (Amber) Constraint					
Polecat	If polecats are present a license may be required for development work. The Wildlife and Countryside Act 1981 (as amended) lists the polecat on Schedule 6.		No* – A Pre-works check of the surrounding area should be conducted to confirm absence.		If construction occurs which involve offences under this legislation (schedule 6), or if a translocation project is needed. a licence must be provided from National Resources Wales.
Eurasian Badger	If Badger setts are present, a license may be required for development work.		No* – A pre-works check should be conducted on hedgerows and nearby woodland no more than 24 hours before works commence to ensure no new setts have been dug.	Legislation states that no works can commence less than 30m from an active badger sett.	If an active badger sett is found an ecologist must be present to supervise all works and to ensure no work is undertaken within 30m of the sett. If this cannot be avoided, a license must be applied from Natural England and significant mitigation measures must be put in place possibly including the construction of a new artificial sett away from the development.
Birds	Breeding Birds The areas of trees and hedgerows and grassland have moderate to high suitability as nesting habitat for a variety of bird species. All wild birds, their active nests and eggs are protected under The Wildlife and Countryside Act 1981.	Scope to provide targeted nesting boxes or features for either specially protected or notable bird species. Habitat creation.	No* - If nesting bird habitat is to be removed March to August inclusive, pre works check will be required. If works take place between March to August, a ground-nest pre-works check will be required.	Avoidance (if possible). Minimise impact on the woodland/trees/scrub which provide suitable habitat for breeding birds (if possible). Create new habitats.	If required, vegetation removal will need to take account of the potential presence of bird nests. Ideally, such works would be completed outside the main nesting period (i.e., within the period September to February inclusive). If this is not possible, areas to be cleared would require a pre works check by a suitably experienced ecologist.
Great Crested Newts	If Great Crested Newts are present a license will be required to carry out development works, and the		Yes – eDNA samples to be taken between April-June to determine presence or absence	Avoid habitat loss	An ecologist must be present for any vegetation removal to ensure no great crested newts are present and if so, are not disturbed

Ecological feature	Constraints	Opportunities	Further Survey Required	Design Stage Considerations	Implementation Stage Considerations
	development design must ensure their conservation status remains favourable.				
Low (Green) Constraint					
Hazel Dormouse	Hazel dormouse – If Hazel Dormice are present a license may be required for development work.	Hedgerow and scrub planting could help provide suitable habitat and/or commuting corridors.	No – Assuming no woodland or scrub habitats are affected, a survey is not required.	Dormice are protected along with their breeding and resting sites.	Construction may require an English nature and DEFRA license if hazel dormice are found and/or are nesting in the area. Improvement of hedgerows to allow higher potential for foraging, shelter and habitat corridors.
Broadleaved woodland/ Bats	Broadleaved woodland is a priority habitat. If active bat roosts present, plans may need alterations, or a license may be required for development.		No – Assuming no woodland or mature trees are affected, a survey is not required.	Avoid habitat loss if possible. Retain trees where possible.	Construction Environmental Management Plan to take into account: • Construction to take place at significant distance from any identified bat roosts • Soft felling methodology to be carried out on any trees with bat roost potential under the watch of a licensed ecologist • Improvement of hedgerows to allow higher potential for foraging, shelter and habitat corridors. • Noise and Vibration control which can include acoustic barriers • No excess light to be used at night • Improve the woodland by introducing biodiversity and introducing trees at different life stages into the woodlands. License may be required if confirmed roosts.
Reptiles	If Reptiles are present a license may be required for development work		No – The habitat on site has low suitability for reptiles. If any areas of woodland are to be cleared, reptile surveys may need to be conducted beforehand.	Avoid habitat loss. Suitable nearby habitat for reptiles needs to be identified if translocation is required	An Ecologist must be present during any vegetation removal throughout the works. Vegetation to be replaced to improve appropriate reptile habitat. A licensed ecologist will need to be present if reptiles need to be translocated.

* While no further survey is required, mitigation of some nature is required (detailed in the table)

4.6. Following the issue of the National Planning Policy Framework (NPPF July 2021), all planning decisions should aim to maintain and enhance, restore or add to biodiversity and geological conservation interests. Further information is provided in **Appendix H**.

4.7. The Government plans to mandate Biodiversity Net Gain (BNG) (10%) through the Environment Act 2021, to secure a positive impact on biodiversity through development. A tool to facilitate this has recently been made available from Natural England: The Biodiversity Metric 4.0 Calculation Tool, which will at least closely reflect the mandated metric. The metric measures the present and predicted future biodiversity value of the site using habitat type and quality as a proxy for biodiversity and calculates whether development of a site will lead to a net gain in biodiversity value. Many Local Planning Authorities are now requesting that a Biodiversity Net Gain Assessment using this tool is provided with planning applications, to evidence BNG. As part of the pre-app process the requirement for a BNG assessment should be discussed and agreed with the LPA.

4.8. As detailed above, in the first instance, the principles of the mitigation hierarchy should be followed in the development of any masterplan; this approach would be critical to allow development at the Site to try to achieve BNG whilst minimising the requirements for any offsetting and maximising enhancement opportunities on-site.

4.9. The scheme design should aim to create ecologically valuable habitats which connect to the wider landscape. In relation to this Site, this would comprise enhancement of introduce shrub. Further ecological enhancement measures could comprise the following:

- Consider opportunities for incorporating ecological enhancements alongside proposed drainage, access and landscape design provisions.
- Species specific faunal enhancements incorporated within the scheme design, including integrated into the built form (such as bat, bird and invertebrate boxes), where appropriate and within suitable habitats areas within the Site (hibernacula, log piles, bat and bird boxes on retained trees).
- Creation of new habitat such as hedgerows.
- Ecological sensitive green infrastructure that serves both people and nature such as green walls, green/brown roofs, wildflower verges and living pillars.

5. Conclusion

5.1. This PEA provides the methods and results of the ecological desk study and UK habitat classification completed to inform the proposed works in Carmarthenshire, West Wales.

5.2. A summary of the pertinent ecological constraints and opportunities is provided within **Table 1**, which also outlines where further survey is likely to be required and provides high level considerations for the scheme design and implementation.

5.3. The Site comprises areas of hedgerow and neutral grassland. Areas of semi-natural broadleaved woodland are located adjacent or nearby (100-250m) the site boundary.

5.4. In order to progress the proposed works, the following next steps will be required:

- Liaison with the project team to ensure the masterplan design has considered the mitigation hierarchy accordingly.
- Further surveys are required dependent on timing of works and final details:

- An eDNA survey should be conducted on any waterbodies within 500m of the site boundary to ensure that great crested newts are absent from the area.
- A pre-works badger check is required by a suitably qualified ecologist no more than 24 hours before works commence.
- If works are between March and August inclusive, a pre-works nesting bird check is required by a suitably qualified ecologist no more than 24 hours before works commence. This must include ground nesting birds.
- If the works design changes the requirement for further surveys must be reviewed.

- An Ecology Assessment Report (EAR) will need to be produced which will be submitted to support the planning application. The EAR will set out the full survey results, will provide an evaluation of the value of habitats present and their value to support protected and notable species, assess the impact of the proposed works and will detail the mitigation and compensation measures (if required) to be implemented to ensure that the works are undertaken in line with local and national policy aspirations (National Planning Policy Framework (NPPF), 2021) and local planning policies.

- An ecologically informed landscape design would contribute towards a measurable BNG, as likely to be required by Local and National Planning Policy. Potentially off-site enhancement may also be necessary to meet this requirement.

- Environmental control measures will have to be devised and detailed in the Construction Environmental Management Plan (CEMP) in order to prevent direct/indirect impacts upon ecological features. As a matter of good practice precautionary measures as set out in **Appendix H** should be implemented during construction.

REFERENCES

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Technical Note No	Rev	Date	Prepared	Reviewed	Approved (Project Manager)
331201429	1	15/09/2023	Amy Freeland	Zak Mitchell	Lucy Bankhead
331201429	2	03/10/2023	Amy Freeland	Zak Mitchell	Lucy Bankhead

DOCUMENT ISSUE RECORD

TECHNICAL NOTE

FIGURE 1 Extended phase 1 habitat survey plan

TECHNICAL NOTE

APPENDIX A – Survey Methodology

Desk Study

An ecological desk study was completed to collate current baseline data held by statutory and non-statutory consultees in line with standard guidelines (IEA, 1995) and current best practice (CIEEM, 2017a and 2017b).

Ecological records were requested from West Wales biodiversity information centre (WWBIC) in November 2022. Additionally, the Multi-Agency Geographic Information for the Countryside (MAGIC) website was searched for any supplementary information. The desk study records include only those from the last 10 years to reflect the current / recent ecological context of the Site.

The following baseline data were gathered for a 5 km radius around the Site. Records of statutory sites designated for nature conservation value including European Sites (comprising Special Areas of Conservation (SACs) and UK sites such as Sites of Special Scientific Interest (SSSIs);

- Records of non-statutory sites designated for nature conservation;
- Records of notable habitats as listed in accordance with Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006), and ancient woodland parcels;
- Records of legally protected species and notable species (including Species of Principal Importance (SPIs) under the NERC Act (2006)), locally rare and scare species and European Protected Species (EPS); and,
- Records of invasive non-native species.

Additionally, a search of ponds within a 500 m radius of the Site was also carried out using a combination of aerial photographs/satellite imagery and OS mapping.

The desk study also included a review of relevant national and local planning policy and biodiversity strategies.

Limitations

Data supplied by records centres provides useful baseline information on the species that have been recorded within a local area and details of sites with nature conservation designations. This data often includes surveys undertaken by third parties on an ‘ad hoc’ basis so may be incomplete. Absence of species records may not therefore indicate absence of that species from an area. For this reason, a preliminary ecological appraisal is always informed by both desk study and information gathered during field survey.

TECHNICAL NOTE

APPENDIX B – Designated Areas

Statutory Designated Sites

There are two international statutory designated sites located within 5km of the site. **Table 2** details the location of the areas designated and their reason for designation.

Table 2. Internationally designated Sites within 5km of the Site.

Designations	Reason(s) for Designation	Approximate Distance from the Site
River Twyi / Afon Twyi SAC	Considered to be an area of great significance for species such as the European otter (*Lutra lutra*), and Brook Lamprey (*Lampetra planeri)* Twait shad (*Alosa fallax*) (protected under Appendix III of the Bern Convention, 1979).	4.6km north
Carmarthen bay and estuaries / Bae Caerfyrddin ac Aberoedd SAC	Habitats present here include sandbanks which are partially covered by marine estuaries. Additionally, mudflats and sandflats not covered by seawater at low tide, large shallow inlets and bays are present, for which this is considered to be one of the best areas in the United Kingdom. Also considered to be an area of great significance for species such as the European otter (*Lutra lutra*), and Brook Lamprey (*Lampetra planeri)* Twait shad (*Alosa fallax*) (protected under Appendix III of the Bern Convention, 1979).	2.0km northwest

There are four nationally designated sites have been identified within 5km of the site. **Table 3** details the location of designated sites and their reason for designation.

Table 3. Nationally designated Sites within 5km of the Site.

Designations	Reason(s) for Designation	Approximate Distance from the Site
Afon Tywi SSSI	Afon Tywi Site of Special Scientific Interest extends downstream from Llandovery to the confluence with the Afon Taf and Pembrey Coast SSSI in Carmarthen Bay. It is an actively eroding river meandering across a wide flood plain which is composed of alluvium, glacial sands and gravels. This has resulted in extensive shingle banks being formed. These are important for water and wetland birds namely; Kingfisher (*Alcedinidae*) and Sand martins (*Riparia riparia*) and invertebrates, and the river is also of special interest for its fish species and otters, and in its lower reaches for its saltmarsh vegetation.	2.0km northwest
Coed Gwempa SSSI	Coed Gwempa is a semi-natural woodland. Over large areas the ground flora comprises dog's mercury (*Mercurialis perennis*), which is sometimes very abundant, along with enchanter's-nightshade (*Circaea lutetiana*)	2.1km southeast
Coedydd Capel Dyddgen SSSI	The site is of special interest principally for its ash-hazel woodland and unimproved neutral grassland but various mammal, invertebrate and plant species also contribute to the biological interest of the site. Greater horseshoe bats (*Rhinolophus ferrumequinum*) and at least five other species of bat utilise the large cave Ogof Capel Dyddgen and the adjoining mosaic of woodland and pasture provide important feeding areas for these species. Dormice (*Muscardinus avellanarius*) also occur in the ash-	4.7km east

Designations	Reason(s) for Designation	Approximate Distance from the Site
	hazel woodland and adjoining hedgerows The neutral grassland areas are also of conservation interest, holding the only known example of slightly calcicolous neutral grassland in Carmarthenshire.	
Glan pibwr stream section SSSI	Glan Pibwr is of particular importance as it is regarded as the 'type locality' for part of the Lower Ordovician sequence of South Wales. The strata exposed in this stream section were laid down as a blanket of mud on a sea floor which existed in this area during Lower Ordovician times some 500 million years ago. Over the years, the section has yielded a great diversity of fossil animals, the most notable of which are the trilobites. Remains of these sea dwelling arthropods, a group of animals which is now extinct, are well-preserved in the mudstones at Glan Pibwr and the section has yielded a number of species which are only rarely found elsewhere in Britain.	4.5km north

Non-Statutory Designated Sites

There were no non-statutory designated sites identified within a 5km radius.

Notable habitats

There are seven notable habitats (identified using data from the Wales biodiversity information & reporting data base) within the 5 km study area surrounding the Site during the desk study are summarised in **Table 4** below.

Table 4: Notable Habitats within 5km

Habitat	Reason(s) for protection	Approximate Distance from the Site
Ancient semi natural woodland (ASNW).	Comprising mainly native tree and shrub species which are believed to have been in existence for over 400 years. They will have been woodland for centuries and contribute substantially to our natural and cultural heritage.	0.6km (surrounding site)
Restored ancient woodland site (RAWS)	These are woodlands which are now predominately broadleaved and are believed to have been continually wooded for over 400 years.	1.2km northwest
Plantation on ancient woodland site. (PAWS)	These are sites which are believed to have been continuously wooded for over 400 years. They have been replanted with native or non-native species, most commonly with conifers.	1.9km northwest
Ancient woodland site of unknown category	Woodland which may be ASNW, RAWS or PAWS. These areas are predominantly in transition where the existing tree cover is described as shrubs, young trees, felled or ground prepared for planting.	3.6km south
Coastal saltmarsh priority area	Saltmarshes act as a valuable natural flood-defence, dissipating wave energy and reducing scour.	2.0km west

Habitat	Reason(s) for protection	Approximate Distance from the Site
Woodland – PAWS priority area	NRW Priority habitat areas are large scale areas which were prioritised for targeted conservation work, based on factors including the habitats within them.	1.7km northwest
Heathland and grassland priority area	Hhabitat has been vastly reduced over the last century. Reptiles such as the adder and common lizard are in decline in the area and are increasingly confined to heathland and peatland habitats.	3.9km northeast

APPENDIX D – Protected and Notable Species Records

See accompanying excel file.

APPENDIX E – List of protected Fungi species.

See accompanying excel.

APPENDIX F – Non-Native Invasive Species Records

See accompanying excel file.

TECHNICAL NOTE

APPENDIX H – Relevant Legislation and Policy

This report does not purport to provide detailed, specialist legal advice. Where legislation is referenced, the reader should consult the original legal text, and/or the advice of a qualified environmental lawyer.

Conservation of Habitats and Species Regulations 2017 (as amended)

The conservation of Habitats and Species Regulations transpose the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("The Habitats Directive") into law.

The 2017 Regulations consolidate the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales. The regulations provide for:

- designation and protection of European Sites (Special Protection Areas (SPA) and Special Areas of Conservation (SAC)) including the need for Appropriate Assessment' of plans and proposals.
- protection of European protected species.
- adaptation of planning and other controls for the protection of European Sites.
- make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2.

No actions that will impact upon a European protected species or its habitat can be undertaken unless authorised by a European Protected Species licence issued by Natural England. Such a licence is granted until after planning consent has been granted once Natural England are satisfied that adequate measures are to be put in place to mitigate for the impact of the development.

Wildlife and Countryside Act 1981 (as amended)

The Act implements the Convention of European Wildlife and Natural Habitats (The Bern Convention) and the Directive 2009/147/EC 'The Birds Directive'.

The 1981 Act has been amended by the Countryside and Rights of Way (CROW) Act 2000.

Schedules 1 (birds) and 5 (animals) of the Act identify species of bird and other animal in relation to which the Act makes killing, injury, taking and disturbance an offence while Schedule 8 to the Act lists species of plant in relation to which the Act makes it an offence to intentionally pick, uproot or destroy.

The Act also prohibits certain methods of killing, injuring, or taking wild animals.

Section 14(2) of the Act makes it an offence to cause any species of animal or plant listed in Schedule 9 of the Act to grow in the wild.

The Act further provides for notification and confirmation of Sites of Special Scientific Interest (SSSI) for their flora, fauna, geological or physiographical features. It also contains measures for the protection and management of SSSIs.

The Natural Environmental and Rural Communities Act 2006 ('NERC')

The NERC Act sets a duty on public bodies (including Local Authorities) to have due regard for habitats and Species of Principal Importance for biodiversity in England when carrying out their duties.

Section 41 (S.41) the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list is used by decision-makers, such as Local Authorities, in implementing their protection duties under this Act when carrying out their

functions.

The S.41 list includes 56 habitats and almost 1000 Species of Principal Importance in England. Since the UN Convention on Biological Diversity (CBD) in 2010 the UK identify these habitats and species as conservation priorities under the UK Post-2010 Biodiversity Framework, (they were formerly identified as UK BAP habitats and species).

Protection of Badgers Act

The Protection of Badgers Act 1992 protects badgers from killing or injury and makes it an offence to damage or interfere with a badger sett unless a licence is obtained from the statutory authority.

Summary of species-specific legislation

A summary of species/species group specific legislation is presented below in **Table 6**

Table 6 Summary of species/species group specific legislation

Species/species group	Summary of legislation
Great Crested Newts	Great crested newts are a European Protected Species (EPS), and both individuals and their habitat are legally protected under the Conservation of Habitats and Species Regulations (the 'Habitats Regulations') 2017 (as amended) and the WCA. Great crested newts and common toads are both Species of Principal Importance (SPI) under the NERC Act. Other UK wild amphibian species are listed on the WCA but this prohibits sale only.
Bats	Bats and their roosts are legally protected under the Conservation of Habitats and Species Regulations 2017 (as amended) ("Habitats Regulations") and the Wildlife and Countryside Act 1981 (as amended) ("WCA"). In broad terms, these pieces of legislation jointly mean that the animals themselves are protected against killing, injury, taking (capture) and disturbance. In addition, their places of shelter are protected against damage, destruction and obstruction. Some species of bat (e.g. brown long-eared, noctule and soprano pipistrelle) are also a SPI
Badger	Badgers and their places of shelter (setts) are protected under specific legislation known as the Protection of Badgers Act 1992. This prohibits (among other things) the killing or injury of badgers, the damage or destruction of setts and disturbance of badgers occupying setts.
Otter	Otters and their places of shelter are afforded protection under the Habitats Regulations 2017 and the WCA. In broad terms, these pieces of legislation jointly mean that the animals themselves are protected against killing, injury, taking (capture) and disturbance. In addition, their places of shelter are protected against damage, destruction and obstruction. Otters are also an SPI.
Water vole	Water voles and their places of shelter are afforded protection under the WCA. In broad terms, this piece of legislation mean that the animals themselves are protected against killing, injury, taking (capture) and disturbance. In addition, their places of shelter are protected against damage, destruction and obstruction. Water voles are also an SPI.
Reptiles	All reptile species in the UK are protected from killing and injury under the WCA. All native reptiles are also on the list of Species of Principal Importance (SPIs) prepared in response to Section 41 of the NERC Act 2006.
Breeding Birds	All nesting birds are legally protected from killing and injury with their active nests and eggs being protected from damage and destruction under the WCA. A selection of bird species (including house sparrow (*Passer domesticus*) among others) are also SPI under the NERC Act. As well as the blanket protection afforded to all wild birds (see above) bird species listed on Schedule 1 of the WCA, including the barn owl and kingfisher are subject to additional protection, which prohibits disturbance at or near an active a nest site. This extends to disturbance of dependent young.

Hedgehog	Hedgehogs in the UK are protected from killing and injury under the WCA. Hedgehogs are also on the list of Species of Principal Importance (SPIs) prepared in response to Section 41 of the NERC Act 2006.
Polecat	In addition to its protection under the Wildlife and Countryside Act 1981, the polecat has recently (2007) been added to the list of UK BAP mammals, protected as species of principal importance for the conservation of biological diversity in England under Section 74 of the Countryside and Rights of Way (CRoW) Act 2000.
Japanese Knotweed, Himalayan Balsam and Giant Hogweed	Listed on Schedule 9 of the Wildlife and Countryside Act (WCA) 1981 (as amended). It is an offence to plant or otherwise cause to grow in the wild any plant listed on Schedule 9 of the WCA.

National Planning Policy Framework (NPPF)

Full text is available at: National planning policy | Sub-topic | GOV.WALES

The revised NPPF was updated July 2021 setting out the Government's planning policies for Wales and the process by which these should be applied. The policies within the NPPF are a material consideration in the planning process. The key principle of the NPPF is a presumption in favour of sustainable development, with sustainable development defined as a balance between economic, social and environmental needs. Policies 170 to 183 of the NPPF address conserving and enhancing the natural environment, stating that the planning system should:

- Contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes;
- Recognise the wider benefits of ecosystem services; and
- Minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

Furthermore, there is a focus on re-use of existing brownfield sites or sites of low environmental value as a priority, and discouraging development in National Parks, Sites of Specific Scientific Interest, the Broads or Areas of Outstanding Natural Beauty other than in exceptional circumstances.

Where possible, planning policies should also:

> "*promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity*"

Local Planning Policies

Plan: Carmarthenshire county council

Phosphate pollution

Natural Resources Wales / Advice to planning authorities for planning applications affecting phosphorus sensitive river Special Areas of Conservation

In January 2021 Natural Resources Wales (NRW) published new targets to reduce river phosphate levels in special areas of conservation (SAC) across Wales.

The review followed evidence from the Joint Nature Conservation Committee that warmer and drier weather, predicted as a result of climate change, could reduce river flows during the summer and therefore increase phosphate concentrations. It is also based on new evidence about the damaging effects of phosphates to water ecosystems and species.

At present, over 60% of waterbodies in Wales fail against the tighter targets, and Welsh local planning authorities are being asked to take more action to avoid further deterioration of the environment. It means any proposals for development within SAC river catchments - in particular those that will generate increased volume or concentration of wastewater - must now prove that the design will not contribute to increased phosphate levels.

Development, flooding and coastal erosion 15

Technical Advice Note 15, Developing, flooding and coastal erosion (gov.wales)

Planning Policy Wales (PPW) establishes the delivery of sustainable places as the overall ambition of the planning system. To achieve this aim, placemaking must be embraced both in Development Planmaking and in Development Management decisions. PPW identifies five key principles of placemaking, to help shape how planning is undertaken: • Maximising environmental protection and limiting environmental impact • Facilitating accessible and healthy environments • Making best use of resources

Biodiversity

Biodiversity (gov.wales)

Welsh Government (WG) published a list of species in Wales that they consider are of key significance to sustain and enhance biodiversity the country. WG and other public bodies have a duty to take all reasonable steps to maintain and enhance these species [Environment (Wales) Act 2016]. This list (S7 list) is currently under review by WG and Natural Resources Wales.

Welsh Government (WG) have published a list of habitat types in Wales that they consider are of key significance to sustain and enhance biodiversity the country. WG and other public bodies have a duty to take all reasonable steps to maintain and enhance these of habitat [Environment (Wales) Act 2016].

Conservation areas

Conservation Areas (gov.wales)

Conservation Areas are designated to preserve and enhance the special character of areas of architectural or historic interest. We have a duty to consider the designation of such areas under Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990.

TECHNICAL NOTE

APPENDIX I – General Guiding Principles

Mitigation Hierarchy

To protect features of greatest ecological value within and around the Site, the 'Mitigation Hierarchy' needs to be applied in the development of the project. This is a set of principles, in sequential order of preference which can be defined as follows (Adapted from Business and Biodiversity Offsets Programme, 2012):

- Avoidance: measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to avoid impacts on certain components of biodiversity.
- Minimisation: measures taken to reduce the duration, intensity and / or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided, as far as is practically feasible. The detailed design should be prepared following recommendations to minimise ecological impacts.
- Rehabilitation/restoration: measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised.
- Compensation: measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and / or rehabilitated or restored. Compensation can take the form of positive management interventions such as restoration of degraded habitat, arrested degradation or averted risk, protecting areas where there is imminent or projected loss of biodiversity. The specific requirement and design of any compensation should be developed, as a last resort, if avoidance, minimisation and mitigation is not practicable, and in response to the findings of the baseline surveys, and the habitats to be lost as a result of redevelopment. Compensation may include like-for-like replacement or creation of higher quality habitat.

Net Gain in Biodiversity

Following the issue of the National Planning Policy Framework (NPPF), all planning decisions should aim to maintain and enhance, restore or add to biodiversity conservation interests. The Government also plans to mandate Biodiversity Net Gain (BNG) (10%) through the Environment Bill 2021, to secure a positive impact on biodiversity through development. The Biodiversity Metric 4.0 Calculation Tool and associated User Guide has recently been published and will closely resemble the mandated metric to be published. The metric measures the present and predicted future biodiversity value of the Site using habitat type and quality as a proxy for biodiversity and calculates whether development of a site will lead to a net gain in biodiversity value. Many Local Planning Authorities are now requesting that a Biodiversity Metric calculation using this tool is provided with planning applications, to evidence Biodiversity Net Gain (BNG).

It is important that BNG is considered early in the design stage to ensure that proposals can meet this requirement, or identify whether biodiversity offsetting will be required, i.e. provision or payment for BNG offsite. To reduce offsite requirements, high distinctiveness habitats should be favoured for retention as opposed to low distinctiveness habitats which are easier to replace. The main way to ensure that this is incorporated is to follow the mitigation hierarchy.

General Measures during Construction Phase

General environmental protection measures should be implemented during the construction phase. Such measures include best environmental practice guidance outlined in the Environment Agency's Pollution Prevention Advice and Guidance (Environment Agency, 2007) (now archived) and those outlined by the Construction Industry Research and Information Association guidance (CIRIA, 2015):

- Cover any open holes, or install mammal ladders or earth ramps in any open excavations at the end of each day to prevent animals from becoming trapped;

- Cap off any open pipes at the end of each day;
- Keep all fuel and other harmful substances in a locked area;
- Ensure any spillages are treated with spill kits; and
- Night work should be avoided where possible, and any flood lighting should face away from the Site boundaries.

TECHNICAL NOTE

APPENDIX J – Survey Seasonality Requirements

Breeding Birds

Works such as vegetation clearance and building demolition will need to take account of the potential presence of bird nests. Ideally, such works would be completed outside the main nesting period (i.e. within the period September to February inclusive). If this is not possible, areas to be cleared and /or demolished would require a pre works check by a suitably experienced ecologist to be completed no more than 24 hours prior to clearance/demolition. If birds are found to be nesting then the nest will need to be left intact until no longer in use (i.e. until the young have fledged). In addition, if nesting Schedule 1 birds are identified then a buffer zone must be established to prevent disturbance.

Badgers

Badger surveys can be completed at any time of year (although the optimal time is May to October inclusive). If a badger sett is found within 30m of proposed development, licences may be required for works to go ahead.

Bats

Bat roosting potential can be surveyed all year round, although winter months can be more optimal as roost features may be more visible without dense vegetation present. Bat surveys can be carried out between April and September.

Great Crested Newt

eDNA surveys to establish Great crested newt (GCN) presence can be carried out mid-April to end of June. Population surveys can be carried out mid-March to mid-June.

Hazel dormouse

To determine dormice, present the placement of nest tubes are the most successful and const effective strategy. Firstly, placed in March and then checked throughout the months of May-August.

Otter

Surveys can be carried out any time of the year, avoiding periods when there is heavy rain. Surveys should be conducted by a suitable experienced ecologist based on current best practice methods set out in Monitoring the Otter *Lutra lutra* (Chanin, 2003.) and evidence of use of otter searched for should include:

- Spraints;
- Anal jelly;
- Footprints;
- Feeding remains;
- Otter slides;
- Holts; and
- Couches or resting places.

Polecat

Surveys can be carried out any time of the year and should be conducted by a suitable experienced ecologist with up-to-date knowledge of polecat surveying techniques and evidence of use of polecat should include:

- Scat surveys
- Hair tubes
- Footprint plates

Appendix E Outline Flood Consequence Assessment

PONT ABRAHAM 4.2 STAGE FEED DESIGN

TAN15 Flood Consequences Assessment

January 2023

Stantec

Version	Date	Description	Author	Check	Reviewer
1	13 January, 2023	1st Draft	R Pickersgill	K. Limbrick	K. Limbrick

Table of Contents

1.0 Executive Summary

This document presents the findings of an outline Flood Consequences Assessment (FCA) for substation site centred on E:241868 N213542, which is a potential substation site in National Grid's Pont Abraham 4.2 stage Front End Engineering Design (FEED) (the Proposed Project).

This FCA has been produced in accordance with Planning Policy Wales and Technical Advice Note (TAN) 15: Development and Flood Risk. This FCA demonstrates that:

- the consequences of flooding from all sources to the Proposed Project are fully understood;
- appropriate mitigation measures will be put in place to ensure that the Proposed Project will remain safe and operational during times of flooding over its intended lifetime, whilst taking climate change into account;
- the consequences (i.e. the overall impacts) of the Proposed Project on flood risk elsewhere are understood; and
- the flood consequences of the Proposed Project will be further detailed in a full Flood Consequences Assessment.

As such, this FCA demonstrates that the Proposed Project will be safe, will not increase flood risk elsewhere and is acceptable in principle for its location.

2.0 INTRODUCTION

2.1 PURPOSE

This document presents the findings of an outline Flood Consequences Assessment (FCA) undertaken for the proposed construction of a new substation at the site centred on E:241868 N213542, which has been currently identified as a design area for the 400KV+132KV substation as part of National Grid's Pont Abraham South Wales Substation Siting Study.

This FCA demonstrates that the Proposed Project site is not at risk of flooding from rivers and the sea, and is located within Development Advice Map (DAM) Zone A. However, the site contains areas shown to be at medium and high risk of flooding from surface water, as shown by Natural Resources Wales' (NRW's) "Flood Risk from Surface Water and Small Watercourses" map. The Proposed Project will introduce new areas of impermeable hardstanding; a drainage strategy for which will need to be developed, that also accounts for the presence of these surface water flooding zones.

As such, a full FCA will be required to accompany the planning application for the Proposed Project, and also an application to the SuDS Approval Body (SAB) for its Sustainable Drainage Systems (SuDS) design. SAB approval is required for the Proposed Project because its site area is greater than 100m².

This FCA seeks to demonstrate that flood risk from all sources has been considered as part of the proposed development and that the requirements of TAN15 are met. As set out in TAN15, the objectives of an FCA are to ensure that:

- Flood risk is taken into account at all stages of the planning process to ensure that new development is appropriate for its location;
- The proposed development will remain safe and operational throughout the duration of its intended design lifetime; and
- The proposed development will not increase flood risk elsewhere.

The purpose of this document is to:

- Present the broad scale and nature of the proposals for the substation development;
- Summarise the potential sources of flood risk to the new plant; and
- Identify the primary source of flood risk and present detailed flood level data to inform the ongoing designs.

2.2 REPORT OBJECTIVES AND STRUCTURE

This FCA concentrates on the flood risk issues over the operational lifetime of the proposed development. This report has been prepared in accordance with the requirements of the Welsh Government's Technical Advice Note 15 – Development and Flood Risk (TAN15). The objectives of this report are to a) quantify the flood risk to the site; b) demonstrate that the proposed development will remain safe and operational over its intended

design lifetime taking climate change into consideration; and c) demonstrate that the proposed development will not increase flood risk elsewhere.

2.3 AVAILABLE INFORMATION

This FCA is based on the following available information:

- Natural Resources Wales Development Advice Map;
- Natural Resources Wales Flood Risk from Surface Water and Small Watercourses map; and
- A site layout plan showing an indicative site location.

3.0 DESCRIPTION OF THE EXISTING SITE AND PROPOSED DEVELOPMENT

3.1 EXISTING SITE DESCRIPTION

Stantec has been commissioned to provide support to the 4.2 stage Front End Engineering Design (FEED) design of National Grid's South Wales Substation Siting Study project. It is understood that there are no viable options for the expansion of the existing Swansea or Pembroke Substation compounds to accommodate new customer connections, therefore a new 16 bay 400kV substation consisting of four feeder bays, two bus couplers, two bus sections and 7 Supergrid Transformer (SGT) bays and possibly additional generator bays is required.

A new double busbar 132kV AIS substation is required, with space for at least 11 bays, including NGET's 7x SGT bays, NGET's two bus sections and two bus couplers plus feeders.

The potential Substation site centred on E:241868 N213542 has been indicated by Stantec as a potential site for further investigation. The site is located to the north of Llandyfaelog at National Grid Coordinates (SN 41806 13449). The site is predominately agricultural in nature. The topography of the site ranges from 115 mAOD to 130 mAOD, and gradually slopes to the south west. The site is within the hydrological catchment of Afon Tywi / River Towy, which is located 2.1km to the west of the site.

The site is shown to be at minimal risk of flooding from rivers, as demonstrated in Appendix C1. However, some areas of the site are shown to have a risk of flooding from surface water and small watercourses

3.2 DETAILS OF THE PROPOSED DEVELOPMENT

The Proposed Development involves the construction of a new substation site. For the purposes of this outline FCA report, proposed development drawings of the site have not been developed. The total area of the proposed development will be approximately 10 ha.

A sustainable drainage plan will be developed as part of the site designs, which will ensure that surface water runoff from the site is attenuated to prevent an increase in surface water runoff rates in line with TAN15 guidance on drainage, in addition to wider benefits to water quality and biodiversity. As the proposed development comprises over 100m² of new impermeable area, SuDS Approval Body (SAB) approval will be required for the development. The full FCA will be used to support the SAB application.

Additionally, if the site drainage plan features a discharge into an existing watercourse, Land Drainage Consent will be required from the local authority, Carmarthenshire County Council.

4.0 FLOOD RISKS TO THE PROPOSED DEVELOPMENT

4.1 POTENTIAL SOURCES OF FLOODING

Flooding can occur from a number of sources as presented in Table 1. Maps showing the potential sources of flooding that could impact the proposed development are shown in Appendices C, D and E.

Table 1 - Possible sources of flooding (outlined in the English Planning Practice Guidance (PPG))

Source	Description
Flooding from rivers (or fluvial flooding)	River flows which exceed the flow capacity of the river channel (or culverts) can cause flooding from rivers. It can happen for example, when heavy rain falls on an already waterlogged catchment. A blockage caused by natural material or manmade objects/litter can also cause rivers to overtop their banks.
Flooding from the sea (or coastal/tidal flooding)	High tides and/or storm surges which lead to overtopping of existing defences (if any) can cause flooding from the sea.
Flooding from surface water (or pluvial flooding)	Intense rainfall that cannot soak into the ground or enter drainage systems can quickly run off the land and result in local flooding. This type of flooding is typically localised and happens very quickly after the rain has fallen.
Flooding from groundwater	Groundwater flooding occurs when water levels in the ground rise above surface elevations. It is most likely to occur in areas underlain by permeable rocks or granular layers called aquifers.
Flooding from sewers	Sewer flooding can occur when piped systems are overwhelmed by heavy rainfall, when sewers become blocked or when sewers are of inadequate capacity.
Flooding from reservoirs, canals and other artificial sources	Non-natural or artificial sources of flooding can include reservoirs, canals and lakes where water is retained above natural ground level.

4.2 FLOOD RISK FROM RIVERS

TAN15 defines three Flood Zones as shown in Table 2. The following section presents the flood risk classification for the proposed development based on the Natural Resources Wales (NRW) Flood Risk from Rivers map.

Table 2 - TAN15 DAM Flood Zones

Flood Zone	Description
A	Considered to be at little or no risk of fluvial or tidal/coastal flooding.
B	Areas known to have been flooded in the past evidenced by sedimentary deposits.
C	Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal)
C1	Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.
C2	Areas of the floodplain without significant flood defence infrastructure.

According to the Flood Risk from Rivers map provided by Natural Resources Wales (NRW), the site is located entirely within DAM Zone A (Appendix C1), meaning that there is little or no risk of fluvial or tidal/coastal flooding. Under TAN15, this means that a justification test is not applicable for this development, and the full FCA will only be required to demonstrate that there is no increase in flooding elsewhere.

4.3 FLOODING FROM GROUNDWATER

The proposed substation site is located at the top of the catchment. Any groundwater present beneath the site is likely to be deep and the effect of flooding from groundwater can be considered to be insignificant in comparison to the effect of surface water at the site. The risk of flooding from groundwater is, therefore, not considered further

4.4 FLOODING FROM SEWERS

The proposed development is currently greenfield, so no sewers are, or will be present at the site. The risk of flooding from sewers is, therefore, not considered further.

5.0 TAN 15 LAND USE ACCEPTABILITY

5.1 TAN 15 DEVELOPMENT CATEGORY FOR THE PROPOSED PROJECT

Under the TAN15 guidance, utilities infrastructure is usually classed as “Less Vulnerable” development. However, as the Proposed Development is for a National Grid substation, it is prudent to consider the development as “Especially vulnerable industrial development (e.g. power stations, chemical plants, incinerators)” which falls within the “Highly Vulnerable” category. Highly Vulnerable Development is appropriate for DAM Zone A, subject an assessment of the acceptability of flood consequences.

6.0 TAN 15 JUSTIFICATION TEST

6.1 JUSTIFICATION TEST FOR THE PROPOSED PROJECT

As the Proposed Development is within DAM Zone A, a justification test is not applicable.

7.0 FLOOD RISK CONSIDERATIONS

7.1 BE SAFE AND REMAIN OPERATIONAL FOR ITS LIFETIME

7.1.1 Remain Safe and Operational

The site is shown to be at risk of flooding from surface water and small watercourses. Due to the high voltage equipment, surface water ponding is particularly dangerous at electrical substations, and as part of the standard design of the substation, all equipment will be constructed on an area of stone chippings. A site drainage strategy will be developed that will demonstrate that surface water is safely removed from the site, and ponding does not occur.

7.1.2 Climate Change

The surface water drainage plan will include a factor to account for increased rainfall anticipated for Climate Change, in line with the TAN15 guidance for 'Highly Vulnerable' development, which is to apply the 'Upper End' allowance for climate change impacts on peak rainfall rates. Under August 2022 guidance produced by the Welsh Government[1], the Upper (90th percentile) total potential change anticipated for the West Wales River Basin District is 75%. The appropriate design horizon for the proposed development is the 2080 period.

7.2 NOT INCREASE FLOOD RISK ELSEWHERE

7.2.1 No net loss of floodplain storage

The Proposed Development is not located in an area at risk of flooding from rivers, so there is no anticipated net loss of floodplain storage.

7.2.2 No impediment to flood water flows

The Proposed Development is not located in an area at risk of flooding from rivers, so there is no anticipated impediment to flood water flows. Surface water will be managed by the site drainage strategy.

7.2.3 Surface water runoff

While there are some locations within the proposed site boundary at risk of flooding from surface water or small watercourses, the drainage strategy of the site will ensure that surface water is effectively managed such that the risk of ponding at the site is mitigated and there is no increase in flood risk resulting from the development.

[1] Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales, August 2022

7.2.4 SAB Approval

As the proposed development comprises over 100m² of new impermeable area, SuDS Approval Body (SAB) approval will be required for the development. This will require the development of a SuDS Strategy for the Proposed Project, which will be outlined in the full FCA. The full FCA will be used to support the SAB application.

8.0 CONSEQUENCES ASSESSMENT

8.1 OBJECTIVES OF THE CONSEQUENCES ASSESSMENT

Appendix A1.2 of TAN 15 states that the prime objective of a consequences assessment is to develop a full appreciation of:

- The consequences of flooding on the development; and
- The consequences (i.e., the overall impacts) of the development on flood risk elsewhere within the catchment for a range of potential flooding scenarios up to that flood having a probability of 0.1%.

Section 7.3 of TAN 15 also states that where development is justified (as demonstrated in Section 7 of this FCA) the consequences assessment can be used to establish whether suitable mitigation measures can be incorporated within the design to ensure that development is as safe as possible and there is:

- minimal risk to life;
- minimal disruption to people living and working in the area;
- minimal potential damage to property;
- minimal impact of the Proposed Project on flood risk generally; and
- minimal disruption to natural heritage.

Finally, section A1.12 of TAN 15 presents the acceptability criteria for flooding consequences. The main criteria for deciding whether a development in an area not at risk from flooding from rivers is acceptable will depend on there being no increase in flooding elsewhere. NRW will advise the planning authority on the consequences of flooding for the type and nature of any proposal, and this should enable the planning authority to arrive at a judgement on the acceptability of the flooding consequences. To satisfy these criteria a site should only be considered for development if the following conditions can be satisfied:

- The cost of future maintenance for all new/approved flood mitigation measures, including defences must be accepted by the developer and agreed with NRW;
- The development is designed by the developer to manage surface water runoff such that the risk of flooding on site is minimised;

- Development is designed to minimise structural damage during a flooding event and is flood proofed to enable it to be returned to its prime use quickly in the aftermath of the flood; and
- No flooding elsewhere.

As such, this section on the TAN 15 Consequences Assessment addresses each of these points in turn.

The consequences of flooding on the development

Due to the Proposed Development being located in DAM Zone A, outside the extent of flooding from rivers, there will be no change to the consequences of flooding.

The consequences (i.e. the overall impacts) of the development on flood risk elsewhere

This outline FCA has highlighted that a site drainage strategy will be developed and calculations will be provided to demonstrate that the site runoff will not increase flood risk elsewhere. The design event will include an appropriate Climate Change factor to ensure the drainage strategy continues to provide protection against surface water flooding for the length of its design life.

Minimal risk to life

The Proposed Development will not increase flood risk to third party land or property and would be routinely unmanned throughout the operational phase, with the exception of visits by National Grid's operational staff for the purposes of asset management and maintenance.

Minimal disruption to people

During its operational phase, the Proposed Development will only incur minimal disruption to the surrounding communities and only as a result of visits by National Grid's operational staff for the purposes of asset management and maintenance.

Minimal damage to property

The Proposed Project will not increase flood risk to third party land or property, as it is entirely located within an area with no risk of flooding from rivers.

Minimal impact of the Proposed Project on flood risk

This outline FCA has demonstrated that the Proposed Project would not have a significant impact on flood risk elsewhere; the full FCA will include a SuDS strategy that will ensure this.

Minimal disruption to natural heritage

An Environmental Assessment Report, produced as part of the Outline Design, will demonstrate that the Proposed Development will incur minimal disruption to natural heritage.

Cost of future maintenance for all new/approved flood mitigation measures

The main flood mitigation measure associated with the Proposed Development will be the site drainage strategy, which will be developed as part of the Outline Design phase, and additional flood mitigation measures are not required. The cost of future maintenance of the drainage scheme will be met by National Grid; it is anticipated that the drainage scheme will be privately maintained.

Occupier awareness of flooding risks and consequences

The Proposed Development would be routinely unmanned throughout the operational phase, with the exception of visits by National Grid's operational staff for the purposes of asset management and maintenance.

Escape/evacuation routes

The Proposed Project would be routinely unmanned throughout the operational phase, with the exception of visits by National Grid's operational staff for the purposes of asset management and maintenance. The provision of safe escape/evacuation routes is not required, given the low risk of fluvial flooding.

Flood emergency plans and procedures

N/A – see Escape/evacuation routes above.

Facility for rapid movement of goods/possessions

N/A – the Proposed Development will not be subject to flooding under the 0.1% AEP event over the duration of its intended lifetime.

Designed to minimise structural damage

N/A – the Proposed Development will not be subject to flooding under the 0.1% AEP event over the duration of its intended lifetime.

No flooding elsewhere

This outline FCA has demonstrated that the Proposed Project would not have a significant impact on flood risk elsewhere; the full FCA will include a SuDS strategy that will ensure this.

8.2 CONCLUSION OF THE CONSEQUENCES ASSESSMENT

Based on the above, the conclusion of this assessment is that the flood consequences of the Proposed Project are considered to be acceptable.

9.0 CONCLUSIONS AND RECOMMENDATIONS

This document presents the findings of an outline Flood Consequences Assessment (FCA) undertaken to accompany the initial siting of the potential substation site centred on E:241868 N213542, as part of National Grid's 4.2 stage FEED design.

The proposed site is shown to be located in DAM Zone A, outside the risk of flooding from Rivers and the Sea. A SuDS Strategy and full FCA will be produced as part of the Outline Design which will detail how the proposed site will not increase the risk of flooding elsewhere.

As the proposed development comprises over 100m² of new impermeable area, SuDS Approval Body (SAB) approval will be required for the development. This will require the development of a SuDS Strategy for the Proposed Project, which will be outlined in the full FCA. The full FCA will be used to support the SAB application.

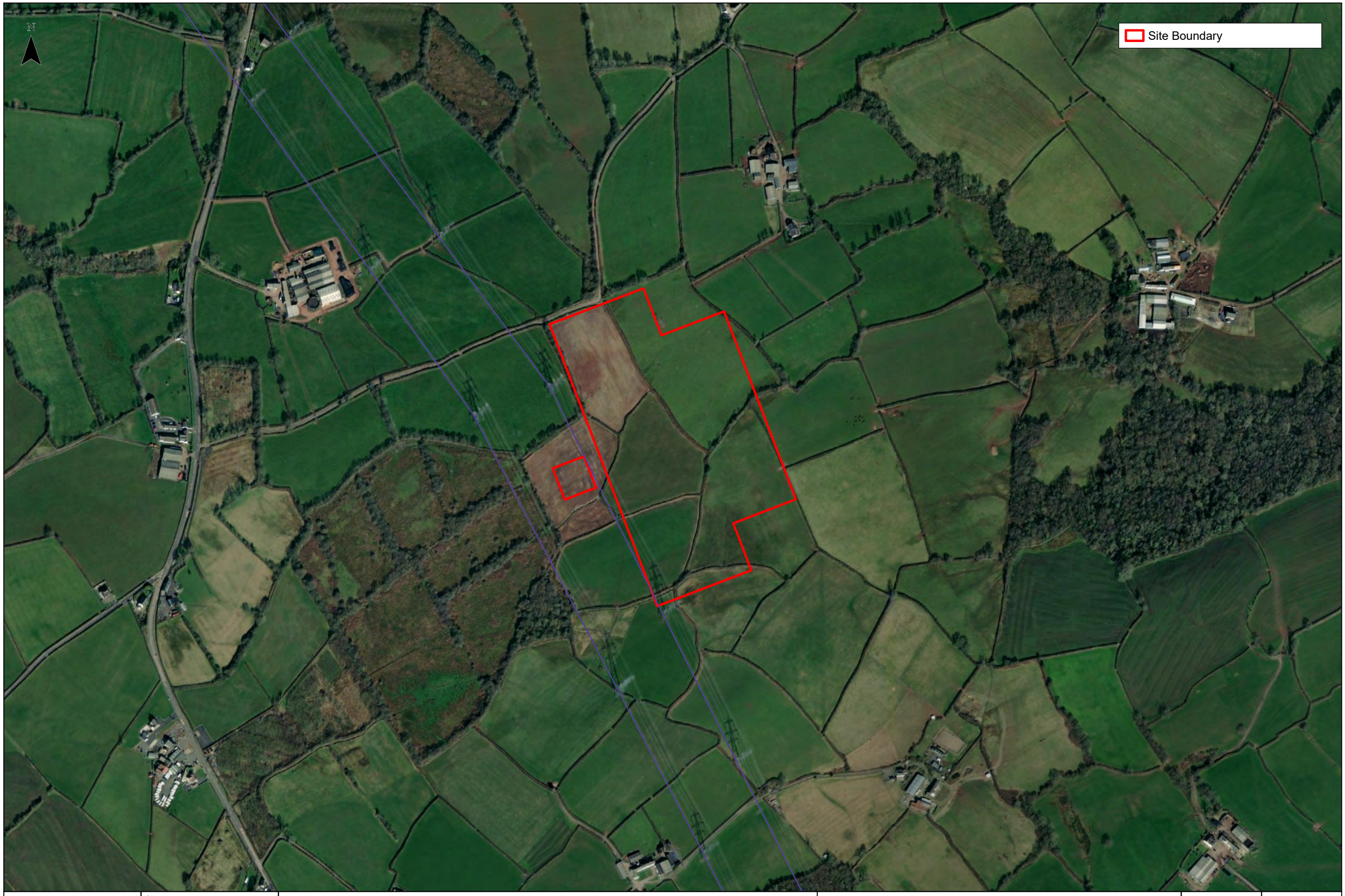
This outline FCA confirms that, as part of the Outline Design, the proposed development will be designed to meet the requirements of TAN15. Specifically, this outline FCA has demonstrated that:

- The proposed land use is appropriate for location within an area with a low risk of flooding from rivers, and the development proposals will not involve an increase in the number of staff working within a flood risk area;
- The proposed development will not result in a loss of floodplain storage capacity or reduce floodplain conveyance; and
- A SuDS Strategy developed as part of the Outline Design will demonstrate how the new infrastructure will not result in an increase in the volume and rate of surface runoff leaving the site, whilst taking climate change into account.

In summary, this outline FCA has demonstrated that the proposed development is appropriate for its location, will remain operational in times of flooding, and will not result in an increase in off-site flood risk.

APPENDICES

Appendix A. EXISTING SITE LOCATION



Stantec

Client

National Grid

PONT ABRAHAM

Site Location - Aerial

0 250 500 m

Maxar, Microsoft, Contains OS data © Crown Copyright and database right 2019

1:5,000 @ A3 | Date: 03/01/2023

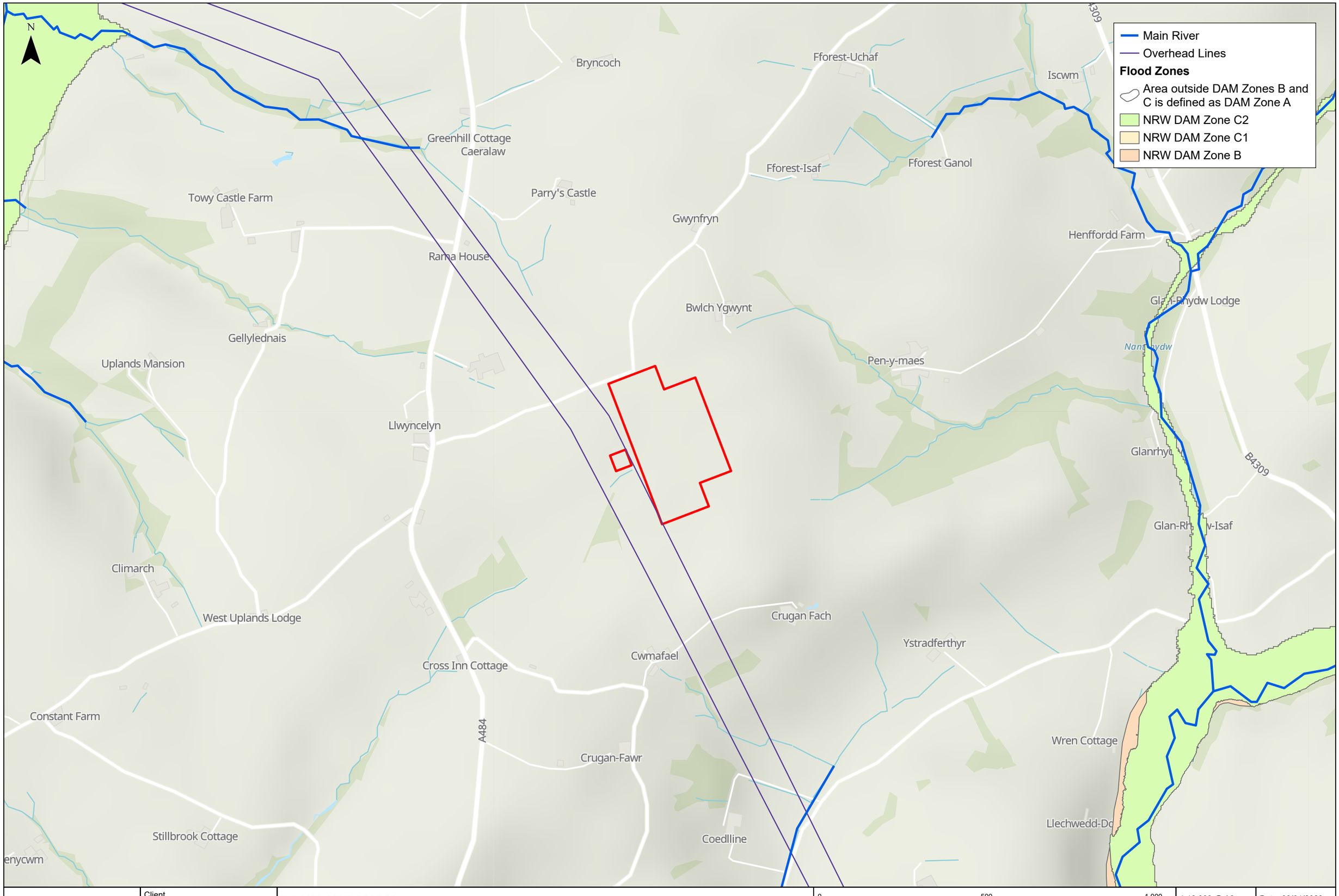
Drawn: RP | Checked: GC

Appendix A | Rev: A

Document Path: C:\Users\rpickersgill\Documents\ArcGIS\Projects\Pont_Abraham\Pont_Abraham.aprx

Appendix B. PROPOSED DEVELOPMENT DRAWINGS (TO BE ADDED IN FULL FCA SUBMISSION)

Appendix C. NATURAL RESOURCES WALES FLOOD RISK FROM RIVERS AND SURFACE WATER



Stantec

Client: National Grid

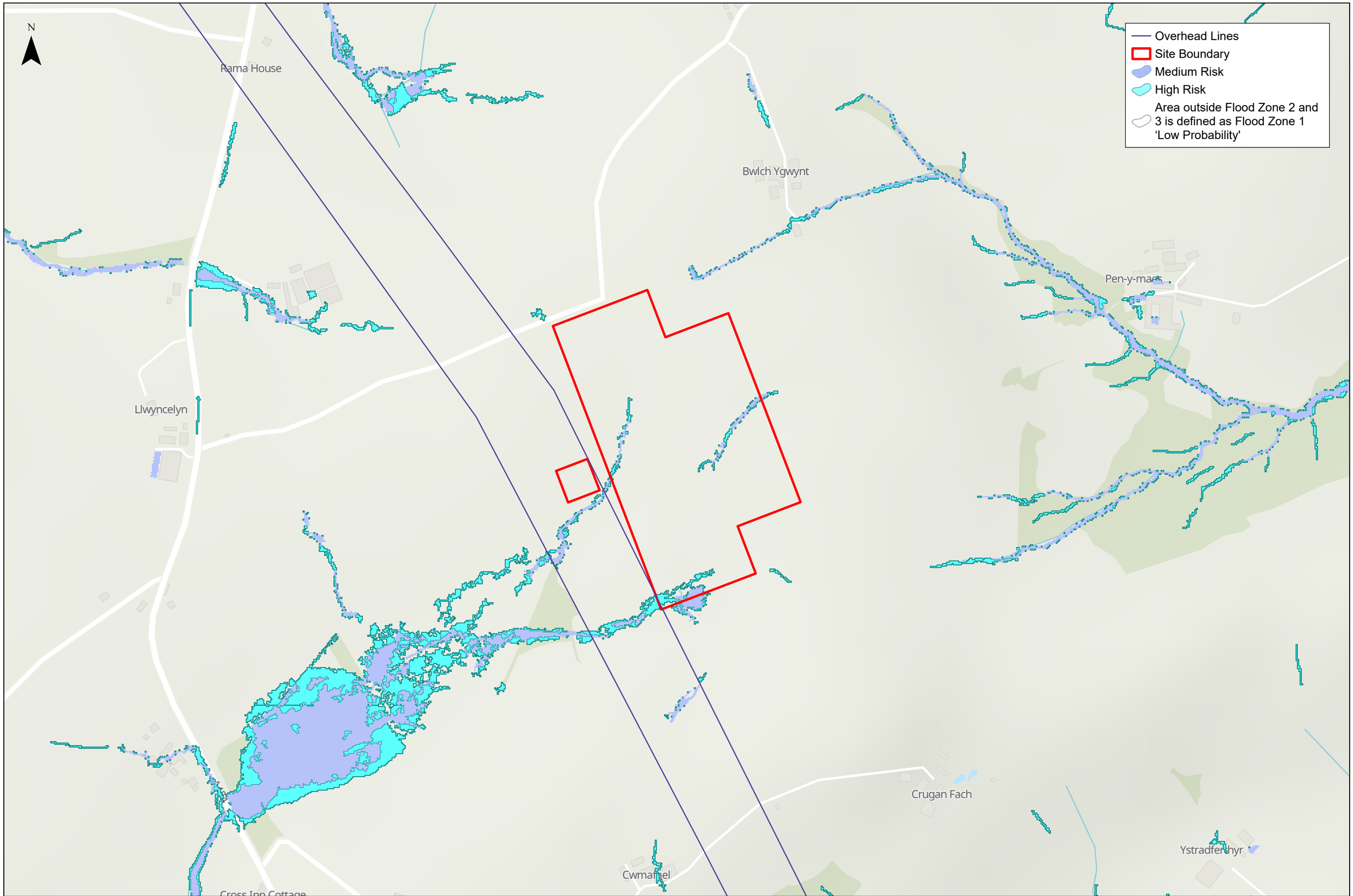
PONT ABRAHAM

National Resources Wales (NRW) Development Advice Zones

0 500 1,000 m

1:10,000 @ A3	Date: 03/01/2023
Drawn: RP	Checked: GC
Appendix C1	Rev: A

Document Path: C:\Users\rpickersgill\Documents\ArcGIS\Projects\Pont_Abraham\Pont_Abraham.aprx



Stantec

Client: National Grid

PONT ABRAHAM

National Resources Wales (NRW) Risk of Flooding from Surface Water

0 250 500 m

1:5,000 @ A3	Date: 03/01/2023
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Appendix C2	Rev: A

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Appendix F Archaeology and Heritage Level 1 Survey

Llandefaelog – Level 1 Survey

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1 Introduction

1.1 Stantec UK was instructed to undertake an initial desktop survey to identify any key heritage constraints associated with the construction of Llandefaelog substation and associated infrastructure.

1.2 This document has been informed by Cadw's National Historic Assets Wales (3km study area), Dyfed Historic Environment Record (DHER, 1km study area), and freely available online resources, including the National Library of Wales, to provide a high-level screening and summary of designated and non-designated heritage assets which might be affected by the proposed development. Where discussed below, DHER records are referenced by the DHER 'PRN' reference. English translations are provided by Google. This document has also been informed by a site visit and study area walkover, undertaken 3 October 2023, in bright and clear conditions.

1.3 This document provides an overview of the proposed development site (hereafter the 'Site'), the proposed development and the key heritage constraints and opportunities for consultation purposes.

1.4 It is understood that the proposed development will require planning permission. The Site falls within Carmarthenshire County, and any planning application for the scheme would be subject to Carmarthenshire County Council planning policies. A revised Local Development Plan (LDP) has been prepared by Carmarthenshire County Council and public consultation on the emerging plan closed in April 2023. Until its adoption, planning applications will be subject to policies contained within the 2006-2021 LDP and relevant Supplementary Planning Guidance including Archaeology and Development (adopted Carmarthenshire County Council, 2018). National planning policy contained within Planning Policy Wales (Edition 11, 2021) and Technical Advice Note (TAN) 24: The Historic Environment (2017) is also applicable.

2 The Site and Proposed Development

2.1 The Site, centred on NGR 241874, 213379, lies *c.*6km south of Carmarthen. The Site straddles 11 agricultural fields and is surrounded by further agricultural fields. The Site lies at *c.*120m aOD in the north-west, sloping south-eastwards to *c.*110m aOD, within an undulating landscape. The field boundaries within the Site are almost entirely formed of hedgerows save for one which has been grubbed out to create a larger enclosure. The underlying geology of the Site is mapped by British Geological Survey as Milford Haven Group, argillaceous rocks, sandstone and conglomerate, interbedded. This is a sedimentary bedrock formed between 427.4 and 407.6 million years ago during the Silurian and Devonian periods (BGS, 2023). No superficial deposits or boreholes are recorded within the Site. During the Site visit, it was noted that the geology and soil conditions impede drainage, and the Site held rainwater from recent downpours.

2.2 The proposed development is for the construction of a new Air Insulated Substation (AIS) south of Carmarthen. In its current iteration, the Site is formed of two parcels, one measuring 9.9ha and the second measuring 0.24ha, as shown on Figure 1.

3 Historic and Archaeological Overview

3.1 Designated and non-designated heritage assets, and previous heritage events recorded by Cadw and DHER within the 3km study area of the Site are plotted on Figure 1 and summarised below.

Designated Historic Assets (Figure 2)

3.2 There are no designated historic assets, including world heritage sites (WHS), within the Site and there are no WHS, registered parks and gardens or conservation areas within a 3km study area of the Site.

3.3 There are six listed buildings within the 3km study area, The most proximate listed buildings comprise; the Grade II listed Glanrhydw located *c.*1.3km east of the Site (26769); the Grade II listed Church of St Maelog located *c.*1.3km south of the Site (26768); and the Grade II listed Upland and Former Stables at Upland, located *c.*1.4km west of the Site (21456 and 21457).

3.4 There are two scheduled ancient monuments within the 3km study area comprising:

- Castell y Domen, Gwempa, the remains of a motte and ditch of medieval date, located *c.*1.7km south-east of the Site (CM240); and
- Pen Celli Standing Stone, the remains of a standing stone of probable Bronze Age date and assumed to be of funerary and / or ritual function, located *c.*1.7km east of the Site (CM122)

3.5 The nearest Registered Park and Garden comprises the Grade II Llechdwnni, located just over 3km south of the Site (PGW(Dy)21(CAM)) associated with the Grade II listed Old House at Llechdwnni (14553). The most proximate conservation areas to the site comprise Llansteffan *c.*7km to the west and Carmarthen Town conservation area*c.*6km to the north.

3.6 Tywi Valley Registered Landscape passes through the north-western extent of the 1km Study Area of the Site (Figure 2). Registered Historic Landscapes, a non-statutory advisory register compiled by Cadw, are defined as landscapes of outstanding or special historic interest. 58 landscapes are included on the list and are considered the best examples of different types of historic landscape in Wales. Further characterisation of these 58 landscapes was undertaken by the Welsh Archaeological Trusts, who looked at the landscapes and divided them into particular areas of character. The Tywi Valley character area as defined by the Welsh Archaeological Trusts extends further into the 1km study area (Figure 2).

Archaeological Baseline Summary (Figure 3)

3.7 DHER data for a 1km study area of the Site is reproduced on Figure 3.

3.8 There are two previous archaeological events recorded within the Site, both relating to Pontyates to Bancyfelin Gas Pipeline and comprising a Desk-Based Assessment undertaken by Cambria Archaeology in 2000 (40762) and an Archaeological Assessment (42706) which included fieldwalking but no intrusive works (Crane, 2000). No previous intrusive archaeological investigations are recorded. A faint linear seen on satellite imagery of the Site dating to 2012 appears to correspond to that of the pipeline.

3.9 The DHER holds a record within the Site for an undated field boundary (40851). The boundary is noted as being visible on the 1844 tithe map of Llandefaelog (discussed in more detail below). The report notes that the boundary was recorded as a slight trace of a ditch (Crane, 2000) and a faint linear appearing to correspond to this feature can be seen on 2012 satellite imagery of the Site; this part of the Site was not accessible during the Site visit owing to livestock. A further undated field boundary is recorded *c.*50m south of the Site (40849), also seen marked on the Tithe, and surviving as a substantial earth bank of *c.*1.1m high and 3.3m wide, supporting a hedge. Of the 27 undated sites within the Study Area, 24 relate to field

boundaries. One possible 'platform' was found to be natural in origin. The remaining two records relate to place name evidence (12264 and 11282) for which the place names (Beili Glas / Blue Bailey and Cae Hen Wall / Old Field) presented no clear indication of remains and no further information was provided. An undated field boundary is highly unlikely to preclude or constrain the development of the Site.

3.10 There are five prehistoric DHER records within the Study Area. Located immediately west of the Site (11288) is a record for a possible standing stone of prehistoric date. The record notes that the site is based on place name evidence (Cae Maen / Stone Field), but that no standing remains were observed during the Site visit. However, the record references the Llandefaelog tithe map of 1844 as a source and incorrectly locates this field name to the location shown on Figure 3. The field name Cae Maen is given on the tithe map further east, also recorded by the DHER *c.*480m north-east of the Site (11287). It would appear that DHER 11288 is an incorrect and duplicate record. The remaining three prehistoric records are sited in the north-west of the study area. A burnt mound recorded to be of Bronze Age date is recorded *c.*735m north-west of the Site (42757). A possible Bronze Age barrow is recorded immediately north of the burnt mound (5357), though the DHER record notes that the feature is uncertain and could be interpreted as natural or possible a further burnt mound. A record for a possible standing stone is recorded 950m north-west of the Site, with the only information given being the place name 'Park Main' as evidence. In summary, the evidence for prehistoric sites and features within the Study Area is limited to place name evidence. However, it is worth noting that a scheduled standing stone is recorded *c.*2km east of the Site (see Figure 2, CM122). As noted in the listing description for this monument, standing stones are often part of a larger cluster of associated monuments. Whilst the potential for prehistoric remains to be present within the Site would appear to be low, there was activity in this locality during the period and thus potential for remains cannot be entirely ruled out.

3.11 There are two Romano-British records within the study area, both of which relate to Roman roads. A road is depicted on a broadly north-south alignment in the north-east of the study area, terminating *c.*120m north-east of the Site, though the reason for the termination at this location is unclear and would thus likely relate to a lack of visible evidence for its continuation rather than an actual termination. RCAHMW also record this feature (NPRN 415842) and note that the road was identified as cropmarks showing the intermittent buried agger of the Roman road with flanking quarry pits and roadside ditches. The DHER notes that an earthwork is recorded *c.*590m north-east of the Site (13303). Earthworks in this location are noted to have been identified from aerial photographs and, whilst the presence of old hedge banks are observed, the proximity to the Roman road is given to indicate some potential for remains of Romano-British origins. Given the projection of a Roman road through the Site, there is some potential for Romano-British remains within the Site itself either consisting of or relating to it.

3.12 Two medieval sites are recorded by the DHER, both based on documentary / placename evidence. The site of an extra-parochial chapel in Llandyfaelog parish is recorded *c.*1km east-south-east of the Site (1687), though it is noted that the site of the chapel remains unclear. Place name evidence relating to a church is recorded *c.*700m west of the Site (5358), but the DHER notes that the lack of evidence for a church building suggests this was instead land owned by the church. The absence of Medieval records within the Study Area suggests a low potential for Medieval remains within the Site, though remains of this period cannot be entirely ruled out based on current information and given that very little previous archaeological investigation has been undertaken in the locality of the Site.

3.13 Most of the records within the study area are of post-medieval date and relate to features common of this period and indicate a sparsely occupied landscape dotted with cottages and homesteads with associated chapels and public houses, resources such as wells and orchards and indicators of local industry such as quarries, kilns and blacksmiths. The local economy is likely to have been predominantly agrarian, as evidenced by the DHER records for farmsteads (all 13 post-medieval polygons on Figure 3 relate to farmsteads), post-medieval field boundaries and records for associated features such as pounds. The Site likely formed part of the agricultural land of known settlement, for which limited archaeological remains would be anticipated such as infilled boundary ditches and plough furrows.

3.14 The Site is covered by the Plan of the Parish of Llandefaelog in the County of Cararthen tithe map of 1844. Some of the field names within the accompanying apportionment include 'Park' references, which could indicate that the land formerly belonged to part of a parkland landscape or estate. Other names are self-explanatory such as 'Peat Pond' and 'Woodpecker Pond' and don't otherwise indicate any specific archaeological potential.

4 Key Constraints and Risks

Designated Historic Assets

4.1 The listing description for the Grade II Llechdwnni Registered Historic Park and Garden notes that the walled garden includes a projection in its northern wall, accommodating a belvedere/gazebo providing panoramic views of the countryside. Whilst the intervening distance of just over 3km would reduce the visual impacts of any changes to the appearance of the Site in such views, the potential impacts of such changes remain uncertain and the possibility of historic associations between Llechdwnni and the Site remains uncertain.

4.2 There are Scheduled Ancient Monuments within the wider environs of the Site, including prehistoric ritual monuments, which have the potential to receive negative impacts to their significance from the proposed development as a result of changes to their setting.

Historic Landscape

4.3 The Registered Historic Landscape which falls within the study area would not be directly impacted by changes to the use and appearance of the Site, but consideration of any contribution the Site makes as part of its setting should be assessed.

4.4 There are hedgerows within the Site which are likely to be considered important under the Hedgerow Regulations 1997, in that they have existed for 30 years or more and may pre-date the Enclosure Acts. Removal of such hedgerows will require submission of a Hedgerow Removal Notice application (for which there is no fee), which must be submitted 6 weeks before any removal to Carmarthenshire County Council.

Archaeological Remains

4.5 The nature and extent of prehistoric and Romano-British activity within the immediate vicinity of the Site remains uncertain, particularly considering the very limited previous archaeological investigations within the study area, including a complete absence of intrusive studies. As such, whilst the DHER evidence is limited, there remains an uncertainty as to the potential for archaeological remains within the Site.

4.6 However, based on current evidence, the known and potential heritage resource of the Site would not be of such significance as to preclude the development of the Site.

4.7 As noted above, ground water was observed during the Site visit. Such ground water may influence the methodology for any archaeological trenching, including the possible need for sumps and pumps, but particularly with regards to tracking machinery across the Site and making good the Site following trenching.

The Setting of Historic Assets

4.8 Initial assessment indicates limited potential for material historic associations between the Site and designated historic assets which might be considered to contribute to their physical setting. Regarding changes to the current experience of designated historic assets, the undulating nature of the local topography, combined with intervening distance and green screening, limited the visibility of the Site from all those assets located within a 3km study area. On this basis, limited change is anticipated in respect of the setting of proximate listed buildings. Regarding scheduled monuments, Pen Celli Standing Stone is located on private property and not visible from the most proximate public rights of way. However, mapping

indicates that the standing stone is situated overlooking the Gwendraeth Fach and Nantrhydw valleys, with further standing stones recorded to the south-east. The key setting of these assets is anticipated to comprise of their position with the landscape and their proximity to broadly contemporary remains; the Site is thus not likely to form part of the key and immediate setting of these assets from which they draw significance. Castell y Domen is situated on Gwendraeth Fach, within the valley itself, and this physical and topographic position along with any contemporary remains within its vicinity will form the key and immediate setting from which it draws most significance. The Site does not form part of this key and immediate setting.

5 Next Steps and Recommendations

5.1 Initial consultation has been undertaken with Dyfed Archaeological Trust. Mike Ings, Archaeological Planning Manager, advised (via email 21/09/2023) that an archaeological desk-based assessment should be provided with any forthcoming planning application, which would then be used to establish the scope and methodology of any associated mitigation which might be required. This recommendation is in line with Planning Policy Wales (2021) which states '*the planning system recognises the need to conserve archaeological remains. The conservation of archaeological remains and their settings is a material consideration in determining planning applications, whether these remains are a scheduled monument or not (section 6.1.23) and where archaeological remains are known to exist or there is a potential for them to survive, an application should be accompanied by sufficient information, through desk-based assessment and / or field evaluation, to allow a full understanding of the impact of the proposal on the significance of the remains. The needs of archaeology and development may be reconciled, and potential conflict very much reduced, through early discussion and assessment* (section 6.1.26). Given the absence of development details at this stage, a study area of 1km for non-designated sites and 3km for designated has been indicated as sufficient.

5.2 It has not been possible to undertake initial consultation with the Conservation Officer for Carmarthenshire County Council. Whilst the potential for material change to the key and immediate setting of potentially susceptible heritage assets is considered to be relatively limited on the general basis of the proposed development, a setting assessment is highly recommended, particularly given the scale of the scheme, to consider any non-physical impacts on potentially susceptible non-designated heritage assets.

5.3 We strongly recommend a staged approach to archaeology and heritage input into the evolving scheme design. Such an approach would provide baseline heritage conditions, presented in a Heritage Statement, along with recommendations for heritage led design measures, where necessary, which seek to minimise harm to both the heritage resource within the Site as a result of direct impacts, but also to any susceptible heritage assets within the vicinity of the Site as a result of changes to their setting. Ad-hoc design advice could then be provided to the design team. Following the receipt of fixed designs, the Heritage Statement could be revised to include a full Heritage Impact Assessment such that it would comprise a Heritage Desk-Based Assessment suitable for submission with a planning application.

6 References

British Geological Survey (BGS)., 2023 *Geology Viewer* [Online] available at https://geologyviewer.bgs.ac.uk/ [Accessed January 2023]

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Carmarthenshire County Council., 2018 *Supplementary Planning Guidance, Archaeology and Development (including Gardens and Designed Landscapes)* [Online] available at https://www.carmarthenshire.gov.wales/media/1227176/adopted-archaeology-spg-august-2018.pdf [Accessed January 2023]

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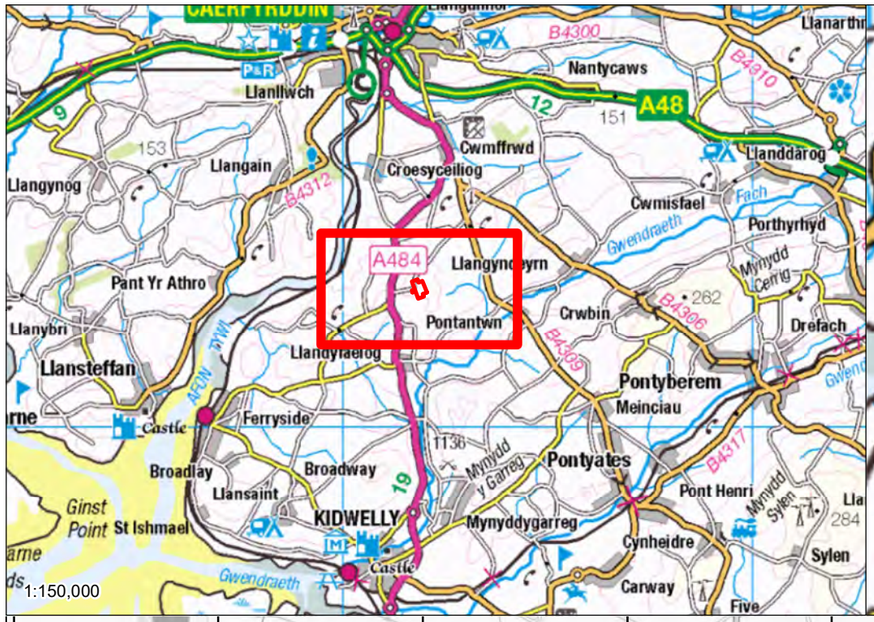

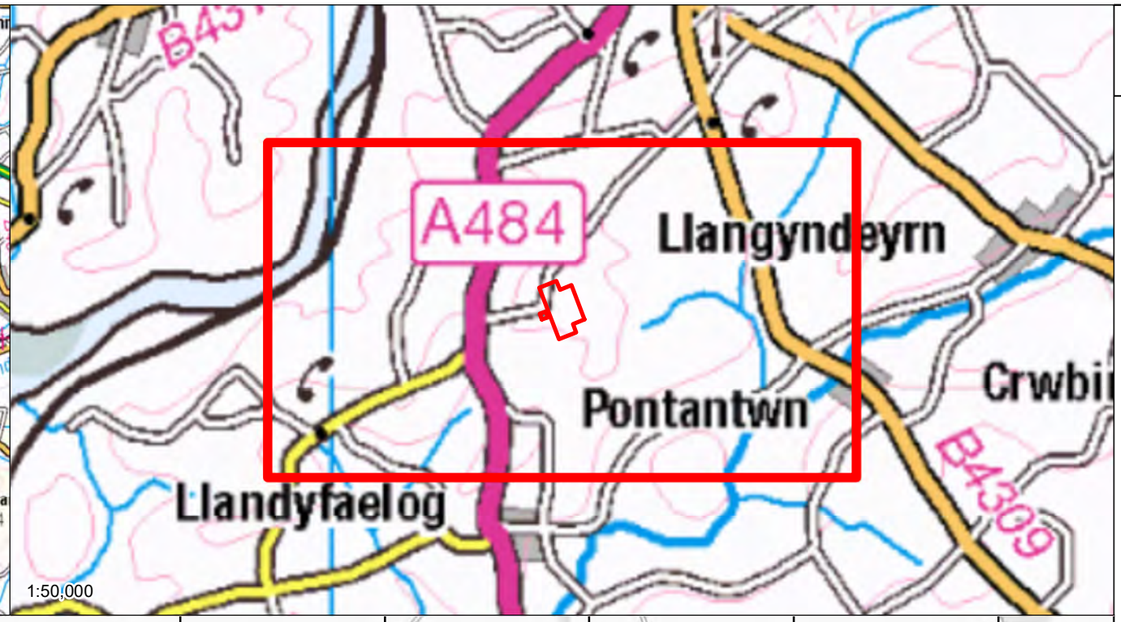

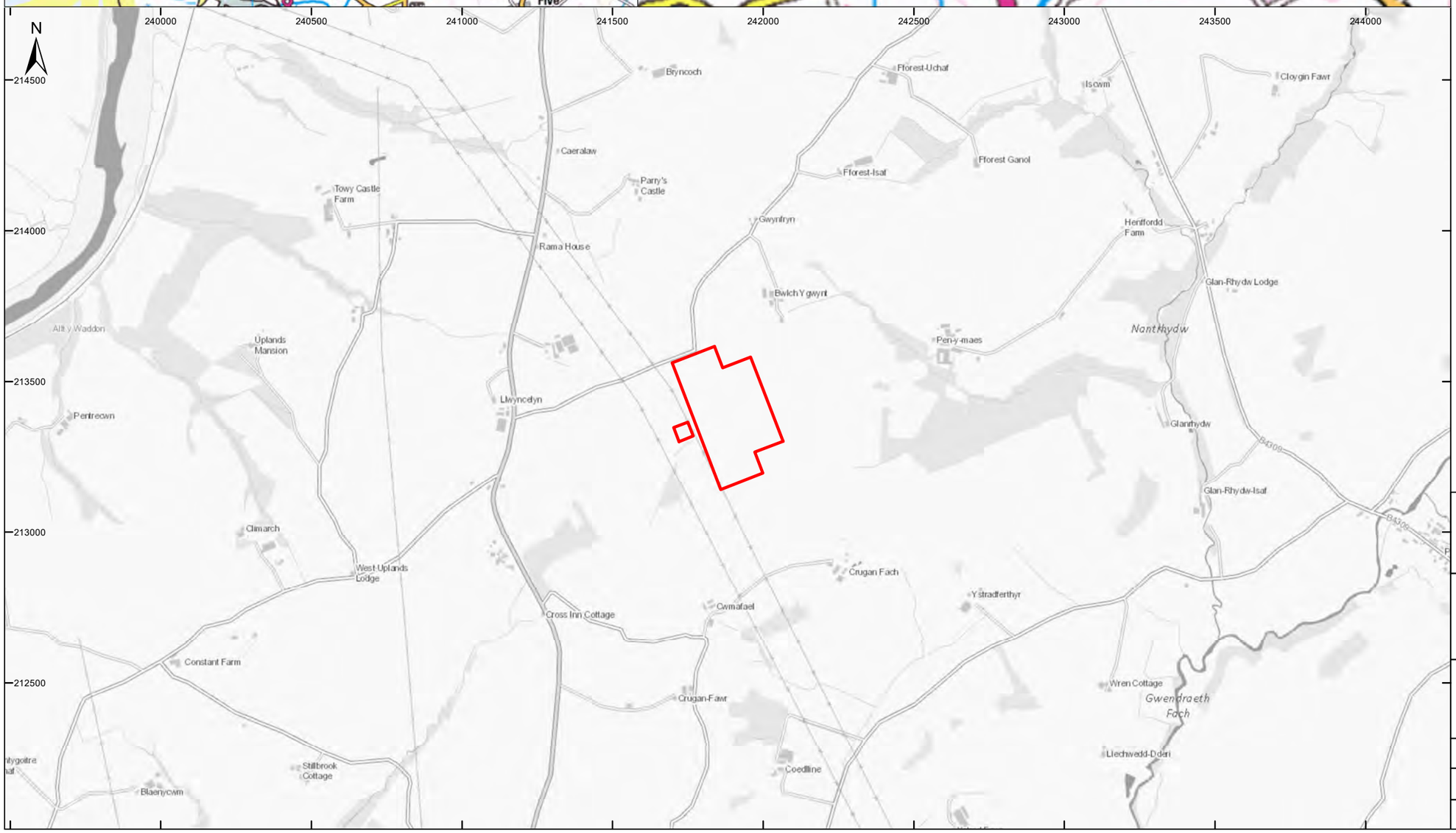

Stantec

Site

LLandefaelog
Site Location

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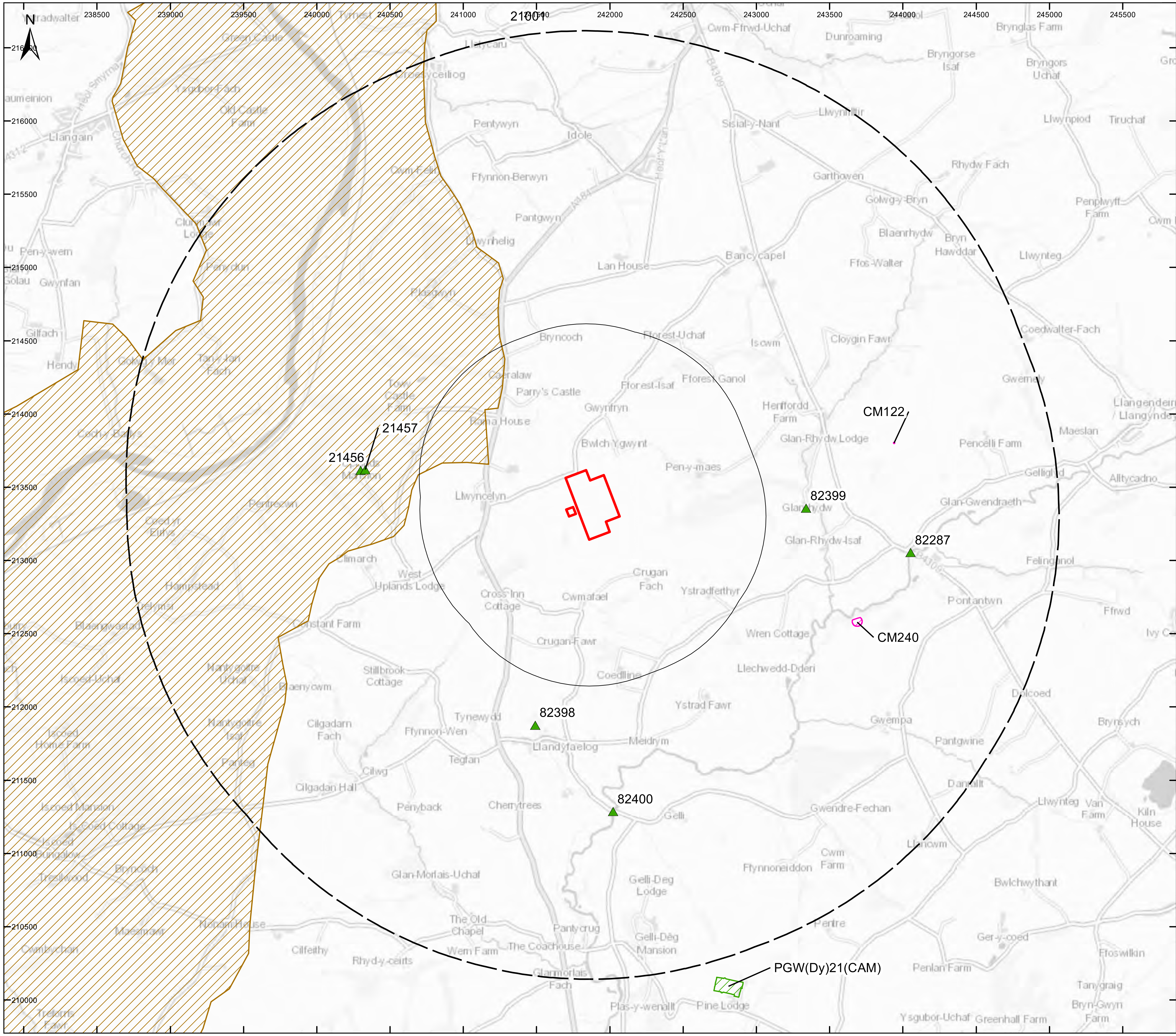

Site

1km Study Area

3km Study Area

Listed Building

Grade II

Scheduled Ancient Monument

Registered Park and Garden

Welsh Arch Trust Historic Landscapes

Llandefaelog
Cadw Data

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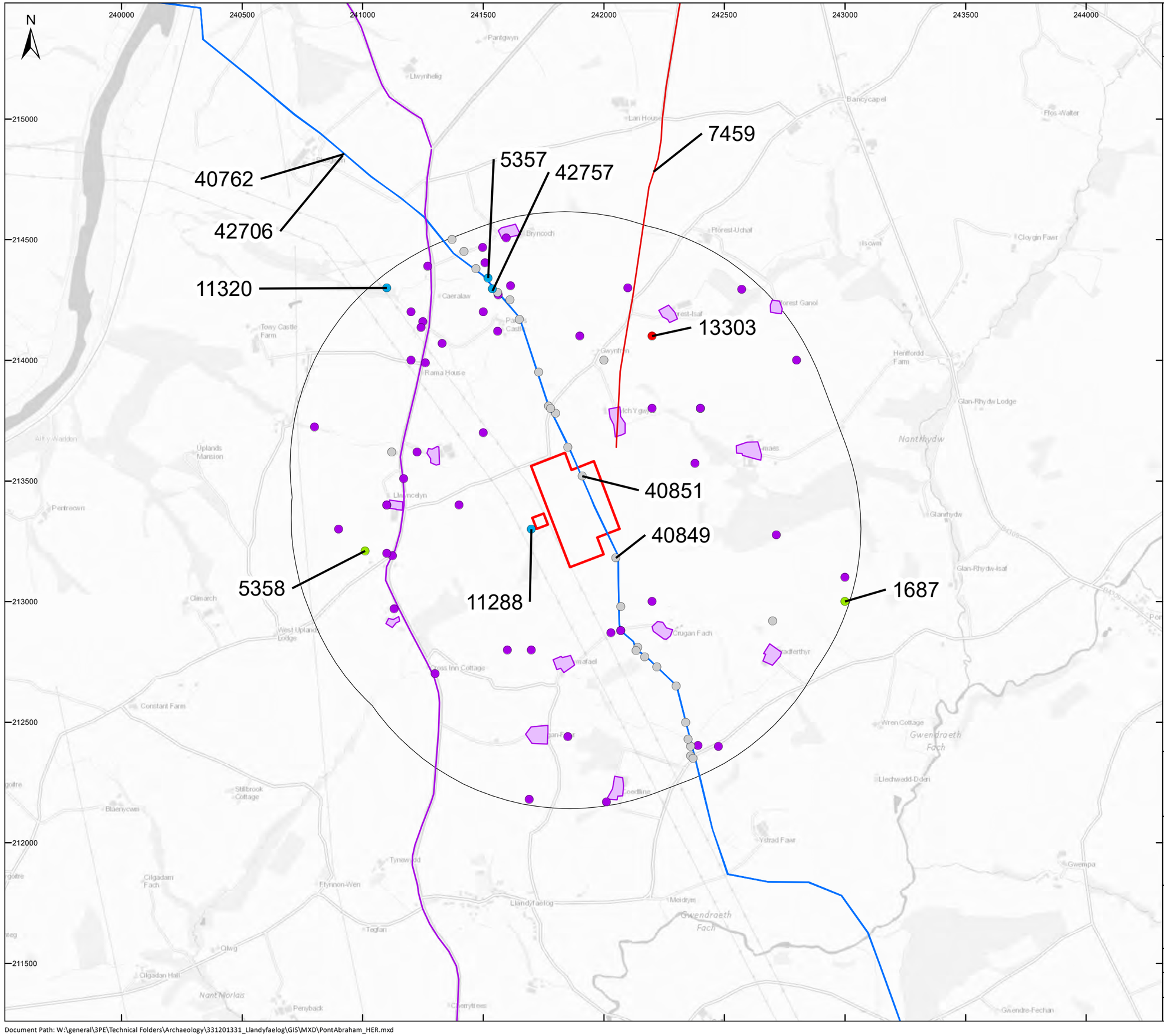

Stantec

DHER Mon Point

Period

- Prehistoric
- Romano-British
- Medieval
- Post-Medieval
- Unknown

DHER Toll Roads

DHER Roman Roads

period

- Post-Medieval Farmsteads
- DHER Event
- Site
- 1km Study Area

Llandefaelog

DHER Data

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Appendix G View Location Plan for LVA