

18 Marine Archaeology

Introduction

- 18.1 This section of the Screening and Scoping Report describes the baseline marine archaeological environment and identifies potential impacts of the Proposed Marine Works which includes the following:
- Removal and dismantling of two pylons and their foundations (4ZC030R and 4ZC031 and the associated temporary access tracks to these locations),
 - Removal of the foundations of the previously dismantled pylon 4ZC030,
 - The temporary access to enable the dismantling of pylon 4ZC032 (although the pylon itself is within the terrestrial environment).
- 18.2 The rationale for excluding certain pressures is provided where the level of impact is considered to be minimal and therefore not significant. It provides the rationale for excluding certain impacts from further consideration; and for those which are to be considered further, it incorporates evidence collected previously for the desk-based assessment¹ and explains the proposed approach to the assessment of the effects of the Proposed Marine Works on aspects of the historic environment.

Legislation and Policy

National Legislation

- 18.3 The primary legislation in relation to the marine environment is set out by the Marine and Coastal Access Act 2009. This is supplemented by statutory controls related to archaeological material in the marine and intertidal zones, which includes:
- The Protection of Wrecks Act 1973;
 - The Ancient Monuments and Archaeological Areas Act 1979;
 - The Protection of Military Remains Act 1986;
 - The Merchant Shipping Act 1995; and
 - The Treasure Act 1996.

National Policy and Relevant Sector Guidance

- 18.4 National legislation is further supported by the UK Marine Policy Statement² and Draft Welsh National Marine Plan³. In addition, the primary guidance/policy on archaeology for Wales is contained in:
- Planning Policy Wales⁴;
 - Technical Advice Note (TAN) 24: The Historic Environment

¹ Cotswold Archaeology 2017a *Visual Impact Provision (VIP), Snowdonia Scheme: Marine archaeological desk-based assessment*, Andover: Cotswold Archaeology

² HM Government 2011 *UK Marine Policy Statement*, London: The Stationary Office Limited

³ Welsh Government 2018 *Draft Welsh National Marine Plan*, Cardiff: Welsh Government

⁴ Welsh Government 2016 *Planning Policy Wales. Edition 8*. S.I.: Welsh Government

- 18.5 A strategic assessment of the Irish Sea⁵ was also carried out which includes an assessment of archaeology.

Local Planning Policy

- 18.6 Key policies in the Eryi Local Development Plan 2007-2022⁶ plan relating to archaeology and heritage include:
- Strategic Policy A: National Park Purposes and Sustainable Development (A);
 - Strategic Policy B: Major Development (B);
 - Development Policy 1: General Development Principles (1); and
 - Development Policy 8: Protection of Non-Designated Sites (8).

Baseline Environment

- 18.7 Owing to coastal morphology it is difficult to determine what activities may have been undertaken in proximity to the area of the Proposed Marine Works at different periods. It is likely that these would have included a combination of marine, intertidal and terrestrial elements ranging from fishing to land management. Peat deposits in nearby Penrhyndeudraeth⁷ suggest that sea levels were at one point higher than at present; but with information currently available it is unclear how this might have affected habitation patterns. It is likely that buried deposits could also be present within the area of the Proposed Marine Works.

Landscape context

- 18.8 The superficial geology of the area of the Proposed Marine Works is comprised of tidal flat deposits composed of clay, silt and sand. These overlie bedrock geology of the Ffestiniog Flags Formation, composed of mudstone, siltstone and sandstone⁸.
- 18.9 The Proposed Marine Works lies within the Tremadog Bay and Dwyrdd Estuary Marine Character Area (MCA 14)⁹. This characterises the Dwyrdd Estuary as an extensive intertidal area with a meandering channel running through it which continues inland. There are also extensive saltmarshes, sand flats, mud and dune systems, with the tidal island of Ynys Giffan forming a prominent feature¹⁰.

Designated heritage assets within the Marine Area

- 18.10 There are no World Heritage Sites, Scheduled Monuments, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas within the Marine Area.
- 18.11 The estuary marks the boundary between the Ardudwy Landscape of Outstanding Historic Interest to the east, and the Aberglaslyn Landscape of Outstanding Historic Interest to the west.

⁵ British Geological Survey 2005 *DTI Strategic Environmental Assessment Area 6: Irish Sea (SEA 6)*

⁶ Snowdonia National Park Authority 2011 *Eryi Local Development Plan 2007 – 2022. Written Statement. Adopted Version*, Penrhyndeudraeth: Snowdonia National Park Authority

⁷ Hyder Consulting 2013 *Balfour Beatty Jones Brothers Joint Venture A487 Porthmadog, Minffordd and Tremadog Bypass: Report on archaeological mitigation (GAT report1065)*, Warrington: Hyder Consulting (UK) Ltd.

⁸ British Geological Survey 2016 *Geology of Britain Viewer* [Online] Available at: <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> [Accessed 14 August 2018]

⁹ Natural Resources Wales 2015 *Marine Character Areas. MCA 14: Tremadog Bay & Dwyrdd Estuary.*, s.l.: Natural Resources Wales

¹⁰ *ibi*

- 18.12 The Pont Briwet railway bridge is listed twice as a Grade II Listed Building on either side of the Dwyrdd at Penrhyndeudreath and Talsarnau. This is located on the northern limit of the Marine Area, c. 380m east of Pylon 4ZCO30R.

Previous archaeological investigations

- 18.13 The Dwyrdd Estuary was included in the Coastal Erosion Survey: Aberadon to Aberdyfi¹¹ which assessed the effects of coastal erosion on heritage assets. In the case of the area of Traeth Mawr, Traeth Bach and Talsarnau it was noted that, largely owing to modern development of the coastline, very little coastal archaeology predating the 19th century was observed.
- 18.14 The OHL overlaps the southern extent of the A487 assessment and excavation project which terminates in Minffordd¹². This report identified evidence of Bronze Age, Roman and medieval activity along the route of the A487.
- 18.15 In preparation for the Proposed Project a marine geophysical survey was undertaken in June 2017. This focussed on the Marine Area and was followed by a terrestrial geophysical survey in July 2017. The survey achieved limited coverage owing to the challenging environment, including shallow water depths and shoaling conditions. The archaeological assessment of survey data concluded that there were no archaeological features in this area.
- 18.16 No previous marine surveys or walkover assessments of the Traeth Bach area of the Dwyrdd Estuary were identified.

Non-designated heritage assets

- 18.17 There is limited direct evidence for prehistoric activity in the environs of the Proposed Marine Works. The identification of intertidal peats to the north of Tremadog Bay at Afon Dwyrdd and Afon Wen¹³ may suggest a higher potential for finding similar deposits in the Afon Dwyrdd. Terrestrial archaeological remains have been identified in the wider landscape. It has also been suggested that the distribution of Mesolithic flint scatters in the wider area of Tremadog Bay indicates the exploitation of coastal resources¹⁴.
- 18.18 The peats noted above date to the 2nd to 3rd millennium calibrated (cal) Before Christ (BC), and pollen samples suggest Bronze Age landscape development¹⁵. Bog oak was also identified within the peat, however no tool marks or signs of working were observed. There is additional evidence for Bronze Age activity in the surrounding area in the form of find spots in Penrhyndeudraeth.
- 18.19 In the wider context of north Wales there is evidence for Roman maritime trade, including the discovery of a Graeco-Italic anchor from the 3rd or 2nd century BC at Porth Felen, Aberdaron¹⁶. In the immediate environs of the estuary, Roman activity is most clearly expressed by Roman roads which run east-west through Penrhyndeudraeth. There is another road recorded as crossing the Dwyrdd Estuary at Portmeirion to the west that also crosses north-east of the OHL at the Vale of Ffestiniog. There is additional direct evidence for Roman activity in the environs in the form of three silver coins found at Penrhyndeudraeth, c. 2.1km west of Pylon 4ZCO31.

¹¹ Gwynedd Archaeological Trust 1996 *Coastal Erosion Survey: Aberdaron to Aberdyfi. Report 198*, s.l.: Gwynedd Archaeological Trust.

¹² Hyder Consulting 2013 *Balfour Beatty Jones Brothers Joint Venture A487 Porthmadog, Minffordd and Tremadog Bypass: Report on archaeological mitigation (GAT report 1065)*, Warrington: Hyder Consulting (UK) Ltd.

¹³ *Op cit*

¹⁴ Gwynedd Archaeological Trust 1996

¹⁵ Hyder Consulting 2013

¹⁶ *Op cit*

- 18.20 Following the Roman departure, the Kingdom of Gwynedd developed in this part of north Wales, although there is limited archaeological evidence for this and many accounts appear to be based in myth¹⁷.
- 18.21 There is archaeological evidence of marine activity in the wider environs of the Marine Area during the medieval period, including a ferry embarkation point which may have been canalised in the Middle Ages to improve access to the wharf by ships at Ty Gwyn y Gamlas, south of the Marine Area¹⁸. However, the evidence of activity in the immediate environs of the Proposed Marine Works is limited and relates to terrestrial activity, including the re-use of one of the Roman roads as a pre-turnpike road.
- 18.22 In the wider context of Tremadog Bay, the fishing industry appears to have played an important role in the region from the medieval period onwards. During the post-medieval period the Dwyryd Estuary became a focal point for fishing and ship-building. The Historic Environment Record (HER) indicates that Penrhyndeudraeth and Talsarnau developed considerably during the post-medieval period. This includes evidence of managed waterways such as the channelled stream at Talsarnau, and a notable increase in quarrying activities around Penrhyndeudraeth. There is also evidence of maritime infrastructure related to quarrying in the form of a quay for the transportation of the slate at Cei Newydd, north-east of the OHL.
- 18.23 There is also a record of attempts to reclaim the area of Traeth Bach in the 18th century, which had been designated previously as waste land. It is unclear how this parcel of land correlates with modern maps, or how it was used. In 1806 an Act of Parliament was obtained to inclose [sic] common and waste ground adjoining the parish of Llandanwg, including marshes in the intertidal area of Traeth Bach¹⁹. This led to the construction of sea-walls and defences at Talsarnau between 1809 and 1810²⁰, elements of which are still visible. On the northern side of the Penrhyndeudraeth peninsula more extensive efforts were made to reclaim Traeth Mawr for agricultural land with William Maddocks construction of the Great Embankment, commonly referred to as the Cob, which was completed in 1811²¹. This was a large construction project and there are indications that there was a ship or boat-building capacity in Traeth Bach evidenced by the hiring of boats from there to build the Cob.
- 18.24 Throughout the modern period there was an increase in boat-building and coastal trade, primarily linked to slate quarrying. This can be seen in the slate quay c. 1.2km to the east of Pylon 4ZCO30R and the wreck site of a slate boat c. 1.8km south-west of pylon 4ZCO30R. There are also references to ferries operating in Traeth Bach, one of which is reported to have sunk in the area²². It may be that there are more small vessels similar to the slate-carrying boat, or their cargoes, buried in the sands of Traeth Bach.
- 18.25 There was a shift away from marine transport of slate following the arrival of the railway in the 1860s. This led to the construction of the Traeth Bach road and railway bridge, Pont Briwet Grade II Listed Building. Coastal shipping associated with the slate trade appears to have ended with the advent of World War I, and the prohibition on export to the considerable German market²³.
- 18.26 Evidence from historic mapping and aerial photographs indicates that the areas of saltmarsh were in use, as evidenced by the depiction of channels and trackways. The use of the saltmarshes appears to have continued into the modern period. Assessment of Royal Air

¹⁷ *ibid*

¹⁸ Lewis 1849 Llanvihangel – Llanvillo. In: *A Topographical Dictionary of Wales*. London: s.n., pp. 129-147

¹⁹ *ibid*

²⁰ *Op cit*

²¹ Hyder Consulting 2013

²² Gewefan gymunedol: Talsarnau, n.d. *Discovering the slate carrying boat* [Online]

Available at: <http://www.talsarnau.com/index.php/en/history/discovering-slate-carrying-boat> [Accessed 14 August 2018]

²³ *Op cit*

Force (RAF) (1946, frames 4015 and 4016) and Ordnance Survey (OS) (1971, 266) aerial photographs covering Traeth Bach also appear to show possible tracks or channels across the saltmarshes on both the north and south sides of the channel.

- 18.27 More recently, the National Monuments Record for Wales (NMRW) records the wreck of an amphibious vehicle in the immediate environs of the OHL. No additional information is provided on the wreck indicating details of its construction or date of loss. Assessment of RAF (1946, frames 4125 -4127) and OS (1971, frames 202, 256 and 257) aerial photographs covering its location show no signs of the amphibious vehicle. The aerial photographs from 1946 do however indicate a spread of possible debris south of Pylon 4ZCO30R, to the east of the landing craft. The resolution of the photographs is insufficient to identify what these objects are, and it is possible that they are natural features, but they seem to be spread in an east-west alignment over c. 240m. No similar objects are visible in the 1971 OS aerial photographs or modern coverage of the area, viewable in Google Earth, suggesting they have either been removed or buried by sand.
- 18.28 There is some potential, therefore, for archaeological remains to be present in the area of the Proposed Marine Works. Although the potential archaeological remains are most probably of post-medieval or modern date, there is also a low potential for earlier remains. If present, the earlier remains are most likely to be associated with coastal activity, in artefactual form and would be considered to be of high evidential value for remains of prehistoric or Roman date and low to medium from medieval and later.

Significance of recorded heritage assets within the Marine Area

- 18.29 Only two recorded heritage assets have been identified within the Marine Area. The Grade II listed bridge, Pont Briwet, located c. 380m east of the Pylon 4ZCO30R, does not fall within the scope of this assessment of below ground archaeology in the marine environment. There is also very little information available relating to the amphibious vehicle, c. 560m west of Pylon 4ZCO30R.
- 18.30 If the amphibious vehicle is still present its significance would likely be derived from its evidential value relating to its construction and use. It may also hold historical and communal value depending on the circumstances of its loss or if the circumstances of its loss have entered local oral tradition, although no evidence for this has, as yet, been identified. If this is a military craft then it may inform our understanding of the history of Traeth Bach at the time of its loss.

Potential Impacts

Direct damage to archaeological assets

- 18.31 Any direct impacts associated with the ground works within the area of the Proposed Marine Works would be limited to any disturbance of the ground immediately adjacent to the pylons which had not previously been disturbed during their installation. These impacts would be very localised. There is the additional potential impact of machinery movement within the wider environs of the pylons, including the laying of temporary access routes.
- 18.32 There are limited known archaeological remains within a 500m radius of the pylons within the Proposed Marine Works. The majority of these archaeological remains are terrestrial and would be unaffected by the removal of the pylons. The wreck of an amphibious vehicle is the only identified marine archaeology. Based on its known location it would not be affected by the removal of the pylon bases. There is potential for some disturbance to the possible debris identified in the immediate environs of the pylons during their removal, although their identification as debris is not certain.

- 18.33 The potential for encountering buried archaeological material during these works is thought to be negligible as the construction works associated with the installation of the pylons is likely to have impacted or removed any archaeological remains.

Direct damage to submerged prehistory and palaeolandscapes

- 18.34 No submerged prehistory or palaeolandscapes have been identified in the immediate environs of the pylons. Remains have been noted, however, in the wider landscape with a potential for deposits associated with the formation of the palaeolandscape in the Dwyryd Estuary. The most likely deposits of archaeological interest to be encountered are buried peats which could be used to inform our understanding of the palaeo or prehistoric environment at the time of the deposition. Based on the information discussed above, it has been determined that the potential for encountering such material is limited.

Indirect damage to archaeological asset

- 18.35 There are no anticipated indirect impacts to heritage assets during the pylon removal works.

Proposed Assessment Methodology

- 18.36 A marine archaeological desk-based assessment was conducted to inform a Marine Licence for Ground Investigation works associated with the Proposed Project²⁴. This assessment allowed for the Proposed Marine Works, so further baseline assessment is not considered necessary. The preceding assessment will form the basis for an assessment of the potential impacts of the removal of the pylons on known and potential marine archaeological remains.
- 18.37 A walkover survey will be undertaken to identify previously unrecorded heritage assets, areas of potential archaeological interest, and areas of ground disturbance to feed into the Proposed Project. The survey will entail a systematic walkover of the area surrounding the pylons. Sites of potential archaeological interest will be plotted using a GPS, and a photographic and written record of the walkover will be maintained.
- 18.38 To inform the Marine Licence for Ground Investigation works associated with the Proposed Project a geophysical survey was carried out in the marine environment²⁵. The results of the survey were limited owing to environmental difficulties.
- 18.39 As the proposed work comprises the removal of modern installations rather than new installations it is considered that an assessment of the significance of the Proposed Project on historic landscape (ASIDOHL) will not be required.

Assessment of potential effects

Sensitivity of the Receptor

- 18.40 The method used to assess the impacts of the Proposed Project on marine archaeology will begin with an assessment of the sensitivity of each historic asset. Sensitivity can be defined as the sum of cultural heritage values, such as evidential, historical, aesthetic, and communal values and is derived from their potential to contribute to our understanding of past human activity guided by local, regional and national research priorities. The following assessment of sensitivity is based on the professional judgement of the assessor informed by these values and by the criteria presented in Table 18.1.

²⁴ Cotswold Archaeology 2017. Visual Impact Provision (VIP), Snowdonia Scheme: Marine archaeological desk-based assessment, Andover: Cotswold Archaeology

²⁵ ibid

Table 18.1 Criteria for determining the significance of a heritage asset

Historic asset sensitivity	Criteria
High	<ul style="list-style-type: none"> Designated assets including World Heritage Sites, wrecks and scheduled monuments Historic assets of national importance Maritime losses where the position is known and has been positively identified Targets of high archaeological potential identified in the geophysical survey
Medium	<ul style="list-style-type: none"> Historic assets of regional importance Targets identified in the geophysical survey and walkover survey of medium archaeological potential Obstructions that could be indicative of wreckage or submerged features
Low	<ul style="list-style-type: none"> Other sites listed on the HER Targets of low potential identified in the geophysical survey and walkover survey Stray archaeological find spots
Very low	<ul style="list-style-type: none"> Targets identified through the assessment of geophysical survey and walkover survey data as likely to represent a natural feature

Magnitude of Impact

- 18.41 Unlike terrestrial assessments, the method to determine the magnitude of impact in the context of marine archaeology is limited to the severity of impact. For the purpose of this assessment severity is considered to be synonymous with magnitude.
- 18.42 The magnitude of impact is a measure of the scale or extent of change in baseline conditions, irrespective of the value of the heritage assets affected. The criteria used to inform the assessment of the magnitude of impact is set out in Table 18.2.

Table 18.2 Criteria for assessing the magnitude of impact

Magnitude	Definition
High	<ul style="list-style-type: none"> Total loss or major alteration of the historic asset removing the asset's value
Medium	<ul style="list-style-type: none"> Loss of one or more key elements of the historic asset substantially reducing the asset's value
Low	<ul style="list-style-type: none"> Slight physical alteration of the historic asset not affecting key elements, slightly reducing the asset's value
Very Low	<ul style="list-style-type: none"> Very slight or negligible alteration of the historic asset

Significance of effect

- 18.43 The assessment of the significance of an effect will be undertaken using professional judgement, guided where necessary by the matrix shown in Section 3 of this Screening and Scoping Report. The assessment of significance is influenced by the sensitivity of the heritage asset and the magnitude of the predicted change from the baseline condition. This

takes into account embedded mitigation measures incorporated into the Proposed Project as part of the design process to reduce potentially significant effects e.g. the avoidance of known heritage assets will be a consideration during the determining of placement of pads for vehicles and access tracks.

Proposed Mitigation Measures

- 18.44 Mitigation measures will be proposed if the impact assessment process identifies potentially significant adverse effects arising from the Proposed Project. Measures to mitigate impacts to heritage assets would normally consist of preservation in situ where possible, or where this is not feasible, investigation and recording before and/ or during proposed works. Currently no mitigation measures are deemed necessary as all known heritage assets are sufficiently far away from the Proposed Marine Works not to be impacted and the proposed works are on ground which has been disturbed previously (with the exception of any access tracks).
- 18.45 A Protocol for Archaeological Discoveries (PAD) for unexpected discoveries, by which the construction crews will abide, will be implemented prior to any works on site. The establishment of a PAD with an associated Written Scheme of Investigation (WSI) will outline in detail the method for dealing with any archaeological remains discovered during the works.
- 18.46 Avoidance of impact will be the primary aim.

Issues to be Scoped Out

- 18.47 The project-specific desk-based assessment, completed to inform the marine licence for the ground investigation for the Proposed Project, suggests that there are no cultural heritage issues to be scoped out of the assessment at this stage.

Overview of the Likely Significance of Effect

- 18.48 Based on the limited potential for surviving archaeological remains within the Proposed Marine Works Area, it is anticipated that no heritage assets will be impacted by the Proposed Project as the ground has been disturbed previously during Pylon installation. In the unlikely event that unknown archaeological remains are encountered, these are anticipated to be of low to very low sensitivity and of local importance and will be addressed in full compliance with the conditions of the PAD. Any disturbance of unknown archaeological remains would therefore be considered to result in low to very low impact on the historic environment.