

MORFA BERWIG, LLANELLI ARCHAEOLOGICAL DESK-BASED ASSESSMENT



Prepared
by
Cambria Archaeology
for
Llanelli Watervole Action Group



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**MORFA BERWIG, LLANELLI
ARCHAEOLOGICAL DESK-BASED ASSESSMENT**

By

Cambria Archaeology Field Services

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SUMMARY

Proposals for a new mixed development on land at Morfa Berwig, Llanelli (NGR SS54499871), currently being devised by Carmarthenshire County Council, required an archaeological desk-based assessment. The council are hoping that the project will be a model of sustainable development utilising best practice in all aspects of the scheme. This is important as the site under consideration is one of the few surviving water vole habitats. The Llanelli Water Vole Action Group commissioned Cambria Archaeology Field Services to carry the assessment in January 2007.

The proposed development site lies within a large area of reclaimed former salt marsh that extends east from Llanelli. The landscape present within the proposed development site is typical of a coastal wetland that has been reclaimed over a long period of time, with flood defence banks and irregular fields separated by sinuous, former tidal watercourses. Traces of two flood defence banks survive within the scheme boundary, at least one of which pre-dates the mid 18th century. The existing pattern of drains, watercourses and fields is a product of the 18th and 19th centuries.

The site also contains the overgrown remains of the Carnarfon Colliery and its associated tramway. The colliery was sunk in the late 18th century and worked on and off by various individuals and groups until the early 20th century. The tramway was added in the mid 19th century.

As with all coastal wetland environments the proposed development site has the potential to contain significant palaeoenvironmental evidence within its underlying deposits.

A mixed programme of monitoring and recording any surface features, such as the colliery remains or the flood banks, prior to and during construction works and sampling to test the nature and palaeoenvironmental potential of the underlying deposits has been suggested.

1. INTRODUCTION

Project proposals and commission

Carmarthenshire County Council are advancing proposals for a new mixed development on land at Morfa Berwig, Llanelli (NGR SS54499871). It is hoped that the development will be a model of sustainable development utilising best practice in all aspects of the scheme. This includes the cultural and natural heritage of the site. Therefore, this archaeological desk-based assessment was deemed necessary to provide up to date baseline information regarding the development and condition of the archaeological and cultural heritage resource within the development site. The Llanelli Water Vole Action Group commissioned Cambria Archaeology Field Services to carry out the archaeological component of the EIA in January 2007.

Scope of the project

This assessment was designed to provide enough information to allow an assessment of the potential archaeological resource within the proposed development area and the likely impacts of the proposed development on that resource. Recommendations for further work or mitigation measures have been given where appropriate.

The assessment was a non-intrusive process and consisted of the examination of a wide variety of source material held at a number of local, regional and national repositories.

Report outline

This report describes the physical environment of the study area (Section 2) before summarising the archaeological resource (Section 3) and the likely impact of the proposed scheme on that resource (Section 4). Suggestions for possible further archaeological works based on the results of Sections 3 and 4 are given in Section 5.

Abbreviations used in this report

All sites recorded on the county Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). References to cartographic and documentary evidence and published sources are given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

2. THE STUDY AREA

The proposed development site occupies c.14.5ha (c.37 acres) of reclaimed salt marsh on the southern edge of Llanelli at NGR SS54499871. The site is currently degenerating grassland crossed by several watercourses, with former industrial land in the southeast section (Plate 1).

Wetland landscapes

The importance of wetlands as areas of high archaeological potential has been recognised since the mid-19th century. Since that time, work in wetland areas – coastal or otherwise – has produced a number of important archaeological finds, sites and even entire landscapes preserved within their unique conditions.

There is little doubt that the principal archaeological importance of wetlands is the survival of forms of evidence not normally recoverable from dry sites, namely organic materials such as wood, plant remains, leather and textiles. Furthermore, the matrix within which this material is found also has archaeological potential as it can contain palaeoenvironmental evidence, including pollen, plant and insect remains, which provide information about past landscapes and climates. This provides a wider study base for the investigation of wetland sites than is possible on comparative dry land sites, giving a more integrated and fuller understanding of past activity.

Previous work carried out on the coastal wetlands around Llanelli has outlined their development history and highlighted their archaeological potential (James 1993; James and Morgan 1994; Page 1997; Page 1999; Page 2000; Lillie *et al* 2000; Lillie *et al* 2003; Page 2006a, 2006b).

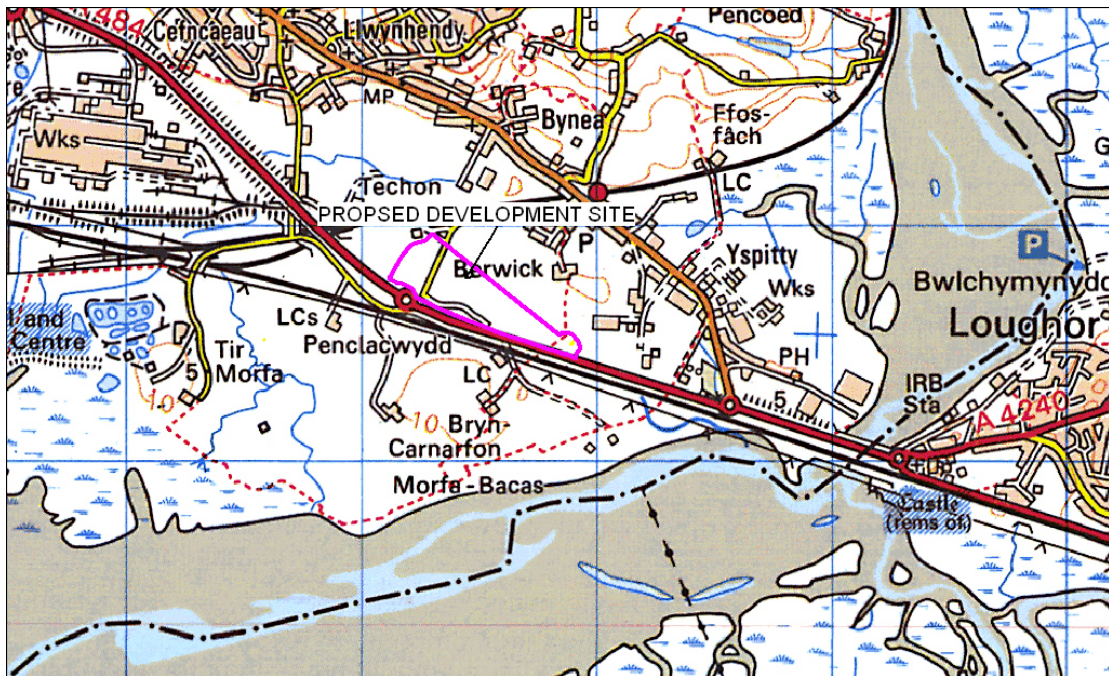


Figure1: Location map showing extent of proposed development site. Reproduced from Landranger® 1:50000 scale by permission of Ordnance Survey® on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright 1999. All rights reserved. Licence number AL 100020930.

Landscape development within the study area

The coastal wetlands of Llanelli are a dynamic and constantly evolving environment that have been shaped by natural processes, such as rising sea levels and the changing course of the River Loughor, and human actions, which have included the reclamation of large areas of former salt marsh. The Morfa Berwig Project site lies within such an area of reclaimed saltmarsh. Mapping and aerial photography clearly show the pattern of former tidal creeks and watercourses fossilised in the irregular field boundaries in this area (Fig 2).

Traces of former landscapes are present on the foreshore in the intertidal zone to the south of the study area, where remnants of a submerged forest are often visible at low tide. A radiocarbon date of 4190 ± 80 BP (Swan-238) was obtained from a sample of peat from the submerged forest (Page 1997, 8), which calibrates out at 2 sigma level (95% confidence) to 2921-2475 cal BC. This suggests that during the Neolithic period the north bank of the Loughor estuary was well wooded, with the woodland in some places probably extending close to the water line.

Results from palaeoenvironmental sampling at Machynys, c.2.5km to the west of the study area, did not identify a submerged forest deposit in that area (Lillie *et al* 2000; Lillie *et al* 2003). The lack of a similar submerged forest at Machynys may be explained if there were different environmental regimes on either side of the Dafen river, which used to flow into the Loughor on the east side of Machynys prior to its canalisation in the early 19th century. However, the samples at Machynys did identify a peat deposit that was developing during the Neolithic and Bronze Age indicating a period of marine regression, or a slowing in the rate of sea level rise (Lillie *et al* 2003, 56).

Reclamation of the saltmarshes in the Berwig area began in the medieval period with banks erected in the Maes ar Dafen area, a short distance to the east of the proposed development site to control the tidal reach of the Afon Dafen. Embankment in the Berwig region is also likely to have medieval origins, but it was the later post-medieval and early modern periods that saw the main episodes of embankment and the establishment of the main elements of the present landscape. A map of lands at Berwig produced in 1751 shows that many of the present day landscape components had been established by the mid 18th century. Most of the study area was common land and it appeared to be only semi-enclosed. A bank, the remains of which run north-south across the site (PRN 31652), and a small parcel of enclosed common appear to have been the outer limit of the enclosed land in the mid 18th century (Fig 2).

By 1822 the present layout of fields had been established and the Carnarfon Colliery, originally sunk as the Baccas Colliery in 1795, was shown as a group of four or five buildings (Symons 1979, 192). The tramway that linked the colliery to the Llanelli Railway – and which today forms the northern site boundary – was not shown in 1822 (Symons 1979, 192) but it was shown on the Llanelli parish tithe map of 1841, so it had clearly been constructed in the 20 years between the production of the two maps (see below for a discussion of the Carnarfon Colliery).

The present landscape has a typical appearance of a coastal wetland that was reclaimed over a long period of time, with its irregular fields separated by sinuous watercourses. The sinuous nature of the watercourses are characteristic of former tidal creeks that have been incorporated into the reclaimed areas to provide the drainage necessary to ensure that the newly enclosed land does not flood. Therefore, the existing pattern of drains, watercourses and fields is a product of the 18th and 19th centuries.

Some modern clearance works associated with various infrastructure projects have taken place on the site, which have had an impact on several boundaries and drains.

3. SUMMARY OF THE ARCHAEOLOGICAL RESOURCE

The historic landscape

The landscape within the development site retains its characteristic layout of flood defence banks, irregular watercourses, drains and fields. It is suffering from deterioration and some modern clearance works have affected the centre of the site, but on the whole the of the 18th and 19th century landscape is intact.

Archaeological features within the development site

There are five archaeological sites within the project boundary (Fig. 2). They are typical sites of the Llanelli region and very characteristic of this area, representing land reclamation and coal mining.

PRN	NGR	SITE NAME	SITE TYPE
4657	SS54859842	Carnarfon Colliery	Coal mine
31637	SS54209903 Ss54849853	Carnarfon Colliery	Tramway
31652	SS54479882 SS54499861		Flood defence
31653	SS54299870		Building
31656	SS54229885		Spoil tip
31658	SS54029870 SS54199883		Flood defence

Table 1: Known archaeological sites and features within the proposed development site.

PRN 4657 Carnarfon Colliery

The Carnarfon Colliery, originally Baccas Colliery, was sunk in c.1795 by David Hughes and Joseph Jones. They also constructed the Baccas Canal to move coal from the mine to the Loughor. For a variety of reasons the colliery was never successful and it appears that by the 1820s one of the original partners had died and the colliery was closed (Symmons 1979, 180). Several attempts were made to rework the colliery and by 1841 a tramway had been constructed to carry coal from the mine to the Llanelli Railway, c.800m to the northeast. The mine finally closed in 1927 (Symmons 1979, 91; James 1993, 23).

PRN 31637 Carnarfon Colliery tramway

A tramway linking the Carnarfon Colliery to the Llanelli Railway. The tramway was constructed between 1822 and 1841 to replace the Baccas Canal, which was shown as 'Old Canal' on a map of 1824, as the means of transporting coal from the mine. On the Ordnance Survey 1st edition map (1889) the tramway is shown as a single track line carried on a low embankment, with the southeast end extending through the colliery site to a small area of spoil tips. By the time the 2nd edition map was published in 1907 the section of tramway through the colliery had been removed.

PRN 31652 Flood defence

The line of the bank is shown as the edge of the enclosed land on a plan of lands at Berwig produced by William Jones in 1751. This suggests that the bank was the defence between the enclosed land and the unenclosed common, which would probably have been an area of tidal saltmarsh used for grazing. The bank is shown on the Ordnance Survey 1st and 2nd edition maps of 1889 and 1907 along

the east side of a large drain that stills forms an important part of the drainage system for the site.

PRN 31653 Building

A small building was shown in this location on the Ordnance Survey 1st edition map of 1889 and on the 2nd edition map of 1907. It had been abandoned and demolished by the mid 20th century. The building was probably a small cottage constructed on newly enclosed land in the mid 19th century.

PRN 31656 Spoil Tip

A small spoil tip was shown in this location on the Ordnance Survey 1st edition published in 1889, but not marked on the 2nd edition of 1907. This was probably part of the Tychon Fach Colliery, which lay to the northwest of the proposed development site.

PRN 31658 Flood defence bank

A bank is shown on the Ordnance Survey 1st and 2nd edition maps of 1889 and 1907 running south from spoil tip PRN 31656 to the unclassified road that leads to the Penclacwydd Wildfowl and Wetland Centre. Only the north half of this bank is within the project boundary. A short length of the bank is visible on aerial photographs between the modern A484 and the unclassified road.

Current condition of the archaeological features within the development site

PRN 4657 Carnarfon Colliery

Today only the chimney from the engine house is visible (Plate 1). The site is very overgrown and the chimney itself is vegetation covered. There may be other structures or features, such as shafts and spoil tips, surviving on the site beneath the vegetation, which is currently too dense to allow access to the site.

PRN 31637 Carnarfon Colliery tramway

The tramway survives as a low very overgrown earthwork. Only the northwest end is clear of vegetation where it survives as a low grass bank (Plate 2).

PRN 31652 Flood defence

The bank survives in very degraded form. It has been partially destroyed by modern clearance works that has removed the central section of the bank resulting in two short lengths of bank. Where it survives on the south side of the site it is a low stone and earth bank, which – although virtually covered by vegetation – is in fairly good condition (Plate 3). The north section is less well preserved.

A modern flood defence bank constructed from industrial waste and demolition debris now extends northwest from the surviving southern section of the original bank.

PRN 31653 Building

This area has been heavily disturbed and there are no above ground remains of this building (Plate 4). It is possible that some below ground remains survive.

PRN 31656 Spoil tip

The area of the site that contained this spoil tip has been levelled and there are now no visible traces.

PRN 31658 Flood defence

The section of the site containing this bank was inaccessible during the site visit for this assessment and its current condition is unknown.

The palaeoenvironmental potential

Even though there no previous palaeoenvironmental work has been carried out on this site, the results from other studies in the area have shown that the Llanelli Marshes contain deposits of significant palaeoenvironmental potential. Therefore, it is likely that similar buried deposits will be present across the site.

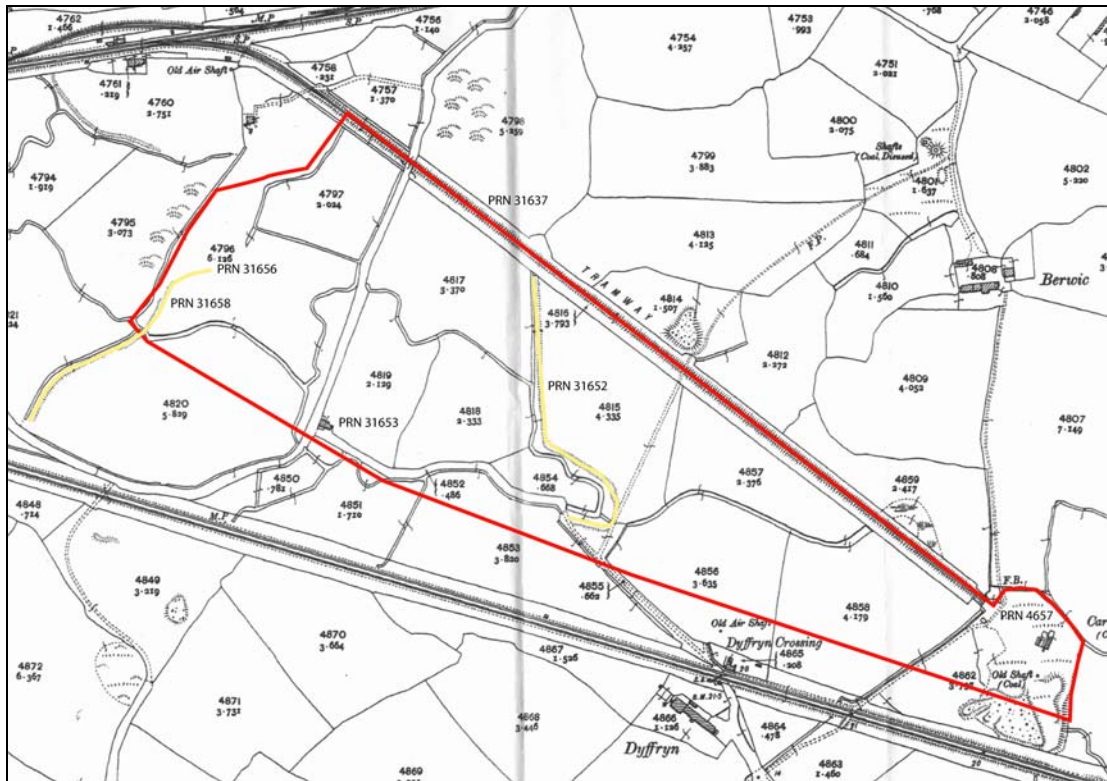




Plate 1: The overgrown remains of Carnarfon Colliery PRN 4657.



Plate 2: the grassed earthwork remains of the northwest end of the former Carnarfon Colliery tramway PRN 31637.



Plate 3: The overgrown flood defence bank PRN 31652 with the new defence bank in the foreground.



Plate 4: The site of the former building PRN 31653 that was shown on the Ordnance Survey 1st and 2nd edition maps of the area.

4. POTENTIAL IMPACT OF DEVELOPMENT ON THE ARCHAEOLOGICAL RESOURCE

Without any design plans it is not possible to be definitive about the impacts of development on the archaeological resource within the project area. However, the processes of development are well enough known to be able to make general statements that can be used to inform the final design plans.

The impacts of built development in a wetland environment

New building has a range of processes that have immediate and very obvious archaeological implications. The main processes are:

1. Site clearance
2. Demolition of standing remains
3. Excavations for new foundations and service trenches
4. Construction of new roads
5. Landscaping
6. Heavy machinery moving across the site.

To these can be added the further implications of construction in a wetland environment, which include:

1. Changes to the drainage pattern in the development site affecting the local water table, which can lead to the drying out of waterlogged deposits across a wide area
2. The introduction of oxygen into an anaerobic environment leading to the loss of organic material
3. Pollution and chemical changes affecting buried waterlogged deposits
4. Compression of the underlying deposits

Although it is not intended to discuss all of the above issues it is worth emphasising a few of the issues to highlight the particular problems of development in a wetland environment.

All building works require physical intervention, from site clearance works, to topsoil stripping, levelling, through to the excavation of foundation and service trenches prior to construction. All of these carry the obvious potential of damaging or destroying surface features, such as the former flood defence banks (PRNs 31652 and 31658) or any remains of Carnarfon Colliery (PRN 4657). They also have the potential to damage or remove previously unknown buried archaeological sites or deposits.

As well as the obvious and direct impacts that can occur during the above processes they can also have a significant indirect impact through the lowering of water tables and the introduction of pollution or oxygen into what is – if left undisturbed – a reasonably stable, but fragile environment.

Potential impacts on the historic landscape

Any development will fundamentally alter the existing character of the site, although, the history of the site is one of reclamation and industry, so development on the site is not without precedent. However, the layout of watercourses, drains and fields that is so characteristic of this type of landscape is vulnerable to large-scale and unsympathetic development.

Alteration of the layout will remove a landscape that has been established for over 150 years, with some elements significantly older than that.

Potential impacts on the known archaeological features

All of the standing remains, the flood defence banks (PRNs 31652 and 31658), Carnarfon Colliery (PRN 4657) and its tramway (PRN 31637), are vulnerable to site clearance and construction works.

The site of demolished building PRN 31653 is also vulnerable to groundworks and any below ground remains that may survive could be affected by construction works.

Potential impacts on the buried archaeological resource

The nature of the underlying deposits is unknown and their palaeoenvironmental potential has yet to be assessed. However, given the potential identified during sampling in the Machynys region, c.2km to the west, it is extremely likely that the deposits on this site also contain significant palaeoenvironmental material.

5. SUGGESTIONS FOR FURTHER ARCHAEOLOGICAL WORKS

This assessment has shown that the development site contains remains that characterise the development of Llanelli and the surrounding area. It has also highlighted the palaeoenvironmental potential of the buried deposits.

As well as the potential negative implications of development there are also opportunities for enhancement and increased understanding of the history of this particular landscape.

The historic landscape

The irregular pattern of fields, defined by the watercourses and drains, is characteristic of a reclaimed coastal wetland and it should, if possible, be maintained. If built development is to take place it is desirable that it is confined to within the existing fields so that each field is retained as a separate and discrete block of land. This will retain the historic layout of the landscape and provide a more interesting environment.

Standing remains

The standing remains are in fairly discrete areas of the site and could be avoided by intrusive processes that would directly affect them. Flood defence bank PRN 31652 still protects part of the site from flooding so presumably could be left intact and not replaced with a modern bank.

Both flood defence banks (PRNs 31652 and 31658) and the tramway (PRN 31637) could be cleared of some of their vegetation to make them more visible and to reintegrate them into the present landscape. A programme of archaeological monitoring and recording might be required for those features that were cleared.

The remains of Carnarfon Colliery would be more difficult to reintegrate because of the significant engineering and health and safety implications of clearing and consolidating standing buildings. A programme of archaeological recording might also be required if the colliery site was cleared to record the surviving buildings, including the chimney, and any other features, such as spoil tips or shafts that may survive below the vegetation cover. This would also allow for on-site interpretation of the history and development of the area, possibly through the installation of information panels.

The other option for the colliery site is the 'do nothing option', although this excludes the, not inconsiderable, costs of clearance, recording and consolidation, it inevitably means that the surviving structures will continue to deteriorate and ultimately collapse. As well as the deterioration of the remains, this option carries a higher risk of personal injury to anyone that gains access to the colliery site.

Buried remains and the palaeoenvironmental potential

A sampling programme could be established to investigate and assess the nature of the underlying deposits and their potential to contain palaeoenvironmental material. The programme could, in the first instance, consist of monitoring any geotechnical works that may be undertaken, with targeted hand-augering, based on the geotechnical results, to test the nature of the deposits with some rapid assessment of the pollen and other environmental indicators they contain. The results of the rapid assessment could be used to determine whether further, more comprehensive sampling is required.

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