

## 8 ARCHAEOLOGY AND CULTURAL HERITAGE

### 8.1 Introduction

- 8.1.1 This Chapter of the Environmental Appraisal considers the potential effects of the Proposed Project on onshore archaeology and cultural heritage during the construction phase (including overhead line (OHL) removal), and operation and decommissioning phases. Measures for mitigation of impacts are specified where necessary.
- 8.1.2 Appraisal of the effects of the Proposed Project on offshore cultural heritage assets (i.e. below Mean High Water) are considered separately in Chapter 17.

### 8.2 Scope and Methodology

#### *The Study Area*

- 8.2.1 The Site Boundary<sup>1</sup> is the boundary of the Proposed Project comprising the tunnel shafts, laydown/working areas, permanent and temporary access tracks, crane pads, replacement pylon foundations, tunnel head houses and associated compounds. There is the potential for direct physical impact upon historic assets identified within the Site Boundary.
- 8.2.2 A Study Area comprising a 500m buffer surrounding the Site Boundary has been used to identify known historic assets, determine the likely potential for currently unknown historic assets to be present, and to appraise potential impacts of the Proposed Project upon them.
- 8.2.3 An Extended Study Area comprising a 5km buffer surrounding the Site Boundary has been used for the consideration of visual impacts upon the setting of designated historic assets arising from the Proposed Project, specifically those associated with the construction of permanent above-ground infrastructure and the removal of the VIP Subsection of OHL. The Site Boundary, Study Area, Extended Study Area and locations of all known historic assets considered in the appraisal are indicated in Figures 8.1 and 8.2.

#### *Establishment of Existing Environment*

- 8.2.4 Planning Policy Wales<sup>2</sup> states that the historic environment comprises all the surviving physical elements of previous human activity and illustrates how past generations have shaped the world around us. It is central to Wales's culture and its character, whilst contributing to a sense of place and identity. It enhances quality of life, adds to regional and local distinctiveness and is an important economic and social asset. The historic environment is made up of individual historic features, collectively known as 'historic assets' which may be designated under national legislation or international agreements (e.g. world heritage sites, scheduled monuments, protected wreck sites, listed buildings, historic landscapes, historic parks and gardens and conservation areas) or non-designated, recorded on regional historic environment records and other regional and national databases.
- 8.2.5 Cultural heritage more broadly includes intangible aspects which contribute to the cultural significance of a place (aesthetic, historic, scientific, social or spiritual value for past, present or future generations), including potentially the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

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<sup>1</sup> Excluding the alignment of the tunnel.

<sup>2</sup> PPW 2018 Chapter 6, para 6.11

- 8.2.6 Quantitative and qualitative baseline data, comprising records of designated and non-designated historic assets, alongside a summary of the history and development of the Study Areas, is presented in the Existing Environment section below (Section 8.5). The archaeological and historical review enables judgements to be made regarding the archaeological potential of the Study Area and the impact of the Proposed Project on the historic environment as a whole.

#### **Data Sources/Gazetteer**

- 8.2.7 A summary of known historic assets is presented in a gazetteer (Appendix 8A) using information from the data sources listed below. All assets within the gazetteer have been allocated a unique reference number prefixed 'RSK'. The locations of the known historic assets are indicated in Figures 8.1 and 8.2. Data sources are listed in Table 8.1.

**Table 8.1: Baseline Data Sources**

<b>Source</b>	<b>Data</b>
Cadw	Designated historic assets, location and extent: <ul style="list-style-type: none"> <li>• Listed Buildings</li> <li>• Scheduled Monuments</li> <li>• World Heritage Sites</li> <li>• Registered Landscapes of Outstanding and of Special Interest in Wales</li> <li>• Designated Wrecks</li> </ul> It is noted that Cadw is currently compiling a statutory register of Historic Parks and Gardens. At the time of writing the final dataset was not available, and for the purposes of this appraisal a pre-existing dataset has been used relating to Portmeirion.
Gwynedd Council	Conservation Areas
Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW)	<ul style="list-style-type: none"> <li>• Non-designated historic assets, location and extent</li> <li>• Previous archaeological events</li> <li>• Historic aerial photography</li> <li>• Historic mapping</li> </ul>
Gwynedd Historic Environment Record (HER), maintained by the Gwynedd Archaeological Planning Service (GAPS)	<ul style="list-style-type: none"> <li>• Non-designated historic assets, location and extent</li> <li>• 'Grey literature' resulting from previous archaeological investigations and interventions</li> <li>• Historic Landscape Character Area (HLCA) data</li> <li>• Previous archaeological events</li> </ul>
National Trust	<ul style="list-style-type: none"> <li>• Records of land parcels within National trust ownership</li> </ul>
Meirionnydd Record Office	<ul style="list-style-type: none"> <li>• Background information, published and unpublished sources</li> <li>• Historic maps and plans</li> </ul>
Online sources and publications	<ul style="list-style-type: none"> <li>• Background information, published and unpublished sources</li> </ul>
Historic Mapping	<ul style="list-style-type: none"> <li>• Historic Ordnance Survey and pre-Ordnance Survey maps</li> </ul>

Source	Data
LiDAR (light detection and ranging) data	<ul style="list-style-type: none"> <li>Detailed topographical information on the Study Area, freely available via the Lle Geo-Portal<sup>3</sup>.</li> </ul> <p>NB: Following a desk-based review of the available LiDAR data no additional historic assets were added to the gazetteer beyond those already identified by the HER and RCAHMW.</p>
Walkover surveys of each land parcel potentially affected by the Proposed Project within the Site Boundary	<p>Observations relating to archaeological potential and visual impact:</p> <ul style="list-style-type: none"> <li>Setting of designated heritage assets;</li> <li>Above-ground, negative earthwork, or structural features;</li> <li>Soil discolouration, crop or parch marks indicative of subsurface features;</li> <li>Surface finds;</li> <li>Evidence of current and previous land use, boundaries, topography and aspect;</li> <li>Exposed geology and soils;</li> <li>Watercourses; and</li> <li>Health and safety considerations for further appraisal stages.</li> </ul> <p>NB: Walkover survey was undertaken in two phases, in April 2018 and August 2019. No additional historic assets were added to the gazetteer beyond those already identified by the HER and RCAHMW.</p>
British Geological Survey (BGS)	Geological data
Watching brief during geotechnical investigations, undertaken by CR Archaeology and RSK in 2017 (see Appendix 8B)	<ul style="list-style-type: none"> <li>Intrusive archaeological information</li> <li>Stratigraphic modelling, specifically with regards to depth of overburden, presence of truncation or made ground, evidence for buried land surfaces or palaeoenvironmental material, where this may assist determining archaeological significance and development impact</li> </ul> <p>NB: One additional historic asset was added to the gazetteer as a result of the watching brief.</p>
Ground investigation and peat probing data	Stratigraphic modelling, specifically with regards to depth of colluvium, presence of truncation or made ground, evidence for presence and depth of buried land surfaces or palaeoenvironmental material, where this may assist determining archaeological significance and development impact

### **Walkover Survey**

- 8.2.8 A walkover survey of the VIP Subsection and Study Area/ Extended Study Area was undertaken in two phases by appropriately qualified archaeologists and heritage consultants, recording all observations relating to archaeological potential and the setting of heritage assets.
- 8.2.9 Information was gathered for the known historic assets identified as part of the baseline data collection exercise. The results of the walkover survey are integrated into the

<sup>3</sup> <http://lle.gov.wales/catalogue/item/LidarCompositeDataset?lang=en>

gazetteer and baseline data description. No new non-designated historic assets were identified during the surveys.

- 8.2.10 During the walkover survey, designated historic assets in the Extended Study Area with theoretical visibility of the Proposed Project during construction and operation were visited in order to consider the geographic range of effects (both positive and negative) in relation to their setting and heritage significance. Using professional judgement, groups of assets have been excluded from further consideration since any effects would be of, at most, Very Low magnitude and in all cases beneficial when considering the balance between visibility of new infrastructure and the removal of OHL; the assets excluded from the appraisal are summarised as a separate table in Appendix 8A.

### ***LiDAR***

- 8.2.11 Using freely available datasets a Digital Terrain Model (DTM) has been generated from the signal returned to the LiDAR<sup>4</sup> with surface features, such as built structures and vegetation, removed. The results have been compared with modern aerial photography and historical mapping to refine the extent of known historic assets. No previously unrecorded assets were identified using this method.

### ***Watching Brief during Geotechnical Site Investigation***

- 8.2.12 The methodology for the watching brief was set out in a scope prepared by RSK on behalf of National Grid and approved for use in advance of the works by the Gwynedd Archaeological Planning Service. The watching brief was targeted on the excavation of trial pits in August and September 2017. Borehole logs and peat probing records were also examined and the results are included in Appendix 8B.
- 8.2.13 The primary aim of the watching brief was to augment the available baseline information with details on the depth and nature of the sub-surface Quaternary sediments and stratigraphy, evidence for made ground and truncation associated with industrial era development. This information has assisted in the development of a predictive deposit model for land within the Site Boundary and informs the archaeological response to the Proposed Project.
- 8.2.14 As a result of the watching brief one asset- an area of peat surrounding the proposed Cilfor Sealing End Compound (SEC) and Tunnel Head House- was identified and added to the gazetteer.

### ***Appraisal***

#### ***Historic Asset Importance***

- 8.2.15 The importance of each identified historic asset is considered in this appraisal using the component heritage value criteria (i.e. evidential, historic, aesthetic and communal value) as defined in *Conservation Principles*.<sup>5</sup> For each historic asset taken forward to appraisal, their heritage significance is described in a narrative format, including a consideration of the contribution that setting makes to its significance.
- 8.2.16 The relative importance of each asset is then categorised according to the criteria set out in Table 8.2 to provide a framework for comparison between different assets. These categories take into account pre-existing grades and types of legal designation, however non-designated historic assets have the potential to be of equivalent or even higher value in particular circumstances, and the narrative discussion will make this explicit.

<sup>4</sup> Light Detection and Ranging (LiDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated.

<sup>5</sup> <https://cadw.gov.wales/advice-support/conservation-principles/conservation-principles>

When combined, these factors offer a measure of importance of a given resource and provide an analytical tool that can inform later stages of appraisal and the development of appropriate mitigation measures.

**Table 8.2: Criteria for Determining the Importance of Historic Assets**

Historic Asset Importance	Criteria
Very High	<ul style="list-style-type: none"> <li>assets of acknowledged international importance inscribed as World Heritage (WH) Property, individual assets which contribute to the outstanding universal value of a WH Property, other designated and non-designated assets, historic landscapes and heritage associations which are of recognised international importance</li> <li>nationally designated historic assets, protected in law, of the highest significance, including scheduled monuments, listed buildings at Grades I and II*, conservation areas containing nationally important buildings. Other designated and non-designated assets, historic landscapes and heritage associations which are of national importance including registered historic parks and gardens</li> </ul>
High	<ul style="list-style-type: none"> <li>nationally designated historic assets, protected in law, of less than the highest significance, including conservation areas containing buildings which contribute significantly to their historic character, Grade II listed buildings and historic parks and gardens</li> </ul>
Medium	<ul style="list-style-type: none"> <li>non-designated historic assets of regional importance, including locally listed buildings, archaeological sites, landscapes and historical associations which are of regional importance</li> </ul>
Low	<ul style="list-style-type: none"> <li>non-designated assets of local importance, including archaeological assets compromised by poor preservation, some locally listed buildings and unlisted buildings/townscapes of modest quality/integrity/historical associations</li> </ul>
Very Low	<ul style="list-style-type: none"> <li>assets with little or no heritage value, buildings and urban areas of little or no architectural merit, landscapes with little or no historical interest</li> </ul>
Uncertain	<ul style="list-style-type: none"> <li>Importance has not been ascertained</li> </ul>

### *Magnitude of Impact*

- 8.2.17 Direct physical impacts are defined as damage to the fabric of a historic asset such that it becomes partially fragmented or wholly lost. Typically, these impacts are rapid and occur during construction phases, however gradual impacts can occur over time where, for example, changes in groundwater regime lead to deteriorating conditions for the preservation of buried organic remains.
- 8.2.18 Indirect impacts can comprise visual or other sensory changes to a historic asset or its setting, resulting in a reduced ability to interpret, understand or appreciate the asset's significance. Development impacts of this nature can include changes in vegetation cover, the introduction of new built form or movement within a landscape, machinery noise or lighting which affects the appreciation of an asset. Indirect impacts may be beneficial, where changes within an asset's setting better reveal its significance or reinforce the connections between associated assets or the surrounding landscape, or neutral where changes have no effect on the significance of an asset. Typically, indirect impacts have their most tangible expression in relation to built historic assets or those with form above-ground.

8.2.19 The magnitude of an impact reflects the scale of change, whether direct or indirect, which would potentially be caused by the Proposed Project. The magnitude of impact is defined for each asset according to the scale set out in Table 8.3.

**Table 8.3: Criteria for Determining the Magnitude of Impact**

Magnitude of Impact	Description
High	<ul style="list-style-type: none"> <li>Change such that heritage values are substantially harmed, significantly reduced or totally lost.</li> <li>Substantial change to setting, resulting in a serious loss to heritage value affecting our ability to understand and appreciate the asset.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Change such that the heritage values of the asset are significantly affected.</li> <li>Significant change to setting affecting heritage value, resulting in erosion in our ability to understand and appreciate the asset.</li> </ul>
Low	<ul style="list-style-type: none"> <li>Change such that the heritage values of the asset are slightly affected.</li> <li>Slight change to setting affecting heritage value resulting in a change in our ability to understand and appreciate the asset.</li> </ul>
Very Low	<ul style="list-style-type: none"> <li>Very minor changes to the asset that hardly affect heritage values.</li> <li>Minimal change to the setting of an asset that have little effect on heritage value resulting in no real change in our ability to understand and appreciate the asset.</li> </ul>
No Impact	<ul style="list-style-type: none"> <li>No change to the historic asset or its setting.</li> </ul>

*Indirect Impacts*

8.2.20 The appraisal of indirect impacts aims to identify potential change within views from, towards, across and between historic assets, where their settings contribute to heritage significance.

8.2.21 This appraisal focuses on identifying those assets upon which any adverse or beneficial effects arising from the Proposed Project (including temporary construction works, permanent new above-ground infrastructure at the Garth and Cilfor Tunnel Head Houses and adjacent SECs, and the permanent removal of above-ground infrastructure within the VIP Subsection) would have an appreciable effect with regard to their heritage significance.

8.2.22 Zone of theoretical visibility (ZTV) models for the Proposed Project (illustrated in Figures 6.3 to 6.5, Chapter 6, Landscape and Visual) have been used to identify designated assets within the Extended Study Area which have potential intervisibility with the new infrastructure and may be subjected to indirect effects. In combination with this, the ZTV model for the pylons to be removed (see Figure 6.6, Chapter 6, Landscape and Visual) has been used to establish the extent to which beneficial effects balancing or outweighing any adverse effects may also arise as a result of the Proposed Project.

8.2.23 For those assets or settings sensitive to visual impacts, further appraisal has been undertaken, both as a desk-based exercise and using site visits and professional judgement, in order to focus the appraisal only on those assets which will be affected. The appraisal considers whether there are any visual, spatial or historic relationships between the asset and its setting and the area of the Proposed Project; and if there is, the degree to which this contributes to the asset’s significance. As such, the appraisal considers the following:

- Asset significance;

- Setting definition;
- Asset character, integrity, appearance and the way in which it is appreciated;
- Relationships with other historic assets, including group value and shared settings;
- Reasons for designation, and degree to which they contribute to appreciation and significance of the asset;
- Formal design - intended sight lines and vistas, intervisibility with contemporaneous and other historic assets, and natural features;
- 'Key' (principal/critical) views towards, from, and within a historic asset;
- Topography/landscape situation;
- Asset scale: prominence/dominance;
- Relative anticipated scale of the Proposed Project;
- Landscape character, particularly unaltered settings; and
- Degree of existing alteration and existing impacts, including indirect impacts.

### ***Limitations, Uncertainty and Technical Difficulties Encountered***

8.2.24 The limitations of data relating to the historic environment for the Study Area include the following:

- The archaeology and history of the area has been the subject of numerous published thematic studies, and the large concentrations of specific themed historic assets within the Study Area is a reflection of this. There have however been few systematic intrusive archaeological studies or developer-funded investigations undertaken in the location of the Proposed Project;
- Many of the known historic assets recorded by the HER and RCAHMW have been transcribed from historic map evidence and topographic study. Mis-located assets have been identified within the collected dataset, and errors duplicated between both data sources;

8.2.25 The limitations of the walkover survey include the following:

- The visibility of surface features of potential heritage value is determined by the ground conditions at the time of survey, particularly where modern surfaces or vegetation cover is present. For most of the Study Area the undeveloped land is in use as pasture, giving good visibility of surface landform.

8.2.26 There are a number of inherent limitations associated with the watching brief exercise:

- The trial pits and boreholes were positioned for geotechnical purposes rather than to address specific archaeological research objectives; and
- The small size and scattered distribution of the geotechnical trial pits and boreholes means that any interpretation of the site's archaeological potential is subject to a degree of uncertainty.

## **8.3 Consultation Undertaken**

8.3.1 A Scoping Report was prepared and accompanied a formal request for a screening opinion which was issued by National Grid to Gwynedd Council and Natural Resources Wales on 26 October 2018, relevant archaeology and cultural heritage responses are provided in Appendix 3B.

- 8.3.2 Consultation was undertaken with the Gwynedd Archaeological Planning Service to determine the scope and methodology for watching brief during the geotechnical ground investigations (GI). It was agreed that trial pits would be monitored by an archaeologist and that borehole logs would be reviewed on completion of the ground investigation.
- 8.3.3 Following collection of baseline data and the completion of GI watching brief and peat probing assessment, further consultation was undertaken with the Gwynedd Archaeological Planning Service to agree that no further pre-determination investigation of the Proposed Project construction areas would be necessary, and to agree in outline the mitigation proposals for each area.
- 8.3.4 Consultation was undertaken with the Senior Conservation Officer for Gwynedd Council to discuss the appearance and potential impact of the Garth Tunnel Head House on the setting of the adjacent listed property 'Rhos House'.
- 8.3.5 Consultation feedback from the National Trust commented on the mitigation of impacts of the scheme on archaeology within National Trust land. This relates to those components of the Proposed Project within the saltmarsh (offshore) environment and are therefore discussed further in Chapter 17.

## 8.4 Statutory and Planning Context

### *Legislation*

- 8.4.1 Table 8.4 summarises the statutory legislation relating to archaeology and cultural heritage relevant to this appraisal.

**Table 8.4: Legislation and guidance relevant to the historic environment**

Document	Summary
Ancient Monuments and Archaeological Areas Act (1979)	Any proposal to carry out works at a scheduled ancient monument which would have the effect of demolishing, destroying, damaging, removing, repairing, altering, adding to, flooding, or covering up a monument must be the subject of an application for scheduled monument consent
Planning (Listed Buildings and Conservation Areas) Act (1990) Planning (Listed Buildings and Conservation Areas) (Wales) Regulations 2012	Listing means that when a building is included on a Listed building Register; it is necessary to obtain for 'Listed Building consent' from the LPA before carrying out works which would affect the building's character as a building of special architectural or historic interest There is a duty on LPA's in exercising its planning functions to 'pay special attention to the desirability of preserving or enhancing the character or appearance of the area' (Section 72 of the 1990 Act).
Treasure Act (1996)	The 1996 Act defines 'Treasure' as any object that is at least 10% gold or silver, associated coins or groups of coins which are over 300 years old, objects formerly classed as 'treasure trove' (i.e. deliberately deposited items with a high content of gold or silver) and any objects found in association with the above. Any find of 'Treasure' must be reported to the local Coroner.



Document	Summary
Burial Act (1857)	Under Section 25 of the 1857 Act, it is generally a criminal offence to remove human remains from any place of burial without an appropriate licence issued by the Ministry of Justice (MoJ), although recent legislative changes indicate that some cases are exempt from this requirement.

### ***National Planning Policy***

- 8.4.2 Planning Policy Wales<sup>6</sup> (Chapter 6, Historic Environment) contains country-wide policies and principles relating to the historic environment under the overriding aim of 'recognising the special character of places'. Specific objects are identified as follows:
- protect the Outstanding Universal Value of the World Heritage Sites;
  - conserve archaeological remains, both for their own sake and for their role in education, leisure and the economy;
  - safeguard the character of historic buildings and manage change so that their special architectural and historic interest is preserved;
  - preserve or enhance the character or appearance of conservation areas, whilst the same time helping them remain vibrant and prosperous;
  - preserve the special interest of sites on the register of historic parks and gardens; and
  - protect areas on the register of historic landscapes in Wales.
- 8.4.3 Any decisions made through the planning system must fully consider the impact on the historic environment and on the significance and heritage values of individual historic assets and their contribution to the character of place (paragraph 6.1.9).
- 8.4.4 Relevant policies relating to differing types of historic asset considered in this appraisal are summarised in Table 8.5 below:

**Table 8.5: Planning Policy Wales: Summary of relevant policies**

Asset	Policy
Listed Buildings	Paras 6.1.10-6.1.13. There should be a general presumption in favour of the preservation or enhancement of a listed building and its setting, which might extend beyond its curtilage. For any development proposal affecting a listed building or its setting, the primary material consideration is the statutory requirement to have special regard to the desirability of preserving the building, its setting or any features of special architectural or historic interest which it possesses.
Conservation Areas	Paras 6.1.14-6.1.17. There should be a general presumption in favour of the preservation or enhancement of the character or appearance of conservation areas or their settings. Preservation or enhancement of a conservation area can be achieved by a development which either makes a positive contribution to an area's character or appearance or leaves them unharmed. Mitigation measures can also be considered which could result in an overall neutral or positive impact of a proposed development in a conservation area.

<sup>6</sup> Welsh Government, December 2018

Asset	Policy
Historic Parks and Gardens	Paras 6.1.18-6.1.19. Planning authorities should value, protect, conserve and enhance the special interest of parks and gardens and their settings included on the register of historic parks and gardens in Wales.
Historic Landscapes	Paras 6.1.20-6.1.21. Planning authorities should protect those assets included on the register of historic landscapes in Wales.
Archaeological Remains	<p>Paras 6.1.23-6.1.27. Where nationally important archaeological remains are likely to be affected by proposed development, there should be a presumption in favour of their physical protection in situ.</p> <p>In cases involving less significant archaeological remains, planning authorities will need to weigh the relative importance of the archaeological remains and their settings against other factors, including the need for the proposed development.</p> <p>Where archaeological remains are known to exist or there is a potential for them to survive, an application should be accompanied by sufficient information, through desk-based assessment and/or field evaluation, to allow a full understanding of the impact of the proposal on the significance of the remains. If the planning authority is minded to approve an application and where archaeological remains are affected by proposals that alter or destroy them, the planning authority must be satisfied that the developer has secured appropriate and satisfactory provision for their recording and investigation, followed by the analysis and publication of the results and the deposition of the resulting archive in an approved repository.</p>

8.4.5 PPW is supplemented by a series of technical advice notes, circular and policy clarification letters. Technical Advice Note 24<sup>7</sup>: The Historic Environment contains detailed guidance on how the planning system considers the historic environment during development plan preparation and decision making. It replaces Welsh Office Circulars: 60/96 Planning and the Historic Environment: Archaeology, 61/96 Planning and the Historic Environment: Historic Buildings and Conservation Areas and 1/98 Planning and the Historic Environment: Directions by the Secretary of State for Wales. The replacement of Welsh Office Circular 1/98 has required the making of three new directions (non- statutory):

- Conservation Areas (Disapplication of Requirement for Conservation Area Consent for Demolition) (Wales) Direction (2017 No. 27);
- Listed Building Applications and Decisions (Duty to Notify National Amenity Societies and the Royal Commission (Wales) Direction (2017 No. 26); and,
- Listed Building Consent Applications (Disapplication of Duty to Notify Welsh Ministers) (Wales) Direction (2017 No. 25).

**Local Planning Policy**

8.4.6 Local Development Plans reflect national policies for the conservation and enhancement of the historic environment. Locally specific policies aim to identify opportunities for the conservation and enhancement of historic assets in the consideration of development proposals. Of relevance to the Proposed Project are:

<sup>7</sup> Welsh Government, 2017

- Anglesey and Gwynedd Joint Local Development Plan (Gwynedd Council, 2017); and
- Eryri Local Development Plan 2016-2031 (Snowdonia National Park, 2019).

8.4.7 The Anglesey and Gwynedd Joint Local Development Plan contains the following policies pertaining to the preservation and enhancement of the historic environment:

- PS20 (Preserving and where appropriate enhancing heritage assets);
- Policy AT 1 (Conservation Areas, World Heritage Sites and Registered Historic Landscapes, Parks and Gardens);
- Policy AT 3 (Locally or regionally significant non-designated heritage assets); and
- Policy AT 4 (Protection of non-designated archaeological sites and their setting).

8.4.8 Section 4 of the Eryri Local Development Plan outlines (relevant) development policies on protecting and enhancing the cultural and historic environment as follows:

- Strategic Policy FF (Historic Environment);
- Development Policy 6 (Sustainable design and materials); and
- Development Policy 8 (Protection of non-designated sites).

8.4.9 Supplementary Planning Guidance to the Eryri LDP on the Historic Environment has not yet been completed.

## 8.5 Existing Environment

### *Site Description*

#### *Location and Topography*

8.5.1 The Study Area is located within a low-lying coastal landscape at the margins of the Dwyryd Estuary, generally extending between the western tunnel portal at NGR 259387, 338701 and the eastern tunnel portal at NGR 262489, 337950.

8.5.2 At its western limit the Study Area commences on reclaimed former marshland of the Glaslyn Estuary at 1.83m AOD (land which is now in agricultural use as pasture) and extends eastwards along the line of the VIP Subsection across the Penrhyn-Garth promontory, which rises to a maximum height of approximately 40m AOD. The promontory comprises a spur of rocky ground extending 3.5km south westwards between the former Glaslyn Estuary on its west side and the Dwyryd Estuary to the south east. The settlements of Minffordd and Penrhyndeudraeth are located at the north east end of the promontory, Portmeirion at the south west end, with major road and rail connections including the A487 and A4971 to Porthmadog, the Penrhyndeudraeth Bridge (road and rail) which spans the Dwyryd Estuary, the Ffestiniog Railway (a significant visitor attraction) and the Cambrian Coastline Railway.

8.5.3 The Study Area continues eastwards across saltmarsh of the Dwyryd Estuary (c. 2.5m AOD) and tidal flats (1.1m AOD) to the eastern side of the estuary which is characterised by low lying pasture reclaimed from former marshland (2.5-3m AOD) flanked by a rocky outcrop known as Y Garth to the north, the small hamlet of Cilfor and the foothills of Moel Tecwyn which rise steeply to the east. The A496 Cilfor to Maentwrog road spans the Study Area broadly on a north-south alignment in this location.

### *Geology*

- 8.5.4 The underlying geology of the Study Area is highly varied, with bands of differing bedrock lithologies trending to the south west, reflecting the orientation of the visible surface landscape. The Penrhyn-Garth promontory comprises marine mudstone and siltstone of the Dol-Cyn-Afon Formation (Ordovician) and Dolgellau Formation (Cambrian). Within the Dwyryd Estuary and extending to the coastal plain and outcrop of Y Garth to the east, the bedrock comprises shallow marine mudstone, siltstone and sandstone of the Ffestiniog Flags Formation (Cambrian) and Maentwrog Formation.
- 8.5.5 Superficial geology is sparsely recorded and varied, with key areas within the Study Area recorded as follows:
- Western tunnel head house and working area- alluvium
  - Garth sealing end compound- head deposits
  - Snowdonia Business Park- peat
  - Dwyryd Saltmarsh- tidal flat deposits
  - Eastern estuary shore and Cilfor tunnel head house- tidal flat deposits.
- 8.5.6 The British Geological Survey records a number of areas of artificial geology within the Study Area, however the only area within the Site Boundary comprises Garth SEC which is recorded as undifferentiated made ground, reflecting the artificial platform on which the SEC itself is built.
- 8.5.7 Further ground condition information was recorded during a watching brief maintained as part of Ground Investigation works in 2017. The detailed results are included in Appendix 8B, however key observations were as follows:
- The low-lying land within which the western tunnel head house and working area is situated comprised topsoil and subsoil to a depth of 0.72m overlying 0.5m alluvium containing marine mollusc shells- the latter is interpreted as the former Glaslyn Estuary alluvium.
  - The low-lying land corresponding with the access and working areas for the Cilfor Tunnel Head House comprises a shallow modern topsoil (0.25m depth maximum) overlying approximately 0.6m depth of dark brown soft peat.

### *Historic Landscape Character (HLC)*

- 8.5.8 Historic landscape characterisation data maintained by the Gwynedd Archaeological Trust places the western part of the Proposed Project within the Vale of Ffestiniog, which contains a series of major settlements interspersed with rural land characterised by low-lying river floodplain, woodland and varied field patterns and high mountain wilderness<sup>8</sup>. The historic landscape characterisation report identifies a series of distinct character areas within the Study Area which include the late 19<sup>th</sup> century Minffordd Quarry (numbered 31 in the report), Penrhyn-Garth, a former promontory between the Glaslyn and Dwyryd Estuaries (number 27), the reclaimed Glaslyn Estuary which was drained in the early 19<sup>th</sup> century (number 14) and the settlement of Penrhyndeudraeth which is recorded from the 13<sup>th</sup> century (number 32).
- 8.5.9 The eastern part of the Proposed Project corresponds with the Ardudwy Registered Historic Landscape, with HLCAs recorded as Morfa Harlech – fieldscape (number 30) and Coed Felinrhyd & Moel Tecwyn (number 5). These areas comprise natural landform

<sup>8</sup> [www.walesher1974.org/her/groups/GAT/media/GAT\\_Reports/GATreport\\_422\\_compressed.pdf](http://www.walesher1974.org/her/groups/GAT/media/GAT_Reports/GATreport_422_compressed.pdf)

with little significant heritage interest noted in the character appraisal<sup>9</sup>, overlooking farmland reclaimed from marshes in the 18<sup>th</sup>/19<sup>th</sup> century on the fringes of the estuary.

8.5.10 A portion of the landscape within the Study Area is in the ownership of the National Trust (the Hafod y Wern estate) which comprises part of the saltmarsh and land on the intermediate slopes of the Moelwyn Range which rise to the north of the Study Area at the head of the Dwyryd Estuary.

8.5.11 The location of all historic landscape areas discussed above are depicted in Figure 8.3.

### **Archaeological and Historical Baseline**

#### *Designated Historic Assets*

#### **Registered Landscapes**

8.5.12 The south-east part of the Study Area is within the Ardudwy Registered Landscape of Outstanding Historic Interest, which lies within Snowdonia National Park, and is described in the Register of Outstanding Landscapes (Cadw, 1998) as follows:

*“a large and exceptionally archaeologically rich and well-studied landscape situated on the western flanks of the Rhinog Mountains, containing extensive relict evidence of recurrent land use and settlement from prehistoric to recent times”.*

8.5.13 The western part of the Study Area is within the Aberglaslyn Registered Landscape of Outstanding Historic Interest, described in the Register (Ibid.) as follows:

*“a man-made landscape occupying a reclaimed river estuary situated in south Snowdonia, the whole conceived as one man’s grand scheme, probably the most ambitious of its kind in 19<sup>th</sup> century Britain”.*

#### **Scheduled Monuments**

8.5.14 There are no scheduled monuments within the Study Area. The most proximate are:

- The site of Cei Tyddyn Isa is a post medieval quarry site located on the northern shore of the Dwyryd (ME108) approximately 1km north of the Study Area.
- The site of Ty’n y Berllan Settlement which is an enclosed prehistoric hut circle, approximately 100m north of the Study Area (ME096).

8.5.15 Following inspection on site it was noted that there is no intervisibility between these assets and the Proposed Project due to the intervening landform. Scheduled monuments are therefore not considered further in this appraisal.

#### **Listed Buildings**

8.5.16 There are 18 Grade II listed buildings within the Study Area. These are predominantly located on the western side of the Dwyryd Estuary around Penrhyndeudraeth and Minffordd, and include listed houses, the former workhouse (Bron-y-Garth Hospital), chapels and structures associated with the Ffestiniog Railway. These assets are summarised in Table 8.6 below.

8.5.17 Three listed buildings are located at the south east limit of the Study Area, comprising the Church of St Tecwyn (RSK 231), its lychgate and churchyard walls (RSK 232) and an adjacent cottage Ty’n Llan (RSK 233). During the site walkover it was confirmed that there would be no effects arising from the Proposed Project in respect of these three buildings, and therefore they are not considered further in this appraisal.

<sup>9</sup> <http://www.heneb.co.uk/ardudwycharacter/ardudwy/ardudwy22.html>

**Table 8.6: Listed Buildings within the Study Area**

RSK ID	Name	Cadw Ref. No	Easting	Northing
RSK 060	Rhos House	5205	259554	338696
RSK 062	Plas Newydd Farmhouse	4774	259865	339072
RSK 063	Former Stable Range at Plas Newydd	19800	259856	339041
RSK 071	The Vicarage Including Adjoining Service Complex and Gates	26853	261070	338770
RSK 072	Former Coachhouse at the Vicarage, Including Associated Garden Walls	26854	261039	338763
RSK 073	Former Lodge to Plas Penrhyn	26860	259454	338359
RSK 078	Bron-y-Garth Hospital	5222	260323	338661
RSK 079	Casual Ward at Bron-y-Garth Hospital	5223	260274	338648
RSK 080	North Block at Bron-y-Garth Hospital	26882	260322	338716
RSK 082	Nazareth Chapel	26856	260920	339254
RSK 083	Parish Church of the Holy Trinity	26852	261150	338839
RSK 084	Gorffwysfa Chapel Including Hall Adjoining to the Rear and Railed Forecourt Walls to the Front.	26855	260982	338787
RSK 092	Railway Lodge at the Ffestiniog Railway Crossing	5211	259541	338517
RSK 093	Minffordd Station	26859	260016	338540
RSK 224	Mardir	87607	261120	338785

8.5.18 One listed building (a milepost located along the A496 carriageway to the north of Llandecwyn) could not be located during the site walkover and is assumed to have been moved or destroyed. This has not been included in the gazetteer and is not considered further in this appraisal.

8.5.19 In addition to the listed buildings within the Study Area, six Grade II listed buildings have been included for appraisal from the Extended Study Area. These comprise foreshore buildings at Portmeirion approximately 2km south west of the Study Area and are summarised in Table 8.7 below.

**Table 8.7: Listed Buildings selected for appraisal within the Extended Study Area**

RSK ID	Name	Cadw Ref. No	Easting	Northing
RSK 218	Sea-front Terrace Incorporating the Casino and Amis Reunis	26861	258961	337041
RSK 219	Portmeirion Hotel Including Revetment, Balustrade and Sculptures to the Upper Terrace	4853	258931	337016
RSK 220	Observatory Tower	4893	258925	336886
RSK 221	White Horses	4894	258916	336880
RSK 222	Statue of Nelson	4895	258920	336888
RSK 223	Entrance Piers at the Minffordd Approach to Portmeirion	26888	259640	338419

### **Registered Parks and Gardens and Conservation Areas**

8.5.20 Portmeirion is located to the south west of the Study Area. In 1973 the whole of Portmeirion was given Grade II listed status and in 1993 the Portmeirion Estate was

designated a Conservation Area by Gwynedd Council. The approach road to Portmeirion falls just inside the Study Area and is part of the designated conservation area.

- 8.5.21 Portmeirion is also designated as a Registered Historic Park. The core of the park is approximately 500m to the south of the Study Area, but its essential setting includes land to the north east and extends along the approach road, again falling just inside the Study Area. Significant views identified by Cadw are oriented away from the Proposed Project, to the south east from the foreshore structures, however site inspection identified that views to the north east (towards the eastern end of the Study Area) are possible from listed buildings in the southern limit of the group.
- 8.5.22 The designated areas above are considered as one asset in this appraisal (RSK 217).
- 8.5.23 Further conservation areas are located in the Extended Study Area, including Porthmadog, Tremadog and Maentwrog. Site inspection has confirmed that there would be no appreciable effects arising from the Proposed Project in respect of the character or appearance of these areas (or the associated listed buildings they contain) due to distance and topographic features, and therefore are not considered further in this assessment.

#### *Non-Designated Historic Assets*

- 8.5.24 There are 8 non-designated historic assets within the Site Boundary. These comprise two projected Roman road alignments (RSK 008 and RSK 009), two former field boundaries (RSK 022 and RSK 036), a channelled stream south of Bron y Garth (RSK 038), an embankment and ditch forming part of the sub-base for an 1833 Turnpike (RSK 058), a railway embankment north east of Syenite Terrace (RSK 127) and an area of peat (RSK 234).
- 8.5.25 There are a further 201 non-designated heritage assets recorded within the Study Area. These reflect activity in the Prehistoric, Roman, early medieval, medieval, post-medieval and modern periods, with a strong bias towards railway, industrial and relict landscape features.
- 8.5.26 All non-designated assets were recorded by the Gwynedd HER and RCAHMW, with the exception of an area of peat recorded during the GI watching brief in 2017 (RSK 234). No additional non-designated heritage assets were identified during the site walkover.

#### *Archaeological Events*

- 8.5.27 A total of 23 previous archaeological events are recorded coinciding with the Study Area. These are summarised in Table 8.8 below. Of these, 21 are desk-based or thematic research assessments undertaken by the Gwynedd Archaeological Trust. In addition, one geophysical survey is recorded at Porthmadog/Tremadog (ref 44018), and one intrusive investigation on the line of the A487 Porthmadog, Minffordd and Tremadog Bypass (ref 44568). The latter recorded 27 sites including a Roman lime kiln.

**Table 8.8: Archaeological events within the Study Area**

Ref. No	Name	Description
40294	A487 Porthmadog/Minffordd and Tremadog Bypasses	Desk based assessment and field survey carried out by Gwynedd Archaeological Trust in advance of the proposed construction of a bypass on the A487 at Porthmadog, Tremadog and Minffordd
40009	Minerals: An Archaeological Assessment of Mineral	Desk based assessment carried out by Gwynedd Archaeological Trust of all

Ref. No	Name	Description
	Extraction Sites & Resources Within the Snowdonia National Park	active mineral extraction sites in Gwynedd and, within the SNPA.
40529	Prehistoric Funerary and Ritual Monuments: Meirionnydd	Some visits also undertaken by J. Kenney
40538	Roman Roads in North-West Wales	Survey
40558	Historic Landscape Characterisation: Vale of Ffestiniog	Characterisation
40591	Historic Landscape Characterisation of Arduwy	Characterisation
40782	Hut Circle Settlement Survey	Field Observation (Visual Assessment)
41578	Prn 966 Snp Site Visit	Field Observation (Visual Assessment)
41722	Me 096 Fmw Site Visit	Field Observation (Visual Assessment)
41723	Me 096 Fmw Site Visit	Field Observation (Visual Assessment)
41724	Me 096 Fmw Site Visit	Field Observation (Visual Assessment)
41980	Prn 1437 Snp Site Visit	Field Observation (Visual Assessment)
43449	GAT Historic Churches Project	Field Observation (Visual Assessment)
43498	Prn 7899 Gat Site Visit	Field Observation (Visual Assessment)
44018	Porthmadog/Tremadog, Gwynedd	Geophysical Survey
44066	Pont Briwet, Penrhyndeudraeth: ASIDOHL	Desk Based Assessment
44095	Cilfor Water Treatment Works: Talsarnau, Gwynedd	Desk Based Assessment
44353	Minerals: An Archaeological Assessment of Mineral Extraction Sites & Resources Outside the Snowdonia National Park	Desk Based Assessment
44367	Understanding Corrugated Iron Buildings in north west Wales	Desk Based Assessment
44426	Morfa Harlech, Harlech	Desk Based Assessment
44557	Early Celtic Societies in North Wales	Desk based research project
44558	Glastir Private Woodland Management Polygonisation	Desk Based Assessment
44568	A487 Porthmadog, Minffordd and Tremadog Bypass	Excavation

### ***Archaeological and Historic Narrative***

#### Palaeolithic (800,000-8500 BC)

- 8.5.28 There are no recorded Palaeolithic sites recorded within the Site Boundary or Study Area.
- 8.5.29 There is limited evidence for Palaeolithic activity in Wales due to the effect of the Late Devensian glaciation which achieved glacial maximum around 15,000 BC<sup>10</sup> (Bowen,

<sup>10</sup> Bowen, D. Q. 1980. The Pleistocene Scenario of Palaeolithic Wales. In J. A. Taylor (Ed) *Culture and Environment in Prehistoric Wales*: 1-14. BAR British Series 76. Oxford: BAR



1980). Early Palaeolithic evidence is constrained to south Wales, with evidence for the Late Palaeolithic occurring in caves and open sites on the margins of the Welsh massif (Aldhouse-Green 2000<sup>11</sup>).

- 8.5.30 There is a low potential for Palaeolithic remains to be located within the Site Boundary.

#### Mesolithic (8500-4000 BC)

- 8.5.31 There are no recorded Mesolithic sites recorded within the Site Boundary or Study Area.

- 8.5.32 The Mesolithic period is characterised by a rise in sea-level which culminated in the isolation of Britain as an island around 7,100 BC. Human subsistence regimes remained mobile and the focus of activity was on the coastal areas where foods could be sourced, with estuary environments representing a particular focus. Mesolithic sites are few in number, but there is evidence for Mesolithic activity at Pencilan Head on the Llŷn Peninsula (Jacobi 1980<sup>12</sup>), with a further two Mesolithic sites close to Abersoch at Brynrefail (Burrow 2003<sup>13</sup>).

There is a low potential for the presence Mesolithic activity within the Site Boundary. If present, any evidence is likely to comprise ephemeral activity in the form of flint scatters and stray artefacts reflecting seasonal exploitation of the local environment. Any such remains are likely to be encountered within the estuary margins, and potentially within peat deposits. Undated peat deposits are recorded at Penrhyndeudraeth (RSK 001) and at Cilfor (RSK 234). The latter was recorded during ground investigations for the Proposed Project, including trial pits excavated under archaeological watching brief conditions and a subsequent peat probing exercise. The programme of peat probing has established the peat thicknesses within the area of the proposed eastern tunnel head/SEC and surrounding working area, identifying for the most part a shallow thickness of peat (<350mm) overlying tidal flat deposits. A deeper zone was recorded in a linear band along the southern edge of the area, with depths of up to 1m, and in small areas (including the tunnel head house location) in excess of 1m. The deposit profile has been interpreted as potentially representing a former channel in which peat has built up<sup>14</sup>, presumably a relict watercourse draining into the Dwyryd Estuary from the east prior to reclamation of the immediate area in the 18<sup>th</sup> and 19<sup>th</sup> centuries.

#### Neolithic (4000-2200 BC)

- 8.5.33 There are no recorded Neolithic sites recorded within the Site Boundary. A single flint find is recorded on land 100m to the north east of the Garth Tunnel Head House (RSK 003) which may date to this period.
- 8.5.34 A mixed farming economy is thought to have prevailed during the Neolithic in Wales (Briggs 1985<sup>15</sup>), taking advantage of tree clearance from the end of the 5<sup>th</sup> millennium BC (Savory 1980a<sup>16</sup>). The concentration of monuments and artefacts, such as leaf-shaped arrowheads and pottery suggests a strong preference for Anglesey,

<sup>11</sup> Aldhouse-Green, S. 2000 Palaeolithic and Mesolithic Wales. In F. Lynch, S. Aldhouse-Green and J. L. Davies (Eds) *Prehistoric Wales*: 1-41. Thrupp: Sutton Publishing

<sup>12</sup> Jacobi, R. M. 1980. The Early Holocene Settlement of Wales. In J. A. Taylor (Ed) *Culture and Environment in Prehistoric Wales*: 131-206. BAR British Series 76. Oxford: BAR

<sup>13</sup> Burrows, S. 2003. *Catalogue of the Mesolithic and Neolithic Collections in the National Museums and Galleries of Wales*. Cardiff: National Museums and Galleries of Wales

<sup>14</sup> Arcadis 2019, Visual Impact Provision (VIP) Project – Snowdonia Peat Depth Survey

<sup>15</sup> Briggs, C. S. 1985. Problems of the early agricultural landscape in upland Wales, as illustrated by an example from the Brecon Beacons: 285-316.. In D. Spratt and C. Burgess (eds) *Upland Settlement in Britain*. BAR British Series 143. Oxford: BAR

<sup>16</sup> Savory, H. N. 1980a. The Neolithic in Wales. In J. A. Taylor (Ed) *Culture and Environment in Prehistoric Wales*: 207 – 231. BAR British Series 76. Oxford: BAR

Pembrokeshire and the Glamorgan and Monmouthshire coasts in Wales (Lynch 2000<sup>17</sup>). Settlement generally took the form of rectangular post-built structures, identifiable by the preservation of post-holes (*Ibid*).

- 8.5.35 In light of the geographic location of the Proposed Project and the specific environments within which development activities will occur, it is assessed that there is a low potential for encountering previously unknown *in situ* Neolithic remains. Any material dating from this period is likely to be confined to stray artefacts within later plough soil horizons, or potentially within areas of peat (see above).

#### Bronze Age (2200-700 BC)

- 8.5.36 There are no recorded Bronze Age sites recorded within the Site Boundary.
- 8.5.37 Two Bronze Age sites are recorded within the Study Area, comprising findspots of a sword (RSK 004) and a bronze axe (RSK 005), both located on higher ground to the north of the centre of Penrhyndeudraeth, indicating some level of settlement in the area in this period.
- 8.5.38 The Bronze Age was a period of intensive agricultural production, resulting in the clearance of woodlands to make way for farming. The most common Bronze Age site types within Gwynedd are cairns made from stone and ring ditches.
- 8.5.39 A borehole survey was undertaken to evaluate the palaeoenvironmental potential of the deposits along the Tremadog to Porthmadog bypass. A core was recovered which collected 1 metre of sediment. Radiocarbon dates showed that the sediment dated to the Bronze Age. The pollen indicated an alder carr environment with a birch and oak woodland which later became more open. The opening up of the environment is indicative of woodland clearing which occurred during the Bronze Age.
- 8.5.40 The potential for encountering previously unrecorded assets dating to the Bronze Age is assessed as low. Any material dating from this period is likely to be confined to stray artefacts within later ploughsoil horizons, or potentially within areas of peat (see above).

#### Iron Age (700 BC- 43 AD)

- 8.5.41 There are no recorded Iron Age assets within the Site Boundary.
- 8.5.42 A single asset potentially dating to this period (though recorded only as 'Prehistoric' in the HER), comprises a hut circle and walling located at Y Garth 180m north west of the Cilfor Tunnel Head House (RSK 006).
- 8.5.43 The Iron Age of Wales is characterised by the development of extensive defensive hillfort settlements. They were used as settlements, defensive structures, areas for trade and exchange and possibly for the purposes of ritual and for gathering the population. Within the wider area there is evidence for hillforts and other enclosures<sup>18</sup>. The presence of the inlet, Afon Dwyrdd, up which boats could have travelled for trade, does imply this may have been a desirable location for an Iron Age settlement. Other methods of transport across land would have been difficult, hence the coastal or inlet locations of many of the known hillforts.
- 8.5.44 Despite the presence of known Iron Age settlement in the locality, due to the topographic location of the Proposed Project components the potential for encountering previously unrecorded assets dating to the Iron Age is assessed as low. Any material dating from this period is likely to be confined to stray artefacts within later ploughsoil horizons, or potentially within areas of peat.

#### Romano-British Period (43AD- 410AD)

<sup>17</sup> Lynch, F. 2000. The Earlier Neolithic. In F. Lynch, S. Aldhouse-Green and J. L. Davies (Eds) *Prehistoric Wales*: 42 - 78. Thrupp: Sutton Publishing

<sup>18</sup> <http://www.heneb.co.uk/merionethforts/merionethfortsmap.html>

- 8.5.45 There are four recorded assets of Romano-British date within the Study Area, all being sections of the projected alignment of a Roman road between Segontium (a Roman fort near Caernarfon) and the forts at Pen Llystyn and Tomen y Mur (RSK 007 – RSK 010). Two of these sections span the Site Boundary:
- RSK 009 crosses the location of the Garth Tunnel Head House and surrounding Working Area. During the GI watching brief a trial pit was excavated directly on the projected alignment of the road (TP 100A). This recorded 0.3m of topsoil overlying 1.1m clean sandy silt and a further 0.5m of grey sandy clay containing marine mollusc shells. There was no evidence of a road, and the low-lying location, within the former Glaslyn Estuary, suggests this projected alignment is unlikely to be realistic. There is no evidence of a road visible in this location in aerial photographic data or LiDAR data.
  - RSK 010 passes beneath overhead lines between Pylon 4ZC035 and 4ZC036, following the route of an existing country lane.
- 8.5.46 Immediately to the north of the Study Area there is evidence for a rural Roman settlement; Ty'n y Berllan, a homestead. This scheduled monument consists of 4 circular rooms opening on to a central courtyard and stretches of wall.
- 8.5.47 While there is evidence for Roman activity in the Study Area and immediate surroundings, it is assessed that the projected road alignment at Garth is unlikely to pass through the site. Elsewhere the potential for the presence of Roman activity is moderate, potentially representing roadside activity and rural settlement at the fringes of the Glaslyn and Dwyryd Estuaries.

#### Early Medieval Period (410AD –1066AD)

- 8.5.48 From the late Roman period, Roman troops were gradually withdrawn from Britain, which led to the evacuation of many forts (Frere 1974<sup>19</sup>) and the breakdown of urban life (Jones 1984<sup>20</sup>). From the 5<sup>th</sup> century, Wales is seen as part of an international cultural community extending across the Irish Sea, in which connections were made and technologies and goods exchanged along the coast (Alcock 1965<sup>21</sup>). High-status sites were frequently located on fortified hilltops, continuing or re-establishing the settlement pattern prevalent in earlier centuries.
- 8.5.49 Important place names in the wider area can be dated back to the post-Roman period, with Meirion, one of the sons of Cunedda, giving his name to Merioneth (Bowen 1995<sup>22</sup>).
- 8.5.50 Lower-status sites in north west Wales frequently took the form of enclosed homesteads (Longley, 1997<sup>23</sup>). Arable farming continued to be practised but with pastoral agriculture forming the basis of the rural economy and therefore leaving few archaeological traces.
- 8.5.51 Although nominally Christianised during the Roman occupation, it was in this period that Christianity began to dominate religious activity in Wales. It is through inscribed stones and documentary evidence (in the form of hagiographies) that this is apparent (*Ibid*). One such inscribed stone is recorded within the Study Area (RSK 011) at the Church of St Tecwyn, on the high plateau above Cilfor. This was found in 1879 when the former

<sup>19</sup> Frere, S. S. 1974. *Britannia*. 2<sup>nd</sup> Edition, London

<sup>20</sup> Jones, M. L. 1984 *Society and Settlement in Wales and the Marches: 500BC to AD1100*. Part i. BAR British Series 121(i)

<sup>21</sup> Alcock, L. 1965. Wales in the Fifth to Seventh Centuries. In I. LL. Foster and G. Daniel (Eds) *Prehistoric and Early Wales: 177 – 212*. London: Routledge

<sup>22</sup> Bowen, E. G. 1995 Merioneth in the Dark Ages. *Journal of the Merioneth Historical and Record Society*. Volume II: 169-177

<sup>23</sup> Longley, D. 1997. The Royal Courts of the Welsh Princes in Gwynedd. In N. Edwards (Ed) *Landscape and Settlement in Medieval Wales: 41 – 54*. Oxford: Oxbow

church was being demolished to make way for the present church, and probably dates to the 8<sup>th</sup> or 9<sup>th</sup> century.

- 8.5.52 Subsequent centuries witnessed the incursions of Saxons and Norse into Wales. Whereas the eastern border of Wales bore the brunt of conflict with the Saxon kingdom of Mercia, the Irish Sea-facing coastal parts of Wales had to contend with the incursions of the Norse from the 9<sup>th</sup> century onwards. Norse activity in the Irish Sea culminated in long-term settlement at Dublin, the Isle of Man and the west of Scotland. Permanent Norse settlement evidence in Wales is sparse (Richards 1999<sup>24</sup>), although there is some evidence for activity on Anglesey.
- 8.5.53 In light of the above, the potential for previously unrecorded early medieval remains to be present within the Site Boundary is assessed as low

#### Medieval Period (1066AD- 1500AD)

- 8.5.54 There are no medieval assets recorded within the Site Boundary. The archaeological record of the medieval period is dominated by settlements, road systems, buildings and the traces of agriculture. Within the wider area, there is a site of a Medieval castle known by various names, including Castell Deudraeth, Castell Gwain Goch and Castell Aberlau. It was recorded in 1188 by Gerald of Wales. This is located to the south-west of Minffordd, within the grounds of Portmeirion.
- 8.5.55 Within the Study Area is Penrhyndeudraeth parish (RSK 012), which at the end of the 13<sup>th</sup> century was the richest parish in Meirioneth. The land was productive and there was a good supply of lime which was used as a building material. Logistically its position was important, with trade routes out to the sea. The road from Penrhyndeudraeth to Minffordd probably dates from the medieval period or possibly earlier and the lane from Minffordd towards the farms of Plas Newydd and Ty Obry probably also dates to the medieval era.
- 8.5.56 A shell midden (RSK 002) recorded at Llanfrothen, indicating human subsistence close to the margin of the Glaslyn Estuary, is located 50m to the north of Pylon 4ZC036. The midden was radiocarbon dated to the 13<sup>th</sup>/14<sup>th</sup> centuries. An enclosure is also recorded to the north of Garth Quarry which may indicate a possible settlement location (RSK 014).
- 8.5.57 The potential for the Site Boundary to contain archaeological remains dating to the medieval period is assessed as low to moderate, potentially reflecting foreshore activity close to the margins of the Glaslyn Estuary and rural subsistence activity on the higher ground around Penrhyndeudraeth. Such deposits may appear as material within alluvium/reclamation deposits, or as truncated features below the level of the modern ploughsoil.

#### Post-Medieval Period (1500AD-1900AD)

- 8.5.58 The archaeological record for the post-medieval period within the Study Area is dominated by records of assets associated with rural landscape and agriculture, industry, settlement and transport. These are discussed below by theme.

#### *Agricultural and Landscape Features*

- 8.5.59 There are 42 recorded assets relating to agriculture and other landscape features within the Study Area (RSK 015 to RSK 056). These are clustered within the alignment of the A487 Minffordd bypass and clearly relate to landscape features identified during the programme of archaeological mitigation carried out for the road scheme. A number of features were also transcribed by the RCAHMW from historic OS maps. Scattered

<sup>24</sup> Richards, J. D. 1999. The Scandinavian Presence. In J. Hunter & I. Ralston (Eds) *The Archaeology of Britain: An Introduction from the Upper Palaeolithic to the Industrial Revolution*: 194 – 209. Oxford: Routledge

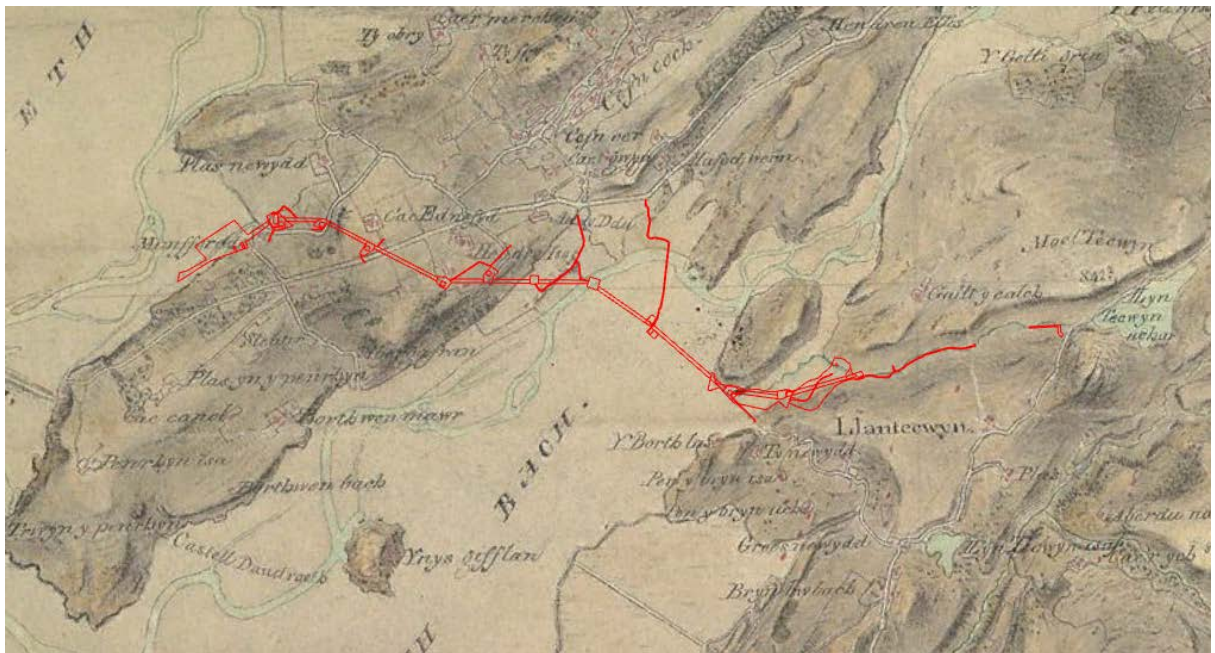
features are recorded on land to the south of Penrhyndeudraeth/Minffordd and to the north of Cilfor. These features can broadly be classified as follows:

- Ditches;
- Field boundaries;
- Trackways;
- Drystone walls;
- Embankments;
- Enclosures; and
- Relict structures.

8.5.60 Three landscape features are recorded on the HER within the Site Boundary, comprising two relict field boundaries (RSK 022 and 036) and the channelling of the Nant yr Efail (RSK 038) which passes immediately to the south of Pylon 4ZC028. This activity is dated prior to 1842 as the land is shown in its present form on the Llanfihangel y Trethau and Llandecwyn Tithe Map.

8.5.61 At a wider scale, the present form of much of the rural landscape surrounding the Proposed Project originates in the later post medieval period as a result of major episodes of land reclamation. The Glaslyn Estuary to the north and west of the Garth Tunnel Head House was drained and a causeway known as ‘The Cob’ constructed across the mouth of the estuary in 1813. On the eastern side of the Dwryrd Estuary the fieldscape and enclosures were being actively reclaimed from the end of the 18<sup>th</sup> century and beginning of the 19<sup>th</sup> century. This is clearly illustrated in Dawson’s map of Harlech dated 1819 (Plate 8.1) which shows both the western and eastern tunnel head locations within the Glaslyn and Dwryrd estuaries respectively, prior to reclamation having reached its present extent. The landscape in these locations is now typified by a rectilinear post-enclosure field system.

**Plate 8.1: Dawson’s map of Harlech, 1819**



*Settlement*

8.5.62 Sixteen assets are recorded within the Study Area relating to residential buildings, of which six are Grade II listed. These are widely dispersed through the Study Area, and

include buildings dating from the 17<sup>th</sup> century onwards. Rhos House (RSK 060) is most proximate to the Site Boundary, located less than 100m to the east of the Garth Tunnel Head House. This building is close to another (Glan y Don, RSK 061) which is a former tavern. Other key early groups include a cluster of structures at Plas Newydd (including a farmhouse, tannery and stables- RSK 062, 063 and 064) 200m to the north of Pylon 4ZC036.

- 8.5.63 Two halls are recorded, comprising the Town Hall (Penrhyndeudraeth, RSK 070) which dates in part from the mid-17<sup>th</sup> century, and the mid-19<sup>th</sup> century Women's Institute Hall at Minffordd (RSK 077) which is one of the earliest in the country.
- 8.5.64 A group of four assets relate to the former Ffestiniog Union Workhouse, later the Bron y Garth Hospital, which dates from 1838 and was subsequently expanded in the late 19<sup>th</sup> century (RSK 078-081). This includes three listed buildings and is located prominently on the A4871 Eryri Terrace 160m east of Pylon 4ZC035.
- 8.5.65 A further ten assets within the Study Area are religious establishments (churches and chapels), concentrated within Penrhyndeudraeth, with outliers at Minffordd and Llandecwyn (RSK 082 – 091). Three are Grade II listed -Nazareth Chapel (RSK 082) Parish Church of the Holy Trinity (RSK 083) and Gorffwysfa Chapel (RSK 084).

#### *Transport*

- 8.5.66 There are two assets associated with turnpikes within the Study Area. RSK 058 is an embankment and ditch to the south of Bron y Garth on the east side of the Dwyrdd Estuary, which is associated with the formation of the 1833 turnpike from Harlech to Maentwrog. A second asset (RSK 059) is the route of the pre-turnpike road between Minffordd and Maentwrog.
- 8.5.67 The arrival of the railways had a significant effect on local industries, as there was now a viable way to move people and produce more easily. There are two primary routes within the Study Area, the Ffestiniog Railway and the Cambrian Railway which intersect at the location of the current Minffordd Station. Minffordd railway station was originally two stations opened independently from each other. In 1836 Boston Lodge railway was opened, followed in 1872 by Minffordd Junction. The coming of the railways was particularly significant for the quarries, as produce could now be transported over large distances. Buildings associated with Boston Lodge railway still exist.
- 8.5.68 As a result, a large number of assets recorded within the Study Area are associated with these railways, a total of 48 (RSK 092 to RSK 139). These include two Grade II listed buildings- Minffordd railway station (RSK 093) 120m south west of Pylon 4ZC035 and a railway lodge at the Ffestiniog Railway level crossing 250m south of Pylon 4ZC037. The remainder comprise yard buildings, bridges, embankments and ancillary features of the railway with a cluster focussed on Minffordd Yard. It should be noted that five recorded assets are no longer extant- RSK 132 – 136 recorded by the HER relate to the Pont Briwet viaduct, walls, piers and a toll house which have all been demolished and replaced by the present concrete bridge structure and its approaches.

#### *Industry*

- 8.5.69 Industrial records account for the majority of the recorded historic landscape in the Study Area, a total of 78 individual assets though it is noted that these primarily relate to just two sites- Garth Quarry and the former Cooke's Explosive Works. These can be broken down as follows:
- Fulling mill (Pandy) –RSK 057, comprising a single asset recorded to the west of Minffordd from tithe records, though no surface remains of a mill exist.
  - Quarries – RSK 140-166, comprising 22 assets associated with Garth Quarry and 5 'other' quarries.

- Explosive works – RSK 167 – 216, comprising 50 assets associated with the Cooke's Explosive Works.

8.5.70 Garth Quarry opened in the 1870s for granite setts and continues to operate as an aggregate quarry. The majority of records relate to the location of former (now-demolished) buildings and mineral tramways. None of these assets, or scattered small-scale quarrying sites, would be affected by the Proposed Project.

8.5.71 Cooke's Explosive Works opened in 1865, with explosives manufactured from guncotton, starch and India rubber in an area now known as Cooke's valley at the head of the Dwyryd Estuary, east of Penrhyndeudraeth. The site covers 28 hectares and includes the sites of many internal structures including stores, inclines, boiler houses, preparation plants, packing houses and administrative buildings.

#### *Historic Mapping*

8.5.72 Historic mapping reviewed for this appraisal has not resulted in the addition of any additional post-medieval assets to the gazetteer. Historic Ordnance Survey maps dated 1889 and later depict the landscape within which the temporary and permanent above-ground works of the Proposed Project will occur as largely unchanged from the present condition.

8.5.73 In light of the existing and extensive dataset for the post-medieval landscape, it is considered unlikely that significant previously unrecorded archaeological remains dating to this period would be present within the Site Boundary.

#### Modern Period (1900AD – Present)

8.5.74 There are 5 assets within the Study Area dated to the modern period, and a further seven within the Extended Study Area. Within the Study Area these comprise:

- RSK 224: 'Mardir', a Grade II listed house built in Penrhyndeudraeth in 1926 to the designs of Clough-Williams Ellis, the architect of Portmeirion;
- RSK 225: a wreck within the Dwyryd Estuary;
- RSK 226-227: two housing estates built at Penrhyndeudraeth in the 1960s to house workers at the Trawsfynydd Nuclear power station; and
- RSK 228: a possible modern dump at Snowdonia Business Park.

8.5.75 The assets recorded in the Extended Study Area are all associated with Portmeirion, and include the conservation area/ registered historic park and garden (RSK 217), and six Grade II listed buildings within the park which have theoretical visibility of the Proposed Project:

- RSK 218: Sea-front Terrace Incorporating the Casino and Amis Reunis;
- RSK 219: Portmeirion Hotel Including Revetment, Balustrade and Sculptures to the Upper Terrace;
- RSK 220: Observatory Tower;
- RSK 221: White Horses;
- RSK 222: Statue of Nelson; and
- RSK 223: Entrance Piers at the Minffordd Approach to Portmeirion.

8.5.76 Historic mapping reviewed for the Proposed Project indicates minor changes to the land within the boundary of temporary and permanent above-ground works.

- Immediately to the east of the area of the Garth Tunnel Head House and surrounding working area: a sewage works was established in the late 1960s.

- Garth SEC and Pylon 4ZC037: the existing overhead infrastructure was established on former rough ground in the late 1960s.
- Working area around Pylon 4ZC036: major alteration of field boundaries in late 1960s to accommodate pylon construction.
- Cilfor SEC and Tunnel Head House: creation of two north-south aligned open cut drains to the south of the proposed SEC in the late 1960s.

8.5.77 It is considered unlikely than significant previously unrecorded archaeological remains dating to the modern period would be present within the Site Boundary.

### ***Archaeological Potential***

8.5.78 Based on the available data for the Site Boundary and Study Area, the potential for the presence of previously unrecorded archaeological remains to be present within the footprint of the Proposed Project and their significance is summarised in Table 8.9 below:

**Table 8.9: Summary of archaeological potential**

<b>Period</b>	<b>Potential</b>	<b>Discussion</b>	<b>Importance</b>
Palaeolithic-Neolithic	Low	There is a low potential for archaeological remains to be encountered for these periods. There is limited evidence for prehistoric activity before the Bronze Age in the immediate area, and any finds are likely to be in the form of chance findspots rather than settlement or funerary activity, as communities were predominantly mobile hunter gatherers. Palaeoenvironmental material may survive within areas of peat	Where present, any well-preserved or interpretive remains of these periods would be of Low to Medium (Local – Regional) importance
Bronze Age	Low	While there is evidence that that Bronze Age people were clearing the landscape, there is in general limited settlement evidence during this period for the Study Area. Any material dating from this period is likely to be confined to stray artefacts within later ploughsoil horizons, or potentially within areas of peat	Where present, any well preserved or interpretive remains of this period would be of Low-Medium (Local to Regional) importance
Iron Age	Low	There is a low potential for Iron Age archaeological remains to be encountered within the site. Known remains of settlement in this period within the Study Area and wider region are situated on higher ground. Any material dating from this period is likely to be confined to stray artefacts within later ploughsoil horizons, or potentially within areas of peat.	Where present, any well preserved or interpretive remains of this period would be of Low-Medium (Local to Regional) importance
Romano-British	Moderate	There is strong evidence for settlement, defence and	Evidence pertaining to communication by



Period	Potential	Discussion	Importance
		communication networks within the Study Area. Settlements, shrines and other archaeological evidence often occurred within the vicinity of Roman roads and the presence of a possible Roman road within the site boundary suggests a heightened for remains of this period to be present in the vicinity of the Proposed Project	road network in the Romano British period would be of Regional importance. Rural settlement activity may be of Low-Medium (Local to Regional) importance depending on the state of preservation of such remains.
Early Medieval	Low	There is a low potential for Early Medieval archaeological remains to be encountered.	Where present, any surviving in situ remains of this date would potentially be of Low-Medium (Local to Regional) Importance, particularly where the remains are of interpretive value to this under-represented period in the archaeological record.
Medieval	Low to Moderate	The potential for the site to contain archaeological remains dating to the medieval period is assessed as low to moderate, potentially reflecting foreshore activity close to the margins of the Glaslyn Estuary and rural subsistence activity on the higher ground around Penrhyndeudraeth. Such deposits may appear as material entrained in alluvium/reclamation deposits, or as truncated features below the level of the modern ploughsoil.	Any remains of this period would be of Low (Local) importance.
Post medieval period	Low	It is unlikely that significant previously unrecorded archaeological remains dating to the Post Medieval period would be present within the Site Boundary. Any remains would likely to be confined to relict field boundaries or the remains of minor agricultural structures or features.	Any unexpected remains of this date are likely to be of Very Low to Low (Local) importance.
Modern	Low	It is unlikely that significant previously unrecorded archaeological remains dating to the modern period would be present	Any unexpected remains of modern date are likely to be of Very Low

Period	Potential	Discussion	Importance
		within the Site Boundary.	importance.

### ***Assets taken forward for appraisal***

8.5.79 Table 8.10 below summarises the historic assets identified for appraisal. These comprise non-designated historic assets within or intersected by the land take for the temporary and permanent works within the Site Boundary, and designated historic assets within the Study Area and Extended Study Area upon which indirect impacts may occur. In addition, the operational phase impacts on registered historic landscapes are considered.

**Table 8.10: Historic assets identified for appraisal**

RSK ID	Name	Type	Date
RSK 060	Rhos House	Listed Building Grade II	Post Medieval
RSK 062	Plas Newydd Farmhouse	Listed Building Grade II	Post Medieval
RSK 063	Former Stable Range at Plas Newydd	Listed Building Grade II	Post Medieval
RSK 071	The Vicarage Including Adjoining Service Complex and Gates	Listed Building Grade II	Post Medieval
RSK 072	Former Coachhouse at the Vicarage, Including Associated Garden Walls	Listed Building Grade II	Post Medieval
RSK 073	Former Lodge to Plas Penrhyn	Listed Building Grade II	Post Medieval
RSK 078	Bron-y-Garth Hospital	Listed Building Grade II	19 <sup>th</sup> Century
RSK 079	Casual Ward at Bron-y-Garth Hospital	Listed Building Grade II	19 <sup>th</sup> Century
RSK 080	North Block at Bron-y-Garth Hospital	Listed Building Grade II	19 <sup>th</sup> Century
RSK 082	Nazareth Chapel	Listed Building Grade II	19 <sup>th</sup> Century
RSK 083	Parish Church of the Holy Trinity	Listed Building Grade II	19 <sup>th</sup> Century
RSK 084	Gorffwysfa Chapel Including Hall Adjoining to the Rear and Railed Forecourt Walls to the Front.	Listed Building Grade II	19 <sup>th</sup> Century
RSK 092	Railway Lodge at the Ffestiniog Railway Crossing	Listed Building Grade II	19 <sup>th</sup> Century
RSK 093	Minffordd Station	Listed Building Grade II	19 <sup>th</sup> Century
RSK 224	Mardir	Listed Building Grade II	20 <sup>th</sup> Century
RSK 217	Portmeirion	Conservation area and Registered Historic Park	20 <sup>th</sup> Century
RSK 218	Sea-front Terrace Incorporating the Casino and Amis Reunis	Listed Building Grade II	20 <sup>th</sup> Century
RSK 219	Portmeirion Hotel Including Revetment, Balustrade and Sculptures to the Upper Terrace	Listed Building Grade II	20 <sup>th</sup> Century
RSK 220	Observatory Tower	Listed Building Grade II	20 <sup>th</sup> Century
RSK 221	White Horses	Listed Building Grade II	20 <sup>th</sup> Century
RSK 222	Statue of Nelson	Listed Building Grade II	20 <sup>th</sup> Century

RSK ID	Name	Type	Date
RSK 223	Entrance Piers at the Minffordd Approach to Portmeirion	Listed Building Grade II	20th Century
RSK 008	Part of Roman Road, Segontium to Pen Llystyn to Tomen y Mur	Non-designated asset	Roman
RSK 010	Part of Roman Road, Segontium to Pen Llystyn to Tomen y Mur	Non-designated asset	Roman
RSK 022	Field boundary, Llanfrothen	Non-designated asset	Post Medieval
RSK 036	Field boundary, Penrhyndeudraeth	Non-designated asset	Post Medieval
RSK 038	Channelled Stream, S of Bron y Garth	Non-designated asset	Post Medieval
RSK 058	Embankment and Ditch, S of Bron y Garth	Non-designated asset	Post Medieval
RSK 127	Railway Embankment, NE of Syenite Terrace	Non-designated asset	19th Century
RSK 234	Area of peat	Non-designated asset	Holocene

## 8.6 Key Parameters for Appraisal

### *Direct Impacts*

- 8.6.1 Direct impacts upon buried archaeological remains have the potential to occur within the footprint of any temporary or permanent working areas for the Proposed Project where ground-breaking activities result in the partial or complete truncation of buried deposits, or alteration of the surrounding ground conditions.
- 8.6.2 In all cases the direct impacts would occur during the construction phase. On completion of the Proposed Project no further direct impacts would occur. All direct impacts would be regarded as permanent.
- 8.6.3 With reference to the Proposed Project, the components with the potential to result in direct impacts upon archaeological remains comprise:
- Western side of the Dwyrdd Estuary:
    - Creation of a working compound around the Garth Tunnel Head House, construction of the tunnel and tunnel head house and permanent access road;
    - Installation of a buried cable within an open cut trench between the Garth Tunnel Head House and Garth SEC;
    - Reconfiguration of equipment at the Garth SEC; and
    - Temporary works to facilitate the installation of buried cable and removal of pylons, including accesses, crane pads and working areas.
  - Eastern side of the Dwyrdd Estuary:
    - Creation of a working compound around the Cilfor Tunnel Head House and new Cilfor SEC, construction of the tunnel, tunnel head house, new SEC and temporary and permanent access roads;
    - Removal and replacement of Pylon 4ZC027 adjacent to the new Cilfor SEC; and
    - Temporary works to facilitate removal of two pylons (4ZC028 and 4ZC029), including accesses, crane pads and working areas.

- 8.6.4 It is assumed that within the footprint of working areas for the tunnel head houses the depth of truncation would be sufficient to remove any archaeological remains which may be present.
- 8.6.5 It is assumed that there would be no direct impacts on onshore archaeological remains arising from the construction of the tunnel beyond the footprint of the initial vertical shafts due to their anticipated depths (in excess of 32m deep in any scenario).
- 8.6.6 It is assumed that there would be no below-ground impacts resulting from the reconfiguration of equipment within the Garth SEC. The working area for removal of Pylon 4ZC037 is located in an area previously landscaped for the construction of the pylon and SEC, therefore no below ground impacts are anticipated in this area.
- 8.6.7 It is assumed that the removal of conductors, including associated temporary working areas and the installation of temporary scaffolds, will not result in below ground impacts.
- 8.6.8 In respect of pylon removal, it is assumed that this would be undertaken by mobile hydraulic crane positioned on a crane pad at the pylon location, or by mobile winch and derrick as outlined in Table 2.2, Chapter 2. The project description states that each crane pad will be approximately 20m x 20m (subject to crane size/site constraints) constructed from imported stone and plastic or metal panelling. It is assumed that this would require topsoil stripping within the footprint of the crane pad.
- 8.6.9 The removal of pylon foundations is proposed to a depth of 1.5m. Since these works would be within areas previously disturbed by the installation of the pylons, it is assumed that there would be no impacts on buried archaeological remains arising from these works.

### ***Indirect Impacts***

- 8.6.10 Indirect impacts upon the setting and significance of historic assets in the landscape surrounding the Proposed Project have the potential to occur where there is intervisibility between the assets and the Proposed Project.
- 8.6.11 Indirect impacts may also occur during the construction phase as a result of the visibility, noise and activity of construction activities, including plant on site and vehicle movements in the surrounding area. Construction phase impacts would be temporary in nature, the effects ceasing on completion of the Proposed Project.
- 8.6.12 Indirect impacts may occur on completion of the Proposed Project during the operational phase due to both the presence of new infrastructure in the landscape and the removal of existing infrastructure within the VIP subsection. Operational phase impacts would be permanent for the lifespan of the project, but ultimately reversible on decommissioning. Because of the static nature of the existing overhead infrastructure and proposed new infrastructure, other sensory effects such as changes in illumination and noise/vibration are not relevant to the appraisal of operational phase impacts.
- 8.6.13 With reference to the Project Description, the components of the Proposed Project with the potential to result in indirect impacts upon historic assets comprise:
- Western side of the Dwyrdd Estuary:
    - Creation of a working compound around the Garth Tunnel Head House, construction of the tunnel and tunnel head house, operation of the tunnel head house;
    - Reconfiguration of the Garth SEC;
    - Temporary works to facilitate removal of pylons, including accesses, crane pads and working areas; and

- Removal of pylons, including removal of pylons 4ZC030R, 4ZC031 and 4ZC032 within the offshore area.
- Eastern side of the Dwyryd Estuary
  - Creation of a working compound around the Cilfor Tunnel Head House and new SEC, construction of the tunnel, tunnel head house and SEC, operation of the tunnel head house and SEC;
  - Removal and replacement of Pylon 4ZC027 adjacent to the new Cilfor SEC;
  - Temporary works to facilitate removal of two pylons (4ZC028 and 4ZC029), including accesses, crane pads and working areas; and
  - Removal of pylons.

## 8.7 Predicted Impacts During Construction

### ***Tunnel Head Houses, Sealing End Compounds, 400kV Cable (Undergrounding) and Replacement Pylon***

#### *Infrastructure Western Side of the Dwyryd Estuary*

##### Direct Impacts

- 8.7.1 Direct impacts associated with the construction of infrastructure on the western side of the Dwyryd Estuary may arise during the stripping of topsoil within the site compound area, the creation of the temporary and permanent access roads, tunnel boring operations at ground level and open-cut trenching for the cable connection between the Garth Tunnel Head House and SEC. The construction of the tunnel head house will be in an area disturbed as part of the compound establishment and tunnel boring activities, therefore no further impacts would arise from its construction.
- 8.7.2 RSK 009 (the projected course of a Roman road) passes through the eastern end of the compound spanning the location of the Garth Tunnel Head House on a north west/south east alignment. If present, the construction groundworks would result in the truncation of any road make-up deposits, outlying ditches and adjacent features over a distance of 143m. the road is projected to continue 5km further to the north west. For an asset of **Medium** importance this would represent a **Low** magnitude of impact. The impact would be permanent and irreversible. However, information studied as part of this appraisal, including LiDAR data, aerial photography, historic mapping and field observations during a watching brief, suggest that it is unlikely any road followed the projected course across the formerly open Glaslyn Estuary, therefore the above represents a worst-case scenario, and it is considered likely there would be no impact.
- 8.7.3 Groundworks for the creation of the western compound, temporary and permanent accesses and open cut trenching for the installation of the buried cable, would not affect any other known archaeological assets. The potential for previously unrecorded assets in this location is centred on potential ephemeral activity in prehistoric and later periods associated with seasonal occupation or exploitation of natural resources at the margins of the reclaimed estuary. Groundworks for above project components may result in partial or complete removal of fragmentary remains of **Low** to **Medium** Importance, a **Medium** magnitude of impact prior to mitigation.

##### Indirect Impacts

- 8.7.4 Indirect impacts have the potential to arise during construction works on the western side of the Dwyryd Estuary. These would include the visibility and noise of moving plant, the presence of slurry treatment/processing plant, lighting during shift working and vehicle movements associated with plant, access and removal of excavated material from the tunnel within the setting of surrounding assets.

- 8.7.5 RSK 060 (Rhos House) is located 100m to the east of the western compound area and 50m to the south of the proposed cable trench. Both areas are screened from the listed building by belts of mature trees to the west and north of the house. The setting of the house is therefore constrained to its existing gardens, the surrounding cluster of dwellings and its access and boundary walls from the lane to the south east. The visibility of construction works is unlikely to have any impact on this asset during construction. Vehicle movements would be noticeable along the lane to the south and east, and noise from construction activity may be audible (though within acceptable limits, incorporating proposals for mitigation, see Chapter 14 Section 14.10), affecting the secluded semi-rural character of the location though it is noted that quarrying activity and road and rail activity is present in its existing setting. For an asset of **High** importance this would represent a **Low** magnitude of impact prior to mitigation. The effect would be temporary however and would cease on completion of the construction works.
- 8.7.6 RSK 092 (Railway Lodge at the Ffestiniog Railway Crossing) is located 188m to the south of the western compound area and proposed cable trench, on a north-facing, steeply sloping lane. Views towards the site are constrained by the presence of buildings and vegetation to its north. The setting of the lodge is dominated by the immediately adjacent Ffestiniog Railway crossing with which it has group value, the surrounding settlement on the lane, and open views at a higher level to the hills to the north. Any impact arising from the Proposed Project are likely to be confined to audible activity at the foot of the lane, however this would have little appreciable effect on the building's setting or values which contribute to its significance. For an asset of **High** importance this would represent a **Very Low** magnitude of impact before mitigation. The effect would be temporary and would cease on completion of the construction works.
- 8.7.7 RSK 062 and RSK 063 (Plas Newydd Farmhouse and Former Stable Range at Plas Newydd) are located approximately 500m to the north east of the western compound area and proposed cable trench. The buildings have group value and are located within a small complex within its surrounding fieldscape, backed by wooded hills, which forms its primary setting. Mature trees to the south west filter views towards the site which would be located to the south west of the A487 (see LVIA Chapter 6, Appendix 6C Viewpoint F). Any effects on these assets is likely to arise from partial visibility of the works during construction, which would have little appreciable effect on the buildings' setting or values which contribute to their significance. For assets of **High** importance this would represent a **Very Low** magnitude of impact before mitigation. The effect would be temporary and would cease on completion of the construction works.
- 8.7.8 While the construction works are also proximate to RSK 223 (entrance piers a the Minffordd approach to Portmeirion) and RSK 073 (former Lodge to Plas Penrhyn), the setting of both is tightly contained and no effects would arise as a result of the construction works.
- 8.7.9 There would be no appreciable effects in respect of assets in Minffordd, Penrhyndeudraeth or further east around Porthmadog.

#### *Infrastructure Eastern Side of the Dwyryd Estuary*

##### Direct Impacts

- 8.7.10 The stripping of topsoil/peat within the Cilfor compound, tunnel boring activities and the construction of Pylon 4ZC027R have the potential to result in permanent direct impacts on buried remains. The construction of the tunnel head house/SEC will be in an area disturbed as part of the compound establishment and tunnel boring activities, therefore no further impacts would arise from its construction.

- 8.7.11 RSK 234 is an area of peat within the area of the eastern compound. The permanent access and works within the compound outside the tunnel head house and SEC will be surface mounted on floating foundations, therefore no below ground impacts are anticipated here. Within the footprint of the tunnel head house and SEC compound and footprint of Pylon 4ZC027R peat may be removed to facilitate construction, with piled foundations. The physical extent of the loss of this material would therefore be confined to the footprint of these activities and assumed to be to the full depth of the peat (in excess of 1m). The importance of the peat is assessed as **Low** to **Medium**. The magnitude of effect would be **Low** prior to mitigation.

#### Indirect Impacts

- 8.7.12 Temporary indirect impacts have the potential to arise during the construction works on the eastern side of the Dwyryd Estuary, including the effects of noise and the visibility of moving plant, silos, lighting during shift working and vehicle movements associated with plant, access and removal of excavated material from the tunnel.
- 8.7.13 Because of the screening presence of Y Garth to the west of the eastern working area, the only assets with potential view of the works would be those clustered to the west of the Dwyryd Estuary at Portmeirion (RSK 217 – RSK 222, see LVIA Chapter 6, Appendix 6C Viewpoint C). At a distance of 3.5km, any effects would be limited to distant visibility of low-level construction works, however this would be barely perceptible in a tightly constrained area at an oblique angle of view against a backdrop of rising hills. The orientation of view is not identified as a significant view from the Registered Historic Park and Garden. Overall therefore **no effect** is anticipated in respect of the setting or significance of these assets.

#### ***Removal of Existing Infrastructure (VIP subsection)***

#### Direct Impacts

- 8.7.14 Permanent direct impacts on below ground archaeological remains have the potential to occur within areas of overhead line removal through the establishment of access tracks and potential crane pads.
- 8.7.15 While removal of the overhead line between pylons 4ZC027 and 4ZC028 spans two known assets (RSK 038 and RSK 058), the nature of the works in this location (lowering the conductors) and of the assets themselves (a water course and road) is such that no direct impacts are anticipated.
- 8.7.16 Creation of temporary stone accesses to the working areas for Pylons 4ZC028 and 4ZC029 is within an area of reclaimed tidal flats. No impacts are predicted on previously unknown remains.
- 8.7.17 The creation of temporary accesses and working areas for pylons 4ZC033 and 4ZC034 would not affect any known assets, however there is a potential for previously unknown archaeological remains to be present (see mitigation below).
- 8.7.18 The creation of temporary access and working areas for pylon 4ZC035 pass close to, but would not directly affect, any recorded assets associated with the Ffestiniog railway.
- 8.7.19 The erection of a scaffold for road crossing of the A487 Minffordd roundabout to the east of pylon 4ZC035 is in the same location as a recorded field boundary RSK022. The erection of a second scaffold to the east of pylon 4ZC036 is also in the same location as a further recorded field boundary RSK 036. Since both field boundaries were recorded during works for the construction of the A487, no further impact is anticipated in respect of these assets.
- 8.7.20 The proposed temporary access and working area for pylon 4ZC036 is within an area already heavily landscaped during the installation of the existing pylon, re-using a former

graded access through the field to the south. No impact is predicted on unknown remains in this location.

- 8.7.21 The removal of the overhead lines to the east of pylon 4ZC036 would not have an impact on the operational road beneath, which is recorded as the possible alignment of Roman road RSK 010.
- 8.7.22 The proposed temporary access and working area for pylon 4ZC037 is within the SEC compound which has been landscaped for the construction of the existing infrastructure. No impact is predicted on buried archaeological remains in this location.
- 8.7.23 Removal of the overhead lines to the east of 4ZC037 would have no impact on the underlying railway embankment recorded as RSK 127.

#### Indirect Impacts

- 8.7.24 Temporary indirect impacts on the setting of historic assets in the surrounding area may arise during the works, associated with plant movement, the presence of temporary working areas and accesses, cranes or winch and derricks.
- 8.7.25 Table 8.11 below summarises the potential effects of these works on designated assets:



**Table 8.11: Summary of Indirect Effects, Removal of Existing Infrastructure**

RSK ID	Name	Pylons visible	Distance approx.	Effects
RSK 060	Rhos House	035 and SEC gantry	80m	Temporary movement of plant and visible works
RSK 062	Plas Newydd Farmhouse	035-037	295m	Temporary movement of plant and visible works
RSK 063	Former Stable Range at Plas Newydd	035-037	265m	Temporary movement of plant and visible works
RSK 071	The Vicarage Including Adjoining Service Complex and Gates	029-032	380m	Temporary movement of plant and visible works
RSK 072	Former Coachhouse at the Vicarage, Including Associated Garden Walls	029-032	355m	Temporary movement of plant and visible works
RSK 073	Former Lodge to Plas Penrhyn	036-037	425m	No visible works affecting setting of Lodge
RSK 078	Bron-y-Garth Hospital	033-035	225m	Temporary movement of plant and visible works at 035 to west of hospital
RSK 079	Casual Ward at Bron-y-Garth Hospital	033-035	175m	Temporary movement of plant and visible works at 035 to west of hospital
RSK 080	North Block at Bron-y-Garth Hospital	033-035	235m	Temporary movement of plant and visible works at 035 to west of hospital
RSK 082	Nazareth Chapel	029-035?	841m	No effect
RSK 083	Parish Church of the Holy Trinity	-	427m	No effect
RSK 084	Gorffwysfa Chapel Including Hall Adjoining to the Rear and Railed Forecourt Walls to the Front.	-	375m	No effect
RSK 092	Railway Lodge at the Ffestiniog Railway Crossing	-	249m	No effect
RSK 093	Minffordd Station	035	131m	Temporary movement of plant and visible works at 035 to east of station
RSK 224	Mardir	029-032	395m	Temporary

RSK ID	Name	Pylons visible	Distance approx.	Effects
				movement of plant and visible works
RSK 218	Sea-front Terrace Incorporating the Casino and Amis Reunis	027-031	2.4km	Temporary visible works at distance
RSK 219	Portmeirion Hotel Including Revetment, Balustrade and Sculptures to the Upper Terrace	027-031	2.4km	Temporary visible works at distance
RSK 220	Observatory Tower	027-031	2.4km	Temporary visible works at distance
RSK 221	White Horses	027-031	2.4km	Temporary visible works at distance
RSK 222	Statue of Nelson	027-031	2.4km	Temporary visible works at distance
RSK 223	Entrance Piers at the Minffordd Approach to Portmeirion	027-031	2.4km	No effect

- 8.7.26 In all cases these are assets of **High** importance. Where there is movement of plant or visibility of the removal works the impact would be of **Very Low** magnitude and adverse, understood to be temporary construction works which are disassociated with the assets themselves. The effects would be of temporary duration, ceasing on completion of the removal works.

## 8.8 Predicted Impacts During Operation

### ***Tunnel Head Houses, Sealing End Compounds, 400kV Cable (Undergrounding) and Replacement Pylon***

#### *Infrastructure Western Side of the Dwyryd Estuary*

##### Direct Impacts

- 8.8.1 During operation there would be no additional direct impacts in respect of any historic assets arising from the infrastructure on the western side of the Dwyryd Estuary.

##### Indirect Impacts

- 8.8.2 Potential indirect impacts may arise from presence of the tunnel head house and its compound, and reduced scale of Garth SEC gantry. Infrequent maintenance visits and localised noise associated with fans at the tunnel head house and equipment at Garth SEC would not result in any appreciable impact on the significance of assets (see Chapter 14 paragraphs 14.8.1-14.8.3).
- 8.8.3 From RSK 060 (Rhos House) the western tunnel head house would be located 120m to the west. It would be 5.87m to roof apex from ground level, with slate ashlar walling and a pitched zinc roof, similar in appearance to a barn-type building. In views from the east (i.e. oriented towards the tunnel head house) the new structure would be oriented side-on. Rhos House is surrounded by mature trees approximately 10m in height, higher than its own roofline, and separated from the proposed tunnel head house by further tall mature trees and a residential building. There is no direct visibility of the existing SEC from Rhos House. There would therefore be **no impact** on the listed building's setting or its significance.

- 8.8.4 There would be no visibility of the infrastructure on the western side of the Dwyryd Estuary during operation from RSK 092 (Railway Lodge and the Ffestiniog Railway Crossing) or RSK 062 and RSK 063 (Plas Newydd Farmhouse and Former Stable Range at Plas Newydd). No impact is therefore predicted in respect of these assets.
- 8.8.5 With regard to the historic landscape, the ZTV for the western tunnel head house (see Figure 6.3, Chapter 6) indicates primary visibility of the structure on the north west side of the Penrhyn-Garth promontory and to the north west, visibility being constrained by The Cob to the south west and Garth Quarry to the north. This zone correlates with the Aberglaslyn historic landscape, and specifically the Glaslyn Estuary, Minffordd Quarry and Penrhyn-Garth HLCAs. While the extent of theoretical visibility covers a wide area, the operational infrastructure would be relatively small in scale, and therefore would not be seen as a significant element within the historic landscape. In light of its proposed location close to a cluster of buildings at the fringe of the reclaimed Glaslyn Estuary, the ability to understand and appreciate the 19<sup>th</sup> century reclamation works and the peripheral mining and settlement activity will not be reduced.

#### *Infrastructure Eastern Side of the Dwyryd Estuary*

##### Direct Impacts

- 8.8.6 During operation there would be no additional direct impacts in respect of any historic assets arising from the infrastructure on the eastern side of the Dwyryd Estuary.

##### Indirect Impacts

- 8.8.7 Potential indirect impacts may arise from presence of the tunnel head house and its compound/SEC, and replacement pylon 4ZC027R. Infrequent maintenance visits and noise would not result in any appreciable impact on the significance of assets.
- 8.8.8 Assets with views oriented towards the eastern infrastructure comprise those within Portmeirion only. At a distance of 3.6km, the presence of the tunnel head house will be imperceptible against the backdrop of hills to the east. Replacement pylon 4ZC027R would be visible, however it is likely this would be indistinguishable from the existing baseline view of pylons in this direction, therefore **no impact** is anticipated in respect of these assets.
- 8.8.9 With regard to the historic landscape, the ZTV for the eastern tunnel head house (see Figure 6.3, Chapter 6) indicates primary visibility of the infrastructure in views from the west and south west, corresponding with the southern end of the Penrhyn-Garth promontory (Portmeirion) and the coastal plain on the eastern side of the Dwyryd Estuary. These fall within the Aberglaslyn Registered Historic Landscape (Portmeirion) and Ardudwy Registered Historic Landscape respectively. In terms of the historic character of Aberglaslyn landscape, visibility of the tunnel head house at a distance of 3.5km on the far side of the estuary would have no appreciable effect on the Penrhyn-Garth HLCA. Theoretical visibility of the eastern tunnel head house is largely confined to the Morfa Harlech fieldscape HLCA within Ardudwy, and from the saltmarshes to the west which are not identified as a character area. From the south west this visibility is likely to be reduced substantially by the presence of intervening vegetation, and there would be no intrusion onto the field pattern or open coastal character of these areas. Close to the tunnel head house and SEC, visibility would be more pronounced, however the simple structure design, enclosed compound and replacement of existing Pylon 4ZC027 will not affect the character of the registered landscape to the south.

##### ***Removal of Existing Infrastructure (VIP subsection)***

- 8.8.10 The removal of infrastructure within the VIP subsection will result in permanent beneficial indirect effects for those assets in the surrounding landscape which currently have visibility of the pylons and conductors. In all cases this change would represent a

benefit, as summarised in Table 8.12 below. No direct impacts would occur during operation associated with the removed infrastructure.

**Table 8.12: Summary of Indirect Impacts, Removal of Existing Infrastructure (Operational Phase)**

RSK ID	Name	Pylons currently visible	Distance approx.	Effects
RSK 060	Rhos House	035 and gantry	80m	Removal of one pylon and conductors, and reduction of SEC scale
RSK 062	Plas Newydd Farmhouse	035-037	295m	Removal of three pylons and conductors. SEC gantry not visible
RSK 063	Former Stable Range at Plas Newydd	035-037	265m	Removal of three pylons and conductors. SEC gantry not visible
RSK 071	The Vicarage Including Adjoining Service Complex and Gates	029-032	380m	Removal of four pylons and conductors
RSK 072	Former Coachhouse at the Vicarage, Including Associated Garden Walls	029-032	355m	Removal of four pylons and conductors
RSK 073	Former Lodge to Plas Penrhyn	036-037	425m	removal of two pylons and conductors visible above hedgeline
RSK 078	Bron-y-Garth Hospital	033-035	225m	Removal of 3 pylons and conductors within wider setting of hospital
RSK 079	Casual Ward at Bron-y-Garth Hospital	033-035	175m	Removal of 3 pylons and conductors within wider setting of hospital
RSK 080	North Block at Bron-y-Garth Hospital	033-035	235m	Removal of 3 pylons and conductors within wider setting of hospital
RSK 082	Nazareth Chapel	029-035?	841m	Removal of 6 pylons and conductors from wider setting, most prominently 034 and 034 which are sky lined to the west.
RSK 083	Parish Church of the Holy Trinity	-	427m	Minimal effect
RSK 084	Gorffwysfa Chapel Including Hall Adjoining to the Rear and Railed Forecourt Walls to the Front.	-	375m	Minimal effect
RSK 092	Railway Lodge at the Ffestiniog Railway Crossing	-	249m	No effect
RSK 093	Minffordd Station	035	131m	Removal of prominent tower and conductors

RSK ID	Name	Pylons currently visible	Distance approx.	Effects
RSK 224	Mardir	029-032	395m	Removal of four pylons and conductors
RSK 218	Sea-front Terrace Incorporating the Casino and Amis Reunis	027-031	2.4km	Removal of five pylons and conductors from wider landscape setting
RSK 219	Portmeirion Hotel Including Revetment, Balustrade and Sculptures to the Upper Terrace	027-031	2.4km	Removal of five pylons and conductors from wider landscape setting
RSK 220	Observatory Tower	027-031	2.4km	Removal of five pylons and conductors from wider landscape setting
RSK 221	White Horses	027-031	2.4km	Removal of five pylons and conductors from wider landscape setting
RSK 222	Statue of Nelson	027-031	2.4km	Removal of five pylons and conductors from wider landscape setting
RSK 223	Entrance Piers at the Minffordd Approach to Portmeirion	027-031	2.4km	Removal of five pylons and conductors from wider landscape setting

8.8.11 For assets of **High** importance, where there is visible removal of overhead infrastructure, the improved connection with their landscape setting will result in a **Low** magnitude of impact. These effects would be permanent. Those assets most evidently benefitting from these works include Rhos House, Minffordd Station, Bron y Garth Hospital and its associated buildings, Mardir, and The Vicarage and adjacent coach house, where the pylons and conductors removed are located in close proximity to (or are prominent in the view from) the assets.

8.8.12 With regard to historic landscapes, the ZTV for removed infrastructure (Figure 6.6, Chapter 6) indicates the wide area within which effects associated with removal of the overhead infrastructure would be visible. Within the Aberglaslyn Registered Historic Landscape the zone of visibility extends in a westward direction (with up to 10 pylons to be removed visible) and to the north (between 1 and 5 pylons to be removed visible). Within the Ardudwy registered Historic Landscape the zone of theoretical visibility is extensive, generally with between 7 and 10 pylons to be removed visible across the Morfa Harlech fieldscape and the wooded valleys around Bryn Bwbach HLCAs. Where there is visibility of the removed pylons, the improved visual connection between distinct character areas (for example the connection between Morfa Harlech and the Intermediate Slopes of the Moelwyn Range) will represent a Low to Medium magnitude beneficial effect.

## 8.9 Predicted Impacts during Decommissioning

### *Tunnel Head Houses, Sealing End Compounds and 400kV Cables (Undergrounding) and Replacement Pylon*

#### Direct Impacts

- 8.9.1 There would be no direct impacts arising in respect of buried assets during decommissioning, with all areas having previously been disturbed as part of the construction works.

#### Indirect Impacts

- 8.9.2 With regard to individual heritage assets, there would be no additional indirect impacts arising following decommissioning, since the presence of the infrastructure during the operational phase is not predicted to impact upon any historic assets.
- 8.9.3 With regard to historic landscapes, the removal of the above-ground infrastructure would have a neutral impact on individual HLCAs from which there is visibility of the structures. As noted above, the presence of the infrastructure during operation is not anticipated to have an impact on the ability to understand and interpret the character of the historic landscape, therefore its removal will also have no impact.

### **8.10 Mitigation and Summary of Residual Effects**

#### ***During Construction***

##### Mitigation of Direct Impacts

- 8.10.1 Within the western compound and cable route, impacts upon below-ground archaeological remains may potentially occur associated with a Roman road alignment and peripheral activity at the margins of the Glaslyn Estuary. The potential for the presence of any such remains within the Proposed Project footprint is low, however it is proposed to undertake an archaeological watching brief during construction to observe groundworks and provide an opportunity for the archaeological investigation and recording of any deposits of significance which are exposed.
- 8.10.2 Within the eastern compound, impacts upon below-ground archaeological remains may potentially occur associated with a Holocene peat deposit infilling a former palaeochannel, and potentially any peripheral human activity at the margins of the Dwyryd Estuary. In order to mitigate the impact on these deposits, a programme of archaeological work will be undertaken, commencing with investigation of the palaeoenvironmental significance of the peat deposit in advance of construction. This initial phase will inform the subsequent mitigation response to construction groundworks and may include a watching brief during construction in order to observe the groundworks and record any deposits of significance that are exposed.
- 8.10.3 Where temporary works, including ground-breaking, are undertaken for the creation of accesses and crane pads for the removal of pylons 4ZC033, 4ZC034 and 4ZC035, a watching brief will be carried out in order to record the presence of any previously unknown archaeological remains.
- 8.10.4 In all instances, where archaeological remains are identified the creation of a permanent record, including public dissemination of the results prior to their removal, would offset the development impact and result in no residual effect.

##### Mitigation of Indirect Impacts

- 8.10.5 Measures to safeguard historic assets during construction will be implemented as part of the general measures in the CEMP, to include avoidance of structures and the use of considerate construction practices. Due to the scale and temporary nature of the construction work, screening of the work sites is not proposed during construction. On completion of the construction works there would be no residual effects.

#### ***During Operation***

- 8.10.6 Landscape mitigation is proposed around both tunnel head houses, to include earth profiling around each compound and mixed native woodland planting, which will soften

their appearance and presence in the landscape. No further mitigation in respect of historic assets themselves is proposed. Detail of landscape mitigation proposals are contained in Chapter 6 and is illustrated in Figure 2.2. At Garth this includes planting around the west, north and southern sides of the tunnel head house. At Clifor the planting will extend around the northern and southern sides of the tunnel head house and SEC, softening any views of the infrastructure from the south west.

- 8.10.7 Following removal of the existing infrastructure, during the operational phase the residual effect will be beneficial.

***During Decommissioning***

- 8.10.8 No mitigation is proposed during decommissioning.