



Proposed Solar Farm and Battery Storage Development on Land at

Cefn Park, Nr Wrexham, LL13 0PA

Landscape and Visual Assessment

Prepared for Novus Renewable Services Ltd

REPORT REF: 321/04/22/LVA/3

April 2022

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Document issue record

Version	Prepared by	Reviewed by	Approved for issue	Issued to	Date
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1 Introduction

- 1.1 Corylus Planning and Environmental Ltd has been commissioned by Novus Renewable Services Ltd to undertake a Landscape and Visual Impact Assessment (LVIA) to accompany a Full Planning Application for the development of a 9.9 MWp solar farm and battery storage facility on land at Cefn Park, approximately 3km to the south-east of Wrexham town centre.
- 1.2 The proposed site (excluding the proposed substation site) is located within relatively open countryside, on farmland immediately to the north of Cefn Road, c.900m to the east / south-east of the south-eastern outskirts of Wrexham and c.3km south-east of the town centre (see Figure 1). The western edge of the Wrexham Industrial Estate lies immediately adjacent to the eastern boundary of the site. The proposed site for the substation associated with the development is located to the south of Cefn Road, immediately east of the Five Fords Wastewater Treatment Works.
- 1.3 The proposed development comprises the erection of solar photovoltaic (PV) arrays, a small battery storage facility, a substation and associated infrastructure within a total area of 14.56 hectares.
- 1.4 This LVIA assesses the baseline conditions of the site and surrounding area and considers the effects of the proposed development upon the landscape character and visual amenity of the site and receptors in the surrounding landscape.
- 1.5 The LVIA should be read in conjunction with the Planning Application drawings and the Planning Statement prepared by Corylus Planning & Environmental Ltd.

2 Scope of the Report and Assessment Methodology

Objectives and Scope of the Assessment

- 2.1 The aim of this report is to assess the qualities and value of the existing landscape resource and the visual amenity of the site and its surrounding area; to describe the development proposals in their landscape context and then to predict and evaluate the landscape and visual effects that may arise from the proposed development.
- 2.2 Landscape and visual impacts are independent but inter-related issues. Landscape impact assessment aims to determine the likely changes in the physical landscape resulting from a given development and to evaluate the significance of these changes in relation to their effects upon both the quality and character of the landscape. Visual impact assessment predicts the appearance of these physical changes within the landscape and their effects upon specific viewpoints or visual receptors, such as the occupants of residential properties and the users of roads, public rights of way or other public open spaces.
- 2.3 The overall objectives of the landscape and visual assessment are to:

- describe and evaluate the existing landscape resource and visual amenity of the site and the surrounding area that may be affected by the development proposals;
- determine the sensitivity and value of the existing landscape resource and its capacity to accept change.
- identify and determine the nature and extent of any direct effects of the development upon physical components within the landscape, the introduction of new or uncharacteristic features into the landscape and the effect of these changes upon the landscape character of the site and surrounding area.
- determine the extent to which the development will be visible in the wider landscape.
- locate the key visual receptors, determine the sensitivity of these receptors and assess the likely changes in views that may result from the development.
- evaluate the magnitude and significance of effects upon both visual receptors and the overall character and quality of the landscape.
- determine and evaluate any cumulative impacts that may be caused by the proposed development in relation to other known developments of a similar nature in the surrounding area.
- determine potential measures to reduce or mitigate the impacts of the proposed development.

2.4 The assessment of the impacts of the proposed development has been undertaken in relation to the scheme for the installation of a solar farm, as described in the Planning Application Statement and as illustrated on the planning application drawings.

Assessor Qualification and Reference Material

2.5 This landscape and visual impact assessment (LVIA) has been undertaken by a chartered landscape architect (CMLI) with significant experience of landscape and visual assessment across a range of development sectors, including solar and other renewable energy developments.

2.6 The methodology used for undertaking this assessment is attached at **Appendix C**. This methodology accords with relevant professional standards and guidelines, including the 'Guidelines for Landscape and Visual Impact Assessment' (*Landscape Institute and the Institute of Environmental Management and Assessment, 3rd Edition 2013*).

2.7 This report makes reference to published landscape character assessments and other authoritative publications, in order to seek consensus and minimise subjectivity in the assessment of the existing landscape.

Scope of Baseline Studies

- 2.8 Baseline studies were undertaken to determine the significance of the development site in the context of the wider landscape and to establish a benchmark against which any potential changes in landscape character and visual amenity could be measured. The baseline studies included a desktop review of relevant designations, planning policies and published character assessments relating to the site and surrounding area. In addition, an assessment was carried out to establish the potential zone of visual influence of the site and to identify potential visual receptors by an analysis of landform and surface features using 1:25,000 scale Ordnance Survey maps and aerial photographs. From the desk studies undertaken, it was concluded that the potential zone of visual influence of the site was estimated to be no greater than 1.5km due to the screening effect of intervening landform and areas of significant vegetation or building development. Hence the study area for the LVIA was generally restricted to a 1.5km radius around the site.
- 2.9 Field survey work was also carried out to verify and expand upon information gathered during the desktop assessment. A walk-over survey and assessment of the site and the surrounding landscape (study area) was undertaken on the 17th June 2021. The weather conditions during the site visit were generally bright and sunny, and visibility was good over a distance of several kilometres.
- 2.10 The field studies comprised a landscape assessment to identify and analyse the physical elements and features within the landscape which contribute to the quality, condition and character of the site and that of the wider landscape setting, and a visual assessment to record the extent and nature of views into the site from a range of visual receptors at varying distances within the potential zone of visual influence.
- 2.11 As part of the field assessment, a photographic survey was carried out to record representative views of the site from selected receptors including settlements, residential properties, roads, public rights of way and other public access areas. Where direct access to residential properties or other potential viewpoints were not available, photographs of the site area were taken from nearby roads or footpaths in order to provide a similar representative view. In all instances, photographs were taken using a digital SLR camera with a 50mm lens (or a lens of equivalent focal length in digital format) and fitted with an integral GPS device to pinpoint the exact location of the photographs taken. All photography was undertaken in accordance with the Landscape Institute's Technical Guidance Note 06/19 - 'Visual Representation of Development Proposals'.

Evaluation of Landscape and Visual Impacts

- 2.12 The significance of both landscape and visual impacts was evaluated by assessing the sensitivity of the landscape and visual receptors in combination with the likely magnitude of landscape or visual change brought about by the proposed development. The criteria for the evaluation of receptor sensitivity and the magnitude of landscape and visual effects are given in Tables 1 to 4 in **Appendix C**. The evaluation of impact significance has generally been determined with reference the matrix set out in Table 5 in **Appendix C**.

- 2.13 However, the evaluation of receptor sensitivity, magnitude of effect and impact significance is often very subjective. Hence the assessment of landscape and visual impacts involves a degree of professional judgement in classifying sensitivity and magnitude for specific situations and in balancing the relationship between these criteria to determine the overall significance of impacts.
- 2.14 The assessments made within this report have graded the overall significance of impacts on an incremental scale from “negligible” to “minor” to “moderate” to “major”, but qualification is also given to each of these categories in respect of whether the effects are “adverse”, “beneficial” or “neutral”, and whether effects are “temporary” or “permanent”.
- 2.15 Assessments of the potential landscape and visual effects of the development are undertaken at various stages of the scheme, for example during the construction phases and then following completion of the development and during its subsequent operation.

Terminology

- 2.16 The following terminology is used in this assessment:
- *Landscape*: those physical components that together form the appearance of land, including its shapes, colours and textures. Landscape also reflects the way in which these various components combine to create distinctive landscape character particular to specific localities. The European Landscape Convention defines landscape as “an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”.
 - *Landscape Character Areas*: are areas of unique landscape character specific to a locality. Typical landscape components defining character include landform, land cover, vegetation, settlement pattern, remoteness and degree of tranquillity.
 - *Landscape Character Types*: are distinct types of landscape that are relatively homogenous in character. They may occur in different areas, but wherever a particular character type is found, it will share broadly similar attributes such as geology, topography, drainage pattern, vegetation type or land use.
 - *Landscape Receptor*: elements within the landscape (whether it be individual landscape features such as hedgerows or woodland, or areas of distinct landscape character) that have the potential to be affected by a proposed development.
 - *Zone of visual influence*: an area within which a proposed development (or feature) may have an influence or effect on visual amenity.
 - *Visual Envelope*: the extent of potential visibility to or from a specific area or feature.
 - *Visual Receptors*: individuals or groups of people such as residents, pedestrians and motorists who would experience an effect on views resulting from a proposed development.

3 Site Description and Landscape Context

The Site and Immediate Surrounding Area

- 3.1 The proposed PV and battery storage development site comprises an area of agricultural land extending to 14.56 hectares and is located within the Clywedog Valley in North Wales, approximately 900m to the east / south-east of the south-eastern outskirts of Wrexham and c.3km south-east of Wrexham town centre. The western edge of the Wrexham Industrial Estate lies immediately adjacent to the eastern boundary of the site. The proposed location for the substation (associated with the development) is situated to the south of Cefn Road, to the south of the PV site, and immediately to the east of the Five Fords Wastewater Treatment Works operated by Welsh Water. The location of the site within its wider landscape setting is shown on **Figure 1**.
- 3.2 Cefn Road, which extends along the southern boundary of the PV site, forms one of the main arterial roads between Wrexham town centre and the Wrexham Industrial Estate to the east. The River Clywedog runs immediately to the south of Cefn Road, and just to the north of the proposed substation site. Clywedog Road South is located some 85m to the east of the eastern site boundary of the PV site, extending along the western edge of the Wrexham Industrial Estate. There is a dedicated cycle path along the pavement on the north side of Cefn Road, immediately alongside the site's southern boundary.
- 3.3 The PV and battery storage site is contained within two separate fields and forms part of a larger agricultural landholding (Little Llwyn Onn Farm) which comprises permanent pasture (cattle grazing) and land utilised for fodder production. The main farmstead at Little Llwyn Onn Farm is located immediately to the west of the site, incorporating a farmhouse along with numerous cattle sheds and other agricultural buildings. At the time of the site visit in June 2021, all of the proposed PV site was under cultivation with a crop of maize.
- 3.4 The proposed substation site is located within an area of scrub to the east of the Five Fords Wastewater Treatment Works and immediately east of a medium scale solar farm. The access road to the water treatment works runs immediately east and south of the substation site with open farmland further to the south and east.
- 3.5 The topography of the site and immediate surrounding area is relatively flat, although the land to the west and north-west does rise more conspicuously. The contour levels across the PV site range from 32m AOD towards the south-eastern corner of the site to around 37m AOD on the western site boundary. The proposed substation site sits at an elevation of approximately 37m AOD on a low terrace just above the narrow floodplain of the River Clywedog. The south-eastern edge of the PV site lies adjacent to a lower lying area identified as being within Flood Zones 2 and 3, and has been excluded from the development area.
- 3.6 The overall PV site is roughly triangular in shape but is split into two fields by a central hedgerow which is orientated on an approximate north-west to south-east alignment. Boundary hedgerows of varying height and composition enclose most of the site. Along Cefn Road, to the south, the roadside hedgerow is mostly continuous at an average height of around 1.8m, but it is lower in places. There are three mature sycamore trees at intervals along the southern boundary hedgerow.

- 3.7 The eastern site boundary, adjacent to the industrial estate, is defined by a discontinuous hedgerow which supports tall shrubs and hedgerow trees in places, but is completely absent of vegetation for part of its length.
- 3.8 The northern / north-western site boundary is mainly enclosed by a tall hedgerow with a prevalence of mature and semi-mature trees. The boundary vegetation becomes somewhat gappy on the extreme western boundary, adjacent to Little Llwyn Onn Farm.
- 3.9 The central hedgerow, which bisects the PV site, is mostly continuous, attains an average height of between 1.5m and 2m, and supports a number of mature and semi-mature trees.
- 3.10 The hedgerow species across the site are predominantly hawthorn and blackthorn, with other species including field maple, hazel, elder and holly. Hedgerow trees comprise a mix of oak, ash, sycamore and field maple, with occasional mature alders.
- 3.11 There are four standalone mature oak trees within the PV site, one in the western field and three in a group in the eastern field
- 3.12 Scrub vegetation within the proposed substation area is mainly composed of hawthorn.

The Local Landscape

- 3.13 The site is located on a relatively flat terrain within the shallow valley of the River Clywedog. The local landscape is agricultural and rural in character, but is heavily influenced by the large-scale Wrexham Industrial Estate to the east and north-east, and the eastern suburban fringe of Wrexham to the west. The site occupies a distinct but relatively narrow 'green wedge' between the township of Wrexham and the Industrial Estate. The wider landscape to the north and south of the site is mostly rural in character.
- 3.14 Topographically, the land rises gently from the narrow floodplain of the River Clywedog to form a smoothly undulating landscape to the south and south-west at elevations ranging between 35m and 55m AOD. The land to the east remains relatively flat at elevations of around 30m AOD, but the topography rises more noticeably to the west and north-west of the site. Localised high ground is evident around the Llwyn Onn Water Treatment Works at an elevation of approximately 70m AOD (c. 600m west of the site), and the distinctive wooded ridge line within the vicinity of Cefn Park at 75m AOD (c. 1.2km to the north-west).
- 3.15 The wider agrarian landscape is a mix of permanent pasture and some arable cultivation, contained within a strong network of hedgerows and a prevalence of hedgerow trees, mostly forming medium sized fields. Blocks of woodland and linear plantations are also prevalent within the landscape, particularly to the north and north-west of the site, and to the south adjacent to the River Clywedog.
- 3.16 Except within the urban area of Wrexham to the north-west and the developed area of the Wrexham Industrial Estate to the east and north-east, the local settlement pattern is relatively dispersed, mainly comprising small villages, hamlets and isolated farmsteads. The slightly larger linear village of Marchwiell is located along the A525, approximately 1km to the south-west of the site.

- 3.17 Wrexham is a large market town and the administrative centre of the Wrexham County Borough, with a current population of around 66,000 people. The town dates back to medieval times but grew significantly with the industrial revolution in the late 18th and early 19th centuries. A number of large collieries were opened up in the local area, leading to the development of iron works at Bersham and subsequent large scale steel works at Brymbo. More recently, Wrexham's economy has moved away from heavy industry to high tech manufacturing, bio-technology, finance and professional services.
- 3.18 The Wrexham Industrial Estate was originally developed during the second world war as a large-scale munitions factory. The current industrial estate extends across an area of approximately 550 hectares and consists of standalone industrial sites, along with multifunctional industrial estates and business parks, and some residential areas. The estate is also the location of the UK's largest prison, HM Prison Berwyn, which opened in 2017.
- 3.19 Other land uses in the local area include an extensive sewage works to the south of the River Clywedog (and south-west of the site) and the visually prominent Llwyn Onn Water Treatment Works on the elevated hillside, 600m to the west of the site. There is a medium scale solar farm immediately to the north and east of the sewage works. Another medium scale solar farm is located in the Clywedog Valley to the south of the industrial estate, 700m east / south-east of the proposed PV site.
- 3.20 1.2km to the north-east of the site is the Cefn Park Estate, incorporating a large 18th century mansion and extensive parkland.
- 3.21 There are only a small number of residential properties close to the site. These include:
- 'Little Llwyn Onn Farmhouse', c.35m to the west of the western site boundary.
 - 'Glanrafon Cottage' to the south of Cefn Road, 35m south/south-west of the site.
 - A pair of semi-detached cottages adjacent to 'Glanrafon Cottage', 35m south/south-west of the site.
 - 'Five Fords Cottage' on the edge of the industrial estate, c. 180m south-east of the site.
- 3.22 There is a handful of isolated dwellings and farmsteads within the wider landscape to the north and north-west of the site, but none of these properties are believed to have any significant visual connectivity with the proposed development area.
- 3.23 Local highways adjacent to the site include Cefn Road directly to the south, and Clywedog Road South on the industrial estate to the east. A narrow country lane, known as Redwither Lane, runs to the north-west and north of the site, at an average distance of some 600m from the site.
- 3.24 There are very few public rights of way within the local area. A public footpath 'MAR/39' extends to the south and east of the sewage works access road, immediately adjacent to the proposed substation site, but there are no other rights of way close to the site. Footpath 'ABE 13' abutting the boundary with Cefn Park, 1.2km to the north-west, has no direct views of the site.
- 3.25 The experiential qualities of the local landscape are varied, ranging from the rural and agrarian landscape within the site and within those areas to the north and west, contrasting with the dominance of large industrial units to the immediate east of the site and the urban

fringes of Wrexham, further to the north-west. The local area around the site feels relatively enclosed with a prevalence of boundary hedgerows, mature hedgerow trees and small blocks of woodland, precluding any long-distance views. The landscape is also contained by the rising ground and localised ridge lines to the north and north-west of the site.

4 Published Landscape Character Assessments

(with reference to **Figure 3**)

National Character Area Assessment

- 4.1 The application site is within the ‘Deeside and Wrexham’ National Landscape Character Area (NLCA 13) as defined within the National Landscape Character Assessment by National Resource Wales in 2014. This assessment is based on LANDMAP data.
- 4.2 The NLCA is a border area on the edge of Wales and England and historically formed part of the hinterland of Chester. A large part of the lowland around the mouth of the River Dee was reclaimed from the sea in the 18th century. The area became industrialised from the 19th century onwards with the Wrexham area taking advantage of its resources of coal, iron-ore, clay and limestone. More recently the area has become an economic hub of the Welsh and regional English economy with leanings more towards Merseyside rather than rural areas to the west. The area is not wholly industrial, it does have some traditional architecture and countryside as well as important monuments from its industrial heritage.
- 4.3 The key characteristics of the area are those of lowlands sloping down to the River Dee and a broad, flat floodplain with views of the Wirral. There are narrow incised wooded tributary valleys, many of which run from the west. There area has a variety of historic sites and has cultural connections to Chester and Merseyside to the north-east. It has an industrial character with historical land usage of mining and power generation. There is a strong settled character to the area with some coalescence between the larger settlements.

LANDMAP Character Assessment.

- 4.4 In Wales, LANDMAP is the formally adopted approach for landscape assessment and is advocated by Planning Policy Wales for use in undertaking landscape and visual assessments to inform local plan policy, planning guidance and the determination of planning applications.
- 4.5 LANDMAP is an all-Wales landscape resource with a whole landscape approach that maps and classifies landscapes, describes their characteristics and evaluates their importance from a national to local scale and recommends appropriate management guidelines. LANDMAP breaks Wales up into discrete geographical areas and then produces spatial datasets for each area.
- 4.6 The spatial datasets (or aspects) for each area are:
 - Geological Landscape – which considers the physical (primarily geological) influences that have shaped the landscape;
 - Landscape Habitats – which records habitat features and their relationship with the wider environment;

- Visual & Sensory – which maps landscape features and qualities as perceived through our senses. It takes into account the physical attributes of the landform and land cover, their visible patterns and relationships;
- Historic Landscape – which identifies historic land uses, patterns and features that contribute to the historic character of the area; and
- Cultural Landscape – which describes the link between people and the landscape, and the way that human activity shapes the landscape.

Wrexham LANDMAP Character Assessment.

- 4.7 The Wrexham LANDMAP Character Assessment was adopted in March 2007. It provides a consolidated and simplified version of the 2004 Wrexham LANDMAP, which it supersedes.
- 4.8 The Wrexham District is divided into four broad Landscape Character Types comprising:
- ‘Uplands’ character type within the west and the south-west of the District;
 - ‘Rural Urban Villages’ character type extending to the east, north, west and south-west of the town of Wrexham;
 - ‘Urban’ character type comprising the town of Wrexham and the Wrexham Industrial Estate to the south-east; and
 - ‘Rural Lowlands’ character type to the south of the town and extending to the east and the south-east of the district.
- 4.9 The site at Cefn Park sits within the ‘Rural Lowlands’ character type, but is close to the ‘Urban’ character type of the Wrexham Industrial Estate to the east and the ‘Rural Urban Villages’ character type to the north-west.
- 4.10 The Character Types are sub-divided into a further 27 Character Areas and each area is assessed in relation to the five spatial datasets (or aspects) listed in paragraph 4.6 above.
- 4.11 The site is located within Landscape Character Area (LCA) 13a - ‘Welsh Maelor’, although it is adjacent to, and influenced by, LCA 11 - ‘Wrexham Industrial Estate’. The site is also relatively closed to LCA 8 - ‘Gwersyllt, Llay, Geresford, Borras’ and LCA 10 - ‘Wrexham Town’
- 4.12 The main characteristics of LCA13a - ‘Welsh Maelor’ that are relevant to the site are:
- Generally an abundance of well managed hedgerows and hedgerow trees;
 - Undulating estate farmland with mosaic of farmland and trees;
 - Tranquillity and landscape affected by roads and pylons;
 - The area drains to the Clywedog (south of Cefn Road and the site);
 - Farmsteads and villages affected by commuter pressure;
 - High levels of recreational use in the Clywedog valley and extensive network of small lanes and public rights of way; and
 - Affected by urban pressures and economic changes to farming;
- 4.13 The Visual Sensory characteristics of LCA13a identified in the assessment that are relevant to the site are:
- Undulating estate farmland with mosaic of farmland and trees;
 - Generally an abundance of well managed hedgerows and hedgerow trees; and
 - Tranquillity and landscape affected by roads and pylons.

- 4.14 The Geological Landscape characteristics of LCA13a that are relevant to the site are:
- The area drains to the River Clywedog
- 4.15 The Ecological Habitats characteristics of LCA13a that are relevant to the site are:
- The River Clywedog valley south of Wrexham town has a diverse range of valuable semi-natural habitats;
 - Semi-natural upland mixed ash woodlands, other broadleaved woodlands and plantations are characteristic of the northern and southern areas, forming a mosaic of woodland and farmland; and
 - Although most grassland is improved, remnants of high value neutral grassland survive in the central and northern areas.
- 4.16 The Historic Landscape characteristics of LCA13a that are relevant to the site are:
- Widespread evidence of medieval open fields - ridge and furrow remnants of the Wrexham Lowlands; and
 - Remnants of former ordnance depot at Parkey area south of Wrexham Industrial Estate.
- 4.17 The Cultural Landscape characteristics of LCA13a that are relevant to the site are:
- Farmsteads and villages affected by commuter pressure; and
 - High level of recreational use in Erddig and Clywedog Valley, and extensive network of small lanes and rights of way in all parts except Wynnstay.
- 4.18 The main characteristics of LCA11- 'Wrexham Industrial Estate' that are relevant to the site or adjacent industrial estate are:
- Urban built land, mixed industrial development;
 - Set within low-lying pastoral farmland, and incorporating former hedgerow oak trees;
 - Evidence of rapid 20th century changes from agriculture to depot to industry within living memory;
 - Relatively flat with network of small streams, ditches and ponds; and
 - Includes areas of semi-natural broadleaved woodland (Black Wood).
- 4.19 The Wrexham LANDMAP Character assessment describes the landscape sensitivity of LCA13a as follows: *'The traditional Welsh Maelor landscape is very vulnerable to continuing development and recreational pressures, to economic changes which threaten traditional farming, and from land use practices and development which do not take historical landscape features into account.'*
- 4.20 The guidelines for LCA13a are:
- To conserve rural character particularly by replacement planting of hedgerow trees;
 - Manage farmland for nature conservation by diversifying agricultural land and developing green networks to link fragmented habitats and species; and
 - Manage grassland to increase biodiversity.
- 4.21 The guidelines for LCA11 are:
- To minimise impact of development on natural landforms and drainage;
 - Enhance setting of estate and mitigate visual impact on wider surroundings by retaining a landscape buffer between the industrial estate and farmland; and
 - Minimise impact of development on areas of high biodiversity value by planting native trees and developing a green network strategy.

5 Landscape, Heritage and Ecological Designations

(with reference to **Figures 2**)

Landscape Designations

- 5.1 The site and surrounding area are not located within any national or local landscape designation.
- 5.2 Clwydian Range and Dee Valley Area of Outstanding Natural Beauty (AONB) lies approximately 8km to the west of the site.

Listed Buildings

- 5.3 There are no listed buildings within or adjacent to the site. The closest listed building to the site is 'Pum-Rhyd' which is a Grade II listed domestic dwelling, dating from the 17th century, located 600m south-east of the site. Other listed buildings and structures within the local area include:
- 'Llwyn Onn Hall' (Grade II), a late 17th / early 18th century house (converted to a hotel in 1986), located 900m north-west of the site. It is understood that the house has now been converted back to a private dwelling.
 - A Grade II listed Ice House, north-west of Llwyn Onn Hall, 1km north-west of the site.
 - 'Cefn Park', a Grade II listed mansion (and attached stable yard range) dating from the 18th century, 1.3km north-west of the site.
 - A Grade II listed Pavilion at Cefn Park (adjacent to the main house), dating from the late 18th century, 1.2km north-west of the site.
 - The Church of SS Marcella and Deiniol (Grade II*) in the village of Marchwiel, 1.2km south-west of the site.

Apart from 'Llwyn Onn Hall', none of the listed buildings highlighted above are believed to have any direct visual connectivity with the proposed development site. Any potential views of the site from 'Llwyn Onn Hall' to the north-west are anticipated to be very limited.

Scheduled Monuments

- 5.4 There are no scheduled monuments within 2km of the site. The closest is Erddig Mound & Bailey Castle which is 3.6km west of the site. This is believed to have no direct visual connectivity to the site and the proposed development is unlikely to have any impact upon the setting of this monument.

Conservation Areas

- 5.5 The closest Conservation Area to the site is 1.1km south-west at Marchwiel. The site is not visible from this location and hence will not impact upon the setting of the Conservation Area.

Registered Parks and Gardens

- 5.6 Erddig Park lies 2km west of the site. This is a Grade I Listed building and parkland which is owned by the National Trust. The House was built in the 17th and 18th centuries and lies within a 1,900 acre estate which includes a 1,200 acre landscaped pleasure park. The grounds were designed by William Emes between 1768 and 1780. It is unlikely that there is any visual connectivity between Erddig Park and the site.

Nature Conservation & Ecological Designations

- 5.7 The closest Sites of Special Scientific Interest (SSSI) are 2.5km from the site. Sontley Marsh SSSI lies to the south-west of the site and the River Dee and Bala Lake SSSI lies to the south and south-east of the site. There is believed to be no visual connectivity between these SSSI's and the site.

Ancient Woodland

- 5.8 Black Wood lies 70m south-west of the site and is an area of restored ancient woodland. It is separated from the site by Cefn Road. There may be some visual connectivity between the woodland and the site, but the development is unlikely to have any physical impact upon the woodland.

6 Relevant Planning Policy

- 6.1 National and local planning policy in relation to the proposed development at Cefn Park is considered in detail in the Supporting Statement, but the current Local Plan policies that are relevant to landscape and environmental issues are examined below.

Wrexham Unitary Development Plan 1996-2011

- 6.2 The Wrexham Unitary Development Plan (WUDP) 1996 -2011 was adopted by Wrexham County Borough Council in February 2005. An updated Plan is currently under review. The current plan doesn't make reference to renewable energy.
- 6.3 The policies that relate directly to landscape and other relevant environmental issues include the following:

Policy EC1 – Green Barriers – Green Barriers possess the same characteristics and purposes of formal Green Belts.

Within Green Barriers, development will only be granted planning permission if it is for agriculture, forestry, essential facilities for outdoor sport and recreation, cemeteries and other uses of land which maintain the openness of the Green Barrier and do not conflict with the purpose of including land within it. Mineral extraction and landfilling do not conflict with the purposes of Green Barriers.

Policy EC4 – Hedgerows, Trees and Woodland - Development proposals should provide for the conservation and management of hedgerows, trees, orchards, woodland, wildlife and

other natural landscape and water features, and include new planting in order to enhance the character of the landscape and townscape. Development which results in the loss or significant damage to valuable trees, important hedgerows or ancient woodland sites will not be permitted.

Policy EC6 – Biodiversity Conservation - Development either within or close to sites of biodiversity interest will only be permitted where it can be clearly demonstrated that the need for the development outweighs the need to safeguard the intrinsic nature conservation value of the site. Where such development is permitted, damage should be kept to a minimum, and compensatory measures should be provided. Measures to improve the biodiversity value of sites and enhance their natural conservation interest and landscape quality including the establishment of local nature reserves, will be supported.

Wrexham Strategic Green Wedge Review (October 2017)

- 6.4 This report was used as part of the evidence base for the updated Local Development Plan that is under review. The term 'Green Wedge' has supplanted the term 'Green Barrier' that was used in the WUDP. The review of the current 'Green Wedges' was carried out to ensure that they are fit for purpose whilst still allowing the new home provision to be undertaken.
- 6.5 The review is split into sub-zones. The site sits within Area 2: Wrexham East. The report concludes that the area contains characteristics that prevents coalescence between Wrexham Town and Wrexham Industrial Estate, but that there is little justification in retaining the 'green wedge' due to other proposed development in the area.

Wrexham Local Development Plan 2013-2028

- 6.6 Although the plan is still under review, some of the policies and evidence may be relevant:

Policy SP7- Green Wedge – 'Green Wedge' designations will ensure the protection of the openness of the land and will act as buffers between settlements and prevent settlement coalescence. Within the designated green wedge areas, development will only be permitted which accords with national planning policy.

Policy SP15: Natural Environment - Development will only be supported where it protects, conserves and enhances the natural environment.

Policy SP19: Climate Change - To mitigate against the effects of climate change and adapt to its impacts, development proposals will need to demonstrate that they have taken into account the following:

- i. Reducing carbon emissions;
- ii. Protecting and increasing carbon sinks
- iii. Adapting to the implications of climate change at both a strategic and detailed design level:
- iv. Promoting energy efficiency and increasing the supply of renewable energy; and
- v. Maintaining ecological resilience

Policy SP20: Green Infrastructure - Wrexham's distinctive natural heritage provides a network of green and blue infrastructure. Protection, conservation and enhancement of natural heritage networks needs to be reconciled with the benefits of development.

Policy NE3: Trees, Woodlands and Hedgerows - Development will only be permitted where it does not cause unacceptable harm to trees, woodlands and hedgerows of significant public amenity, natural or cultural heritage value or those that provide important ecosystem services including mitigating the effects of climate change.

Policy RE2: Renewable Energy Schemes - Proposals to generate energy from renewable and low carbon sources will be supported.

- i. Proposals for solar farms (5MW to 50MW) will be directed to the solar local search areas (LSA) identified on the Proposals Map;
- ii. In assessing such proposals consideration will be given to the impacts of the development on the landscape, the number, scale, size, design and siting of renewable installations and associated infrastructure, alone, cumulatively and in combination.

Wrexham Local Plan – Renewable Energy Assessment (updated September 2019)

- 6.7 As an evidence base to inform the preparation of the Local Development Plan, Wrexham County Borough Council has undertaken a Renewable Energy Assessment (REA). The REA assesses the constraints and potential opportunities for various renewable energy resources within the District and identifies local search areas for solar resources that will need to be identified in the LDP proposals maps and supported by LDP policies. The site at Cefn Park is identified within the Local Search Area (LSA) maps as an area that is least constrained for solar resources. The LSAs are identified to encourage developers to further investigate potential for solar PV farms in these areas.

7 Site Visibility and Visual Sensitivity

(with reference to **Figure 5** and **Photo-Sheets 1-11**)

- 7.1 A visual survey and assessment of the site and surrounding area was undertaken on the 17th June 2021. The weather conditions during the site visit were generally bright and sunny, and visibility was good over a distance of several kilometres. At the time of survey in mid-summer, deciduous hedgerows and woodland were in full leaf providing optimum visual screening. However, judgements have been made in this assessment in respect of the reduced screening potential of tree and hedgerow vegetation during the winter months.
- 7.2 The site and adjoining landscape are relatively well enclosed by hedgerows and a predominance of hedgerow trees, along with some blocks of woodland along the River Clywedog to the south. This local vegetation, in combination with the relatively flat topography to the south and east of the site, tend to limit the site's zone of visibility to a relatively small area. The majority of views of the site are within 100m of the site boundary, although there are some very limited views extending up to 900m.
- 7.3 From Cefn Road, immediately to the south, the site is generally screened by the roadside hedge, although there are short gaps and lower sections of hedgerow where there are some

more open views across the site. It is also likely that the deciduous hedgerow will allow some limited filtered views into the site during the winter months.

- 7.4 To the south of the site, there are some open views over much of the proposed development area from the pair of semi-detached houses adjacent to 'Glanrafon Cottage', although these views are mainly from first floor windows. 'Glanrafon Cottage' is mostly enclosed by tall evergreen hedges to the north of the property, but it does have some limited views of the western end of the site to the north-west.
- 7.5 'Little Llwyn Onn Farmhouse', immediately to the west of the site, has open and slightly elevated views over much of the proposed PV development area.
- 7.6 900m to the north-west, 'Llwyn Onn Hall' (a grade II listed building), may have some limited visual connectivity with the site. However, the site is generally screened from most locations within the wider landscape to the north and west.
- 7.7 From locations to the east of the site, there are some partial views of the proposed development area from Clywedog Road South (c.80-90m east of the site) and potentially from a number of industrial and business units adjacent to the eastern site boundary.
- 7.8 There are no views of the site from local public rights of way, except for some relatively close views of the proposed substation area from footpath 'MAR/39' where the footpath adjoins the Water Treatment Works access road. Notwithstanding this, the substation development site is relatively well enclosed by tall shrub vegetation.
- 7.9 To help define the existing visual baseline and to assess the potential visual effects of the development, it is accepted practice to select a number of representative photo viewpoints within the visual envelope of the proposed development. The selected viewpoints are not intended to cover every possible view of the site, but they are a representation of a range of receptor types (e.g. residents, recreational walkers and road users) from various directions and distances from the site. The locations of these viewpoints are shown on **Figure 5**, with the photographs taken at each of the accessible viewpoints illustrated on **Photo Sheets 1 – 11 in Appendix B**.
- 7.10 A description of the photographic viewpoints and the potential views of the proposed development site, along with the sensitivities of the receptors, are given in Table 1 below. In terms of visual sensitivity, views from dwellings, public rights of way and other public access areas are generally judged to have a high sensitivity, whereas transient views from roads or views from places of work are deemed to be less sensitive. The criteria for sensitivity of visual receptors are given in the visual assessment methodology outlined in **Appendix C**.

Table 1: Representative Views towards the Site (see Figure 5 and Photo Sheets 1 - 11)

Viewpoint Location	Main Visual Receptors	Distance from Site	Receptor Sensitivity	Description of View
<u>Photo Viewpoint 1:</u> A westerly view from Clywedog Road South, looking towards the proposed PV site. This section of road is located on the edge the Wrexham Industrial Estate. (Photograph taken 17th June 2021)	Road users and people working at or visiting nearby industrial / business units	c. 85m to the east of the eastern site boundary.	Low: People passing in motor vehicles and those visiting / working within the industrial estate are judged to have a relatively low visual sensitivity.	A view across an area of open ground on the edge of the industrial estate, with the site being partially visible beyond a gappy hedgerow in the near distance. The character of the viewpoint location is suburban / semi-industrial in nature but with views to the west being very rural.
<u>Photo Viewpoint 2:</u> A westerly view from the southern end of Clywedog Road South, looking towards the proposed PV site. This section of road is located on the south-western edge the Wrexham Industrial Estate. (Photograph taken 17th June 2021)	Road users and people working at or visiting nearby industrial / business units	c. 280m to the east of the proposed development area.	Low: People passing in motor vehicles and those visiting / working within the industrial estate are judged to have a relatively low visual sensitivity.	A view across an area of open ground on the edge of the industrial estate with the site being partially visible in the middle distance. The character of the viewpoint location is suburban / semi-industrial in nature but with views to the west being very rural. Views towards the site are intermittent along Clywedog Road South due to roadside hedgerows and intervening industrial units.
<u>Photo Viewpoint 3:</u> A view from the roundabout at the intersection of Cefn Road, Clywedog Road South and Sesswick Way on the south-western edge of the industrial estate, looking towards the proposed PV site. (Photograph taken 17th June 2021)	Road users	c. 250m to the south-east of the proposed development area.	Low: The receptors are generally people passing in motor vehicles with limited engagement with the wider environment.	The viewpoint is within an urban fringe setting with the industrial estate dominating views to the north and east, but with a relatively enclosed and undeveloped rural landscape to the north- west. Very limited views of the site can be gained to the north-west.

Viewpoint Location	Main Visual Receptors	Distance from Site	Receptor Sensitivity	Description of View
<u>Photo Viewpoint 4:</u> A view from Cefn Road, looking towards the proposed PV site to the north and north-west. (Photograph taken 17th June 2021)	Road users (predominantly motorists and passengers in vehicles, but the wide pavement to the north of the road is also defined as a cycle path).	c. 130m to the south and south-east of the proposed development area.	Low - Moderate: The receptors are mostly people passing in motor vehicles, but the cycleway appears to be well used. Cyclists and pedestrians will have a greater and more prolonged view of the surrounding landscape.	A view along Cefn Road and to undeveloped countryside to the north and north-west. The proposed development site is generally screened by the managed roadside hedgerow, except where there are field gateways. Heavily filtered views into the site may be available in the winter months when the deciduous hedgerow is without leaves.
<u>Photo Viewpoint 5:</u> A view from Cefn Road, near to the Sewage Treatment Works access road, looking towards the proposed PV site to the north. (Photograph taken 17th June 2021)	Road users (predominantly motorists, but also cyclists using the defined cycle path).	Immediately south of the site, but approximately 45m south of the PV development area.	Low – Moderate (as per Viewpoint 4 above).	The view along Cefn Road is similar to Viewpoint 4 above, but a low section of hedgerow provides more open views into the site.
<u>Photo Viewpoint 6:</u> A view from Cefn Road, adjacent to 'Glanrafon Cottage', looking towards the proposed PV site to the north. (Photograph taken 17th June 2021)	Road users (predominantly motorists, but also cyclists using the defined cycle path). Residents at 'Glanrafon Cottage' and the adjacent semi-detached houses.	Immediately south of the site, but approximately 50m south of the PV development area. The adjacent residential properties are some 65-70m from the development area.	Low – Moderate for road users. High for residents at the adjacent properties.	The view along Cefn Road is similar to Viewpoints 4 & 5, with the roadside hedgerow generally screening the site for road users. However, it is likely there will be open views across the site from the first-floor windows of the adjacent semi-detached properties and some limited oblique views from 'Glanrafon Cottage'
<u>Photo Viewpoint 7:</u> An easterly view along Cefn Road, to the south of Little Llwyn Onn Farm and immediately west of the site. (Photograph taken 17th June 2021)	Road users (predominantly motorists, but also cyclists using the defined cycle path).	Immediately west of the site, but approximately 40m west of the PV development area.	Low – Moderate for road users.	This is predominantly an enclosed view along Cefn Road, with the site being substantially screened by the roadside hedgerow. Heavily filtered views into the site may be available in the winter months when the deciduous hedgerow is without leaves.

Viewpoint Location	Main Visual Receptors	Distance from Site	Receptor Sensitivity	Description of View
<u>Photo Viewpoint 8:</u> An open view across the proposed PV site from the western site boundary, immediately east of 'Little Llwyn Onn Farmhouse'. The view is generally representative of views from the farmhouse. (Photograph taken 17th June 2021)	Residents at 'Little Llwyn Onn Farmhouse'.	The viewpoint is on the site boundary, but the farmhouse is located about 40m to the west of the proposed development area.	High for residents at the adjacent property.	The existing view is across an open arable field enclosed by managed hedgerows, with a prevalence of mature hedgerow trees. Industrial units are visible on the industrial estate in the middle-distance, but these buildings do not dominate the view. Much of the proposed site area is open to view from this location and from the nearby farmhouse.
<u>Photo Viewpoint 9:</u> A south-easterly view along Cefn Road from more elevated land to the north-west of the site. (Photograph taken 17th June 2021)	Road users (predominantly motorists, but also cyclists using the defined cycle path).	Approximately 500m west / north-west of the site.	Low – Moderate for road users.	A moderately elevated view across the flat, but relatively enclosed, rural landscape of the Clywedog Valley to the south-east of Wrexham. The development site is partially visible in the middle-distance.
<u>Photo Viewpoint 10:</u> A northerly view from Public Footpath MAR/39, just south of the proposed substation site. (Photograph taken 17th June 2021)	Footpath users (recreational walkers)	c. 30m south / south-east of the substation site and 240m south of the main PV site.	High: The users of public footpaths are judged to have a high visual sensitivity to their surroundings.	The view is along a farm track on the edge of a large arable field to the east of the Sewage Treatment Works. The landscape to the south is flat and open in character, whereas the view to the north illustrates the more enclosed character of the rural landscape along the River Clywedog and around the proposed PV site to the north. The proposed substation site is substantially enclosed by tall scrub vegetation, but there are some limited views through to the proposed PV site further to the north.

Viewpoint Location	Main Visual Receptors	Distance from Site	Receptor Sensitivity	Description of View
Photo Viewpoint 11: A northerly view from the sewage works access road to the south of the River Clywedog and south of the proposed solar site. (Photograph taken 17th June 2021)	Lorry drivers, employees and visitors accessing the sewage works.	110m south of the main PV site.	Low: Lorry drivers accessing the sewage works and those visiting / working within the sewage works site are judged to have a relatively low visual sensitivity.	The view is along the sewage works access road to the junction with Cefn Road. The environment is mostly rural and agricultural in character with moderate visual enclosure provided by trees and woodland along the River Clywedog immediately to the north. The proposed PV development is partially visible to the north of Cefn Road, but views of the site are more extensive as one approaches the junction with Cefn Road.

8 Landscape Sensitivity

- 8.1 The site and the surrounding area are not subject to any national or local landscape designations. The site and local area comprise a relatively intact rural landscape, but it is influenced by the large-scale Wrexham Industrial Estate to the east and north-east, and to some extent by the eastern suburban fringe of Wrexham to the west. The site occupies a distinct but relatively narrow ‘green wedge’ between the township of Wrexham and the Industrial Estate. The wider landscape to the north and south of the site is mostly rural in character.
- 8.2 The local area is generally reflective of the characteristics defined for the ‘Welsh Maelor’ Character Area as described within the Wrexham LANDMAP Character Assessment. The landscape sensitivity statement in the LANDMAP Assessment states that: *‘The traditional ‘Welsh Maelor’ landscape is very vulnerable to continuing development and recreational pressures, to economic changes which threaten traditional farming, and from land use practices and development which do not take historical landscape features into account.’*
- 8.3 From a landscape character perspective, it is predicted that the site and its immediate surrounding landscape would be sensitive to any significant changes in composition and character brought about by large-scale solar development, particularly as the site is located within the ‘Green Wedge’ policy area which promotes the protection of open land to prevent settlement coalescence. However, solar development will not have the same degree of impact as residential or industrial development and it is unlikely that the proposed solar development would result in the loss of valued landscape elements such as hedgerows and trees which help define the local landscape character. Moreover, the site has also been identified within the Borough Council’s Renewable Energy Assessment Local Search Area as being ‘least constrained’ for potential solar farm development.
- 8.4 Hence, in consideration of the above factors, combined with the overall size of the proposed development area, the site is judged to have a ‘moderate’ landscape sensitivity.

9 The Development Proposals

- 9.1 The development proposal is for a 9.9 MWp solar farm and battery storage facility comprising photo voltaic (PV) panels and associated structures located on agricultural land to the west of the Wrexham Industrial Estate. The total development area extends to approximately 14.56 hectares and will be configured as per the layout shown on **Figure 6**.
- 9.2 The proposed development will be comprised of PV panels at a maximum height of 3.1m (above ground level), a battery storage facility (with a 16 MWh import / export capacity), transformers, a substation and associated electrical infrastructure, storage containers, internal access roads, fencing and CCTV cameras. The substation will be located on a small plot of land (c.800m²) to the south of Cefn Road, adjacent to the access road to the Five Fords Wastewater Treatment Works.
- 9.3 The battery storage facility will occupy an area of approximately 0.1 hectares and will be located within the northern central part of the site, immediately south of the northern boundary. The battery modules will be housed in eight 12m long storage container type buildings. Each container will have a heating, ventilation and air cooling (HVAC) unit. The containers, which are approximately 2.9m in height (sitting on 0.6m high concrete plinths), will be delivered ready assembled onto site and will be finished in a dark green colour. Rows of inverters will be located at intervals between the battery storage containers.
- 9.4 A new entrance to the site will be established on the north side of Cefn Road, c. 50m to the east of the sewage works access road junction on the south side of the road. Surfaced access tracks will extend throughout the PV site.
- 9.5 Construction is anticipated to take up to 16 weeks and during this period a temporary construction compound will be established just to the east of the site entrance and south of the PV development area. Upon completion of the construction works, the temporary compound will be removed and the area reinstated for agricultural use.
- 9.6 The whole development will be contained within existing field boundaries and only very limited sections of hedgerow and other boundary vegetation will be removed to provide access and to undertake the construction works. However, there will be a need to remove or cut back a 100m length of hedgerow on Cefn Road to accommodate adequate visibility splays at the proposed site entrance. Also, it will be necessary to clear a small area of scrub vegetation to allow for the development of the substation site adjacent to the sewage works access road.
- 9.7 Once the development is completed and fenced, grassland below and around the solar arrays will be established and will be managed by sheep grazing. Linear hedgerows and plantations will be established to the south of the PV site to provide visual screening and landscape enhancement. In addition, areas will be set aside on the edge of the site to provide landscape and biodiversity enhancement as detailed in the landscape and ecological mitigation plans accompanying the planning application.

- 9.8 The estimated life of the development will be 40 years. After this time all of the solar infrastructure will be removed and the site will be restored to agricultural use with the benefit of the proposed landscape and biodiversity enhancements (see Section 10 below).

10 Proposed Landscape Mitigation and Enhancement

- 10.1 The purpose of mitigation measures is to avoid, reduce or offset any significant adverse effects upon the landscape or visual amenity arising from the proposed development.
- 10.2 The strategy outlined below has been formulated to mitigate the potential landscape and visual impacts resulting from the proposed development scheme and where possible to enhance the overall landscape character and condition of the site and the local area. The proposals have been developed in consideration of the baseline landscape and visual assessment, local planning policies and the guidelines within the local LANDMAP Character Assessment.
- 10.3 Those mitigation proposals which are incorporated into the scheme design are as follows:
- Retention all of the hedgerows and trees in and around the site (except where access is required or for visibility splays at the site entrance) to provide visual screening and to preserve existing landscape structure and character.
 - Provision of adequate development standoff to all perimeter hedgerows and hedgerow trees to protect rooting zones in order to maintain the health and viability of all existing trees and hedgerows, and to allow access for hedgerow maintenance.
 - Locating the battery storage facility within the more remote and visually enclosed part of the site, away from roads, public rights of way and local residential properties.
 - Locating the development substation within an area enclosed by existing scrub vegetation in order to minimise visual impact.
 - Planting and establishing a new native woodland belt along parts of Cefn Road to the south of the PV site to screen potential views of the proposed development from Cefn Road and from residential properties at and adjacent to 'Glanrafon Cottage'.
 - Establishing woodland planting adjacent to the western site boundary to reduce the potential visual impact of the development upon 'Little Llwyn Onn Farmhouse'.
 - "Gapping-up" the existing discontinuous hedgerow on the eastern site boundary to screen or soften views of the proposed PV development from Clywedog Road South and the Wrexham Industrial Estate to the east.

- Establishing additional scrub / woodland planting adjacent to the sewage works access road and around the substation to compensate for the loss of scrub within the substation site and to screen the site
- Managing all retained and proposed hedgerows by annual trimming to maintain density for screening purposes and allow all low hedges to grow to a minimum height of 3m to assist in screening the development.
- Managing the grassland within the development areas, and on the undeveloped margins, to promote floristic diversity and habitat enhancement by low intensity sheep grazing.
- Establishing a dedicated wildlife area to the south-east of the PV development area, to include the construction of a small pond, to provide biodiversity and landscape enhancement.
- Planting only native and locally indigenous tree and shrub species to provide biodiversity enhancement.
- Managing the site to promote biodiversity net gain.

11 Visual Impacts of the Development

- 11.1 The assessment of the development's potential visual impacts has been undertaken in accordance with the methodology set out in **Appendix C**.
- 11.2 There are only a limited number of sensitive visual receptors within the local area and the site is generally screened in the wider landscape by a prevalence of field boundary hedgerows, mature hedgerow trees and small blocks of woodland.
- 11.3 The existing hedgerow along the north side of Cefn Road (the southern site boundary) will mostly screen the site from the road, with the development having a fairly 'minor' or 'negligible' visual impact. However, the PV arrays may have a 'moderate' adverse impact at some location along the road where the existing hedgerow is relatively low or gappy. In addition, it is proposed to cut back the hedgerow adjacent to the proposed site entrance to provide visibility splays. This may cause a more significant adverse impact, particularly during the construction period when a temporary construction compound will be established near to the road.
- 11.4 However, the proposed woodland planting adjacent to the southern boundary, and the management of the existing boundary hedgerow, will substantially screen the development from all of Cefn Road within a period of 5 – 10 years, which will significantly reduce or eliminate any adverse visual impacts upon road users.

- 11.5 It is predicted that four residential properties near to the site will be visually affected by the construction works and the completed development prior to the establishment of the proposed mitigation planting. The development is likely to have a ‘major’ adverse visual impact upon ‘Little Llwyn Onn Farmhouse’ to the west of the site, and ‘moderate’ to ‘major’ impacts upon a pair of semi-detached houses and ‘Glanrafon Cottage’ to the south of Cefn Road. Again, these impacts can be substantially mitigated over time with the establishment of the proposed woodland planting on the edge of the site. The residual visual impacts on these properties are predicted to be ‘moderate’ for ‘Little Llwyn Onn Farmhouse’ and ‘minor’ to ‘moderate’ for residents at ‘Glanrafon Cottage’ and the adjacent properties.
- 11.6 Any potential visual impacts upon residential dwellings in the wider landscape are anticipated to be ‘negligible’. For example, views of the PV development from the Grade II listed building at ‘Llwyn Onn Hall’ (900m to the north-west) will be distant and the development is likely to be perceived as a very small element within the landscape.
- 11.7 To the east and south-east of the site, impacts upon visual receptors within the Wrexham Industrial Estate are predicted to be ‘minor’ or ‘negligible’. Any limited views of the development will be largely screened by the proposed hedgerow planting on the eastern site boundary as this matures.
- 11.8 The only public right of way affected by the development is footpath MAR/39 to the south and east of the substation site. Any adverse visual impacts of the development upon this right of way are predicted to be relatively ‘minor’, although a greater degree of impact might be experienced for a short period of time during the construction works. In the longer term, additional shrub planting around the substation and adjacent to the sewage works access road should totally screen the development from the footpath.
- 11.9 A more detailed assessment of the visual impacts of the proposed PV development upon the selected representative viewpoints are set out in **Tables 2** and **3** below. **Table 2** assesses the impacts during construction and immediately post completion of the development, whereas **Table 3** considers the predicted impacts at 10 years post completion when the proposed hedge planting and plantations should be well established.

Table 2: Visual Impact of the Development during construction and immediately post completion (with reference to **Figure 5** and **Photo-sheets 1 – 11**):

Visual Receptors & Viewpoint Location	Receptor Sensitivity	Magnitude or Scale of Visual Effect (Magnitude of Change)	Nature of Effect	Mitigation	Overall Significance of the Visual Impact of the Development	Significance Rationale / Comment
Photo Viewpoint 1: Road users on Clywedog Road South (to the east of the site) and people working at or visiting nearby industrial / business units	Low	Slight	Adverse	Hedgerow planting along the eastern site boundary.	Minor	The construction activities and completed PV development will be visible to a limited extent from the industrial estate.

Visual Receptors & Viewpoint Location	Receptor Sensitivity	Magnitude or Scale of Visual Effect (Magnitude of Change)	Nature of Effect	Mitigation	Overall Significance of the Visual Impact of the Development	Significance Rationale / Comment
<u>Photo Viewpoint 2:</u> Road users at the southern end of Clywedog Road South (to the east of the site) and people working at or visiting nearby industrial / business units	Low	Negligible	Neutral	Hedgerow management on the site boundary to allow hedgerows to grow in height to screen the development.	Negligible	The construction activities and completed PV development will have only very limited visual effect upon this location.
<u>Photo Viewpoint 3:</u> Road users at the roundabout, 250m south-east of the site.	Low	Negligible	Neutral	Hedgerow management on the site boundary to allow hedgerows to grow in height to screen the development.	Negligible	The construction activities and completed PV development will have only very limited visual effect upon this location.
<u>Photo Viewpoint 4:</u> Occupants of motor vehicles, cyclists and other road users on Cefn Road, c.130m south/south-east of the site.	Low - Moderate	Slight	Adverse	Hedgerow management on the site boundary to allow hedgerows to grow in height to screen the development.	Minor	The construction activities and completed PV development will be visible to a limited extent, particularly at field gateways and to cyclists and pedestrians.
<u>Photo Viewpoint 5:</u> Occupants of motor vehicles, cyclists and other road users on Cefn Road, immediately south of the site.	Low - Moderate	Moderate - Substantial	Adverse	Hedgerow management on the site boundary and the planting of a woodland belt on the inside of the boundary.	Moderate	This location will afford some relatively open views of the construction activities and completed PV development within the fields to the north. The viewpoint is also close to the proposed site entrance and temporary construction compound.

Visual Receptors & Viewpoint Location	Receptor Sensitivity	Magnitude or Scale of Visual Effect (Magnitude of Change)	Nature of Effect	Mitigation	Overall Significance of the Visual Impact of the Development	Significance Rationale / Comment
Photo Viewpoint 6: Occupants of motor vehicles, cyclists and other road users on Cefn Road, immediately south of the site. Residents at 'Glanrafon Cottage' and the adjacent semi-detached houses to the south of Cefn Road	Low – Moderate for road users. High - for residents at the adjacent properties.	Negligible to Slight for road users. Moderate to Substantial for residents at the adjacent semi-detached properties. Slight for residents at 'Glanrafon Cottage'.	Adverse	Hedgerow management on the site boundary and the planting of a woodland belt on the inside of the boundary.	Minor for road users. Moderate to Major for residents at the two semi-detached properties. Moderate for 'Glanrafon Cottage'.	Views of the development for most road uses are likely to be limited. Residents at the pair of semi-detach properties will gain relatively open views across much of the development area from first floor windows. Views of the development from 'Glanrafon Cottage' are restricted to the western end of the site only.
Photo Viewpoint 7: Occupants of motor vehicles, cyclists and other road users on Cefn Road, immediately west of the site.	Low - Moderate	Negligible to Slight	Adverse	Hedgerow management on the site boundary to allow hedgerows to grow in height to screen the development, and the planting of a woodland belt on the western site boundary.	Minor	The construction activities and completed PV development will be mostly screened by the roadside hedgerow, although some filtered views might be available through the deciduous hedgerow in winter.
Photo Viewpoint 8: Residents at 'Little Llwyn Onn Farmhouse', 40m to the west of the site.	High	Substantial	Adverse	The planting of a narrow woodland belt adjacent to the western site boundary.	Major	There will be open views over much of the development area from some ground floor and first floor windows at the nearby farmhouse.

Visual Receptors & Viewpoint Location	Receptor Sensitivity	Magnitude or Scale of Visual Effect (Magnitude of Change)	Nature of Effect	Mitigation	Overall Significance of the Visual Impact of the Development	Significance Rationale / Comment
<u>Photo Viewpoint 9:</u> Occupants of motor vehicles, cyclists and other road users on Cefn Road, 500m to the west of the site.	Low - Moderate	Negligible	Neutral	Planting on the western boundary.	Negligible	Views of the proposed development in the middle distance will be very limited and will have little or no impact on the wider view.
<u>Photo Viewpoint 10:</u> Footpath users (recreational walkers) on Public Footpath MAR/39 to the immediate south of the substation development area.	High	Moderate during construction, Slight following the completion of the construction works.	Adverse	Shrub planting adjacent to the substation site.	Moderate during construction, Minor following the completion of the construction works.	The proposed substation site is enclosed by scrub vegetation and the substation is likely to be relatively well screened. Some activity will be evident during the construction period, particularly with regard to the installation of buried cabling alongside the sewage works access road. Middle distance views through to the main PV site are limited.
<u>Photo Viewpoint 11:</u> Lorry drivers, employees and visitors accessing the Wastewater Treatment Works, along the access road between the main PV site and the substation.	Low	Slight to Moderate	Adverse	Shrub planting adjacent to the access road and a belt of woodland planting along the southern boundary of the main PV site.	Moderate during construction, Minor following the completion of the construction works.	Significant construction activity will be evident alongside the access road and within the main site to the north of Cefn Road. Post construction, the visual effects will reduce, but the PV development will be partially visible to the north, particularly in views near to the junction with Cefn Road.

Table 3: Visual Impact of the Development at 10 years post completion (with reference to **Figure 5** and **Photo-sheets 1 – 11**):

Visual Receptors & Viewpoint Location	Receptor Sensitivity	Magnitude or Scale of Visual Effect (Magnitude of Change)	Nature of Effect	Mitigation	Overall Significance of the Visual Impact of the Development	Significance Rationale / Comment
<u>Photo Viewpoint 1:</u> Road users on Clywedog Road South (to the east of the site) and people working at or visiting nearby industrial / business units	Low	Negligible	Neutral	Hedgerow planting along eastern site boundary.	Negligible	The established hedgerow on the eastern site boundary should effectively screen the development. The planting will provide moderate landscape enhancement.
<u>Photo Viewpoint 2:</u> Road users at the southern end of Clywedog Road South (to the east of the site) and people working at or visiting nearby industrial / business units.	Low	Negligible	Neutral	Hedgerow management on the site boundary to allow hedgerows to grow in height to screen the development.	Negligible	The PV development will be significantly screened and will have little or no impact upon this location.
<u>Photo Viewpoint 3:</u> Road users at the roundabout, 250m south-east of the site.	Low	Negligible	Neutral	Hedgerow management on the site boundary to allow hedgerows to grow in height to screen the development.	Negligible	The PV development will be significantly screened and will have little or no impact upon this location.
<u>Photo Viewpoint 4:</u> Occupants of motor vehicles, cyclists and other road users on Cefn Road, c.130m south /south-east of the site.	Low - Moderate	Negligible	Neutral	Hedgerow management on the site boundary to allow hedgerows to grow in height to screen the development.	Negligible	Allowing the roadside hedge to grow in height and effective hedgerow management should substantially screen the development.

Visual Receptors & Viewpoint Location	Receptor Sensitivity	Magnitude or Scale of Visual Effect (Magnitude of Change)	Nature of Effect	Mitigation	Overall Significance of the Visual Impact of the Development	Significance Rationale / Comment
Photo Viewpoint 5: Occupants of motor vehicles, cyclists and other road users on Cefn Road, immediately south of the site.	Low - Moderate	Negligible	Neutral	Hedgerow management on the site boundary and the planting of a woodland belt on the inside of the boundary.	Negligible	10 years of growth of the plantation along the southern site boundary should substantially screen the development. However, there will a moderate change in character along Cefn Road with the road corridor becoming more enclosed.
Photo Viewpoint 6: Occupants of motor vehicles, cyclists and other road users on Cefn Road, immediately south of the site. Residents at 'Glanrafon Cottage' and the adjacent semi-detached houses to the south of Cefn Road	Low – Moderate for road users. High for residents at the adjacent properties.	Negligible for road users. Slight for residents at the adjacent properties.	Neutral Adverse	Hedgerow management on the site boundary and the planting of a woodland belt on the inside of the boundary.	Negligible for road users. Minor to Moderate for residents at the adjacent properties.	10 years of growth of the plantation along the southern site boundary should substantially screen the development. However, there will a moderate change in character along Cefn Road with the road corridor becoming more enclosed and the properties south of the road losing their open view across the field to the north.
Photo Viewpoint 7: Occupants of motor vehicles, cyclists and other road users on Cefn Road, immediately west of the site.	Low - Moderate	Negligible	Neutral	Hedgerow management on the site boundary and the planting of a woodland belt on the inside of the boundary.	Negligible	10 years of growth of the plantation along the southern site boundary should completely screen the development from this location. However, there will a moderate change in character along Cefn Road with the road corridor becoming more enclosed.

Visual Receptors & Viewpoint Location	Receptor Sensitivity	Magnitude or Scale of Visual Effect (Magnitude of Change)	Nature of Effect	Mitigation	Overall Significance of the Visual Impact of the Development	Significance Rationale / Comment
<u>Photo Viewpoint 8:</u> Residents at 'Little Llwyn Onn Farmhouse', 40m to the west of the site.	High	Moderate	Adverse	The planting of a narrow woodland belt adjacent to the western site boundary.	Moderate	The proposed planting is likely to partially screen or soften the impact of the development but some views of the site are likely to remain due to the properties elevated position.
<u>Photo Viewpoint 9:</u> Occupants of motor vehicles, cyclists and other road users on Cefn Road, 500m to the west of the site.	Low - Moderate	Negligible	Neutral	Planting on the western boundary.	Negligible	Views of the proposed development in the middle distance will be very limited and will have little or no impact on the wider view.
<u>Photo Viewpoint 10:</u> Footpath users (recreational walkers) on Public Footpath MAR/39 to the immediate south of the substation development area.	High	Negligible	Neutral	Shrub planting adjacent to the substation site.	Negligible	The proposed substation will be substantially screened. Middle distance views through to the main PV site will be screened by planting along Cefn Road.
<u>Photo Viewpoint 11:</u> Lorry drivers, employees and visitors accessing the Wastewater Treatment Works, along the access road between the main PV site and the substation.	Low	Negligible	Neutral	Shrub planting adjacent to the access road and a belt of woodland planting along the southern boundary of the main PV site.	Negligible	Views through to the main PV site will be screened by planting along Cefn Road. Planting along the sewage works access road will provide landscape enhancement.

12 Landscape Impacts of the Development

- 12.1 The assessment of the development's potential landscape impacts has been undertaken in accordance with the methodology set out in **Appendix C**.
- 12.2 The proposed development will not result in any significant loss of trees, hedgerows or other established landscape features and the land will still be utilised for agriculture in the form of sheep grazing. However, the erection of PV arrays over a relatively large area is likely to cause a significant change in the prevailing rural character of the site itself, the magnitude of which is assessed as being 'moderate' to 'substantial'. Hence in consideration of the site's 'moderate' landscape sensitivity, the resultant landscape impact of the proposed development is predicted to be 'moderate' to 'major' at the immediate site level, prior to the establishment of the proposed mitigation planting.
- 12.3 In the medium term, the proposed planting on the site boundaries will screen much of the development from the identified visual receptors immediately adjacent to the site, which will serve to mitigate the adverse landscape character impacts upon these locations.
- 12.4 Within the wider landscape, the development will have very limited visual impact, which in turn will have limited effect upon the broader landscape character. Whilst the local landscape is judged to have a 'moderate' landscape sensitivity; and the 'Welsh Maelor' landscape character area is sensitive to *"continuing development and ... to economic changes which threaten traditional farming"*, it is anticipated that the overall scale of the proposed development and its relatively enclosed location will give rise to only 'minor' landscape impacts in relation to the LANDMAP character area.
- 12.5 Moreover, the planting around the site, and the creation of other wildlife habitats, is likely to provide tangible benefits in terms of landscape structure and biodiversity enhancement, which will improve the quality of the local landscape character area.
- 12.6 The development is also temporary, and all of the solar infrastructure will be removed after 40 years with the site being reinstated to agricultural use. Hence in the long term, it is predicted that there will be no residual adverse landscape and visual impacts, but the proposed enhancements in biodiversity and landscape structure will provide long term benefits.

13 Summary

- 13.1 This Landscape and Visual Assessment has been prepared in support of a planning application for the development of a solar farm and small battery storage facility on approximately 14.56 hectares of agricultural land to the south-east of the town of Wrexham in North Wales. The report aims to assess the potential effects of the proposed development upon the landscape character and visual amenity of the site and the local area.

- 13.2 The development will comprise photo voltaic (PV) panels, a battery storage facility, transformers, a substation (to the south of the main site), storage containers, internal access roads, fencing and associated CCTV cameras.
- 13.3 The site is located within a relatively flat landscape alongside the narrow floodplain of the River Clywedog to the south, although the land to the west and north-west does rise more conspicuously. The landscape within the immediate vicinity of the site is agricultural and rural in character, but lies adjacent to the Wrexham Industrial Estate to the east, and the south-eastern outskirts of Wrexham to the north-west. Cefn Road, which extends along the southern boundary of the PV site, forms one of the main arterial roads between Wrexham town centre and the Wrexham Industrial Estate
- 13.4 The experiential qualities of the local landscape are varied, ranging from the rural and agrarian landscape within the site and within those areas to the north and west, contrasting with the dominance of large industrial units to the immediate east of the site and the urban fringes of Wrexham further to the north-west.
- 13.5 The local area around the site feels relatively enclosed with a prevalence of boundary hedgerows, mature hedgerow trees and small blocks of woodland, precluding any long-distance views. The landscape is also contained by the rising ground and localised ridge lines to the north and north-west of the site.
- 13.6 The site's zone of visual influence within the wider landscape is generally restricted by hedgerows and trees, along with the nature of the surrounding topography. There are only a limited number of sensitive visual receptors within the local area.
- 13.7 The main visual receptors include Cefn Road to the south, three residential dwellings to the south of Cefn Road, 'Little Llwyn Onn Farm' to the west and some limited views from the Wrexham Industrial Estate to the east. One public right of way has limited views of the proposed substation site to the south of Cefn Road.
- 13.8 The site and the surrounding area are not subject to any national or local landscape designations. The area comprises a relatively intact rural landscape, but it is influenced by the large-scale Wrexham Industrial Estate to the east and north-east, and to some extent by the eastern suburban fringe of Wrexham to the north-west. The wider landscape to the north and south of the site is mostly rural in character. The local area is generally reflective of the characteristics defined for the 'Welsh Maelor' Character Area as described within the Wrexham LANDMAP Character Assessment. The overall landscape sensitivity of the site and surrounding area is judged to be 'moderate'.
- 13.9 Mitigation proposals have been put forward in order to reduce or eliminate any potential landscape and visual impacts caused by the development. The main mitigation schemes are to establish a woodland belt along the boundary with Cefn Road to the south, and to gap-up and maintain all boundary hedgerows. These mitigation schemes are designed to visually screen the development from identified receptors and to provide landscape and biodiversity enhancement.
- 13.10 Prior to the establishment of the mitigation planting, the development is likely to have a 'major' adverse visual impact upon 'Little Llwyn Onn Farmhouse' to the west of the site, and

‘moderate’ to ‘major’ impacts upon a pair of semi-detached houses and ‘Glanrafon Cottage’ to the south of Cefn Road. However, these impacts can be substantially mitigated over time with the establishment of the proposed woodland planting on the edge of the site. The residual visual impacts on these properties are predicted to be ‘moderate’ for ‘Little Llwyn Onn Farmhouse’ and ‘minor’ to ‘moderate’ for residents at ‘Glanrafon Cottage’ and the adjacent properties.

- 13.11 The visual impacts of the development upon Cefn Road to the south will be fairly ‘minor’ except where there will be some direct views into the site at the entrance on Cefn Road or where the roadside hedge is low or gappy. However, the mitigation planting along the roadside will eliminate or substantially reduce the more adverse impacts once the planting has become established.
- 13.12 With regard to effects upon landscape character, the development is likely to have a ‘major’ impact at the immediate site level, due to the significant change from an established agricultural land use to that of a medium-scale solar farm, which is a change from the inherent character of the existing site. Outside of the site and within the wider ‘Welsh Maelor’ character area, the effects of the development upon the prevailing landscape character are predicted to be relatively ‘minor’.
- 13.13 Moreover, the planting around the site, and the creation of other wildlife habitats, is likely to provide tangible benefits in terms of landscape structure and biodiversity enhancement, which will improve the quality and condition of the local landscape character area.
- 13.14 The development is also temporary. All of the solar infrastructure will be removed after 40 years and the site will be reinstated to agricultural use, with the benefit of the proposed biodiversity and landscape enhancements.

Appendix A– Figures 1 - 6

Figure 1 – Location Plan

Figure 2 – Designations

Figure 3 – Landscape Character

Figure 4 – Public Rights of Way

Figure 5 – Viewpoint Locations Plan

Figure 6 – PV Array Layout

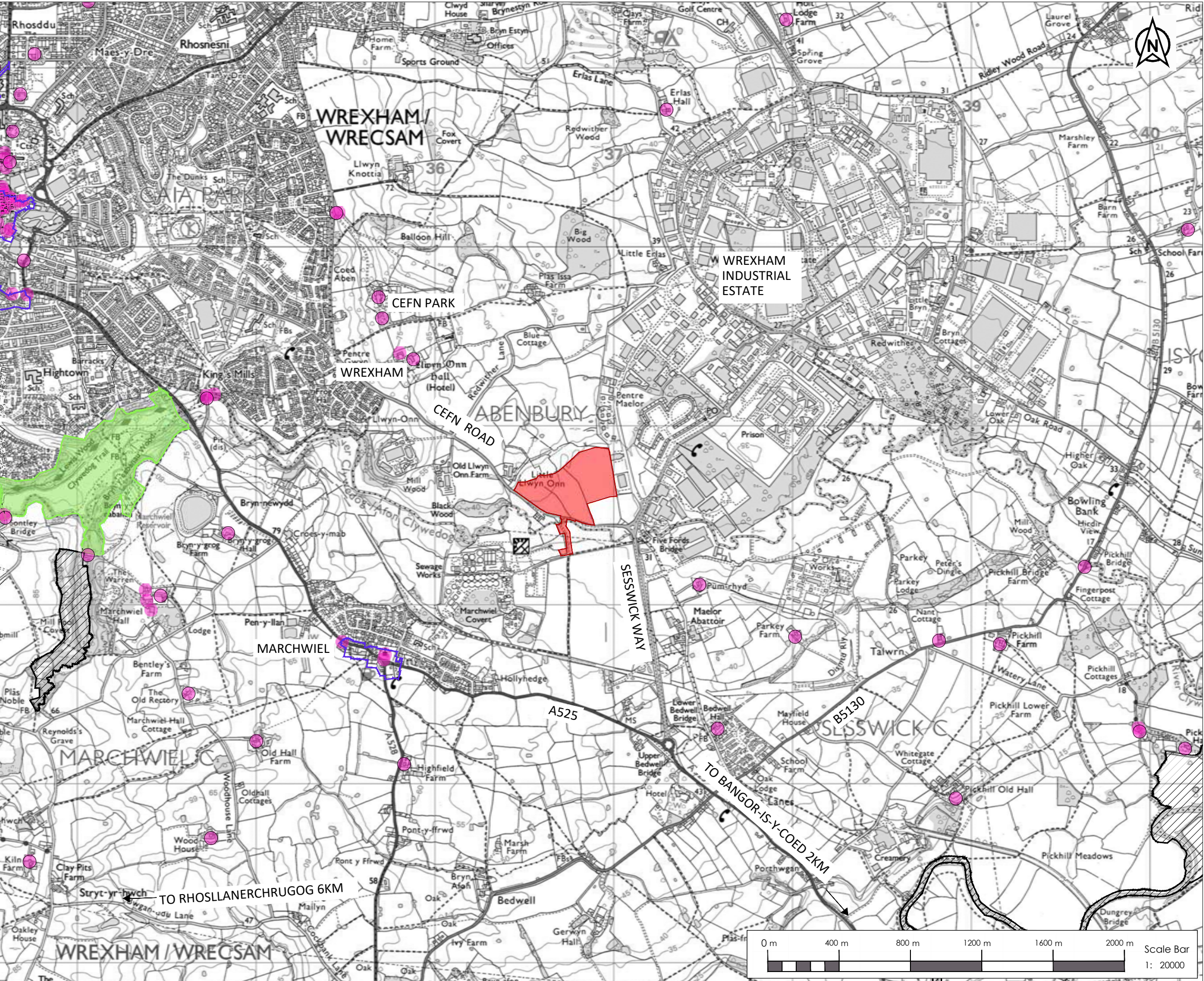


Key:

Application site

Figure 1

rev: -	date: -	details: -
corylus Planning & Environmental Ltd.		
client: Novus RS		
project: Cefn Park		
title: Location Plan		
scale: 1:20,000	date: 15/09/21	drawn by: NG
checked by: AW	size: A3	
project ref: CE/321	dwg no: CE/321/06	rev: -



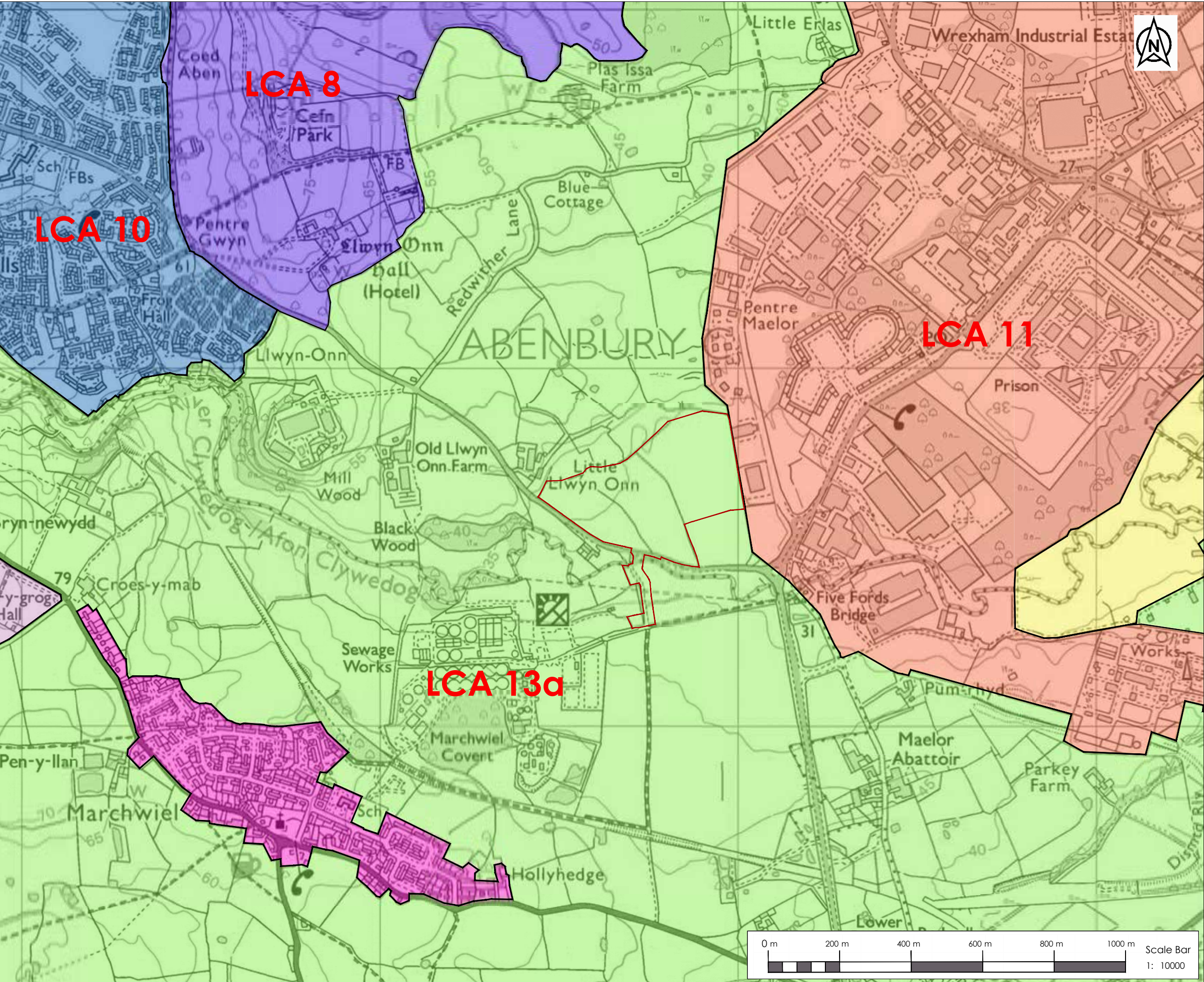
Key:

- Application site
- Site of Special Scientific Interest
- Country park
- Conservation area
- Listed building

Figure 2

rev: -	date: -	details: -
corylus Planning & Environmental Ltd.		
client: Novus RS		
project: Cefn Park		
title: Designations		
scale: 1:20,000	date: 15/09/21	drawn by: NG
project ref: CE/321	dwg no: CE/321/07	checked by: AW
		size: A3
		rev: -

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Key:

Application site

LANDMAP Landscape Character Areas:

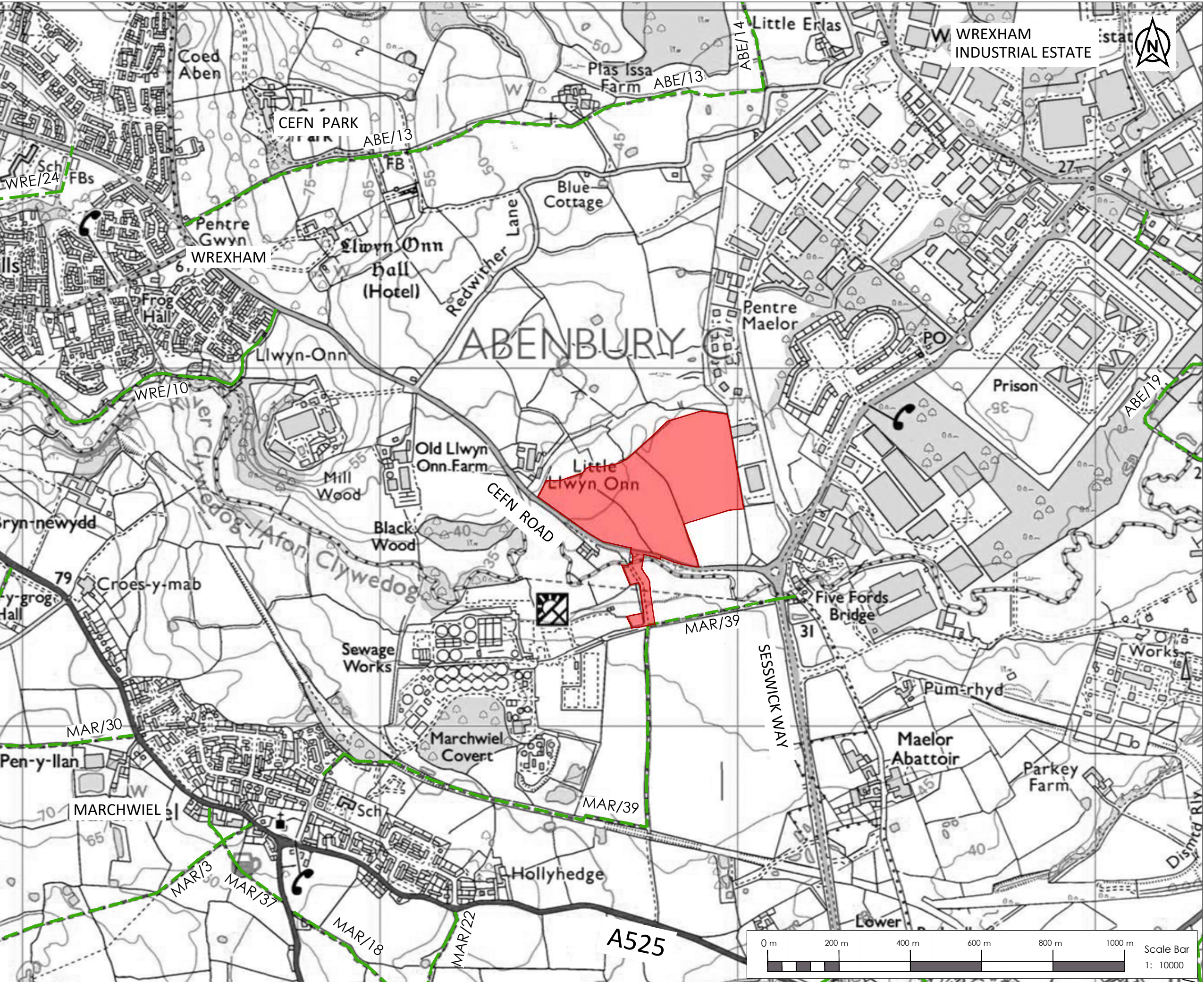
- LCA 8** - Gwersyllt, Llay, Geresford, Borras
- LCA 10** - Wrexham Town
- LCA 11** - Wrexham Industrial Estate
- LCA 13a** - Welsh Maelor

LANDMAP Visual Sensory Character areas

- Maelor South of Wrexham
- Wrexham Industrial Estate
- River Dee Valley Floor
- Terrace North and East of Wrexham
- Wrexham
- Maelor Villages
- Marchwiel Hall and Bryn y Grog

Figure 3

rev:	date:	details:
 The Old Dairy Yanworth Cheltenham Gloucestershire GL54 3LQ tel: 01285 721072		
client:	Novus RS	
project:	Cefn Park	
title:	Landscape Character Areas	
scale:	date:	drawn by:
1:10000	16/09/21	NG
checked by:	size:	
AW	A3	
Project ref:	draw no:	rev:
CE/321	CE/321/08	-



Key:

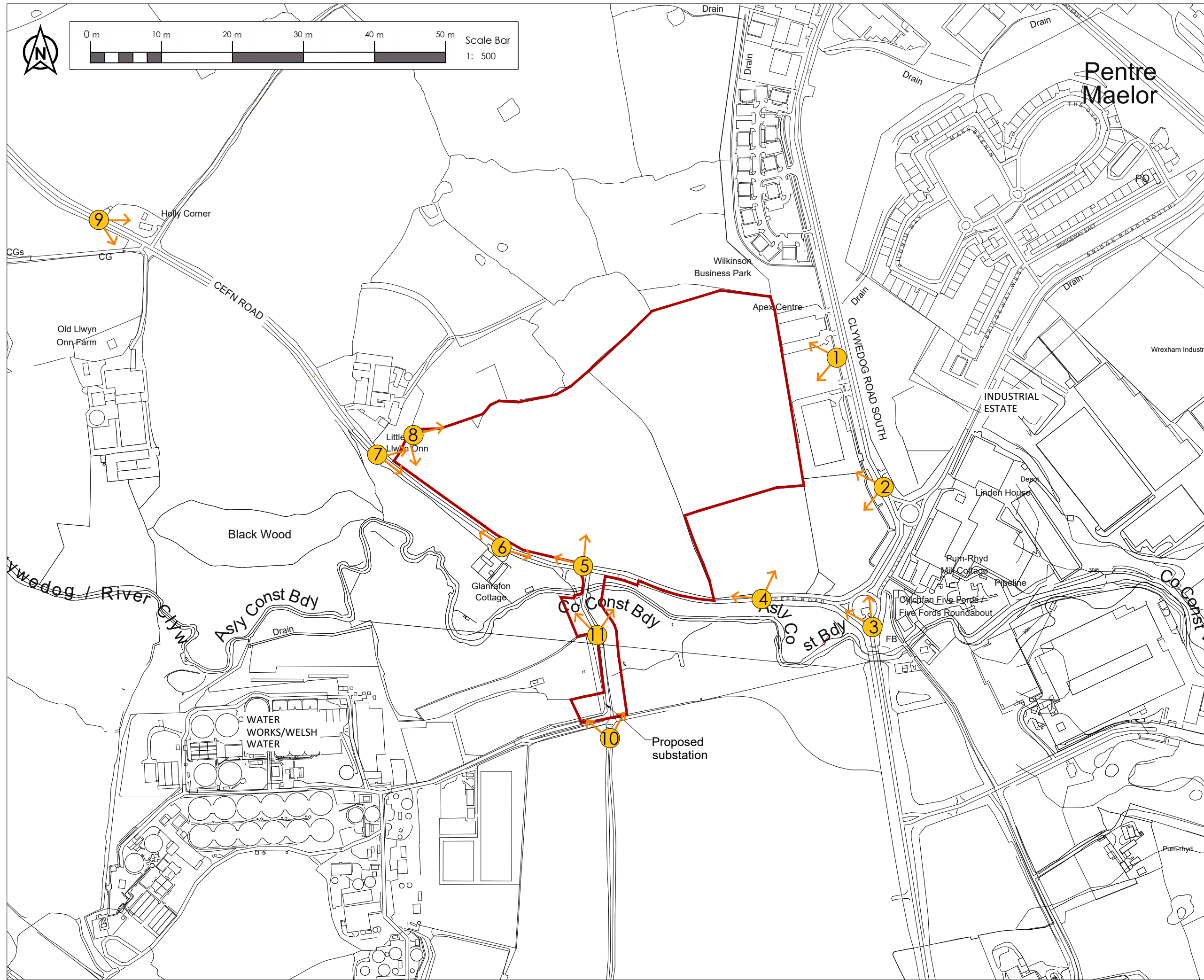
Application site

Public Rights of Way

Figure 4

rev: -	date: -	details: -
corylus Planning & Environmental Ltd. The Old Dairy Yanworth Cheltenham Gloucestershire GL54 3LQ tel: 01285 721072		
client:	Novus RS	
project:	Cefn Park	
title:	Public Rights of Way	
scale: 1:10000	date: 16/09/21	drawn by: NG
checked by: AW	size: A3	
Project ref: CE/321	dwg no: CE/321/08	rev: -

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Key:

- Site Boundary
- Photo Viewpoints

Figure 5

rev: -	date: -	details: -
corylus Planning & Environmental Ltd. The Old Dairy Yanworth Cheltenham Gloucestershire GL54 3LQ tel: 01285 721072		
client: Novus R S Ltd		
project: Cefn Park		
title: Viewpoint Location Plan		
scale: 1:500	date: 05/10/21	drawn by: NG
checked by: AW	size: A3	
Project ref: CE/321	dwg no: CE/321/11	rev: -



- Key:
- Application Area
 - Existing Scrub
 - Existing Vegetation
 - Visibility Splay
 - Proposed temporary compound area
 - Water Main & Easement
 - PROW
 - Internal roads / hard standing
 - Soil bund
 - Hedgerow to be removed
 - Hedgerow to be cut to 0.6 m
 - Proposed hedgerow
 - Hedgerow to be gapped up
 - Transformer
 - Proposed woodland planting
 - Proposed scrub planting
 - PV fence line
 - CCTV
 - Root protection zone

Figure 6

rev:	date:	details:
E	08-04-22	(SJ) Amendment to title
D	28-09-21	(JLB) Ecological enhancements added
C	24-09-21	(JLB) Entrance bund removed
B	22-09-21	(JLB) landscape scheme & red line updated
A	23-08-21	(JLB) landscape scheme updated



The Old Dairy
Yanworth
Chellenham
Gloucestershire
GL54 3LQ
tel: 01285 721072

client:

Novus RS

project:

Cefn Park

title:

Stage 3: Detail Layout

scale: 1:2500	date: 16/08/21	drawn by: JLB	checked by: JLB	size: A3
Project ref: CE/321	dwg no: CE/321/4	rev: E		

Appendix B – Photo Sheets 1 -11



Photo Viewpoint 1: Westerly view from Clywedog Road South, 85m to the east of the site, adjacent to the Wrexham Industrial Estate.

Viewpoint 1



Photo Viewpoint 2: Westerly view from Clywedog Road South, 280m to the east of the site, adjacent to the Wrexham Industrial Estate.

Viewpoint 2



Photo Viewpoint 3: North-westerly view from the roundabout at the eastern end of Cefn Road, 250m to the south-east of the site.

Viewpoint 3

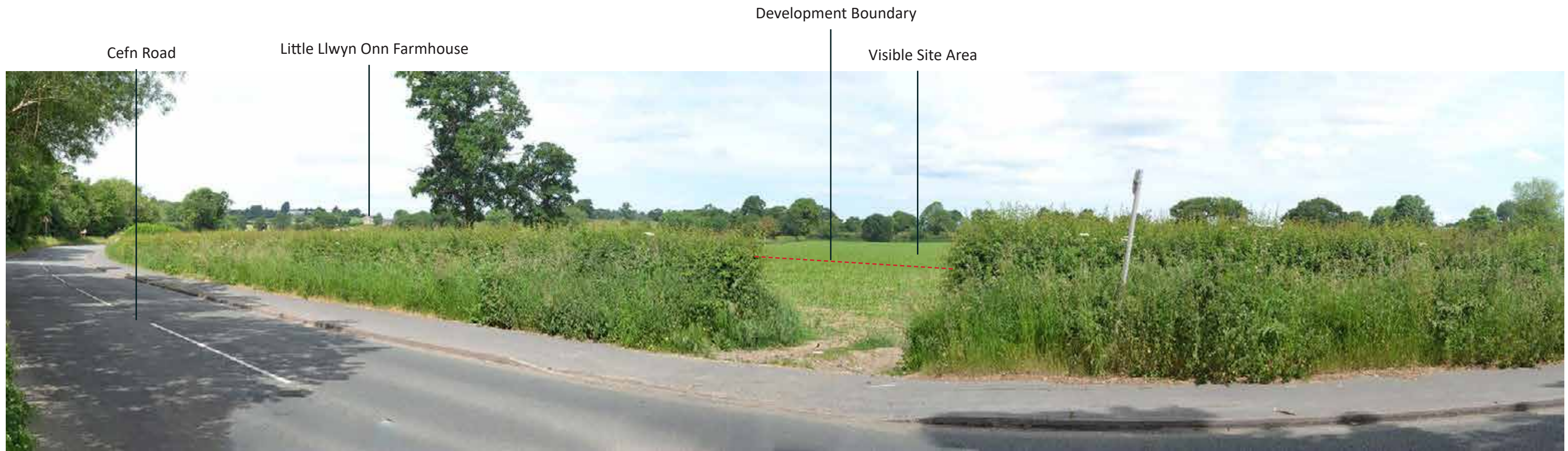


Photo Viewpoint 4: North-westerly view from the eastern end of Cefn Road, 130m to the south of the site.

Viewpoint 4



Photo Viewpoint 5: North-westerly view from Cefn Road (adjacent to the sewage works entrance), immediately south of the site.

Viewpoint 5



Photo Viewpoint 6: A panoramic northerly view from Cefn Road, immediately south of the site and immediately north of Glenrafon Cottage.

Viewpoint 6



Photo Viewpoint 7: Easterly view from Cefn Road immediately west of the site and south of Little Llwyn Onn Farm

Viewpoint 7

Proposed PV
Development Area

Wrexham
Industrial Estate

Houses adjacent to
Glanrafon Cottage

Cefn Road



Photo Viewpoint 8: Easterly view from the western site boundary, near to Little Llwyn Onn Farm. The view is generally reflective of the views from ‘Little Llwyn Onn Farmhouse’.

Viewpoint 8



Photo Viewpoint 9: South-easterly view from Cefn Road, c.500m to the west/north-west of the site.

Viewpoint 9



Photo Viewpoint 10: Northerly view from public footpath MAR/39, immediately south of the proposed substation site and 240m south of the main solar development site.

Viewpoint 10



Photo Viewpoint 11: Northerly view from the access road to the Wrexham Sewage Works, c.110m south of the main solar development site.

Viewpoint 11

Appendix C - Landscape and Visual Assessment Methodology

Introduction

Landscape and visual impacts are independent but inter-related issues. Landscape impact assessment aims to determine the likely changes in the physical landscape resulting from a given development and to evaluate the significance of these changes in relation to their effects upon both the quality and character of the landscape. Visual impact assessment predicts the appearance of these physical changes within the landscape and their effects upon specific viewpoints or visual receptors, such as the occupants of residential properties and the users of roads, public rights of way or other public open spaces.

In summary, the objectives of Landscape and Visual Impact Assessment (LVIA) are to:

- describe and evaluate the existing landscape resource and visual amenity of the site and the surrounding area that may be affected by a given development proposal;
- determine the sensitivity of the existing landscape resource and its capacity to accept change;
- identify and determine the nature and extent of any direct effects of the development upon physical components within the landscape, the introduction of new or uncharacteristic features into the landscape and the effect of these changes upon the landscape character and quality of the site and surrounding area;
- determine the extent to which the development will be visible in the wider landscape;
- locate the key visual receptors, determine the sensitivity of these receptors and assess the likely changes in views that may result from the development;
- evaluate the magnitude and significance of effects upon both visual receptors and the overall character and quality of the landscape;
- determine and evaluate any cumulative impacts that may be caused by the proposed development in relation to other known developments of a similar nature in the surrounding area;
- determine potential measures to reduce or mitigate the impacts of the proposed development;

The methodology set out below draws upon a variety of existing and emerging publications, the most relevant being the 'Guidelines for Landscape and Visual Impact Assessment' (*Landscape Institute and the Institute of Environmental Management and Assessment, 3rd Edition 2013*).

Landscape Assessment

Landscape assessment involves an identification and analysis of various factors pertaining to the site and surrounding area. These factors include:

- **physical resources** - such as geology, landform, trees, hedgerows, built structures, land use etc.;
- **landscape quality or condition** – the physical state of the landscape, its state of repair or its intactness from a visual, functional and ecological perspective.
- **landscape character** – the distinct, recognisable and consistent pattern of elements (or physical resources) within the landscape that makes one landscape different from another. Character can be defined by particular combinations of geology, landform, soils, vegetation, land use, field patterns and human settlement, but may also be influenced by the condition or management of the landscape.
The landscape character of a particular area can be determined through published character assessments or by undertaking a site specific character assessment in accordance with the 'Landscape Character Assessment Guidance for England and Scotland' (*Countryside Agency and Scottish Natural Heritage 2002*);
- **landscape value** – the relative importance or value of the landscape as expressed through national or local designation, or by consensus or public recognition. The value of a particular landscape may be defined through its unique character, scenic beauty, quality, rarity, tranquillity, cultural and historic associations or through biodiversity and conservation interest.

The baseline landscape assessment is undertaken through a combination of desktop research and analysis and subsequent field assessment. The desk based assessment will involve a review of relevant designations, planning policy and existing landscape assessments, plus an analysis of Ordnance Survey maps and aerial photographs. The field work will verify and expand upon information gathered through the desktop exercise, with particular consideration of the existing landscape elements in and around the site and how these contribute to the overall character of the local landscape. Judgemental assessments can also be carried out in the field to reflect upon issues such as landscape condition, visual amenity, psychological perceptions and how people are perceived to use or value the site or local area.

The landscape impact or significance of a particular development can be evaluated by assessing the sensitivity of the existing landscape resource in combination with the likely magnitude of landscape change brought about by the development.

Landscape Sensitivity

Landscape sensitivity is the extent to which a landscape can accommodate change of a particular type without unacceptable adverse effects upon its character, value or quality. The determination of the sensitivity of the landscape resource is based upon an evaluation of each of the key elements or characteristics of the landscape likely to be affected by a development. The evaluation will reflect such factors as the quality and value of various components within

the landscape and their contribution to landscape character, and the degree to which particular elements or characteristics can be replaced or substituted.

In most instances landscape sensitivity can be evaluated based on criteria set out in Table 1 below:

Sensitivity	Criteria	Example
High	A landscape of particular distinctive character or highly valued for its scenic quality or rarity. A landscape where the intrinsic character may be sensitive or very sensitive to change or where valued landscape elements are deemed to be irreplaceable.	Designated landscapes such as World Heritage Sites, National Park, AONB, AGLV or landscapes with nature conservation designations such as SSSIs and SACs. Landscapes that are valued for their historical or cultural associations or are deemed to possess unique features or character.
Moderate	A landscape of valued characteristics of medium importance, scenic quality or rarity. A landscape that may be reasonably tolerant to moderate changes without adversely affecting its intrinsic character.	Undesignated landscapes but value perhaps expressed through existing landscape assessment, planning policy, non-official publications or through its demonstrable use or appreciation by the public. Landscapes that exhibit a relatively positive and attractive character, but may have evidence of alteration to, or degradation of some inherent landscape features.
Low	A landscape of low importance which is not particularly valued for its scenic quality or rarity and is potentially tolerant of substantial change without causing significant harm, or where regeneration or landscape enhancement may significantly improve its quality / condition.	Areas that are deemed to have few, if any, valued landscape features, possibly identified for improvement or regeneration through planning policy. Or where the presence of urban or uncharacteristic features has significantly degraded the intrinsic quality and character of the landscape.

Table 1: Landscape Sensitivity Criteria

However, landscapes can vary in their capacity to accommodate different forms of development. Sensitivity is thus not absolute, but is likely to vary according to specific characteristics of an individual site or landscape area, the nature of the proposed development and the type of change being considered.

Magnitude of Landscape Effects

In the assessment of landscape impacts, the magnitude of landscape change brought about by a development can be determined by a combination of the following factors:

- The scale or extent of the landscape effect
- The duration of the effect – whether short term, long term or permanent
- The nature of the effect – whether adverse or beneficial (negative or positive) or neutral.

Example criteria for the evaluation of the magnitude of landscape change are given in Table 2 below. However, it is important to qualify or substantiate the scale of change with reference to the nature and duration of effects. For example, a ‘substantial’ temporary effect may be considered to be less significant than a permanent ‘moderate’ scale effect.

Magnitude of Effect	Typical Criteria
Substantial	A major change in landscape character over an extensive area or a very intensive change over a more limited area. A total loss or alteration to key elements/features/characteristics or the introduction of significant alien/uncharacteristic features.
Moderate	Prominent but not extensive changes to landscape character over a limited area. Partial loss or alteration to key elements/features/characteristics or the introduction of new / uncharacteristic features that are not perceived to have a significant impact upon the wider landscape character.
Slight	Minor changes in landscape character. Minor loss or alteration of key elements/features/characteristics or introduction of new elements that are not substantially uncharacteristic of the receiving landscape.
Negligible	Virtually imperceptible change in landscape character. Very minor loss or alteration to key elements/features/characteristics or introduction of new elements that are not uncharacteristic of the receiving landscape.

Table 2: Criteria for the Magnitude of landscape effects

Visual Assessment

Visual Assessment involves identifying locations where a given development will be visible from, and an evaluation of the visual effect the development will have upon individual receptors. Visual receptors include the occupants of residential properties and settlements, places of work, users of roads and public footpaths and public vantage points.

In order to identify available views and potential visual receptors it is necessary to define a ‘zone of visual influence’ (ZVI). The ZVI represents an area from which all or part of the proposed development would potentially be visible and defines the area for the visual assessment. A theoretical zone of visual influence (sometimes known as a ‘zone of theoretical visibility’ – ZTV) can be established by the use of specialist computer software in conjunction

with digital terrain data, but this assumes a bare earth situation and does not take into account the screening potential of existing vegetation, buildings or other elements within the landscape. Consequently the use of computerised terrain modelling to establish a ZVI is not always accurate or effective and any desk based assessment should always be verified by undertaking a field survey in order to establish a more accurate zone of visibility and to assess the specific nature and sensitivities of individual visual receptors.

The visual impact or significance of a development on a particular visual receptor can be evaluated by assessing the sensitivity of the visual receptor in combination with the likely magnitude or scale of visual change brought about by the development.

Visual Sensitivity

The sensitivity of visual receptors is influenced by factors such as the location and context of the viewpoint, the extent of available views, whether a view is recognised for its special scenic qualities, the numbers of viewers affected or the interests of viewers in their environment. For example, open views of a proposed development site from residential properties or from a valued landscape are regarded as being less able to accommodate change than views from an industrial site where viewers may have limited interest in their external environment.

Table 3 below defines example ratings and criteria for visual sensitivity:

Sensitivity	Criteria	Example
High	Views experienced by people with a propriety interest in their environment or viewers with prolonged viewing opportunities or where many viewers are affected. Or where views are deemed to be 'special' due to historical or cultural references or scenic quality.	• Occupiers of residential properties or residential communities • Users of public rights of way and public open spaces or valued landscapes. • Viewpoints / views within a landscape that has important references to historical events, cultural heritage or the arts, or where views are valued for their scenic qualities.
Moderate	Views experienced by people who only have a moderate or relatively short term interest in their environment.	• People engaged in outdoor sporting activities • Schools • Motorists or passengers travelling in cars or trains through the landscape.
Low	Views experienced by people having a passing or momentary interest in their environment or where the viewers are engaged in activities which limit their appreciation of the environment.	• Motorists travelling at speed on main roads or motorways. • People at work in commercial or industrial premises

Table 3: Visual Sensitivity Criteria

However, the classification of the sensitivity of visual receptors involves a degree of professional judgement and will be site (or receptor) specific. The hierarchy of the examples given in Table 3 above is not totally rigid, since the sensitivity of one type of visual receptor may vary according to specific circumstances. For example, some motorists may decide to drive on a specific route for its scenic qualities or may regularly use a particular road which is local to their home. Under these circumstances the motorist may have a higher sensitivity to visual changes within the landscape.

Magnitude of Visual Effects

In the evaluation of the effects on views and visual amenity of the identified receptors, the magnitude of visual change is determined by reference to the following factors:

- The distance of the receptor from the development;
- The duration, nature and type of the effect, whether temporary or permanent, adverse or beneficial;
- The angle of the view of the receptor;
- The extent of the area over which the changes would be visible;
- The scale of change in the view with respect to loss or introduction of features, changes in composition;
- The degree of contrast or integration of new features in terms of form, scale and mass, line, height, colour and texture;
- Seasonal effect (i.e. changes in views or visibility through the seasons due to deciduous vegetation or other factors such as weather conditions).

Example criteria for the magnitude (or scale) of visual change are given in Table 4 below. Again, it is important to qualify or substantiate the scale of effects with reference to the nature of effects (adverse, beneficial or neutral) and their duration (short term, long term, permanent).

Magnitude	Typical Criteria
Substantial	The development (or associated changes in landscape composition) forms a dominant large scale feature (or change) and is immediately apparent within the view.
Moderate	The development (or associated changes in landscape composition) may form a visible and recognisable new or changed element within the general scene and may be readily noticed by the observer, but is not over dominant within the landscape.
Slight	The development (or associated changes in landscape composition) forms only a minor component of the wider view, which might be missed by the casual observer.
Negligible	The development integrates into the existing environment and as such scarcely affects the overall view.
None	No part of the development, or activity associated with development, is discernible.

Table 4: Criteria for the magnitude of visual change

Impact Significance

The significance of landscape impacts is evaluated by taking into consideration the following factors:

- The sensitivity and value of the landscape or its ability to accept change caused by a particular type of development;
- The magnitude of that change on the landscape (the nature, scale and duration of the landscape effect brought about by a development).

Similarly, the significance of visual impacts can be evaluated by considering:

- The sensitivity of the visual receptor (dependant on the conditions under which the site is viewed, the interests of the viewer(s), the extent of available views and the number of viewers affected);
- The magnitude of visual effects (type and nature of visual effects, duration and distance of the receptor from the development).

Assessment of the significance of landscape and visual impacts is on a qualitative basis and does not avoid subjectivity. Therefore, the assessment of significance involves a degree of professional judgement in balancing the relationship between the sensitivity of the receptor and the magnitude of effects brought about by the development.

A matrix system can be employed to grade impact significance as shown in Table 5, but this should only be employed as a general guideline, and does not eliminate the need to make a more explicit and qualified judgment in the light of a more complex series of variables.

		Sensitivity		
		High	Moderate	Low
Magnitude/Scale	Substantial	Major	Major	Moderate
	Moderate	Major	Moderate	Moderate
	Slight	Moderate	Moderate	Minor
	Negligible	Minor	Minor	Negligible

Table 5: Impact Significance Grading

Appendix D – References & Bibliography

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