

PROPOSED FOREST HOLIDAYS DEVELOPMENT AT PEMBREY FOREST, CARMARTHENSHIRE: HISTORIC ENVIRONMENT APPRAISAL



Prepared by
DAT Archaeological Services
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**PROPOSED FOREST HOLIDAYS DEVELOPMENT AT PEMBREY FOREST,
CARMARTHENSHIRE:
HISTORIC ENVIRONMENT APPRAISAL**

SUMMARY

A Historic Environment Appraisal of land at Pembrey Forest, Pembrey, Carmarthenshire (roughly centred on SN 4060 0206) was undertaken by DAT Archaeological Services on behalf of Asbri Planning / Forest Holidays, ahead of a planning application for the development of forestry lodges on the land.

This document contains a summary of the archaeological resource and an appraisal of the potential impacts upon the resource by the proposed development. This document will be used by the planning authority to make an informed decision on the development proposals at Pembrey Forest with regards to archaeology and the historic environment.

The development proposals are for a holiday park on a plot of land roughly 57ha in size. It is currently proposed that approximately seventy holiday cabins be built, along with car parks, roads, footpaths, cycle paths, a retreat room, staff accommodation and a maintenance room. The site is currently conifer forest managed by Natural Resources Wales and has many paths running through it that are open to the public for walking, cycling and riding.

There are three known heritage assets within the site area. The development proposals would potentially impact upon on buried archaeology at these sites and also on any associated hitherto unknown archaeology. The first known archaeological site is Towyn Canol, a Post-Medieval ruined farm (PRN 31410; located at SN 4044 0213); the second is the site of Pwlly, a Post-Medieval demolished farm (no PRN; located at SN 40635 01845), known from historic mapping; and the third known site is that of a deconstructed railway track (PRN 31362; now a cycle track) that seems to have been part of the World War I munitions factory to the south. This former railway track runs through the potential holiday development area from SN 40323 01811 in the south to SN 39396 02404 at the northwest corner.

The proposed development will make no significant change to the current setting of any designated or undesignated heritage asset in the vicinity, save for the upstanding remains within the site boundary described above (Towyn Canol and the railway). There is high potential for Post-Medieval or modern buried archaeology at all three of these known sites. There is a moderate potential for buried remains relating to late Post-Medieval and modern military activity throughout the remainder of the proposed development site.

To the south of the proposed development site there were munitions factories dating from the later 19th century onwards, to the north the airfield and military training is known to have taken place in Pembrey Burrows. Directly south of the development site are the remains of the cordite production works of HMF Pembrey dating to the period of the First World War. A series of gun cotton drying ovens were present here as well as associated earthworks which still survive. The area has been considered to be of national significance in previous studies of the area and has been recommended for scheduling, although it is uncertain as to whether Cadw have taken this suggestion forward.

The land within the proposed site boundary is likely to be contaminated with potentially dangerous chemicals that may have leaked or been dumped there after use or production in any of the munitions factories. Other potential site contaminants are building materials and unexploded ordnance (Pembrey was bombed during World War II and the potential for allied ordnance cannot be discounted).

The potential for features and finds originating from any time period before the Post-Medieval cannot be discounted although the potential is low. Farming took place nearby during the medieval period and sea defences were formed. Any earlier land surfaces or evidence for human activity will be buried below the significant depth of sand dune build up.

It is possible that deposits suitable for palaeo-environmental analysis could be present within the proposed development area due to the fact that the below-ground deposits are known from borehole logs to be deep and varied, and are likely saturated at times by water. Further study of geotechnical information from the site area would be needed to confirm this.

The development proposals will cause minimal large scale disturbance to the existing ground surface, other than through the construction of access roads, tracks and services. The proposed holiday lodges themselves will cause minimal impacts to the ground surface within their footprints due to the use of mini-piled foundations and the buildings erected on top of these piles above ground level. It should be noted that although they are of narrow diameter, many piles are used in the footprint of each building possibly of around 4m depth: this could cause significant distortion and damage to underlying buried archaeological remains, although within this part of Pembrey this is considered unlikely to be an issue.

It is possible that further archaeological works will be required within the proposed forestry lodge area before development to record the known upstanding remains (Towyn Canol Post-Medieval ruined farm (PRN31410) and a section of World War II railway (PRN 31362)). Recording would take the form of a photographic survey as a minimum. It is likely that other, as yet unknown, upstanding remains will be found in the dense undergrowth throughout the site. Any new sites identified may also need recording.

Because of the potential for buried remains, further archaeological mitigation may be required before or during any largescale groundworks (as would be associated with the construction of roadways and car parking areas) to assess the survival of any below ground archaeology within the proposed development area. It is thought that a watching brief during groundworks may be required as a minimum due to the potential for late Post-medieval and modern remains relating to settlement (at Ty Canol and Pwllty only) and military activity (throughout the site), which would be of local and possibly regional significance.

The exact nature of any archaeological mitigation will need to be discussed with the archaeological advisors to the planning authority, Development Management - Dyfed Archaeological Trust.

1 INTRODUCTION

1.1 Project Proposals and Commission

- 1.1.1 DAT Archaeological Services were commissioned by Asbri Planning to prepare a Historic Environment Appraisal for a proposed Forest Holidays Development at Pembrey Forest, Carmarthenshire (roughly centred on SN 4060 0206; Figures 1 and 2). The appraisal was requested to support a forthcoming planning application for the development.
- 1.1.2 This Historic Environment Appraisal will determine the known and potential archaeology of the site area, and also the potential effects of the development proposals on the historic environment.
- 1.1.3 An outline of the current development proposals are shown in Figure 3. It is proposed to build a holiday park comprising approximately seventy holiday cabins, and associated infrastructure e.g. car parks, roads, footpaths, cycle paths, a retreat room, staff accommodation, and a maintenance room.
- 1.1.4 No previous archaeological work is known to have taken place at the site itself but several studies and investigations have been previously carried out in and around Pembrey Forest, mostly focussing on the former munitions factory to the southeast and the airfield and training ground to the north.

1.2 Scope of the Project

- 1.2.1 The appraisal is presented as a fulfilment of a Specification of Archaeological Works (Appendix I) working to a generic brief provided by the archaeological advisors to the planning authority (Development Management - Dyfed Archaeological Trust). This appraisal is not a full desk-based assessment of the potential historic environment resource but rather it is a more rapid piece of work involving the use of readily available information to assess the historic environment potential.
- 1.2.2 The results are intended to identify the extent and character of the known and potential archaeological resource, to assess the likely and potential impacts of the scheme on that resource and to outline a possible programme of further works to mitigate those impacts. The appraisal should be seen only as the first stage of the archaeological process and does not preclude the possibility that further archaeological input may be required prior to, or during, the proposed development.
- 1.2.3 The proposed development lies within the planning jurisdiction of Carmarthenshire County Council.
- 1.2.4 The archaeological appraisal was limited to the resources held in the regional HER, a site visit and on-line resources.
- 1.2.5 This report complies with the relevant parts of the Chartered Institute for Archaeologists (CIfA) Standard and Guidance for Historic Environment Desk-Based Assessment (2014). Dyfed Archaeological Trust is a CIfA Registered Organisation and this investigation has been carried out in accordance with the CIfA Code of Conduct (2014).

1.3 Abbreviations

- 1.3.1 All sites recorded on the regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Sites recorded on the National Monument Record (NMR) held by the Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) are identified by their National Primary Record Number (NPRN). Scheduled Monument (SM). Altitude is expressed to Ordnance Datum (OD). References to cartographic and documentary evidence and published sources will be given in brackets throughout the text, with full details listed in the sources section at the rear of the report.

1.4 Illustrations

- 1.4.1 Printed map extracts are not necessarily reproduced to their original scale. North is always towards the top of the page unless otherwise indicated.

1.5 Timeline

- 1.5.1 The following timeline (Table 1) is used within this report to give date ranges for the various archaeological periods that may be mentioned within the text.

Period	Approximate date	
Palaeolithic –	c.450,000 – 10,000 BC	Prehistoric
Mesolithic –	c. 10,000 – 4400 BC	
Neolithic –	c.4400 – 2300 BC	
Bronze Age –	c.2300 – 700 BC	
Iron Age –	c.700 BC – AD 43	
Roman (Romano-British) Period –	AD 43 – c. AD 410	Historic
Post-Roman / Early Medieval Period –	c. AD 410 – AD 1086	
Medieval Period –	1086 – 1536	
Post-Medieval Period ¹ –	1536 – 1750	
Industrial Period –	1750 – 1899	
Modern –	20th century onwards	

Table 1: Archaeological and Historical Timeline for Wales

¹ The post-medieval and Industrial periods are combined as the post-medieval period on the Regional Historic Environment Record as held by Dyfed Archaeological Trust



Figure 1: Map showing the location of the proposed Forest Holidays development at Pembrey Forest, Carmarthenshire (outlined in blue at bottom left)

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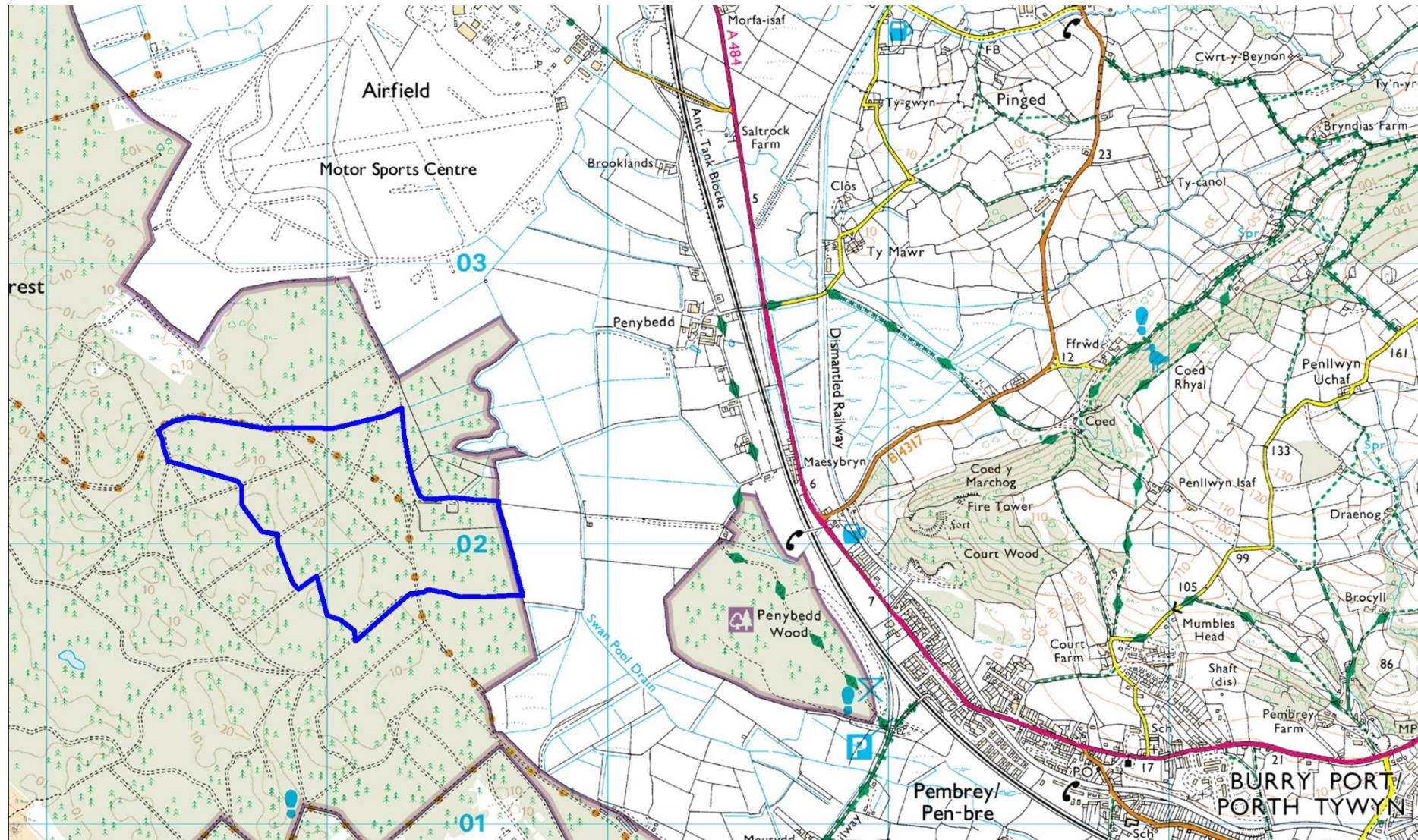


Figure 2: Location of the proposed Forest Holidays development at Pembrey Forest, Carmarthenshire (outlined in blue)

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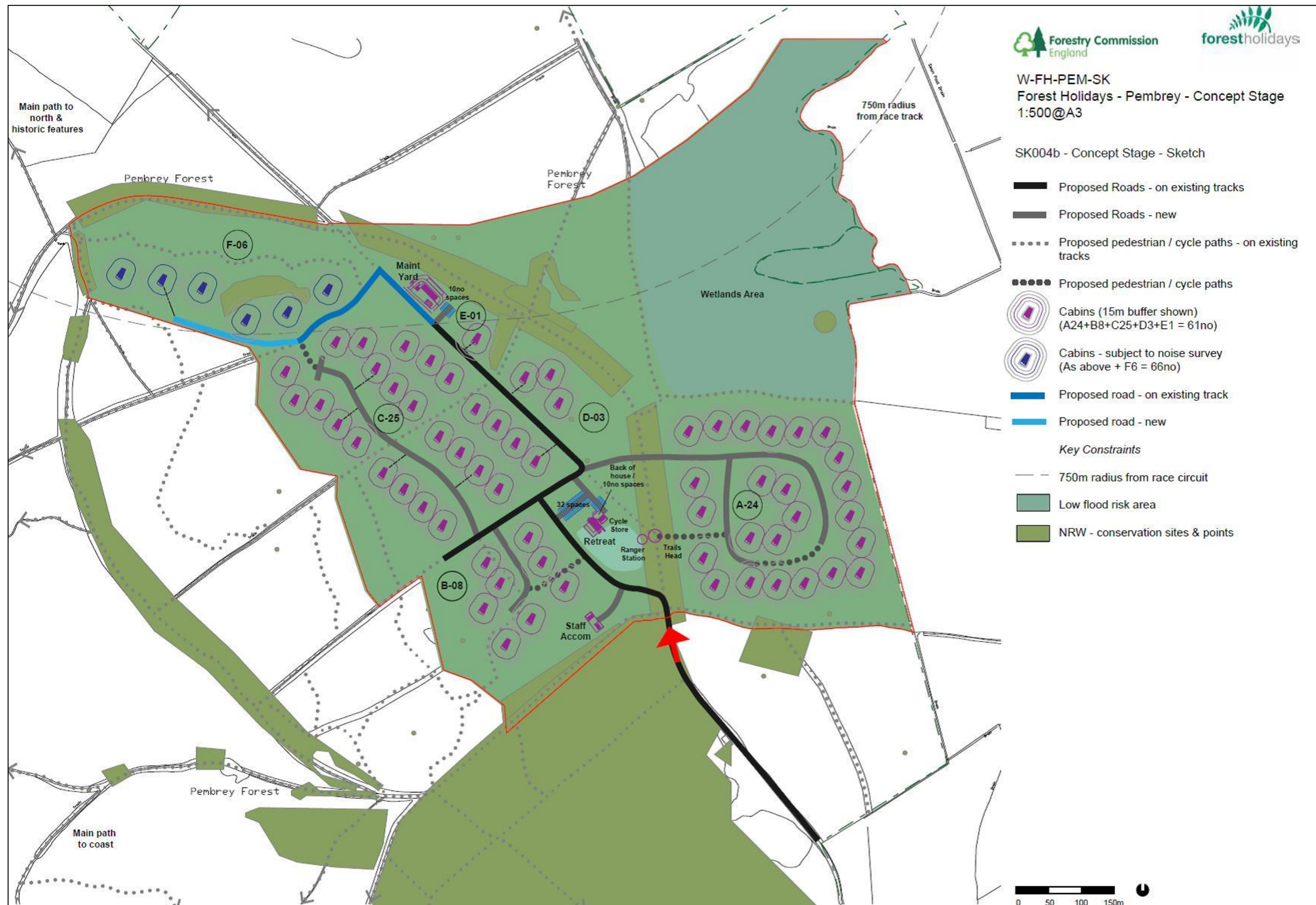


Figure 3: Plan of the current proposals for a Forest Holidays development at Pembrey Forest, Carmarthenshire (supplied by the client, Asbri Planning)

2 LOCATION, TOPOGRAPHY AND GEOLOGY

- 2.1 The proposed development site is situated within Pembrey Forest, near to its southeast end, south of Pembrey Airfield by some 200m, and 500m north of Pembrey Country Park. The site is roughly centred on SN 4060 0206 (Figures 1 and 2) and lies 2km west-northwest of the centre of Pembrey village, and 3km west-northwest of the town of Burry Port in Carmarthenshire.
- 2.2 Pembrey Forest is owned and Managed by Natural Resources Wales (NRW). The proposed Forest Holidays area lies within a coniferous plantation and is surrounded to the north, west and east by the same; beyond its eastern boundary lies open farmland. There are various trackways running through the area, with open access to the public for walking and horse riding. The Wales Coast Path, which is also a traffic-free cycle route at this point, runs roughly southeast to northwest through the site. A ruined farmstead, Towyn Canol, is situated near the eastern boundary of the site.
- 2.3 The site and its environs occupy gently sloping hills with high points of c. 20m above OD and troughs of between 5 and 10m above OD. Within the site itself, there is a high point near to the west side and the general trend is that the land falls gradually away eastwards toward the flat farmland at about 5m above OD beyond the forest edge.
- 2.4 The underlying solid geology of the majority of the site consists of mudstone, siltstone, sandstone, coal, ironstone and ferricrete belonging to the South Wales Upper Coal Measures Formation. In roughly the northern third of the area the bedrock is instead the Llynfi Member - mudstone, siltstone and sandstone.
- 2.5 Overlying the bedrock across the whole proposed site is a superficial deposit of sand, blown inshore from the adjacent beach. Borehole data has revealed that the sand is up to 30m deep in some places in the Towyn and Pembrey burrows (James 1991).

3 METHODOLOGY

- 3.1 This Historic Environment Appraisal is written to the requirements of a generic brief provided by the archaeological advisors to the planning authority (the Development Management - Dyfed Archaeological Trust) as a fulfilment of a Specification of Archaeological Works (Appendix I).

Desk Top Study

- 3.2 Computer-based and other resources within the Regional Historic Environment Record (HER) were consulted in the preparation of this document. Sufficient information was consulted to inform comment on the goals of the appraisal. GIS layers were used to assess and illustrate what the likely effects of the proposals upon the historic environment might be. Relevant information was obtained from a number of sources, and comprised a number of elements, including:
- Dyfed Archaeological Trust HER data and other relevant information (including a review of online information held on the RCAHMW Coflein website);
 - Identification of any Scheduled Monuments, Listed Buildings, Conservation Areas or Historic Landscape Areas within or in the vicinity of the site area from information held by Dyfed Archaeological Trust, Cadw and NRW;
 - Readily available bibliographic, cartographic and photographic information held at the Trust;
 - Map regression exercise;
 - Site visit and walkover survey;
 - Assessment of the archaeological potential of the area and estimation of depths and significance of the archaeological remains (where possible); and
 - Assessment of likely impacts on any identified remains (or potential remains) or setting issues and likely requirements, if any, for further stages of archaeological work.
- 3.3 Designated historic environment assets (Scheduled Monuments, Listed Buildings, Historic Landscape Characterisation Areas, Historic Parks and Gardens) were identified within 2km of the boundary of the proposed development site. The potential visual effect of the proposed development on the settings of the designated sites within this area was then evaluated.
- 3.4 Non-designated archaeological and historic sites were identified within a 1km radius centred on the proposed development site. This area was considered sufficient to enable an assessment of the archaeological potential of the site area to be made.

Site Walkover Survey

- 3.5 Site visits were undertaken on the 22nd and 27th of March 2018. The visits comprised a walkover of the proposed development site and the surrounding area and also incorporated looking at the wider area for views looking back to the proposed development location from designated and other sites. Photographs were taken, field observations were recorded in note form, and drawings were made of a previously unknown archaeological site.

4 HISTORICAL, LANDSCAPE AND ARCHAEOLOGICAL BACKGROUND

4.1 Archaeological and Historic Background

- 4.1.1 Palaeolithic archaeology is not found in situ in this part of Carmarthenshire because the last ice-sheets eroded away all man-made remains in their path. During the Mesolithic period sea levels were lower than thereafter and it is very likely that the Pembrey area was used by man due to its proximity to the sea although there is as yet no archaeological evidence for this. Coastal erosion may have destroyed some evidence for this and sand deposition may have deeply buried any such remains.

- 4.1.2 The historic background of Pembrey Forest was described by Dyfed Archaeological Trust within the Historic Landscape Characterisation of the area (Ref: 162). The following is an extract of the full text (Appendix II).

Pembrey Forest occupies the greater part of Pembrey (or 'Towyn') Burrows, an area of sand hills of comparatively recent origin. The Burrows developed at the mouth of the River Gwendraeth Fawr over a long period. Alongside this a series of reclamations occurred around an initial nucleus formed by a tongue of dry land at the foot of Mynydd Penbre, partly represented by the Medieval Manor of Caldicot. The Burrows themselves have developed since the 17th century at least but, according to James (1991), are no earlier than the medieval period – the earliest date to which shell-midden sites observed within the area can be attributed.

Sea-walls constructed during the 18th- and early 19th-century extended dry land further north and west of the airfield area, into the area of the Burrows, and dune slacks appear to have developed to the southeast of an original tongue of dry land. The Manor of Caldicot had been merged with the Manor of Pembrey (under the Ashburnhams) by the early 19th-century, when the coastline had extended almost to its present line and most of this area appears already to have been occupied by sand hills, called 'Great Outlet.'

- 4.1.3 A more detailed description of the wider historic landscape as a consequence of natural and human actions has been given by Page and Murphy (2001). They wrote that:

Human intervention stopped the cycle and allowed permanent use and settlement of the former marshes. Early intervention was probably confined to the south and west sides of the study area [Pembrey Airfield] where late medieval embankment enclosed the marshland close to the rear edge (west side) of the Pembrey and Towyn dune systems.....

Successful land reclamation relied not only on the construction of the sea banks, but also on a sophisticated drainage system to control the water levels across the newly reclaimed land. The present drainage system is an amalgam of drains, some of which date from the later medieval and early Post-Medieval periods, while others are associated with the 18th century embankment and industry, and yet others were part of the construction of the airfield in the 1940s. The principal drain is Swan Pool Drain, which is classified as a major river, which during the later medieval and Post-Medieval periods drained from two ponds.

- 4.1.4 Another example of human intervention to stop the natural cycle of erosion and deposition was given by Page (1996) is a detailed assessment of the archaeology of the Pembrey wetland landscape. This extract describes the stabilisation of the Towyn Burrows and Pembrey Burrows sand dune systems:

The Burrows are today covered, and rendered stable, by the vast plantation of Pembrey Forest and Pen-y-Bedd Woods, and total of c.950ha..... Prior to forestry planting, which occurred between 1929 and 1954, the dunes were sparsely covered with marram grass and scrub and were vulnerable to erosion by strong winds.

4.1.5 The medieval history of the area was described by Page (1996):

Archaeological evidence recovered from shell middens [rubbish heaps] (PRN 2131) amongst the dunes (now in Pembrey Forest) and from St. Ishmael DMV [deserted medieval village on the northern side of the Gwendraeth estuary] (PRN 2113) indicates settlement and activity from the 13th century. There is no archaeological evidence of settlement on the southern side of the Gwendraeth channel at present. However, a settlement at Pinged is known to have existed during the medieval period and there is a documentary reference to Caldicote dating back to the 13th century. Investigation of the shell middens on Towyn Burrows, now within Pembrey Forest, revealed layers of shells separated by layers of sand indicating periodic, probably seasonal use. The pottery recovered from the middens was of late 13th century to early 14th century date (James 1991).....

John Leland in his Itinerary (c.1535-45) places [Caldicot] on the spit of land between the Gwendraeth Fawr and the Gwendraeth Fach. However the first cartographic evidence does not agree with Leland on the location of Caldicot, and clearly shows it to have been on the site now occupied by Pembrey Airfield. In 1443-4 the farm was held by a John Butler. Who was granted the rights of wreck found on the shore (James 1991).

4.1.6 The following extract from Page and Murphy (2001) describes the development of the area during the industrial period.

The Kidwelly-Pembrey-Llanelli area was, from the early Post-Medieval period, increasingly influenced by the coal industry and the metal processing industries it spawned. Prior to this the woollen industry was possibly the chief industry in the area with the extensive marshes used for sheep grazing. In the 14th century one John ap Owen was grazing his flocks on the Kidwelly Marsh and was shipping 50 sacks of wool annually (Morris 1990; Page 1996). During the early 16th century Leland observed that the land at Caldicot was producing the 'best wool in hye Wallys.' However, by the end of the century mineral extraction appears to have replaced the wool industry as the largest industry of the region, and by 1585 Pembrey was the chief Carmarthenshire port for the export of coal (Sambrook and James 1995).

By the 18th century the region was well on the way to establishing itself as one of the most important coal and metal producing centres in Wales with a rapid increase in the number of sites associated with these industries. A sophisticated infrastructure was required to maintain and service this industrial expansion, which included tramroads, railways and canals.

4.1.7 The area has since undergone two further land-use transformations, to a military centre from the late 19th century and especially during World War II, and most recently to a hub of tourism. A final extract from Page and Murphy (2001) gives an overview of the military history:

Military activity, or the associated munitions industry, has been the dominant factor in the region from the 19th century when the Nobel Company began to manufacture explosives in a factory located in the sand dunes at Pembrey (Page 1996). The Nobel works were taken over by the Royal Ordnance Factory which operated on the site until the 1960s. It is

now the site of Pembrey Country Park; there are many surviving structures from the factory in the sand dunes and Pembrey Forest.

Pembrey Airfield (PRN 31405) became operational in 1940 as a fighter station, but by June of the following year it had become home to 1 Air Gunnery School (Smith 1990). The airfield was typical of the early war years, consisting of grass runways, which were replaced during 1941 with three hard runways..... Most of the airfield buildings have been demolished..... However, some of the dispersal sites for the aircraft survive as concrete bases and run-offs on the southwestern side and northern side of the airfield..... Military activity continues to this day with the live air weapons range, RAF Pembrey Sands, north of the airfield [now privately owned].

- 4.1.8 Little is known of military training at Pembrey before the First World War. A set of photographs kept in Llanelli Library show 'Camp Life, Pembrey Burrows, August 1913.' These photos show many men training on and off horseback, moving and firing heavy artillery guns, and carrying out domestic duties in camp. No particular locations are noted or can be inferred from the photos.
- 4.1.9 The history of the Pembrey munitions factories has been recently summarised by Pyper and Shiner (2016) during their assessment of twentieth century military sites in the region. Their report documents that a dynamite factory was built in 1881 but closed less than a year later after an explosion killed seven people. Newspapers at that time reported that the factory consisted of eighty small sheds, scattered over a large area with a small locomotive used to reach the manufacturing areas. The sheds were positioned seventy yards apart with high mounds of sand in between. Dynamite was store in twelve magazines far removed from each other and almost buried underground. After the factory ceased production it appears that it was used for storage and distribution. No known contemporary plans give the actual location, layout or extent of the factory but the 2nd edition Ordnance Survey map of 1908 shows 'Old Dynamite Works' and its position is shown in Figure 4.
- 4.1.10 During World War I, in 1915 there was a 'shell crisis' as a shortage of explosive shells was perceived to be a pivotal hindrance to Britain's success (Pyper and Shiner 2016). National factories were opened, which included two at Pembrey – Her Majesty's Factory (HMF) Pembrey, and the National Filling Factory, the locations of which are shown in Figure 4. HMF Pembrey made high explosives and propellants (including TNT tetryl, cordite and ballistite), and the Filling factory filled shells with explosive material. Plans of HMF Pembrey (e.g. Figure 5) show guncotton drying-stoves for cordite production in the area just south of the proposed forest holiday development boundary (now surviving as a series of earthwork banks). The plans do not extend any further northwest, into the proposed development area, but a railway line seems to head that way.
- 4.1.11 Little is known of the period between World Wars I and II at Pembrey. From 1935 the site became one of a chain of school camps for the children of South Wales distressed areas (Pyper and Shiner 2016).
- 4.1.12 During World War II Royal Ordnance Factory (ROF) Pembrey operated for the purpose of manufacturing explosive materials including TNT, tetryl and ammonium nitrate (Pyper and Shiner 2016). Plans show ROF Pembrey to be located in roughly the same place as HMF Pembrey had but not extending as far northwest and therefore not abutting the proposed development area (Figure 4). After the war, ammonium nitrate production continued for inclusion in agricultural fertiliser.

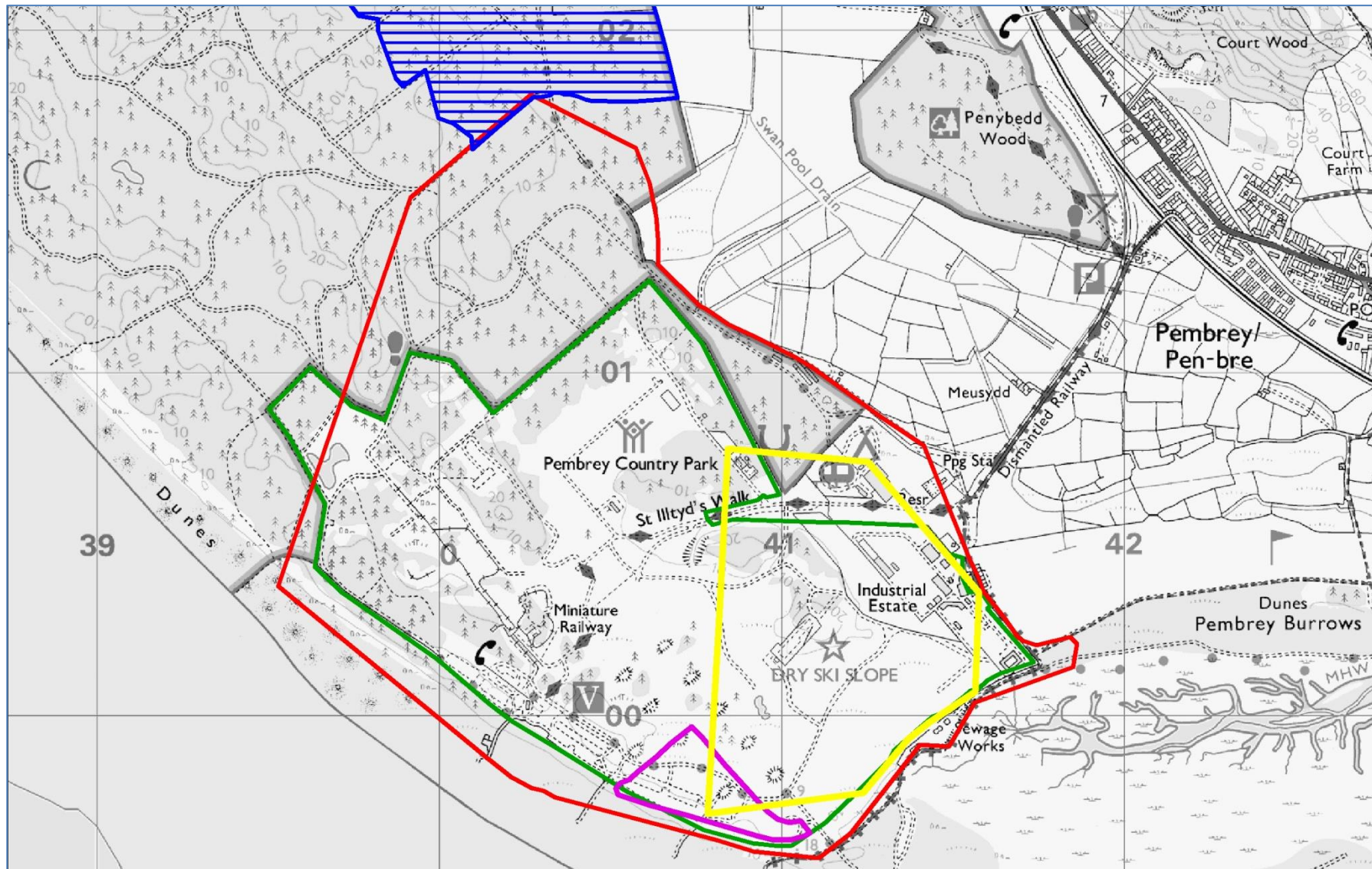


Figure 4: The outlines of munitions factories at Pembrey, south of the proposed development site (shown in blue): Late 19th century dynamite factory (yellow), WW1 HMF Pembrey (red), WW1 Filling Factory (purple) and WW2 ROF Pembrey (green)

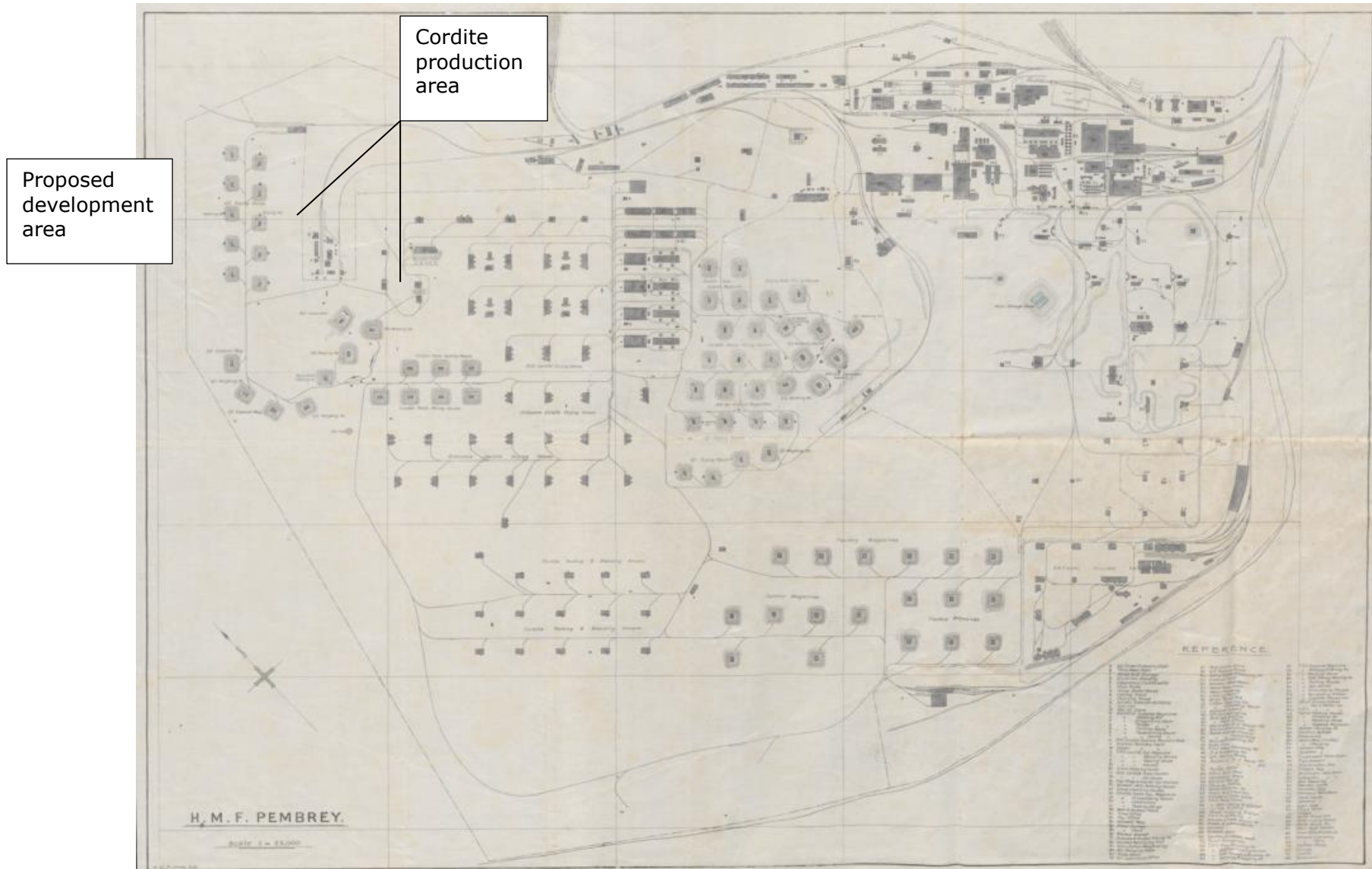


Figure 5: Plan of HMF Pembrey (National Archives Ref. SUPP10_72).
The proposed development lies just off the plan at the top left (northwest corner) of the image.

- 4.1.13 In 1963 ROF Pembrey was no longer needed and closed down. It was subsequently stripped of most of its structural components and remaining buildings were used for a time as an industrial estate. This was cleared too by 1981 when the country park opened. The site had also been decontaminated by this time.
- 4.1.14 It is not known to what extent, if any, the clean-up operation continued into Pembrey Forest north of Pembrey Country Park. It is obviously safest to assume not at all. Hence the land within the proposed site boundary is likely to be contaminated with potentially dangerous chemicals that may have leaked or been dumped there after use or production in any of the munitions factories. Another potential site contaminant would be from asbestos used in building materials, then dumped or left behind at the site. Furthermore, unexploded ordnance has been found in various parts of the forest, airfield and Country Park, mostly due to bombing of the area during World War II. It is likely that live and spent ammunition used during training is also still to be found scattered throughout the area. It is known that there was a particular concentration of training in the area north of the proposed development site, and possibly in the northern part of the site area itself (A. Pyper, pers. comms.).

4.2 The Historic Landscape

- 4.2.1 The proposed Forest Holidays site lies within the 'Taf and Tywi Estuary' historic landscape area, recorded in the Register of Landscapes of Outstanding Historic Interest in Wales (Cadw 1998). Within this historic landscape individual Historic Landscape Character Areas (HLCAs) have been identified and described. The proposed development site is located wholly within HLCA (Pembrey Forest; Ref. 162) and is immediately adjacent to another (Brooklands; Ref. 160).
- 4.2.2 The following is a summary of the essential historic landscape components of Pembrey Forest HLCA (the full description of is given in Appendix II – although it should be noted that these Historic Landscape Character area descriptions pre-date the recent research undertaken by Alice Pyper on the Pembrey munitions factories).

There are few historic landscape components in what is in essence a band of sand dunes some 5 km wide and 2 km long over which a conifer plantation has been established. The dunes are substantial, and achieve heights of over 20m. Only a very small portion of land now under forestry was enclosed farm land, not sand dune; this has not been examined to see if former field boundaries and structures survive, but the outlines of yards, buildings etc. associated with Towyn Canol are shown on the modern Ordnance Survey 1:2500. Prior to the conifer planting, a munitions factory was established at the southern end of this area. The storage bunkers and infrastructure of this factory constitute some of the most important components in the historic landscape, as do the scattered Second World War defensive structures within the forest.

Recorded archaeology is limited to the shell midden, drainage features, and the site of Towyn Canol Farm.

Distinctive buildings are limited to two Second World War gun emplacements and a bunker.

- 4.2.3 The essential historic landscape components of Brooklands HCLA (full description available in Appendix III):

This area consists of flat, reclaimed marsh at, or close to sea level. It is now mostly improved pasture which has been divided into medium-sized irregular enclosures by ditches, dating to the 17th century. In some instances scrubby hedges line the ditches; these are supplemented by wire fences. Alongside tracks hedges are in better condition and are mostly stock-proof. There is no woodland.

Recorded archaeology is limited to drainage features. There are no distinctive buildings. The later 19th century Brooklands Farm has recently been rebuilt in brick, has a large assemblage of modern farm buildings and is the only settlement in this area. Two Second World War pill-boxes lie within the area.

4.3 Known Archaeological Remains

Registered Parks and Gardens

- 4.3.1 No registered park or garden lies within 2km of the proposed development site.

Scheduled Monuments

- 4.3.2 There are three Scheduled Monuments within 2km of the boundary of the proposed development site (Table 2; Figure 6). Two are defended enclosure of Iron Age date (CM221 and CM222), and the other is the Dome Gunnery Trainer at Pembrey Airfield (CM248). The two defended enclosures are close to each other, between 1.3km and 1.8km east of the site, and possibly obscured from view by Penybedd Wood. Part of Pembrey Forest lies between the proposed site and the gunnery trainer, which is situated 1.3km to the north-northeast. There are no Scheduled Monuments further afield whose setting would be affected by the current plans.

Listed Buildings

- 4.3.3 Table 3 and Figure 7 show the Listed Buildings within 2km of the proposed site boundary, one of which is Grade II* and the other Grade II. The Grade II* Listed Building is the Dome Gunnery Trainer already noted (LB No. 82066). The Grade II Listed Building is a milepost on Dan Lan Road (LB No. 82069), which is 1.7m southeast of the site and would definitely not be affected by the development because Penybedd Wood and a built-up area obscure the line-of-sight.

SM No.	PRNs	Name	Summary	NGR
CM221	7648	Court Wood Enclosure 500m SSW of Pen-Llwyn-Isaf	The monument comprises the remains of an earthwork enclosure which probably dates to the Iron Age . It occupies a low knoll on a hill close to the sea with wide views to the south west (including PRN 1645). A single bank and ditch encloses the knoll (an area of 0.25ha.) with an additional length of bank and internal ditch running tangentially to the main body of the enclosure on the north-west. The site was excavated in 1977 and at least 3 phases of structure were revealed. Below the bank was a sealed layer containing occupation debris and a number of structural features. Charcoal from this deposit yielded a radiocarbon date of 335 ± 45bc. The site is associated with nearby cultivation terraces. The monument is of national importance for its potential to enhance our knowledge of later prehistoric defensive organisation and settlement.	SN42400210
CM222	1645	Garreg Lwyd Enclosure 600m SE of Crosslane Cottages	The monument comprises the remains of a defended promontory enclosure, which probably dates to the Iron Age period and which is located on a west-facing spur formed from a natural rock crag which has wide views on three sides. The enclosure is a sub-circular area of approximately 0.4ha defended to the west and north by the natural steep slopes with bare rock scarps, and to the east and south by bi-vallate ramparts. The site is well preserved and retains considerable archaeological potential.	SN42180210
CM248	61600	Dome Gunnery Trainer, Pembrey Airfield	The monument consists of the remains of a gunnery training dome (Post-Medieval period). At Pembrey the structure consists of a hemispherical concrete dome. The trainee air gunner was placed in a central swivelling seat with a camera gun and silhouettes of aircraft were back-projected on to the walls of the dome trainer. The monument is of national importance for its potential to enhance our knowledge of World War II anti-aircraft and coastal defence practices. It retains significant archaeological potential, with a strong probability of the presence of associated archaeological features and deposits. Gunnery training domes may be part of a larger cluster of anti-invasion defences and their importance can further enhanced by their group value.	SN4075703714

Table 2: Scheduled Monuments within 2km of the boundary of the proposed development site (Figure 4)

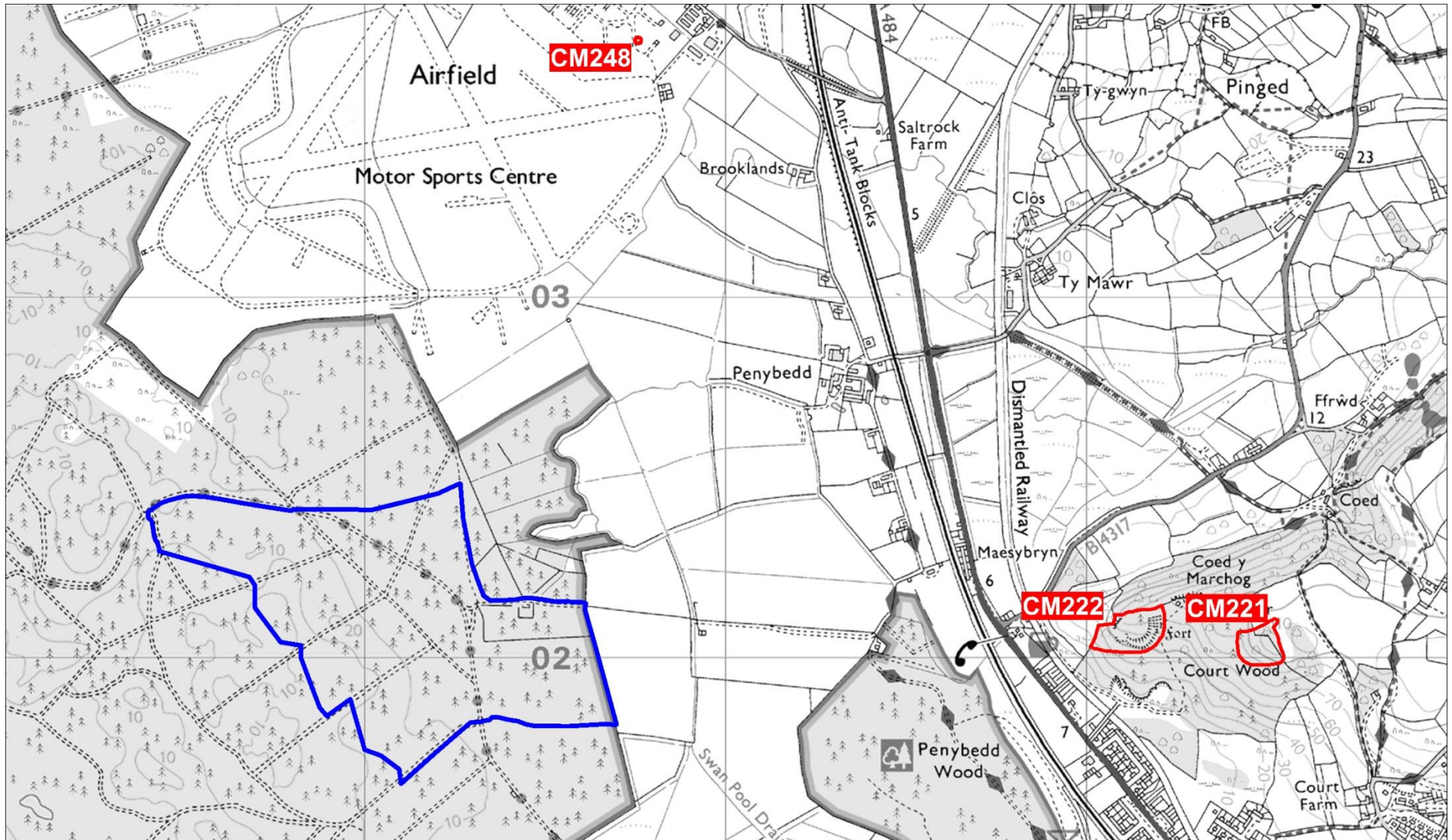


Figure 6: Scheduled Monuments (red) within 1km of the proposed development site (outlined in blue)

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LB No.	PRNs	Grade	Name	Summary	NGR
82066	61600	II*	Dome gunnery trainer at Pembrey Airfield	Erected c.1941 and used as a simulator to train air gunners in shooting down enemy fighters. The interior was originally whitewashed and lights projected on to the domed roof simulated aircraft lights, while a 'gun' was used to fire a light beam. An igloo-shaped domed structure approximately 10m high, of concrete with rendered exterior (partly fallen away to expose steel reinforcement). On the SW side is a lintel doorway. The entrance leads into a single domed chamber. The metal framework of a former screen above the doorway has survived, but the interior has been stripped of its original wall surfaces. Listed in a high grade for its exceptional historic interest as the only surviving World War II air defence simulator in Wales. Scheduled Monument CM248.	SN4075703714
82069	61603	II	Milepost on Dan Lan Road	A late 19th century milepost, one of a series on the Llanelly to Kidwelly road cast by Glanmor Foundry Company of Llanelli, and shown on the 1880 Ordnance Survey. A V-shaped cast iron milepost with ramped top, painted white, on a square plinth. It reads, in raised letters and numerals painted black, 'To Llanelly 5½ miles' on one face, and on the other 'To Kidwelly 4 miles' and 'Carmarthen 13'. Listed for its special interest as one of a series of well-preserved mileposts on the A484.	SN4235001407

Table 3: Listed Buildings within 2km of the boundary of the proposed development site (Figure 5)

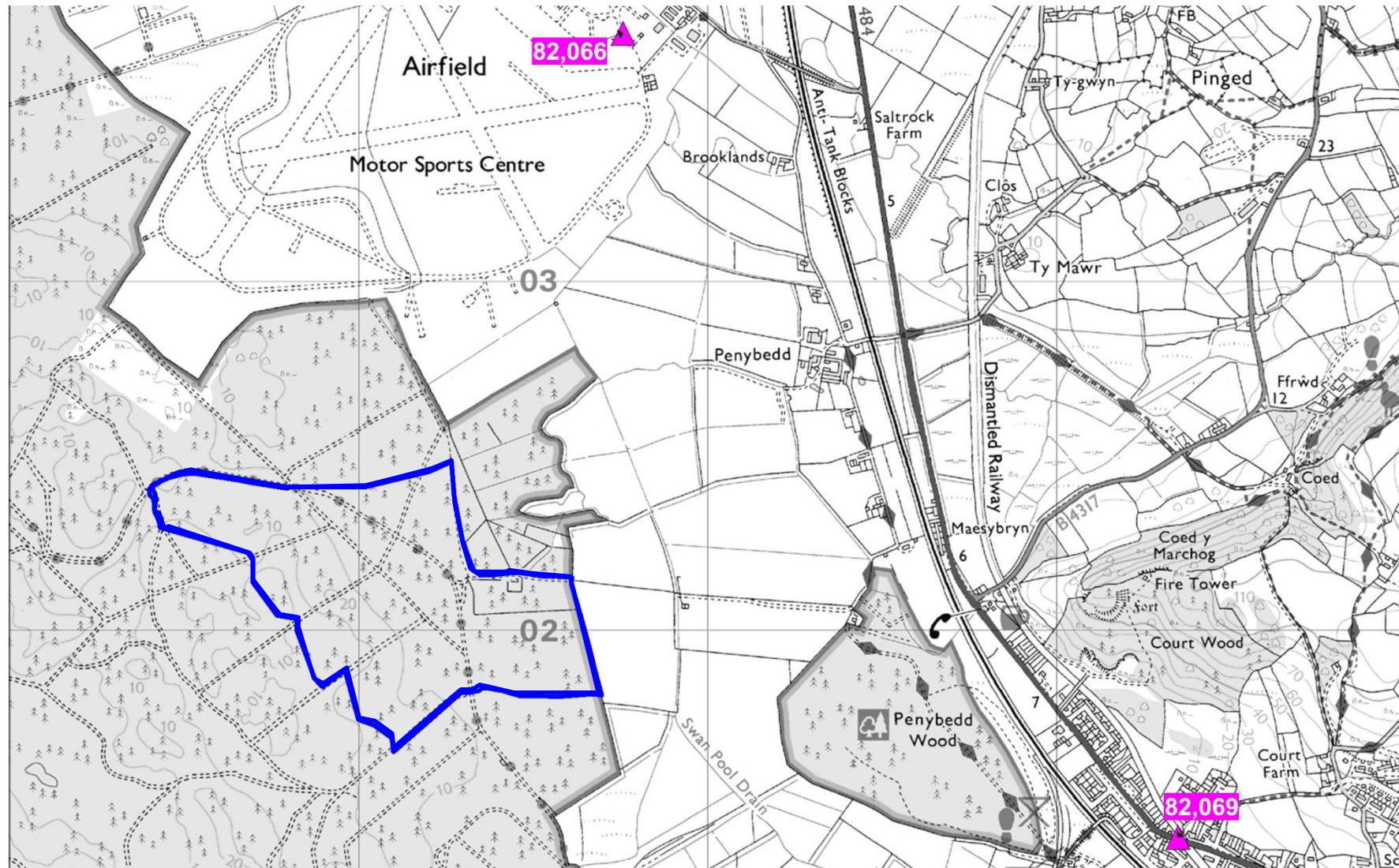


Figure 7: Listed Buildings (purple) within 2km of the proposed development site (outlined in blue)

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Non-designated sites

- 4.3.4 This section considers historic assets that are recorded in the Regional HER and the NMR within 1km of the proposed development site. The Regional HER records a total of sixty three sites of archaeological interest, three of which are also recorded in the NMR. A further ten other sites are recorded only in the NMR (Table 4; Figures 8 and 9).
- 4.3.5 Only one of these archaeological sites lies within the boundary of the proposed development, on the north edge of its eastern spur (Figure 6). That site is PRN 31410, a Post-Medieval destroyed farmstead complex that was known as 'Towyn Canol.' This name translates as 'Middle Seashore' in reference to its topographical position and also to distinguish it from, and also associate it with, a larger farm a few miles to the north known as 'Towyn Mawr.' Towyn Canol may once have been the larger of the two because Towyn Mawr (Big Seashore) was known in the early 19th century as Towyn Isaf (Lower, or Lesser, Seashore).
- 4.3.6 The earliest record (Table 5) is of Post-Medieval/medieval date: PRN 31396, a shell midden [rubbish heap]. It is possible that it is a natural mound or had some other function as it has never been excavated to find out its true nature. It has been recorded as a midden site because of its outward similarity to known middens in the wider area that date from the late 13th century to early 14th century. The site lies approximately 1km west of the proposed forest holiday area.
- 4.3.7 There are thirteen further Post-Medieval sites within 1km of the proposed development boundary comprising a cottage, brick kiln, historic home and flood defences. Two sections of railway track are of Post-Medieval/medieval date. None of these sites would be impacted upon by the proposed development.
- 4.3.8 The numerous modern sites within the study area are all the result of military activity – the creation of the munitions factories at HMF Pembrey and then ROF Pembrey to the south, RAF Pembrey Airfield to the north, and anti-invasion structures such as anti-tank trenches and pill boxes throughout the area.
- 4.3.9 Many guncotton drying stoves associated with cordite production at HMF Pembrey are shown on maps to have been situated just south of the proposed holiday park boundary (Figure 9). Earthworks associated with these works survive within this area. It is understood that this part of HMF Pembrey has been recommended for scheduling to Cadw although it is not known whether Cadw are taking this forward at this stage
- 4.3.10 Pembrey airfield was originally larger than at present, its southern boundary being only 110m north of the potential forest holidays boundary.

4.4 Other archaeological finds

- 4.4.1 No other archaeological finds are known to have been found within the proposed site. The closest findspot, recorded by the Portable Antiquities Scheme, is 2km southeast - a Roman coin (a radiate of Claudius II (268-270)). This is the only known findspot within 4km of the site.

PRN/ NPRN	Name	Summary	Period	NGR
31396	Pembrey Forest	A possible shell midden. A low mound c. 4m x 3m x 1.5m high, which has been reported to the forest warden as a shell midden. There was no visible evidence to suggest this.	Post-Medieval, Medieval	SN38700200
23601	Tai-Uchaf	Cottage shown on 1907 6" OS map. Present condition unknown. Site only known through documents. No surface evidence.	Post-Medieval	SN39800325
23713	-	Brick Kiln, known from documentary evidence	Post-Medieval	SN40500280
25630/ 17666	Penybedd	Historic home described by Francis Jones. 18th - 19th century 'improved' farm with extensive outbuildings.	Post-Medieval	SN41230270
29995	Towyn-Mawr	Flood defence and drainage system.	Post-Medieval	SN3903
31410	Towyn Canol	Recorded as a destroyed farmstead complex.	Post-Medieval	SN40440213
31362	HMF Pembrey	A raised flat-topped causeway which curves NE away from a point near to the main railway line suggesting that it may once have been a branch line or tramway associated with the railway.	Post-Medieval, Modern	SN40750120
31373	HMF Pembrey	A visible section of narrow gauge track relating to the Cordite Packing and Blending houses from the First World War factory, shown on the c1917 plan.	Post-Medieval, Modern	SN40000070
31129	Pembrey Airfield	Airfield.	Modern	SN39820283
31152	Pembrey Airfield	Test House, near destroyed.	Modern	SN405030
31225	Pembrey Airfield	Magazine, near destroyed.	Modern	SN40060289
31226	RAF Pembrey	Battle Headquarters, identified on the Air Ministry plan as type 11008/41. Consisting of a complex of 5 underground rooms entered by concrete steps at one end of the structure.	Modern	SN40120283
31229	Pembrey Forest	Near Destroyed building with staggered entrance.	Modern	SN39690110
31230	Pembrey Forest	Near Destroyed building with staggered entrance.	Modern	SN39690107
31335	Pembrey Forest	AP's Geonex 168-169. Linear bank around pond in Pembrey Forest.	Modern	SN39180308
31336	-	AP's Geonex 168-169. Small grey rectangular building. More likely a small tin farm shed or animal shelter.	Modern	SN39320298
31337	-	AP's Geonex 167-168. Long grey mound, metallic looking possibly a building associated with the airfield or a very large silage stack covered in black polythene sheeting.	Modern	SN39600280
31343	HMF Pembrey	Railway sidings which relate to the movement of materials and workers around the HM Pembrey factory during the First World War.	Modern	SN40930139
31360/ 270357	-	Pill box, type 24, 'bullet-proof' pillbox with narrow splays. Protecting Swan Pool drain.	Modern	SN41220141
31361/ 270547	-	Pill box, type 24, 'bullet-proof' pillbox with narrow splays. Protecting Swan Pool drain.	Modern	SN40950165
31377	HMF Pembrey	Identified in a previous survey, the remains of a small red brick-built structure including a concrete base and a small section of one wall survives (to a height of 0.4m) intact.	Modern	SN40460098
31378	HMF Pembrey	Identified in a previous survey, the remains of a small red brick-built structure lies within the area of the acetone recovery plant in HMF Pembrey during the First World War.	Modern	SN40540102

PRN/ NPRN	Name	Summary	Period	NGR
31397	HMF Pembrey	Complex of bunkers in Pembrey Forest. There are at least five bunkers of similar construction. Each one has a high almost circular sand bank entered from one side by a wide red brick-built tunnel with a concrete roof.	Modern	SN40160126
31400	HMF Pembrey	A long rectangular building within an earth bank identified in the previous survey is located within an area of ballistite production shown on the HMF Pembrey plan.	Modern	SN40390120
31401	HMF Pembrey	A structure identified in the previous survey is located within an area of ballistite production shown on the HMF Pembrey plan.	Modern	SN40340122
31402	HMF Pembrey	A brick built pit identified in the previous survey is located within an area of ballistite production shown on the HMF Pembrey plan.	Modern	SN40300120
31403	HMF Pembrey	Area of Ballistite production in HMF Pembrey. A brick built tunnel has been recorded in an earlier survey and is presumably part of the earth banked structures with the areas of explosive production as shown on the c1917 plan.	Modern	SN40320123
31404	Pembrey Forrest	A latrine, with staggered entrance, two cubicles.	Modern	SN40380120
102502	RAF Pembrey	A sunken, circular, concrete pillbox, flush with the ground surface. Concrete top 2m in diameter with metal hinged trap door 0.56m square with canted corners. Located within the eastern intersection of the runways.	Modern	SN4051703379
107864	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste packing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN4026801045
107865	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste packing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN4022801092
107866	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste packing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN4018701142
107867	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN4010301151
107868	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN4014401103
107869	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN4018501056
107870	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as Cordite Paste mixing house. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN4022801009

PRN/ NPRN	Name	Summary	Period	NGR
107873	HMF Pembrey	A rectangular sunken brick structure approximately 90cm deep and consisting of two parallel pits orientated NE-SW. They are on the same axis as the railway and platform (PRN 107875).	Modern	SN4028001444
107874	HMF Pembrey	A rectangular sunken brick structure approximately 152cm deep and 115x185cm. Three metal U-shaped staples provide steps into the pit. The area is currently under brash from forestry thinning so the full extent of the structures is hard to evaluate.	Modern	SN4028801452
107875	HMF Pembrey	Railway platform, capped with blue coping bricks, at least 1metre high. The full extent of the platform is hard to evaluate as there is a great deal of brush and vegetation. The 1917 plan of HM Factory Pembrey shows the railway coming to the platform	Modern	SN4029801464
107876	HMF Pembrey	Concrete railway platform 30cm high and c 5m deep survives on the side of a former railway bed, now a path. On the 1917 plan of HMF Pembrey this is shown lying between a 'Nitroglycerine Washing House' to the east and a 'Wash Water Settling House'.	Modern	SN4015401212
107877	HMF Pembrey	Section of narrow gauge railway serving the cordite production areas, shown on the 1917 plan of HMF Pembrey. Now used as a footpath with sections of rail still surviving in places.	Modern	SN4015701141
107879	ROF Pembrey	A large earthen mound roughly 50m across, which appears to be a magazine though no entrances are accessible and the mound is well grown over with trees and bushes. Shown on the ROF Pembrey plans within the Tetryl Area.	Modern	SN4060901094
107880	ROF Pembrey	A large earthen mound roughly 50m across, which appears to be a magazine though no entrances are accessible and the mound is well grown over with trees and bushes. Shown on the ROF Pembrey plans within the Tetryl Area.	Modern	SN4066801053
109248	HMF Pembrey	Earth and sand embanked enclosure with brick entrance tunnel labelled on 1917 plan as 'Gun Cotton weighing house'. This enclosure would have surrounded one of the 'danger buildings' of the First World War munitions factory at Pembrey.	Modern	SN3993501366
109249	HMF Pembrey	An earth and sand enclosure with a brick built tunnel entrance through the bank, in front of the entrance is a concrete square pit. Identified on the 1917 plan as a Gun Cotton expense magazine.	Modern	SN39960143
109255	HMF Pembrey	Identified on the HMF Pembrey plan of plant as a Wash Water Settling House, what can be seen on the ground is a brick and concrete tunnel beneath the former railway (now footpath).	Modern	SN4005801257
109256	HMF Pembrey	Earth and sand embanked enclosure with three brick entrance tunnels, one narrow - pedestrian and two wider curved tunnels. Labelled on 1917 plan as N/G Washing house.	Modern	SN4021201260
109257	HMF Pembrey	Labelled on 1917 plan as Nit. Separator (Nitrator). High up on a hill are the remains of the Nitrator Separator House.	Modern	SN40160130
109258	HMF Pembrey	Labelled on the 1917 plan of HM Pembrey as a Gun cotton weighing house. An enclosure of earth surrounds the former danger buildings within this area of cordite production.	Modern	SN39990124
109259	HMF Pembrey	Labelled on the 1917 plan as Guncotton Expense Magazine.	Modern	SN39930129
109289	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40120148
109290	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40090153

PRN/ NPRN	Name	Summary	Period	NGR
109291	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40160152
109292	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40140157
109293	HMF Pembrey	The site of a guncotton drying stove heating house.	Modern	SN40190161
109294	HMF Pembrey	The site of a guncotton drying stove heating house.	Modern	SN40210156
109295	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40250159
109296	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40230165
109297	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40300163
109298	HMF Pembrey	The site of a guncotton drying stove.	Modern	SN40280169
109299	HMF Pembrey	The one inch New Popular Ordnance Survey shows a group of buildings or structures at the end of a sinuous railtrack heading out into Pembrey Forest emerging from the Munitions Factory.	Modern	SN39180216
110408	Pembrey Farm	A report held with the Prisoner of War Information Bureau states that a camp was established with labour from 21 combatant Prisoners of War to establish a crown farm colony (PRN 110409). The PoWs were said to live in a cottage attached to the farm.	Modern	SN41370250
110409	Pembrey Farm	A farm colony was established at Pembrey to provide homes and a livelihood for wounded ex-service personnel from the First World War.	Modern	SN41370250
270548	Pillbox (Type Fw3-24), Pembrey	Type 24 'bullet-proof' pillbox with narrow splays. Located on the landward side (east) of Swan Pool Drain, which functioned as an anti-tank ditch.	Modern	SN407027
270549	Pillbox (Type Fw3-24), Pembrey	Type 24 'bullet-proof' pillbox with narrow splays. Located on the landward side (east) of Swan Pool Drain, which functioned as an anti-tank ditch.	Modern	SN40990306
270561	Anti Tank Ditch, Pembrey	Anti-tank ditch - 3 km earthwork extending from Pembrey Burrows to 200 m north of Penybedd Farm.	Modern	SN40910177
270564	Anti Tank Ditch, Pembrey	Anti-tank ditch - 3 km earthwork extending from Pembrey Burrows to 200 m north of Penybedd Farm.	Modern	SN41490127
270565	Anti Tank Ditch, Pembrey	Anti-tank ditch - 3 km earthwork extending from Pembrey Burrows to 200 m north of Penybedd Farm.	Modern	SN41240135
270566	Anti Tank Ditch, Pembrey	Anti-tank ditch - 3 km earthwork extending from Pembrey Burrows to 200 m north of Penybedd Farm.	Modern	SN40910176
270567	Anti Tank Ditch, Pembrey	Anti-tank ditch - 3 km earthwork extending from Pembrey Burrows to 200 m north of Penybedd Farm.	Modern	SN407027
270568	Anti Tank Ditch, Pembrey	Anti-tank ditch - 3 km earthwork extending from Pembrey Burrows to 200 m north of Penybedd Farm.	Modern	SN40940276
270569	Anti Tank Ditch, Pembrey	Anti-tank ditch - 3 km earthwork extending from Pembrey Burrows to 200 m north of Penybedd Farm.	Modern	SN41000304
421448	Pickett Hamilton Fort I, Pembrey Airfield	-	20 th Century	SN40510336

Table 4: Known heritage assets recorded in the HER and NMR databases within 1km of the proposed development site, in order of PRN/NPRN within order of date (Figures 6 and 7)

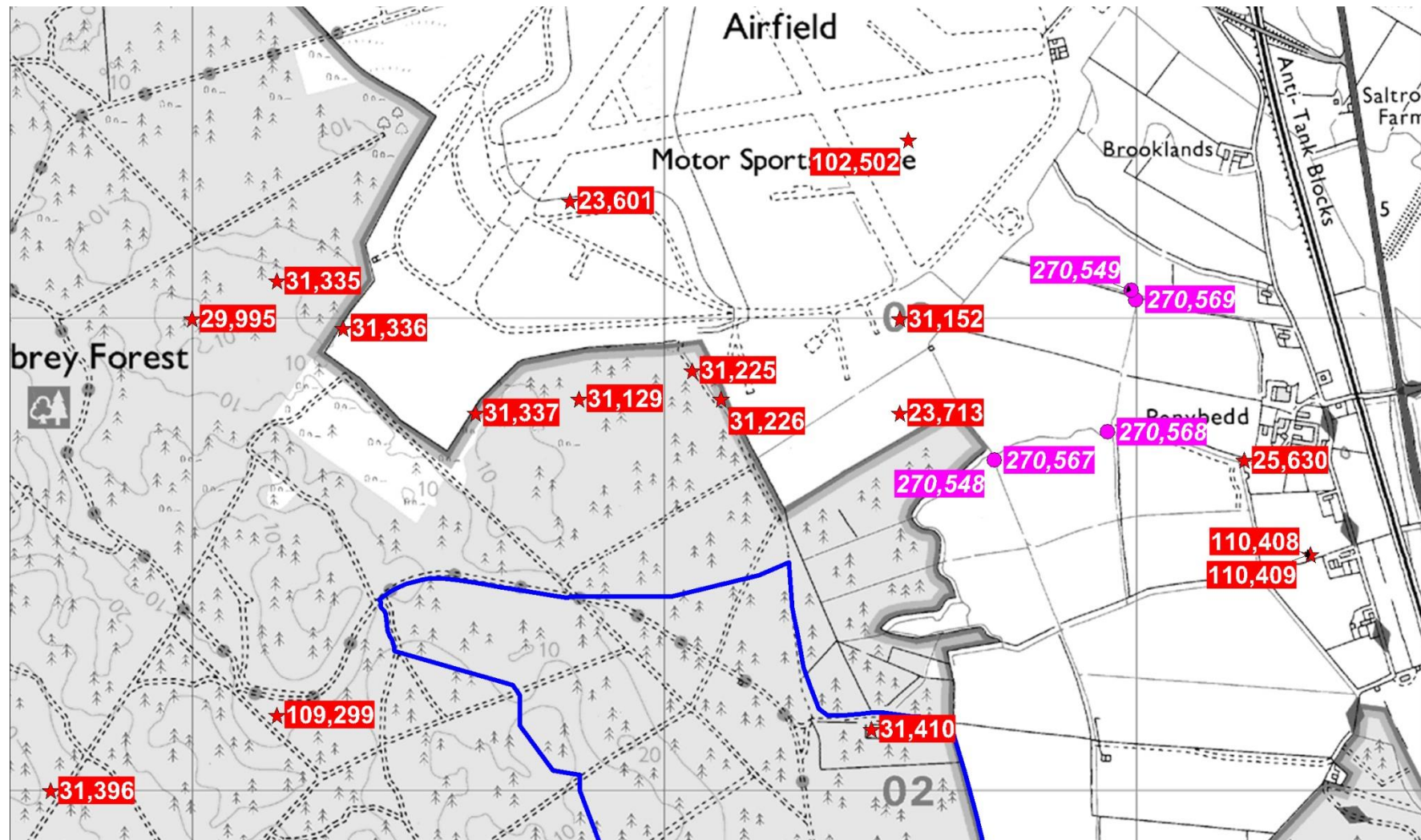


Figure 8: The heritage assets within 1km *NORTH* of the proposed development site (blue outline) as recorded in the HER (red) and NMR (purple) databases. NMR data is only displayed for those sites existing *only* in the NMR database.

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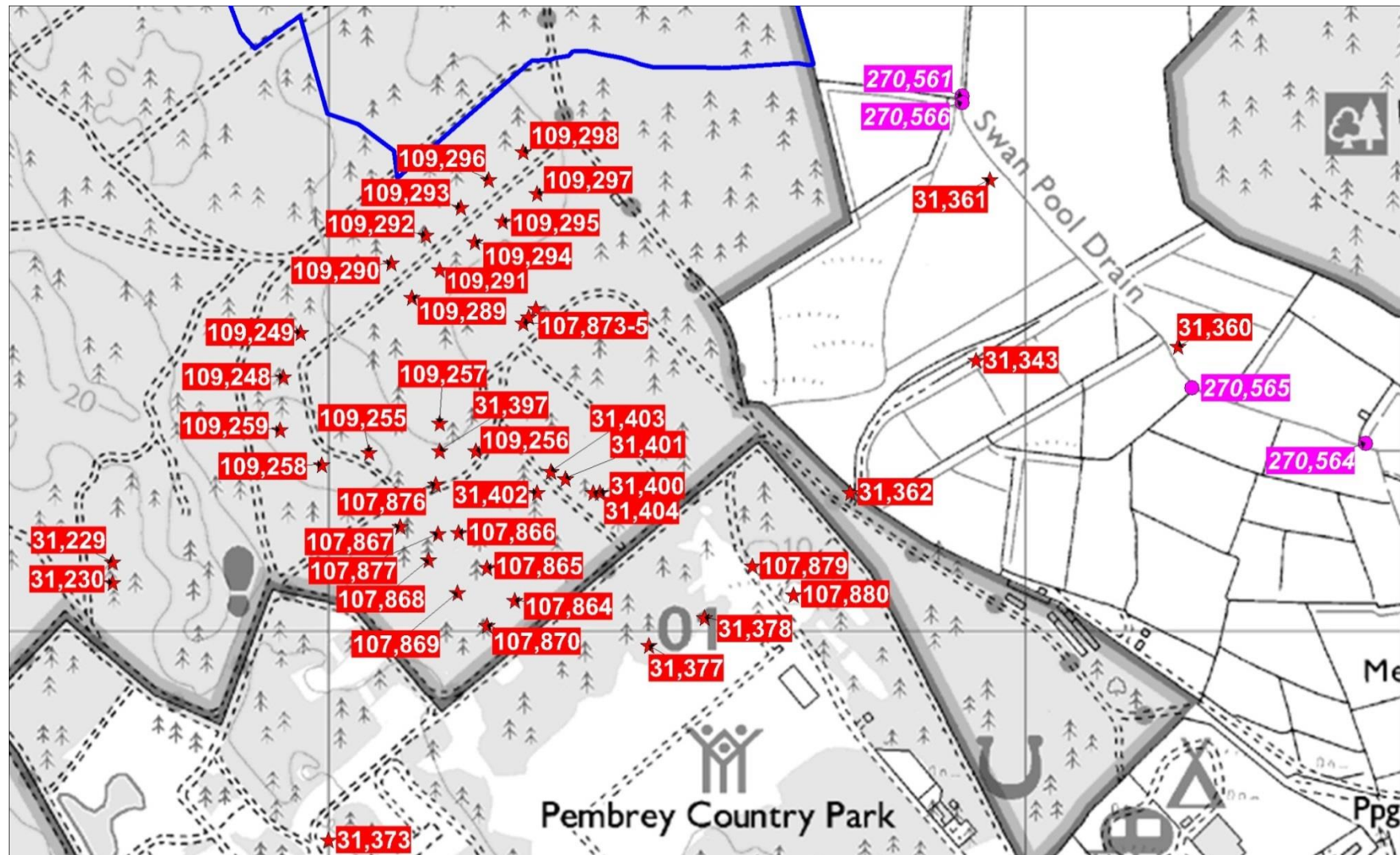


Figure 9: The heritage assets within 1km *SOUTH* of the proposed development site (blue outline) as recorded in the HER (red) and NMR (purple) databases. NMR data is only displayed for those sites existing *only* in the NMR database.

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4.5 Historic Mapping

4.5.1 The earliest known map of the area is a plan of Caldicot c.1681 (National Library of Wales – Ashburnham map drawer 2122). Figure 10 shows a modern redrawing and interpretation of this map (Page 1996, after James 1991). The map shows a sea defence bank called 'The Bulwarke,' which runs from northwest of the airfield to the southeast to a point just north of Pen-y-Bedd Farm.

4.5.2 Other features of this map, discussed by Page and Murphy (2001), are as follows:

There is a hint of a possible earlier sea bank.....a boundary on a generally north-south alignment, c.0.8km landward of The Bulwarke, between areas marked as 'Caldicot Out Ground' and 'Caldicot Inclosed Grounds.' This boundary runs along the back edge of the Towyn Burrows sand dunes and was possibly associated with the Caldicot Farm located in the 'Out Ground,' which was one of three farms with the same name in existence in the later 17th century. It is possible that the Caldicot Farm in the 'Out Ground' was that held by John Butler in 1443-4 (Page 1996). The other two Caldicot farms probably date from the 17th century, following the construction of The Bulwarke. However, it is interesting to note that the Bulwarke loops around the northernmost farm, possibly suggesting that it was in existence when the bank was constructed.

4.5.3 The positions of the three Caldicot farms shown in Figure 10 and described above not certain, but it is very likely that Caldicote Farme is now Towyn Mawr. From the mapping, it seems unlikely that the farm of Towyn Canol, within the site area, was in existence during this period.

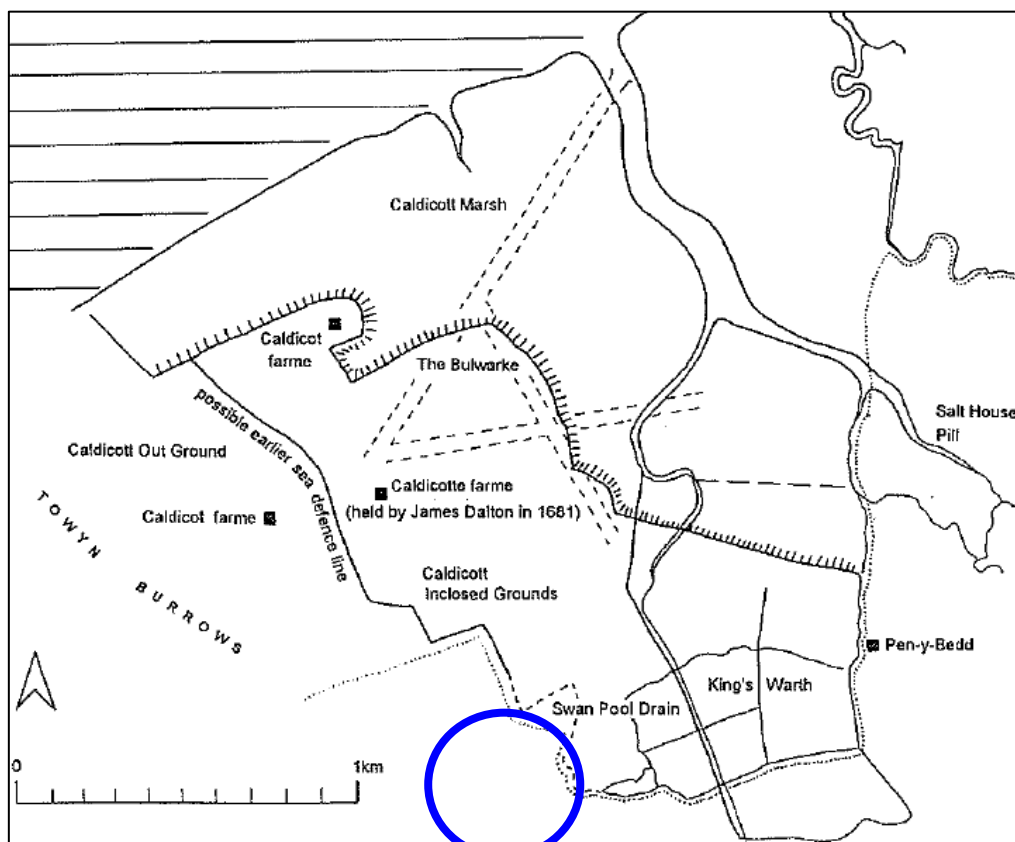


Figure 10: Plan of Caldicot showing the later 17th century landscape, (from Page 1996, based on a plan of c.1681). The runways of Pembrey Airfield are shown as dotted lines, and the approximate position of the proposed development site it indicated by the blue circle.

- 4.5.4 Towyn Canol is first shown on the next available map, the 1811 original Ordnance Survey drawing (Figure 11). Another dwelling/farm is also shown to the south-southwest of Towyn Canol, named 'Pwllty,' which translates as 'Pool House,' although no pool is marked in the vicinity on this or on any later maps. On this map the dunes of the Pembrey Burrows encroach only in the western half of the proposed forest holiday area, whereas the eastern part appears to be farmland. A trackway arrives at Towyn Canol from Towyn Isaf (now Towyn Mawr) and continues on in an easterly direction.



Figure 11: Extract of the 1811 original Ordnance Survey drawing, with the approximate position of the proposed development site outlined in blue

- 4.5.5 The picture given in the c.1840 tithe map of Pembrey Parish (Figure 12) is very similar. Although Pwllty is not labelled it is listed in the apportionment to the map, as is another farm, 'Parc Newydd' (New Park). Judging on the filed numbers listed under Parc Newydd it is presumed that the building north of the proposed development area, in field 40, is that farm (indicated on Figure 12). The apportionment does not give any field names or details about the states of cultivation in this case. The western side of the map is not farmland, presumably the dunes and is thus not recorded in detail on the Tithe map.

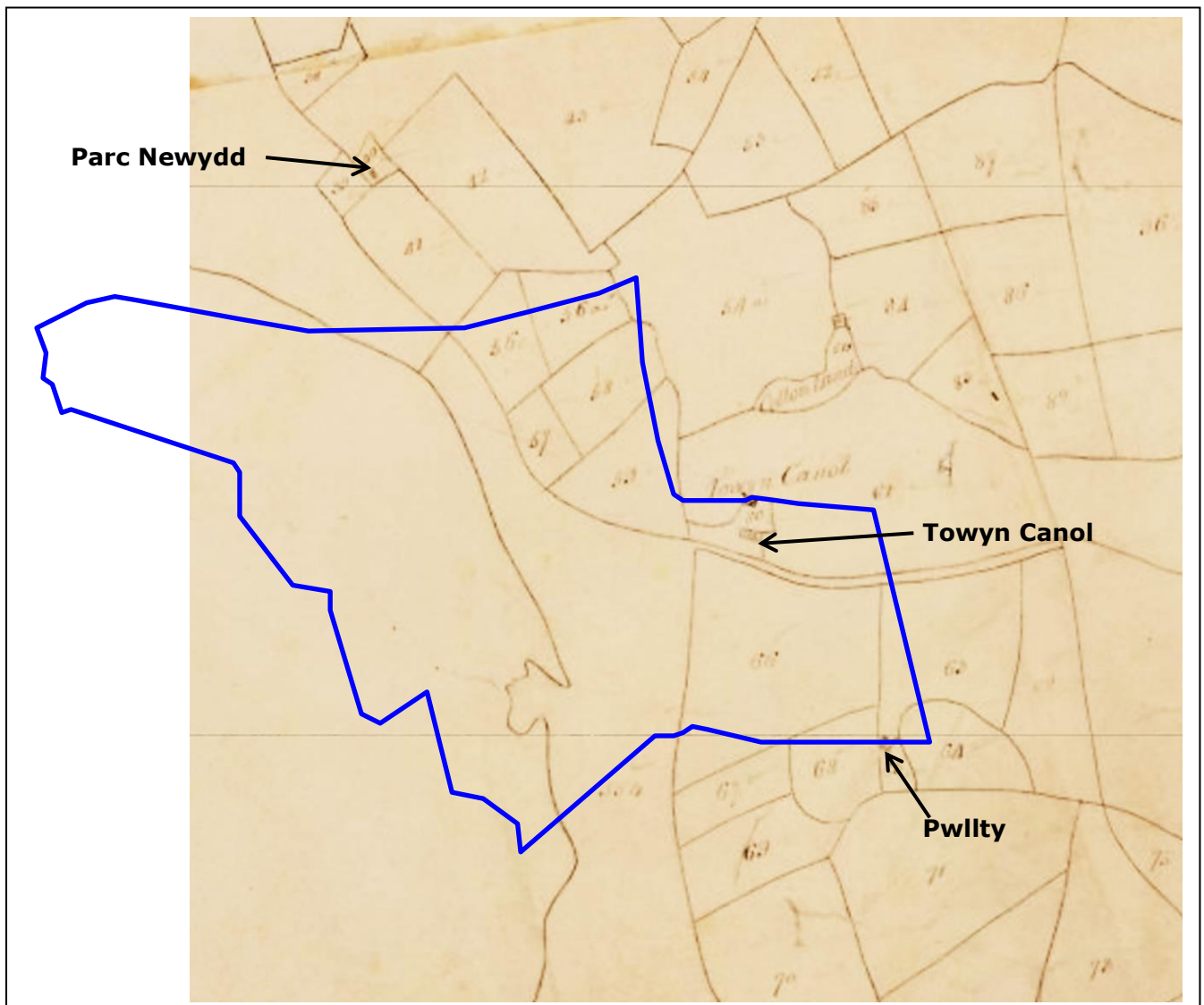


Figure 12: Extract of the Pembrey Parish Tithe Map of c.1840, with the proposed development site outlined in blue

- 4.5.6 Every Ordnance Survey map, except one, starting with the 1st edition 1:2500 in 1880, and working through to the 1:10560 map of 1921, shows the entirety of the proposed development area as marsh and sand dunes within the 'Pembrey Burrows' area. Every one of these maps also depicts Towyn Canol and also further unlabelled buildings 320m to its southeast that possibly formed the settlement known as Pwllty (Figure 13). A trackway is also shown running through the corner of the proposed site, east of Towyn Canol.

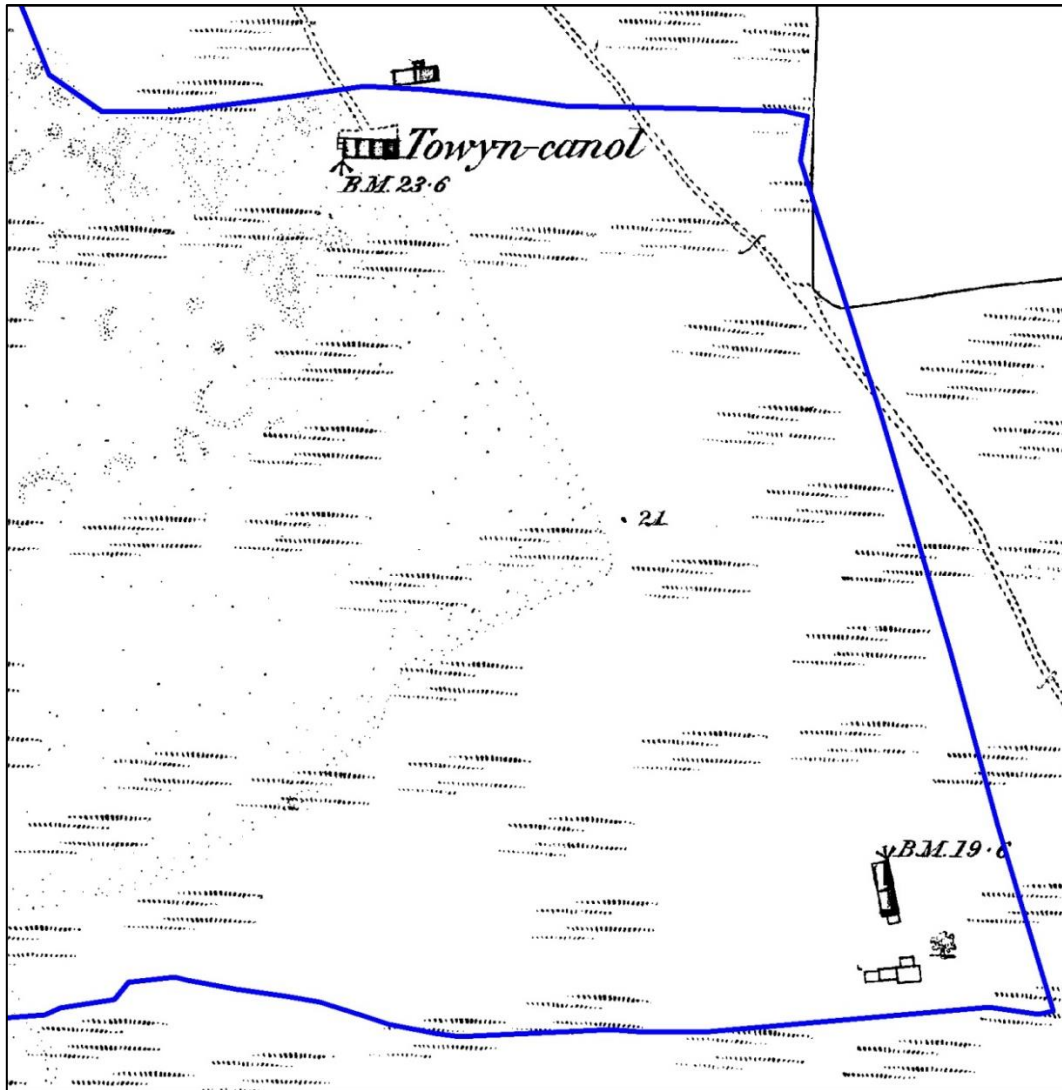


Figure 13: Extract of the 1880 first edition Ordnance Survey 1:2500 map, showing the buildings and trackway at the east end of the proposed development site (outlined in blue)

- 4.5.7 The one map that shows a difference within the proposed development boundary is the OS 1:63360 map of 1945-7, shown in Figure 14. On this map a railway line is shown traversing the site in a curve from its south side to its northwest corner, from whence it travels on a short distance further and terminates at a collection of buildings. This is presumably the same railway line (PRN 31362) as seen on HMF Pembrey plans (Figure 5). This collection was recorded as part of a recent study of the wartime remains at Pembrey (Pyper and Shiner 2016). Their nature and use could not be ascertained, either through fieldwork or documentary sources, and they are not shown on any of the known plans of HMF Pembrey. The railway line originates from the railways tracks in the vicinity of the guncotton drying stoves (cordite production area) of the World War I HMF Pembrey munitions factory. The current cycle path follows the route of this railway line through the proposed development area.
- 4.5.8 Figure 15 shows the first map in which the proposed forest holiday area is forested with conifers. The eastern spur and northeastern corner of the site remain un-forested and Towyn Canol is still marked, but not the buildings of Pwllty. A few trackways are shown running through the forest.

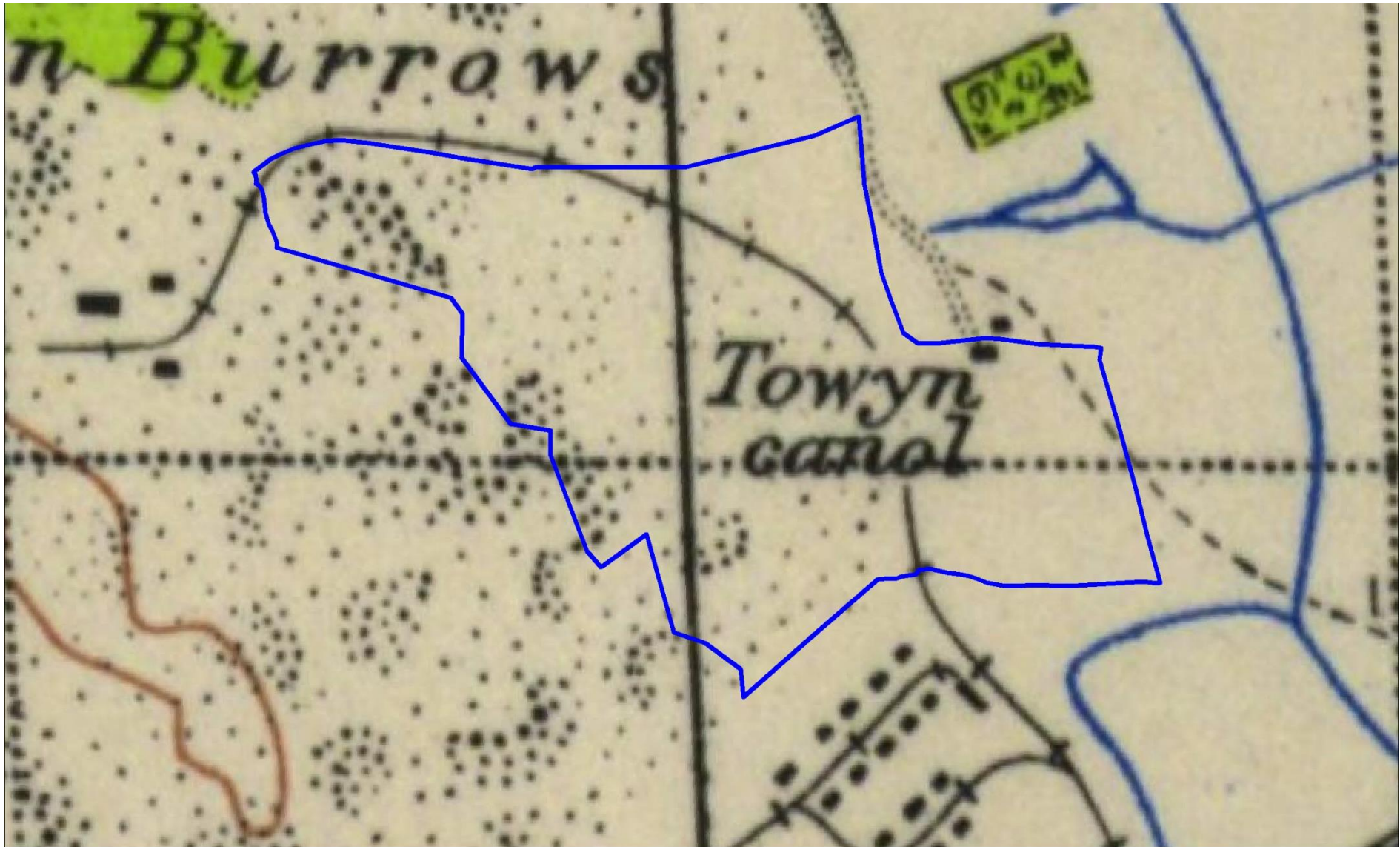


Figure 14: OS 1:63360 map of 1945-7, with the approximate position of the proposed development site shown in blue

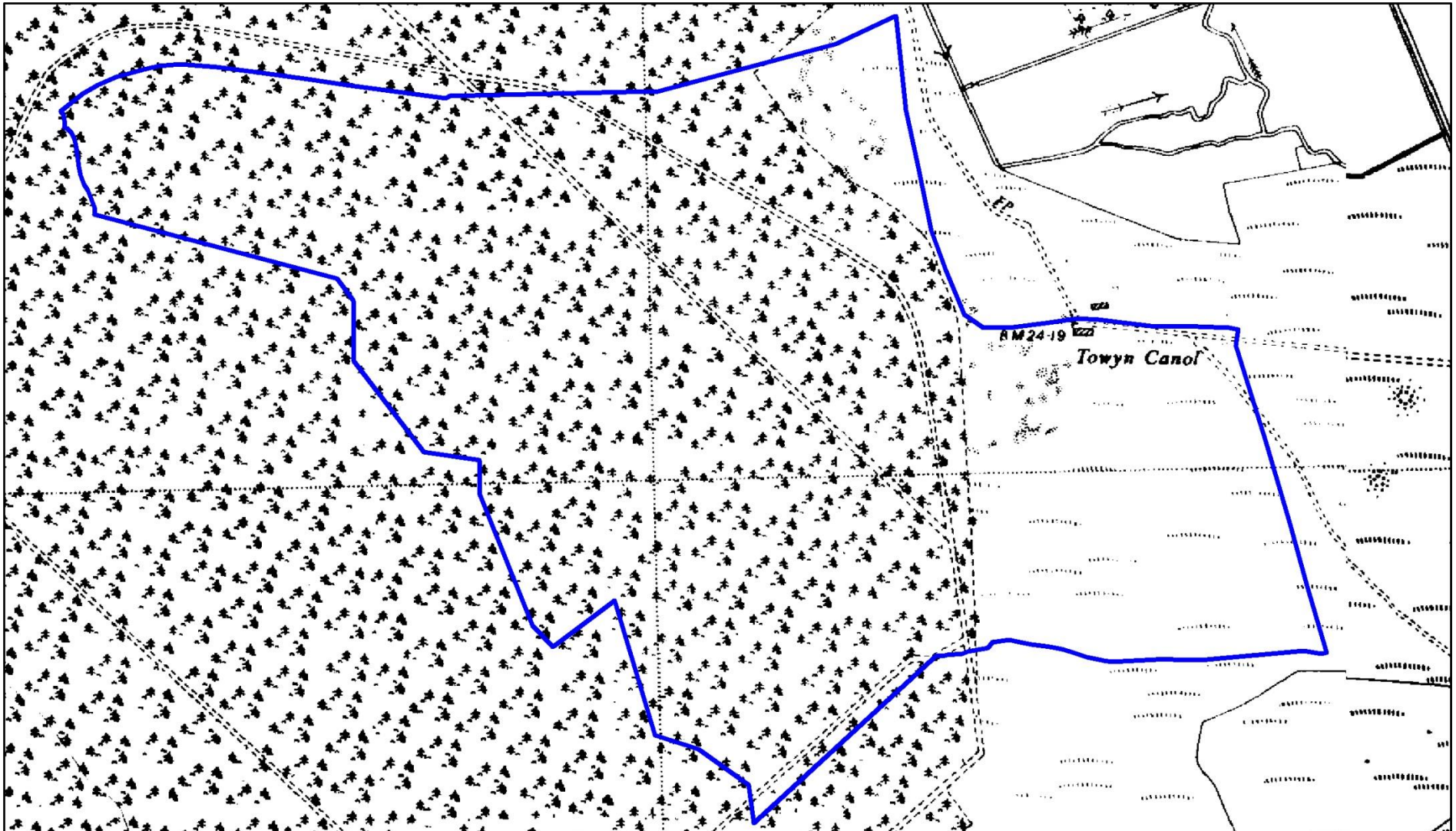


Figure 15: Extract of the 1953 Ordnance Survey 1:10560 map, with the proposed development site outlined in blue

4.6 Aerial Photography and LiDAR

- 4.6.1 The earliest available aerial photos of Pembrey are those taken by the RAF during the First World War. Features of the proposed development area show clearly (Figure 16). The dismantled railway track (now the cycle path) makes a gradual curve through the site from south to northwest. Several other pathways are visible, some of which are still shown on modern mapping. Three possible small buildings can be seen on the east edge of the railway track (circled in red on Figure 16), that presumably would have had a railway-related function.
- 4.6.2 Ty Canol Farm, which was still a working farm at that time, shows clearly in the east, still surrounded by farmland rather than the forest now present. The outline of a building can also be seen at Pwllty to the south of Ty Canol. West of the farmland and the railway trackway there is a patchwork of forest but only about 40% coverage compared to nearly 100% today. It is not possible to identify any further archaeological features or suspected archaeological features from these RAF images, although north of the site boundary there seem to be various small buildings that are thought to be military training huts, but this has not yet been confirmed on the ground.
- 4.6.3 Meridian Airmap aerial photography of the 1950s did not cover this part of the county.
- 4.6.4 Modern satellite imagery does not show any further archaeological sites but it does show the current layout of the numerous trackways through the area in detail.
- 4.6.5 LiDAR imagery shows Ty Canol's building platforms and the position of most of the field boundaries shown on the c.1840 Tithe Map. Building platforms at Pwllty are not evident but their position could be accurately inferred by comparison with the RAF aerial photos and historic mapping.



Figure 16: RAF aerial photo of 1946, with the proposed development site outlined in blue (source: RAF_AP_106G_UK_1400 frames 3088 and 3089). The red circles indicate the position of possible small buildings alongside the railway track.

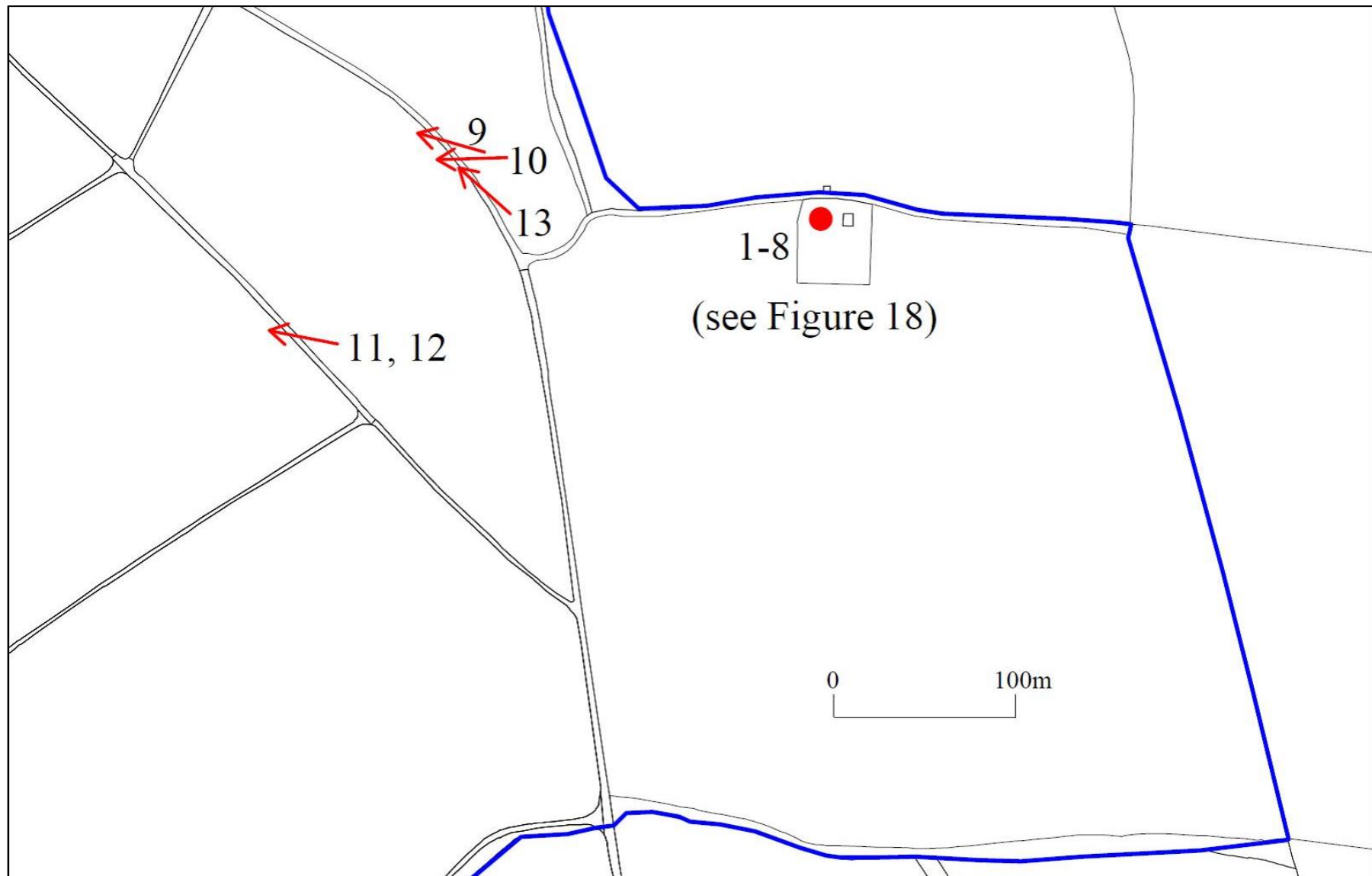


Figure 17: Positions and directions of the photos referred to in this report

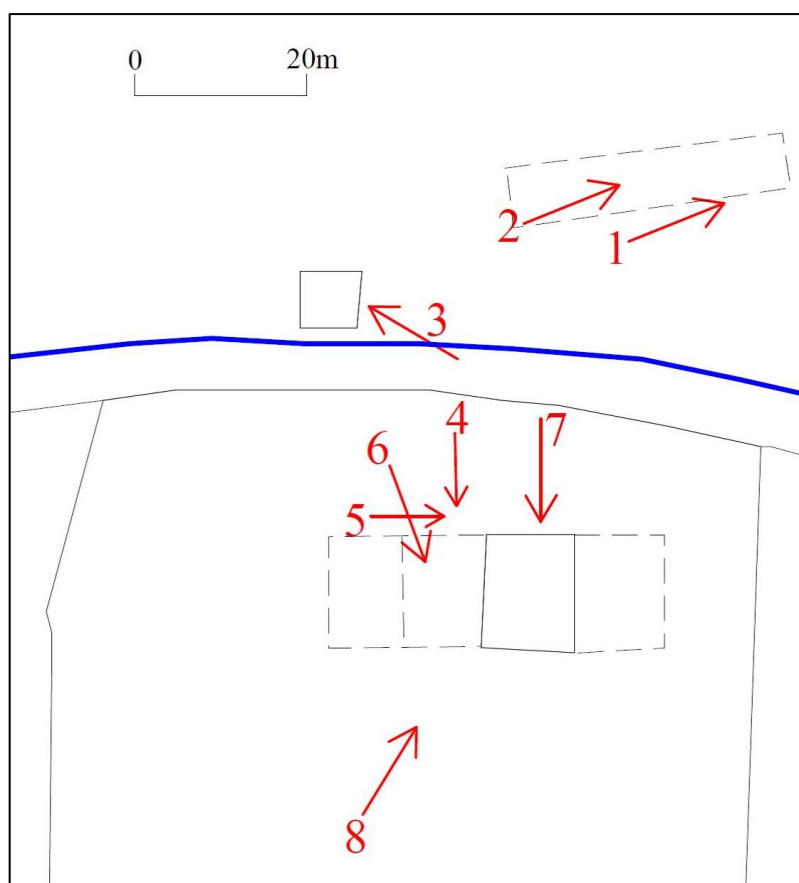


Figure 18: Positions and directions of the photos referred to in this report at the ruined farm of Towyn Canol

4.7 Site Walkover Survey

- 4.7.1 The site walkover survey was undertaken on the 22nd March 2018. A set of suspected archaeological features were additionally recorded on 27th March 2018, which proved in all probability to have been part of an ecological field survey. Figures 17 and 18 show where and in what direction photos were taken on the site. The visit incorporated looking at the wider area for views looking back to the proposed development location from designated and other sites, and it was concluded that there would be no visual impact upon the setting of any designated site, or on any undesignated site outside of the site boundary.
- 4.7.2 It was not possible to access the majority of the site away from the pathways due to dense undergrowth, mainly of brambles. It was just possible to reach the ruins of Towyn Canol, which (Photos 1-8, positions indicated in Figure 18). The northern building (Photos 1 and 2) was very ruinous and vegetation covered the remaining bits of wall. West-southwest of this was a small intact brick building with a doorway in its south end (Photo 3). Only the east side of this building was accessible because of scrub. The building is shown in the RAF aerial photos and was probably used as a privy. South-southwest of this, just north of the main house, lay a concrete covered brick structure of unknown function (Photos 4 and 5). It was cuboid in shape with two opposing ends open, and measured approximately 1m on each side. This may have potentially been the remains of a chimney top, though perhaps a little too large; alternatively it may have been the remains of a water cistern.



Photo 1: Looking east-northeast at the south wall of the ruined north building at Towyn Canol, 1m scale



Photo 2: Looking east-northeast at the north wall of the ruined north building at Towyn Canol, 1m scale



Photo 3: Looking northwest at small brick building of unknown date or function at Towyn Canol, 1m scale



Photo 4: Looking south at a small brick and concrete structure of unknown date or function at Towyn Canol, 1m scale



Photo 5: Looking east at a small brick and concrete structure of unknown date or function at Towyn Canol, 1m scale

- 4.7.3 Viewed from its north side, the southern range of buildings, or main house, at Ty Canol seemed wholly ruinous (Photos 6 and 7), but from its south side could be seen higher, intact walling, and a porch, all rendered and partially ivy-covered (Photo 8)



Photo 6: Looking south at the easternmost part of the ruined south building at Towyn Canol, 1m scale



Photo 7: Looking south-southeast at the middle of the ruined south building at Towyn Canol, 1m scale



Photo 8: Looking north-northeast at the ruined south building at Towyn Canol, 1m scale

- 4.7.4 Only one area of possible archaeological features was observed throughout the rest of the accessible area of the proposed development site. This was a series of small sub-square pits and spoil heaps, seen in two separate locations adjacent to pathways at SN 40225 02175 (Photos 9, 10 and 13; Figure 20) and at SN 40136 02096 (Photos 11 and 12).
- 4.7.5 Some of the series of pits and spoil heaps at the first location, SN 40225 02175, were recorded and planned on 27th March 2018 (Figures 19 and 20). The plan was made using a measuring tape as a baseline and taking offset measurements from it, and the site was located using GPS accurate to +/- 4m. The pits proved to be on average 0.8m by 0.8m in size and because of the variety of their sizes and shapes and the generally haphazard positioning of spoil heaps it is presumed they were dug by hand, probably by more than one individual. One of the pits was cleared of vegetation and was c.0.2m deep (Photo 13). The many other pits appeared to be more or less of the same depth. Their function remains unknown but is thought likely to have been relatively recently dug, perhaps associated with ecological surveys and they are not considered to be archaeologically significant.

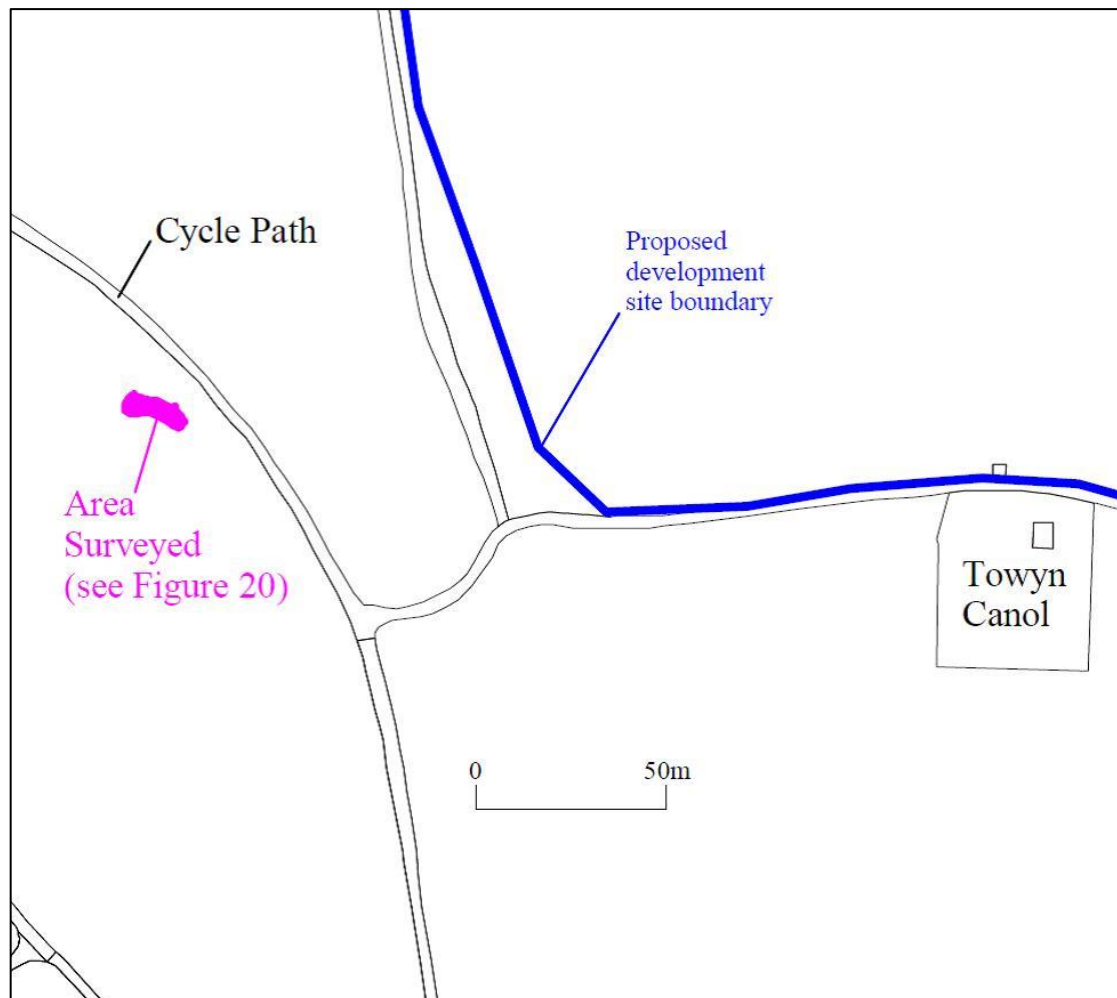


Figure 19: Map showing location of pits and spoil heaps surveyed west of Towyn Canol and just west of cycle path in Pembrey Forest

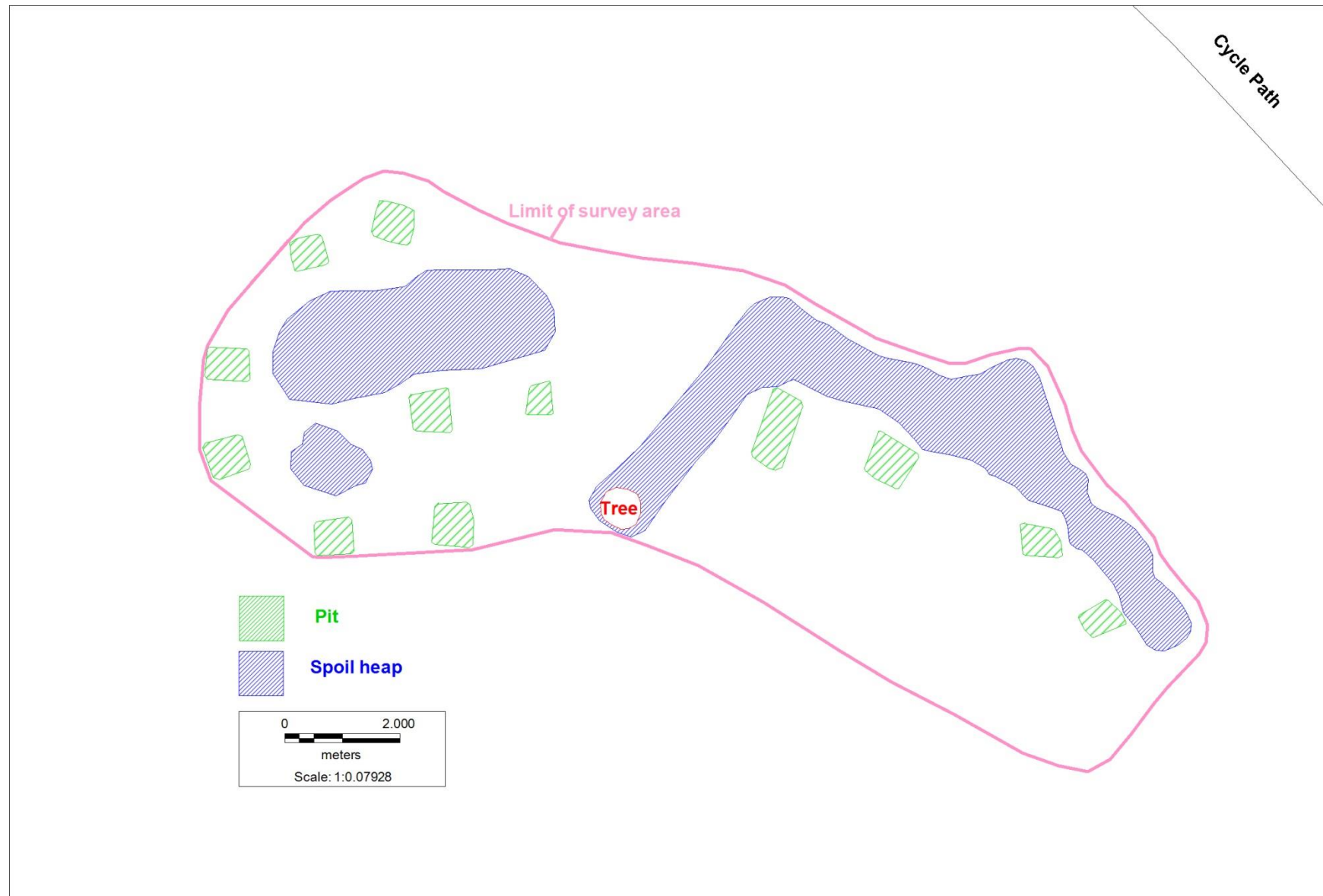


Figure 20: Plan of pits and spoil heaps surveyed west of Towyn Canol and just west of cycle path in Pembrey Forest



Photo 9: Looking southeast at the low linear spoil heaps
at SN 40225 02175, 1m scale



Photo 10: Looking west at the series of square pits
at SN 40225 02175, 1m scale



Photo 11: Looking west-northwest at the series of square pits
at SN 40136 02096, 1m scale



Photo 12: Close-up looking west-northwest at the series of square pits
at SN 40136 02096, 1m scale



Photo 13: Looking northwest at one of the series of square pits at SN 40225 02175, with spoil heaps alongside and beyond, 0.5m and 1m scales

5 IMPACT OF PROPOSALS ON THE HISTORIC ENVIRONMENT

5.1 Physical Impacts of the Development Proposals

- 5.1.1 The development proposals include the construction of approximately seventy forestry cabins, and associated infrastructure e.g. car parks, roads, footpaths, cycle paths, a retreat room, staff accommodation, and a maintenance room.
- 5.1.2 There are three known archaeological sites within the proposed development area (Figure 21) which would be impacted upon by the proposed development. Their significance is of local importance only. Design of the final layout plans for the forest holiday development could be carried out to avoid impacting upon these sites. The three known sites are:
- Towyn Canol Post-Medieval ruined farm (PRN 31410; located at SN 4044 0213)
 - Pwllty Post-Medieval demolished farm (no PRN; located at SN 40635 01845), known from historic mapping
 - A deconstructed railway track (PRN 31362; now a cycle track) that seems to have been part of the World War I munitions factory to the south. It runs through the development area from SN 40323 01811 in the south to SN 39396 02404 at the northwest corner
- 5.1.3 From an archaeological and historic environment perspective there could potentially be impacts on buried, as yet-undiscovered archaeology.
- 5.1.4 Full details of the construction design for the development have not been produced as yet, although the proposed forest lodges would be built on mini piled foundations. The provisional layout of the holiday park is shown on Figure 3. The mini-piled foundations involve the insertion of a number of small diameter piles within the footprint of the cabin (similar sites use between 20 – 30 piles per building). Although the piles are of small diameter (c.20cm), the number of them within small areas could cause significant distortion and displacement of any underlying archaeological deposits, although within this area at Pembrey this is not considered to be an issue. Piles are likely to be of at least 4m depth although it is uncertain if they would need to be deeper within the sand dunes at Pembrey. The timber framed superstructure of the lodges are then built on a metal frame above ground level.
- 5.1.5 Other construction activities are all likely to be undertaken to some extent at the development site, all of which have the potential to expose, damage or destroy archaeological remains if present at the site:
- Enabling works, such as installation of contractor's compound, construction of access roads, parking areas and storage areas;
 - Topsoil stripping for access tracks and parking areas;
 - Landscaping and terracing works if required;
 - Construction of roads and infrastructure; and
 - Service installation.

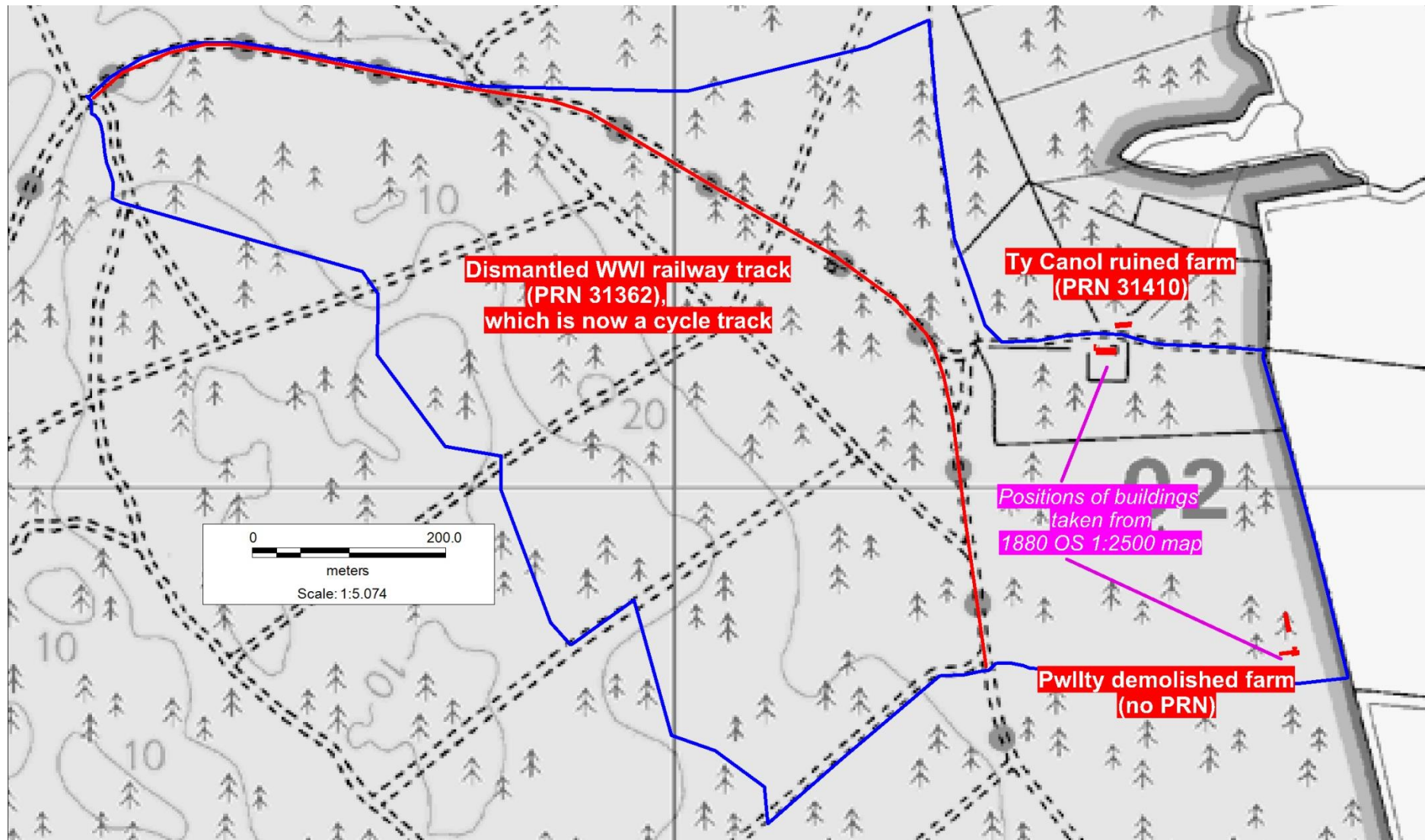


Figure 21: Map showing the locations of known archaeological sites (red) within the proposed development site (outlined in blue)

Background Mapping: Ordnance Survey 1:25,000 scale Map with the permission of The Controller of Her Majesty's Stationery Office, © Crown Copyright Dyfed Archaeological Trust, Corner House, 6 Carmarthen Street, Llandeilo, Carmarthenshire SA19 6AE. Licence No 100020930

5.2 Buried Archaeological Potential

- 5.2.1 There is a high potential for Post-Medieval or modern buried archaeology at all three of the known heritage assets within the boundary (Figure 21): Towyn Canol Farm (PRN 31410), Pwllty Farm (no PRN) and a section of WWI railway (PRN31362). This includes the potential for hitherto unknown remains associated with these heritage assets to be present in the vicinity of their locations.
- 5.2.2 It was not possible to access the entire area during the walkover survey due to vegetation growth and so there is still some potential for other hitherto unknown archaeological remains to be present within the development area. Based on cartographic and photographic research undertaken for this report, this potential is considered low.
- 5.2.3 There is a potential for buried remains relating to late Post-Medieval and modern military activity throughout the proposed area. To the south of the proposed development site there were munitions factories, to the north, the airfield, and military training is known to have taken place in Pembrey Burrows.
- 5.2.4 The land within the proposed site boundary is likely to be contaminated with potentially dangerous chemicals that may have leaked or been dumped there after use or production in any of the munitions factories. Contamination from building materials, such as asbestos, may also be present in the area, dumped or left behind after the closure of the munitions factories. Furthermore, unexploded ordnance has been found in various parts of the forest, airfield and Country Park, mostly due to bombing of the area during World War II but the potential for allied ordnance dumped, stored or dropped during training exercises cannot be discounted.
- 5.2.5 The potential for features and finds originating from any time period before the Post-Medieval cannot be discounted. Farming took place nearby during the medieval period and sea defences were formed. We do not know the position of the coastline before the Pembrey Burrows sand dunes accumulated, the depth of which is substantial in places. There is the possibility of buried land surfaces and thus human activity beneath the dunes, which could potentially be affected by the piled foundations for the forestry cabins although the depth of dune material has been recorded as very substantial and thus this is unlikely.
- 5.2.6 From the historic background research undertaken it is known that the western side of the site area comprised unimproved sand dunes from at least the early 19th century, whereas the eastern half had been improved to agricultural land from the same period. The dunes themselves will be present beneath this agricultural land.
- 5.2.7 Post-medieval and modern remains are the most likely to be present although there is also some potential for medieval remains as indicated by the possible medieval midden noted within the study area. It should be noted that this midden has not been archaeologically investigated and its medieval date has only been assigned through its similarity to other features of confirmed medieval date in the wider area.

5.3 Palaeo-environmental Potential

- 5.3.1 It is likely that deposits suitable for palaeo-environmental analysis could be present within the proposed development area due to the fact that the

below-ground deposits are known from borehole logs to be deep and varied, and are likely saturated at times by water.

- 5.3.2 The following discussion of the archaeological potential of wetland landscapes was written in Page and Murphy (2001) in their assessment of Pembrey Airfield, and is also applicable to the current proposed development.

The preservation qualities that exist in buried wetland conditions provide a unique opportunity to study a wide range of organic archaeological evidence such as artefacts made from wood, leather and textiles, which do not normally survive on 'dry' sites. As well as the survival of organic objects, the matrix in which they are found is itself of intrinsic value as it contains contemporary palaeoenvironmental evidence, in the form of pollen, plant remains, diatoms foraminifera and insect remains, of past environments and climate change (Coles 1995; Page 1996).....The diversity and direct associations of the various strand of evidence means that a much more broad-based approach can be adopted for the study of wetland sites allowing a more complete interpretation of past activity than is generally possible for dry sites.

- 5.2.3 There are a number of problems related to archaeological excavation that are particular to wetland developments, in addition to the direct impact of surface groundworks upon any buried remains:

.....wetland deposits are vulnerable to changes in ground conditions that can seriously affect the fragile organic and palaeoenvironmental evidence. Slight alterations to the groundwater levels or the introduction of oxygen into the anaerobic deposits can lead to a rapid deterioration and loss of significant evidence. Because these changes take place below ground and they can affect archaeological deposits over a wide area, not just in the immediate site of the development, management of wetland sites is difficult. Therefore, a clear idea of the final design plan is required in order to formulate an effective management strategy (Page and Murphy 2001).

- 5.2.4 The proposed mini piled foundations for the lodges, although of narrow diameter, due to their number could potentially cause alteration of the ground water levels in the area. It is very difficult to assess what the extent of this could be because as we do not have the information on borehole data from the site area which would provide information on depths of sand dune deposits, water levels or whether waterlogged deposits are present. The results of any geotechnical surveys at the site should be provided as part of any forthcoming planning application for the site area.

5.4 Visual Impacts

- 5.4.1 It is considered that the proposed development will make no change to the current setting of any designated heritage assets (e.g. Scheduled Monument; Listed Building). Of the known undesignated heritage assets in the area, only Towyn Canol (PRN31410) and a section of World War II railway (PRN 31362), which are both within the proposed development site, will have their settings impacted upon.
- 5.4.2 It is known that the area of cordite production associated with the World War I HMF Pembrey lies directly south of the proposed development area and would potentially be intervisible with the forest holiday site. Due to the presence of forestry and the layout proposals of the site any impacts to the setting of these remains could be mitigated through the careful siting of lodges and additional planting if necessary.

5.5 Summary of Impacts

- 5.5.1 It is concluded that there could be physical impacts to known archaeology within the development site from any groundworks that may disturb late Post-Medieval or modern remains.
- 5.5.2 Three known heritage assets lie within the development site boundary: Towyn Canol Farm (PRN 31410), Pwllty Farm (no PRN) and a section of WWI railway (PRN31362). There is a high potential for further remains associated with these sites to be present within their vicinity.
- 5.5.3 There is moderate potential for buried remains of late Post-Medieval or modern date to be discovered in any part of the site area away from those known sites. There is low potential for buried remains from any other archaeological eras to be present.
- 5.5.4 It is concluded that the proposed development could have a small visual impact on two undesignated heritage assets in the area, which are both within the proposed development site: Towyn Canol Post-Medieval ruined farm (PRN31410) and a section of World War II railway (PRN 31362). No visible remains of Pwllty Farm survive.
- 5.5.5 Impacts to the setting of the cordite works directly to the south of the development area could be mitigated through careful design and additional planting.

5.6 Recommendations for Further Archaeological Works

- 5.6.1 It is likely that further archaeological works will be required within the development area before development to record the known upstanding remains (Towyn Canol Post-Medieval ruined farm (PRN31410) and a section of World War II railway (PRN 31362). Recording would take the form of a photographic survey as a minimum. It is likely that other, as yet unknown, upstanding remains will be found in the dense undergrowth throughout the site. These new sites, if present would also need recording.
- 5.6.2 Because of the potential for buried remains, further archaeological mitigation may be required before or during any groundworks to assess the survival of any below ground archaeology within the proposed development area. It is thought that a watching brief during larger scale groundworks (road or car park construction) may be required as a minimum due to the potential for late Post-medieval and modern remains relating to settlement (at Ty Canol and Pwllty only) and military activity (throughout the site), which would be of local and possibly regional significance.
- 5.6.3 Clearance of contamination and potential unexploded ordnance (if required) would need to have been completed before any further archaeological mitigation could take place.
- 5.6.4 The decision for the scope of any further programme of archaeological works lies with the archaeological advisor to the local planning authority (Development Management - Dyfed Archaeological Trust).

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APPENDIX I:

PROPOSED FOREST HOLIDAYS DEVELOPMENT AT PEMBREY FOREST, CARMARTHENSIRE: HISTORIC ENVIRONMENT APPRAISAL

WRITTEN SCHEME OF INVESTIGATION (excluding figures)

1. INTRODUCTION

- 1.1 This written scheme of investigation presents a proposed methodology for a desk-based archaeological appraisal of the proposed Forest Holidays development on land at Pembrey Forest, Pembrey, Carmarthenshire. The development comprises an area of c.57ha roughly centred on SN 4060 0206 (Figures 1 and 2).
- 1.2 It is proposed to build a holiday park with approximately seventy holiday cabins and associated infrastructure e.g. car parks, roads, footpaths, cycle paths, a retreat room, staff accommodation, and a maintenance room.
- 1.3 The proposed development area lies within Pembrey Forest, close to Pembrey Airport which was established in World War II and close to the former munitions factory used in both World War I and II. Remains associated with these could be present within the proposed development site. Earlier archaeological activity could also be present within the proposed development area.
- 1.4 DAT Archaeological Services have been commissioned to carry out the desk-based appraisal by the Asbri Planning, in order to consider the impact of the development proposals upon archaeological and historical sites within the development site and its surrounding area.
- 1.5 This document outlines the proposed methodology that will be used to undertake the appraisal and provides the information required in support of the planning application for the development.
- 1.6 The report will be a primarily desk-based study of the site area, identifying any known archaeological or historical sites within the site and its environs, identifying potential setting impacts on scheduled ancient monuments or listed buildings in the vicinity, identifying any historic landscape areas that may be affected by the proposals and assessing the potential for hitherto unknown archaeological remains to be present within the proposed development area.
- 1.7 The report will include an appraisal of potential impacts that might occur to buried or upstanding archaeological or historical sites within and in the vicinity of the proposed development.
- 1.8 An indication of what further archaeological works might be required, if any, will also be prepared.
- 1.9 The specification is in accordance with the *Standard and Guidance for Archaeological Desk-Based Assessments* (Chartered Institute for Archaeologists (CIfA) 2014).
- 1.10 The Trust always operates to best professional practice. DAT Archaeological Services is the contractual arm of Dyfed Archaeological Trust that has its own Health and Safety Policy, and all works are covered by appropriate Employer's Liability and Public Liability Insurances. Copies of all are available on request.

- 1.11 ***Dyfed Archaeological Trust is a CIfA Registered Archaeological Organisation.***
- 1.12 ***All permanent staff members of DAT Archaeological Services are CSCS² registered.***

2. AIM AND OBJECTIVES OF THE PROJECT

- 2.1 This document provides a scheme of works for:

The preparation of a desk-based archaeological appraisal of a proposed Forest Holidays development on land at Pembrey Forest, Pembrey, Carmarthenshire. The development comprises an area of c.57ha, roughly centred on SN 4060 0206. The report will assess the potential impact the development may have on any archaeological remains, if present within the area, and an assessment of the wider impact of it on the historic environment. The appraisal shall be presented within a report which will be submitted with the planning application for the new development.

- 2.2 Provision of a written scheme of investigation to outline the methodology by which DAT Archaeological Services will undertake the desk-based appraisal.
- 2.3 To identify any known archaeological remains and assess the potential of any hitherto unknown archaeological deposits within the location of the proposed development and any associated infrastructure.
- 2.4 To identify any known historic environment features within the wider area that could be affected indirectly by the proposed works.

3. DESK-BASED APPRAISAL METHODOLOGY

- 3.1 The archaeological desk-based appraisal will involve the preparation of a stand-alone report. The report will be prepared using relevant information from a number of sources, and will comprise a number of elements, including:
 - Dyfed Archaeological Trust Historic Environment Record data and other relevant information (including a review of online information held on the RCAHMW Coflein site);
 - Identification of any Scheduled Monuments, Listed Buildings, Conservation Areas or Historic Landscape Areas within or in the vicinity of the site area from information held by Dyfed Archaeological Trust, CADW and NRW;
 - Readily available bibliographic information, cartographic material and photographs (including aerial photographs) held at the Trust, RCAHMW, Local records Office and National Library of Wales;
 - A review of historic maps;
 - Relevant web-based information;
 - Site visit and walkover survey;
 - Assessment of the archaeological potential of the area; and

² Construction Skills Certification Scheme (Health and Safety Tested)

- Assessment of likely impacts on any identified remains (or potential remains) or setting issues and likely requirements, if any, for further stages of archaeological work.
- 3.2 The proposed site visit will be undertaken to provide an assessment of the presence of any visible archaeological remains within the proposed development area and its visibility from nearby cultural heritage features. The intervisibility of the development with heritage assets in the vicinity will be investigated. Photographs will be taken of the site area and its environs and these will be used within the report.
- 3.3 To complete an appropriate assessment a 1km search area around the site boundary for non-designated archaeological features and 2km for designated sites (Scheduled Monuments, Listed Buildings etc.) will be used to determine the presence of known historic environment features within and in the vicinity of the proposed development.
- 3.4 The following will be considered when preparing the appraisal, although in some cases no such features may be present and will thus not be considered further:
- Scheduled Monuments and their settings;
 - Non-scheduled ancient monuments and their settings;
 - Listed buildings and their settings;
 - Registered Parks and Gardens and their essential settings;
 - Registered Historic Landscapes;
 - Non-registered historic landscapes;
 - Buried archaeological potential;
 - Place-name evidence;
 - Newly identified sites of historic importance
- 3.5 A report will be prepared on the results of the appraisal. This report will include information on known sites within and in the vicinity of the proposed development site. Maps of known archaeological and historical sites will be presented in the report. Photographs will be used where appropriate.
- 3.6 The report will be fully representative of the information gained from the above methodology, even if there should be negative evidence. The report will include the following:
- a) A concise non-technical summary of the appraisal results;
 - b) At least one plan showing the site's location in respect to the local topography;
 - c) A list of all the sources consulted;
 - d) Where necessary, suitably selected plans and maps (including historic maps) of significant archaeological features;
 - e) Written descriptions of all archaeological features observed during the site visit;
 - f) A statement concerning the local and regional context of the historic assets identified. Consideration, where appropriate, of the National Archaeological Research Agenda;
 - g) An assessment of the relative value or significance of each recognised historic asset;

- h) An impact assessment of the proposed development on the potential archaeological resource.
- 3.7 Once completed, a copy of the report will be submitted to the LPA for the consideration of their archaeological advisers. A further copy of the report should be provided to the Dyfed Archaeological Trust for deposition within the Regional Historic Environment Record (HER).
- 3.8 Where appropriate, a summary report on any new significant archaeological discovery will be submitted for publication to a national journal (e.g. Archaeology in Wales) no later than one year after the completion of the work.
- 3.9 Although there may be a period during which client confidentiality should be maintained, the report and the archive should normally be deposited in the appropriate repository not later than six months after completion of the work.

4. STAFF

- 4.1 The project will be managed by Jim Meek, Head of DAT Archaeological Services.
- 4.2 The report and site walkover survey will be undertaken by Alice Day; Archaeologist, DAT Archaeological Services.

5. HEALTH AND SAFETY

- 5.1 All permanent members of DAT Archaeological Services staff are CSCS³ registered.
- 5.2 DAT Archaeological Services will carry out a health and safety risk appraisal prior to the site walkover survey to ensure that all potential risks are minimised.
- 5.3 All relevant health and safety regulations must be followed where advised by the client.
- 5.4 As the site visit will likely be undertaken by a single archaeologist, it may be necessary to implement lone working procedures and contacts.

³ Construction Skills Certification Scheme (Health and Safety Tested)

Appendix II:

Historic Landscape Characterisation Area 162:

PEMBREY FOREST

(Taken from Dyfed Archaeological Trust's Historic Landscape Characterisation Pages. <http://www.dyfedarchaeology.org.uk/>)

GRID REFERENCE: SN 385 027

AREA IN HECTARES: 863.90

Historic Background

Pembrey Forest occupies the greater part of Pembrey (or 'Towyn') Burrows, an area of sand hills of comparatively recent origin. The Burrows developed at the mouth of the River Gwendraeth Fawr over a long period. Alongside this a series of reclamations occurred around an initial nucleus formed by a tongue of dry land at the foot of Mynydd Penbre, partly represented by the Medieval Manor of Caldicot. The Burrows themselves have developed since the 17th century at least but, according to James, are no earlier than the Medieval period - the earliest date to which shell-midden sites observed within the area can be attributed (James 1991, 159). Sea-walls constructed during the 18th- and early 19th-century extended dry land further north and west of the airfield area, into the area of the Burrows, and dune slacks appear to have developed to the southeast of an original tongue of dry land. The Manor of Caldicot had been merged with the Manor of Pembrey (under the Ashburnhams) by the early 19th-century, when the coastline had extended almost to its present line and most of this area appears already to have been occupied by sand hills, called 'Great Outlet' on the Pembrey tithe map of 1841 and represented as common land. However, the tithe map also shows enclosures to the extreme west and southwest of the area around a farm, Towyn Canol, also shown in 1891 (Ordnance Survey 6" first edition, Sheet LVII NW). During the Second World War, gun emplacements relating to Pembrey Airfield, and the Command Stop Line running from the Bristol Channel to Cardigan Bay, were constructed east-west across the burrows. The entire character area has been planted with coniferous forest since the 1940s.

Description and essential historic landscape components

There are few historic landscape components in what is in essence a band of sand dunes some 5 km wide and 2 km long over which a conifer plantation has been established. The dunes are substantial, and achieve heights of over 20 m. Only a very small portion of land now under forestry was enclosed farm land, not sand dune; this has not been examined to see if former field boundaries and structures survive, but the outlines of yards, buildings etc. associated with Towyn Canol are shown on the modern Ordnance Survey 1:2500. Prior to the conifer planting, a munitions factory was established at the southern end of this area. The storage bunkers and infrastructure of this factory constitute some of the most important components in the historic landscape, as do the scattered Second World War defensive structures within the forest.

Recorded archaeology is limited to the shell midden, drainage features, and the site of Towyn Canol Farm. Distinctive buildings are limited to two Second World War gun emplacements and a bunker. Pembrey Forest is a distinctive and well defined historic landscape area on all sides except to the south. To the south both the forestry and installations associated with the munitions factory spill into the neighbouring area. To the west lies unafforested sand dunes, to the north salt marsh and to the east reclaimed marsh.

Appendix III:

Historic Landscape Characterisation Area 160:

BROOKLANDS

(Taken from Dyfed Archaeological Trust's Historic Landscape Characterisation Pages. <http://www.dyfedarchaeology.org.uk/>)

GRID REFERENCE: SN 408 024

AREA IN HECTARES: 144.90

Historic Background

A very distinct area of former salt marsh behind, and to the east of Pembrey Burrows, which developed when the coastline around the burrows lay considerably further east and south than it does at present. At least part of the area was referred to as 'King's Marsh alias Pembrey Marsh' in a survey of 1638 (James 1991, 152), when it appears to have represented open salt marsh set aside for use by the burgesses of Kidwelly, of which sixty acres had recently been enclosed by Sir Richard Vaughan. These enclosures are probably the fields shown on the estate map of Caldicot Manor of 1681 as the 'King's Warth' ('Morfa Brenin' on the Pembrey tithe map, 1841). The four large enclosures, variously subdivided, in the northern half of the area are shown with boundaries identical to those of today, but with variations in subdivision. One of these boundaries, however, represents the line of the sea wall constructed as 'The Bulwarke', probably in 1629 (James, 1991, 152). The area is crossed from north to south by the man-made Swan Pool Drain, which had probably been established by 1762 to empty a pond formerly lying in Area 163, to the south east, into a former creek beyond The Bulwarke, in Area 157. Much of the remainder of Caldicot Manor now lies beneath Pembrey Airfield (Landscape Area 157). The farmstead of Brooklands itself is a later creation and is not shown on the Pembrey tithe map of 1841. During the Second World War a Command Stop Line was constructed between Cardigan Bay and the Bristol Channel, part of the defences of which follow Swan Pool Drain (Page 1996, 20).

Description and essential historic landscape components

This area consists of flat, reclaimed marsh at, or close to sea level. It is now mostly improved pasture which has been divided into medium-sized irregular enclosures by ditches, dating to the 17th century. In some instances scrubby hedges line the ditches; these are supplemented by wire fences. Alongside tracks hedges are in better condition and are mostly stock-proof. There is no woodland.

Recorded archaeology is limited to drainage features. There are no distinctive buildings. The later 19th century Brooklands Farm has recently been rebuilt in brick, has a large assemblage of modern farm buildings and is the only settlement in this area. Two Second World War pill-boxes lie within the area. The borders of the Brooklands historic landscape character area are only well defined to the west against forestry. To the northwest lies the modern landscape of Pembrey Airfield, and to the northeast the later enclosed land of Pinged Marsh. To the south lies more forestry and more intensively enclosed and settled reclaimed marsh.

PROPOSED FOREST HOLIDAYS DEVELOPMENT AT PEMBREY FOREST, CARMARTHENSHERE: HISTORIC ENVIRONMENT APPRAISAL

RHIF YR ADRODDIAD / REPORT NO. 2018/14
RHIF Y DIGWYDDIAD / EVENT NO. 112035

Ebrill 2018
April 2018

Paratowyd yr adroddiad hwn gan / This report has been prepared by

Alice Day

Swydd / Position: **Archaeologist**

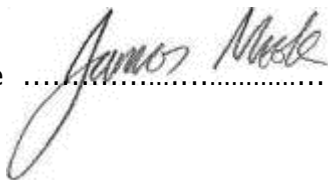
Llofnod / Signature  Dyddiad / Date **17/08/2017**

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith
This report has been checked and approved by

James Meek

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: **Head of DAT Archaeological Services**

Llofnod / Signature  Dyddiad / Date **05/09/2017**

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau
sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

As part of our desire to provide a quality service we would welcome any
comments you may have on the content or presentation of this report

