

# *Archaeology Wales*

## **Blackbridge & Waterson, Milford Haven, Pembrokeshire**

Cultural Heritage Impact Assessment



By Philip Poucher

Report No: 1450

Archaeology Wales Limited  
The Reading Room, Town Hall, Great Oak Street  
Llanidloes, Powys SY18 6BN  
Telephone: 01686 440371  
E-mail: [admin@arch-wales.co.uk](mailto:admin@arch-wales.co.uk)

# *Archaeology Wales*

## **Blackbridge & Waterston, Milford Haven, Pembrokeshire**

### Cultural Heritage Impact Assessment

Prepared For: Egnedol Wales Ltd


Edited by: Mark Houliston

Signed: 

Position: Managing Director

Date:

Authorised by: Mark Houliston

Signed: 

Position: Managing Director

Date:

By  
Philip Poucher

Report No: 1450

**March 2016**

## CONTENTS

1. Introduction & Methodology	1
1.1 Introduction	1
1.2 Planning Policy Context	1
1.3 Impact Assessment Methodology	2
2. Baseline Conditions	8
2.1 Site Description	8
2.2 Previous archaeological studies	10
2.3 Site, Monument, Building and Landscape Designations	11
2.4 Historical Development	12
3. Potential Impacts	18
3.1 Sources of potential direct effects	18
3.2 Sources of potential indirect effects	18
3.3 Archaeological Remains	18
3.4 Historic Buildings	23
3.5 Historic Landscapes	27
4. Impact Significance	28
4.1 Archaeological Remains	28
4.2 Historic Buildings	29
4.3 Historic Landscapes	30
5. Mitigation	30
5.1 Overview	30
5.2 Archaeological Remains	31
5.3 Historic Buildings	32
5.4 Historic Landscape	33
6. Residual Impacts	33
7. Summary	36
8. Bibliography	41

## List of Tables

Table 1	Summary of significance of impact on Archaeological Remains	28
Table 2	Summary of significance of impact on Historic Buildings	29
Table 3	Summary of significance of impact on HLCAs within the registered Historic Landscape	30
Table 4	Summary of significance of impact on registered Parks & Garden of Historic Interest	30
Table 5	Residual impacts	33

## List of Figures

Figure 1	Site location
Figure 2	Proposed development outline
Figure 3	Blackbridge development details
Figure 4	Waterston development details
Figure 5	Zone of Theoretical Visibility (ZTV)
Figure 6	Designated archaeological landscapes and areas within the ZTV
Figure 7	Scheduled Ancient Monuments within the ZTV
Figure 8	Listed Buildings within the ZTV
Figure 9	All non-designated archaeological sites within the search area
Figure 10	Detail of archaeological sites within the Blackbridge development
Figure 11	Detail of archaeological sites within the Waterston development
Figure 12	Ordnance Survey map of 1875
Figure 13	Ordnance Survey map of 1908
Figure 14	Plan of Blackbridge RNAD, c.1960
Figure 15	Overlay of archaeological sites and proposed development on RNAD site

### Copyright Notice:

Archaeology Wales Ltd retain copyright of this report under the Copyright, Designs and Patents Act, 1988, and have granted a licence to Egnedol and ExCAL Ltd to use and reproduce the material contained within.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



## ARCHAEOLOGY AND CULTURAL HERITAGE

### 1 INTRODUCTION & METHODOLOGY

#### 1.1 *Introduction*

- 1.1.1 In January 2016 Archaeology Wales (AW) was commissioned by Egnedol Wales Ltd to prepare a Cultural Heritage Impact Assessment as part of an Environmental Statement, in order to provide a detailed Assessment of the potential effects of a proposed development at Blackbridge, Milford Haven and at the former Gulf Oil Refinery at Waterston, Pembrokeshire (Figures 1&2).
- 1.1.2 The Assessment has collated details of the known archaeological and historic sites and features, or 'heritage assets', and considered the potential for the presence of unknown or unrecorded heritage assets. This information was used to produce an assessment of the historic environment of the area within which the Proposed Development lies.
- 1.1.3 The Assessment considers the likely significant effects of the Proposed Development on all of these heritage assets, including archaeological sites, features and finds, historic buildings and historic landscapes. Both potential 'direct' and 'indirect' effects on the historic environment are considered. Where likely significant adverse effects are identified, mitigation measures to prevent, reduce, or offset them are proposed, and likely residual effects remaining after mitigation are determined.
- 1.1.4 The proposed development consists of the redevelopment of the former RNAD site at Blackbridge, Milford Haven as a gasification and power generating plant, utilising and enlarging some of the existing buildings on the site. The development also includes the redevelopment of an area within the former Gulf Oil Refinery that has largely been cleared of its later-20<sup>th</sup> century industrial structures to create a Fish Farm, Prawn Farm, Algae Farm and Research Area.

#### 1.2 *Planning Policy Context*

- 1.2.1 National Policies relating to archaeology and cultural heritage include the following:
- Ancient Monuments and Archaeological Areas Act 1979.
  - Planning (Listed Buildings and Conservation Areas) Act 1990.
  - Planning Policy Wales (Edition 8, January 2016). Chapter 6 – Conserving the Historic Environment.
- 1.2.2 The National Assembly has recently (February 2016) agreed to the Historic Environment (Wales) Bill, currently in a period of intimation before coming into force, whereupon it will be referred to as the Historic Environment (Wales) Act 2016. This Bill provides amendments to the Ancient Monuments and Archaeological Areas Act 1979 and the Planning (Listed Buildings and Conservation Areas) Act 1990. The Bill also makes provisions for the compilation and maintenance of a register of historic parks and gardens, a list of historic place-names in Wales and accessible Historic

Environment Records for each local authority, as well as issuing guidance to local authorities in Wales, National Park authorities in Wales and Natural Resources Wales.

- 1.2.3 In 2013, Pembrokeshire County Council adopted the Local Development Plan (LDP) for the County, excluding the area of the Pembrokeshire Coast National Park. Within the LDP, **Policy GN.38** 'Protection and Enhancement of the Historic Environment' is of specific relevance to the historic landscape. This policy states:

'Development that affects sites and landscapes of architectural and/or historical merit or archaeological importance, or their setting, will only be permitted where it can be demonstrated that it would protect or enhance their character and integrity.'

- 1.2.4 The development within the boundary of the former Gulf Oil Refinery lies within an area covered by **Policy SP2**, 'Port and Energy Related Development'. Development within this area will be permitted for port related facilities and infrastructure, including energy related development.
- 1.2.5 Development at the Blackbridge site lies within an area covered by **Policy SP3**, 'Strategic Employment Allocation'. This site is one of four in the area that has been identified as a site in a sustainable location suitable for development for enterprise and employment purposes, to help support the future development of port and energy related activities in proximity to Milford Haven.

### **1.3 Impact Assessment Methodology**

#### Introduction

- 1.3.1 The primary objective is to assess the impact of the development proposals on the historic environment. The aim is to make full and effective use of existing information in establishing the archaeological significance of the site, to elucidate the presence or absence of archaeological material, its character, distribution, extent, condition and relative significance.
- 1.3.2 The work includes a comprehensive assessment of regional context within which the archaeological evidence rests and aims to highlight any relevant research issues within national and regional research frameworks. This Assessment provides information of sufficient detail to allow informed planning decisions to be made which can safeguard the archaeological resource. Preservation *in situ* has been advocated where at all possible, but where engineering or other factors result in loss of archaeological deposits, preservation by record has been recommended.
- 1.3.3 Following consultations with Dyfed Archaeological Trust – Planning Services (archaeological advisors to the Local Planning Authority), Cadw and the Local Planning Authority this assessment considers the following:
- a) The nature, extent and degree of survival of archaeological sites, structures, deposits and landscapes within the study area through assessment of various readily available primary sources:

- Collation and assessment of all relevant information held in the regional HER at Llandeilo within a 2km radius of the development site;
- Collation and assessment of all Designated archaeological sites with a 5km radius of the development site;
- Assessment of all available excavation report and archives including unpublished and unprocessed material affecting the site and its setting.
- Assessment of aerial photographic (AP) evidence;
- Assessment of archive records held at the County Archive and at the National Library of Wales (NLW);
- Records held by the developer e.g. bore-hole logs, geological/geomorphological information, aerial photographs, maps, plans;
- Map regression analysis using all relevant cartographic sources e.g. all editions of the Ordnance Survey County Series, Tithe and early estate maps (as available);
- Place-name evidence;
- Internet sourced satellite imagery;
- Historic documents (e.g. charters, registers, estate papers).

b) The significance of any remains in their context both regionally and nationally, and in light of the findings of the desk-based study.

c) The history of the site.

d) The potential visual impact of any proposed development on the setting of known sites of archaeological importance.

e) The potential for further work, with recommendations where appropriate for a suitable investigative and/or mitigation methodology.

- 1.3.4 The scoring system for assessing the magnitude of impact of the proposed development is based on the Design Manual for Roads and Bridges (DMRB, Volume 11 Environmental Assessment, Section 3 Environmental Topics, Part 2, Cultural Heritage, Ref. 9-2), which is published by the UK Government on behalf of the Highways Agency, Transport Scotland, Welsh Assembly Government (Llywodraeth Cynulliad Cymru) and the Department for Regional Development Northern Ireland.
- 1.3.5 DMRB is the established good practice guidance for assessing the impact of the effects of the Proposed Development on the cultural heritage resource, which it divides into three sub-topics: Archaeological Remains, Historic Buildings and Historic Landscapes.

### Archaeological Remains

- 1.3.6 Archaeological Remains are the materials created or modified by past human activities that contribute to the study and understanding of past human societies and behaviour. Archaeology can include the study of a wide range of artefacts, field monuments, structures and landscape features, both visible and buried. For the

purposes of the [DMRB] guidance the sub-topic generally excludes historic buildings and historic landscapes, always accepting there may be important archaeological aspects to these sub-topics.

1.3.7 The following scale of values are used in assessing the value/sensitivity of archaeological remains. For each value, the asset types relevant to the definition are listed in brackets afterwards. Where the definition of the asset type is ambiguous (for example 'sites of international importance'), the assessing archaeologist will use his or her professional judgement in deciding whether to allocate particular remains to it.

- Very High (World Heritage Sites and other sites of international importance);
- High (Scheduled Monuments, undesignated assets of schedulable quality, assets of National importance that can contribute significantly to acknowledged national research objectives);
- Medium (designated or undesignated assets of Regional importance that contribute to regional research objectives);
- Low (assets of local importance, assets compromised by poor preservation or poor survival of contextual associations);
- Negligible (assets with little or no surviving archaeological interest);
- Unknown (the importance of the resource has not been ascertained).

1.3.8 An 'Unknown' value may sometimes be all that can be determined, particularly in the early stages of a project. In these cases, an estimate of the risk of there being valuable archaeological remains that could be affected will be made together with an indication of how this risk is to be managed.

1.3.9 Magnitude of effect is assessed using the guidelines set out in the DMRB. This assessment is made without regard to the value of the resource, so the total destruction of a low value site is considered as the same magnitude of effect as the destruction of a Scheduled Ancient Monument. The effect can be either 'direct' or 'indirect'. A direct effect is where there is a physical impact on a heritage asset, typically during the construction phase. Indirect is when there is a visual effect on the asset or its setting. In the broadest terms, the setting of an asset comprises the objects and conditions around it, and within which it is perceived; and in this sense all assets have settings. Not all settings, however, contribute to the value of the assets they encompass. The setting will be a combination of views, other historic features and their relationships to the asset, ambience (topography, vegetation, sound, and other sensual experiences) and context (what is known or thought about the asset, but not immediately experienced through the senses).

1.3.10 The following scales of values will be used in assessing the magnitude of impacts:

- Major (change to most or all key archaeological materials, such that the resource is totally altered; comprehensive changes to setting);
- Moderate (changes to many key archaeological materials, such that the resource is clearly modified; considerable changes to setting that affect the character of the asset);

- Minor (changes to key archaeological materials, such that the asset is slightly altered; slight changes to setting);
- Negligible (very minor changes to archaeological materials or setting);
- No Change

### Historic Buildings

1.3.11 Historic buildings are architectural or designed or other structures with a significant historical value. These may include structures that have no aesthetic appeal, and the sub-topic includes, in addition to great houses, churches and vernacular buildings, some relatively modern structures, such as WWII and Cold War military structures, early motorway service stations, industrial buildings, and sometimes other structures not usually thought of as 'buildings', such as milestones or bridges.

1.3.12 The following scale of values will be used in assessing the value/sensitivity of historic buildings and structural remains. For each value, the asset types relevant to the definition are listed in brackets afterwards. Where the definition of the asset type is ambiguous (for example 'sites of international importance'), the assessing archaeologist will use his or her professional judgement in deciding whether to allocate particular historic buildings and structural remains to it.

- Very High (World Heritage Sites and other sites of international importance);
- High (Scheduled Monuments with standing remains, Grade I and Grade II\* Listed Buildings, other listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade, Conservation Areas containing very important buildings, undesignated structures of clear national importance);
- Medium (Grade II listed buildings, unlisted buildings that have exceptional qualities in their fabric or historical associations, Conservation Areas that contain buildings that contribute significantly to its historic character, Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings);
- Low (locally Listed buildings, historic buildings of modest quality, Historic Townscapes or built areas of limited historic integrity in their buildings or built settings);
- Negligible (buildings of no architectural or historical note);
- Unknown (buildings with some hidden potential for historic significance).

1.3.13 An 'Unknown' value may sometimes be all that can be determined, particularly in the early stages of a project. In these cases, an estimate of the risk of there being valuable archaeological remains that could be affected will be made with an indication of how this risk is to be managed.

1.3.14 The following scales of values will be used to assess the magnitude of impacts:

- Major (change to key historic building elements, such that the resource is totally altered; comprehensive changes to the setting);

- Moderate (change to many key historic building elements, such that the resource is significantly modified; changes to the setting of an historic building, such that it is significantly modified); considerable (changes to setting that affect the character of the asset);
- Minor (change to key historic building elements, such that the asset is slightly different, change to setting of an historic building, such that it is noticeably changed);
- Negligible (slight changes to historic buildings elements or setting that hardly affect it);
- No Change (no change to fabric or setting).

### Historic Landscapes

- 1.3.15 Historic Landscapes are defined by perceptions that emphasise the evidence of the past and its significance in shaping the present landscape. The definition encompasses all landscapes, including the countryside, townscapes and industrial landscapes as well as designed landscapes, such as gardens and parks. As the whole of the UK's (and most of the world's) landscape has been modified by past human activities, it all has an historic character. However, just as all old materials are not necessarily archaeologically significant merely by virtue of their age, so not all landscapes are equally historically significant.
- 1.3.16 In Wales some historic landscapes are considered particularly significant and/or well-preserved, and have been recorded in a Register of Landscapes of Historic Interest in Wales, issued in two parts in 1998 and 2001. These landscapes are classed as either of outstanding or special interest. The guidance related to these is advisory and non-statutory, but Historic Landscapes on the Register need to be taken into account when considering the implications of developments that will have more than a local impact.
- 1.3.17 The following scale of values will be used in assessing the value/sensitivity of historic landscapes. For each value, the asset types relevant to the definition are listed in brackets afterwards. Where the definition of the asset type is ambiguous (for example 'historic landscapes of international value'), the assessing archaeologist will use his or her professional judgement in deciding whether to allocate particular landscape to it.
- Very High (World Heritage Sites & historic landscapes associated with them);
  - High (designated and undesignated historic landscapes of outstanding interest, designated special historic landscapes, undesignated landscapes of high quality and importance, and of demonstrable national value, well-preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor/s);
  - Medium (landscapes of regional value, averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor/s);
  - Low (robust undesignated historic landscapes, historic landscapes with importance to local interest groups; historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations);

- Negligible (landscapes with little or no surviving archaeological interest);

1.3.18 The following scale of values will be used to assess the magnitude of impacts:

- Major (change to most or all key historic landscape elements, parcels or components; extreme visual, effects; gross change of noise or change to sound quality; fundamental changes to use or access resulting in total change to historic landscape character area);
- Moderate (changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access resulting in moderate changes to historic landscape character);
- Minor (changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access resulting in limited changes to historic landscape character);
- Negligible (very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character);
- No Change (no change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors).

1.3.19 The area lies within the Milford Haven Waterway Landscape of Outstanding Historic Interest (HLW (D) 9) and as such the effect on the Historic Landscape is assessed as part of an ASIDOHL2 study, which is included as an appendix. ASIDOHL2 studies use a different set of assessment categories to those recommended within the DMRB; therefore summaries of the ASIDOHL2 study will be provided within this Assessment and the ASIDOHL2 results will be cross-referenced with the DMRB categories illustrated above.

#### Judging the Overall Significance of Effect

1.3.20 Significance of effect is assessed by combining the value of the resource and the predicted magnitude of change/ effect likely to arise, as per the matrix provided below, which is extracted from the DMRB (Vol.II, Sect.3, Pt.2, Chap.5, Table 5.1).

VALUE/SENSITIVITY	Very High	Neutral	Slight	Moderate/ Large	Large or Very Large	Very Large
	High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large or Very Large
	Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate / Large



	<b>Low</b>	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
	<b>Negligible</b>	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight
		<b>No Change</b>	<b>Negligible</b>	<b>Minor</b>	<b>Moderate</b>	<b>Major</b>
		<b>MAGNITUDE OF EFFECT</b>				

## 2 BASELINE CONDITIONS

### 2.1 Site Description

- 2.1.1 The Blackbridge site occupies an area of mid-20<sup>th</sup> century development at c.8 - 9mOD on the northern edge of the Cleddau to the east of the town of Milford Haven, Pembrokeshire (Figures 1-3, SM 9165 0515). The site comprises the former Royal Naval Armaments Depot (RNAD) and consists of several large brick and concrete buildings. The site is located at the confluence of Castle Pill and the Cleddau, where a large levelled terrace approximately 700m by 550m has been created for the construction of the RNAD depot. This is fronted to the south by a large concrete sea wall to the Cleddau itself, and to the north by a steep quarried and scrub-covered cliff face. An open area also extends back into the mainland, where a small stream valley to the northeast has been artificially enlarged as part of the RNAD site. The terrace narrows to the east, beyond the location of an associated jetty, with a concrete and tarmac track running along the seawall and in front of the cliff, giving access to various tunnels to the east.
- 2.1.2 Four main large derelict industrial buildings comprise the main depot site, set in two rows, and all largely stripped of internal fixtures and fittings. To the rear lies a steel-framed concrete building approximately 180m by 45m with a corrugated iron saw-toothed roof. It was built in 1939 as a bulk store, and has more recently been converted with the insertion of an internal tarmac racing track at the eastern end. This building will be utilised and enlarged as the Pyrolyser House. Attached to the eastern end of this building is a rectangular steel-framed building with brick wall inserts and a curved asbestos roof, measuring 45m by 62m. This was originally constructed in 1939 as a large component store and will be converted into the Grinding Hall. The 2<sup>nd</sup> row of buildings on the seaward side of the complex includes a square triple pile steel-framed building with brick walls and corrugated asbestos saw-toothed roof. This was originally built in 1939 as a workshop block, and is to be converted into the Control Room. Detached to the east is a brick-built, triple pile building with a corrugated asbestos saw-tooth roof. This was originally built in 1939 as an assembly shop for buoyant mines, but due to structural problems it will be demolished and replaced by



an Engine House, contained within a slightly longer building. To the west of these two rows of larger buildings stands a rectangular single-storey brick built structure with a pitched gable roof on steel trusses. The building is now roofless with vegetation build-up internally. This was originally constructed in 1939 as a timber store. Adjacent to this building is a small brick-built, flat-roofed former latrine built c.1970 and now only partly roofed with semi-tumbled walls. Towards the eastern end of the site lies a rectangular two-storey brick-built building with a dutch-gable slate roof and a later attached pitched gable-roofed brick-building on its rear eastern side. The interior is stripped but wood-block flooring survives. This was originally built in 1939 as an office and medical centre.

- 2.1.3 The remainder of the site consists of hardstanding and levelled rubble, having been cleared of other standing buildings. Rail lines are visible set into the ground surface along the northern edge of the site. Further substantial concrete walling and tunnel entrances exist to the east and northeast, but these are largely covered in scrub with areas of rubble also visible. This area formerly comprised numerous store houses, laboratories, workshops, substations, bomb stores and the main manufacturing building associated with the RNAD site. To the south lies an 'L' plan steel-pile jetty with a masonry pier. It was originally built in 1872 and is to be refurbished as part of the proposed development plans.
- 2.1.4 The Blackbridge site also includes an area of land on top of the cliffs that back on to the main depot site. This area includes both enclosed pasture and an extensive area of scrub. The scrub encompasses part of the former RNAD site, and includes a defensive fenceline and other wartime defensive positions and sentry posts lost amongst the undergrowth. The enclosed pasture includes former semi-buried reservoirs, built as emergency water supplies in 1939. This land rises from c.23mOD along its southern edge to 35mOD along its northern edge, and land continues to rise gradually to the north to a ridge at c.58mOD, along which the B4325 runs, before falling away slightly again.
- 2.1.5 The southern boundary to the Blackbridge site is formed by the Cleddau River, a wide coastal Ria. The western boundary of the site is formed by Castle Pill, a wide tidal inlet, beyond which lies the settlement of Milford Haven. To the north, beyond the cliff face and the scrub and pasture topping the cliff there is further agricultural land. To the east lies a small former coastal stream valley that runs off to the northeast, with development also continuing along the sea cliff face. The former Gulf Oil refinery lies further to the east, and the Texaco Oil refinery (acquired by Valero in 2011) lies on the opposite banks of the Cleddau to the south.
- 2.1.6 The Waterston site is spread over two main areas. The proposed Fish, Prawn and Algae Farms and Research Centre are located in the northeast corner of the former Gulf Oil Refinery (Figures 1, 2 & 4; SM 9385 0522). Construction work began on the refinery in 1966. It was closed down as a refinery in 1997 and is now subdivided, with part of the site operating as the Dragon LNG terminal and part as the SEM Logistics Chemicals storage facility. The area of proposed development has now largely been cleared of

buildings and is derelict, although some large rectangular units remain. The use and former layout of this area is not fully understood. Mapping would indicate that the Prawn Farm area was intensively developed with buildings, tanks and pipes; the remaining area less intensively so.

- 2.1.7 The site is surrounded to the south and west by tanks and industrial buildings, and to the north by administrative buildings and car parking within the refinery complex. A high embankment and security fencing surround the northeast and eastern sides of the site, beyond which lies the Hazelbeach/Waterston Road and agricultural land.
- 2.1.8 The Cheese and Packing Factory lies just to the north of the boundary of the former Gulf Oil Refinery, immediately to the east of the village of Waterston (Figure 2; SM 9395 0563). The site is largely occupied by a former car park, bounded by hedgerows, with agricultural land to the north and east. This agricultural land is currently in use as pasture.
- 2.1.9 The bedrock geology consists of interbedded argillaceous rocks and sandstone of the Milford Haven Group which extends across both the Blackbridge and Waterston areas, with a coastal outcropping of sandstone of the Cosheston Group also encompassing the eastern part of the Blackbridge site (BGS, 2015).

## **2.2 Previous Archaeological Studies**

- 2.2.1 The area is included in the Milford Haven Waterway Area of Outstanding Historic Interest (HLW (D) 3) within the Register of Landscapes of Outstanding Historic Interest, published by Cadw, CCW and ICOMOS UK in 1998. The site and the area around it are located within Historic Landscape Character Area 307 Milford Haven (Blackbridge site) along with 310 Gulf Oil Refinery and 348 Waterston - Honeyborough (Waterston site). The area has also been assessed as part of LANDMAP, which includes an assessment of the Historic Landscape (Milford Haven PMBRKHL43876, Gulf Oil Refinery PMBRKHL43879 and Waterston – Honeyborough PMBRKHL43895) based around the same boundaries and reasoning as the HLCA.
- 2.2.2 In 1993 the RCAHMS undertook a survey of the Blackbridge RNAD site, which included black and white photographs of many of the standing buildings and a site report (NMR site files, Catalogue Nos. C3001 – C3004).
- 2.2.3 In 1994, Roger Thomas undertook an assessment of disused military buildings in the area that included a comprehensive survey of all standing remains on the Blackbridge site (Thomas, 1994).
- 2.2.4 In 2002, Dyfed Archaeological Trust (then Cambria Archaeology) undertook a desk-based assessment as part of an Environmental Impact Report on the development of the Petroplus LNG site (Crane, 2002), which identified numerous sites of interest, some of which were subsequently excavated, but all lying outside the current areas of proposed development. In 2015, Dyfed Archaeological Trust undertook a Cadw-funded project examining WWI remains throughout Southwest Wales, which included several sites located on and around the Waterston site (Pyper, 2015).

- 2.2.5 Two wide-ranging studies have also been undertaken encompassing the Milford Haven Waterway and including the areas of proposed development. In 1997-8 Dyfed Archaeological Trust undertook a Cadw-funded coastal survey of the lower Milford Haven Waterway area (Murphy & Allen, 1998). A study was also undertaken on the Milford Haven Waterway area by Dyfed Archaeological Trust in 2008 (Poucher, 2008). This study examined the general history and development of the waterway, focusing largely on maritime links and the archaeological potential of the area.
- 2.2.6 In addition, an ASIDOHL2 study (Poucher, 2016) has been undertaken following recommendations from Natural Resources Wales (NRW). This study examined the impact on the Historic Landscapes.

### **2.3 Site, Monument, Building and Landscape Designations (Figures 5 – 11)**

- 2.3.1 In order to assess the historic environment, Scheduled Ancient Monuments (SAMs), Historic Parks and Gardens, Registered Historic Landscapes, Conservation Areas, and Listed Buildings were examined within 5km of the proposed development. This was subsequently reduced by utilising a Zone of Theoretical Visibility (ZTV) to assess the impact on these assets (Figure 5).
- 2.3.2 Within the 5km search area thirty Scheduled Ancient Monuments were identified (Figure 7). None of these sites lie within the area of proposed development, however eighteen lie within ZTV.
- 2.3.3 Within the 5km search area 286 Listed Buildings were identified (Figure 8), including four Grade I listed buildings and thirty-four Grade II\* listed buildings, the remainder being Grade II listed buildings. No Listed Building lies within the development area, however, 227 listed buildings lie within the ZTV, including one Grade I listed building and twenty-four Grade II\* listed buildings.
- 2.3.4 There are two listed historic Parks & Gardens within the 5km search area (Figure 6). Neither lie within the proposed development area, one lies partly within the ZTV (Castle Hall PGW (Dy) 16 (PEM)), which is Grade II\* listed.
- 2.3.5 There are four Conservation Areas within the 5km search area, comprising Pembroke Dock, Milford Haven, Neyland and Honeyborough (Figure 6). The development area does not lie within a Conservation Area, but all Areas lie partly within the ZTV.
- 2.3.6 The proposed development area lies within the Milford Haven Waterway Landscape of Outstanding Historic Interest (HLW (D) 3). This area is divided into many individual Historic Landscape Character Areas (HLCA), which also encompass areas lying outside the limits of the Registered Historic Landscape (Figure 6). The proposed development sits within Historic Landscape Character Area 307 Milford Haven (Blackbridge site) along with 310 Gulf Oil Refinery and 348 Waterston - Honeyborough (Waterston site). These landscape areas are fully assessed within the accompanying ASIDOHL2 study.
- 2.3.7 Within 2km of the proposed development there are 541 unregistered sites (Figures 9-11 & 15) listed within the regional Historic Environment Record (HER). 119 of these sites lie wholly or partly within the proposed development area, of which 115 refer to specific features of the Blackbridge Royal Navy Armaments Depot, upon which the Blackbridge development is to be located.

- 2.3.8 A further three sites are recorded on the National Monuments Record (NMR), held and maintained by the RCAHMW (Figures 10&11), that have not been previously recorded within the HER. In addition to these previously recorded sites, background research, historic map regression, analysis of aerial photographs and a site visit has identified four new sites not listed within either the regional HER or the NMR.

## **2.4 Historical Development**

### *Prehistoric (Palaeolithic to Bronze Age)*

- 2.4.1 Nomadic groups are known to have been moving through the area during the Late Palaeolithic (c. 45,000 – 10,000 BC) and Mesolithic (c. 10,000 – 4400 BC) periods, as indicated largely through flint scatters. Priory Farm cave, near Pembroke, contains some of the best evidence of activity during these periods. The earliest remains from this cave date to c.10,000BP, when significantly lower sea-levels (20-20m lower) would have meant the landscape in the Milford Haven area would have been markedly different. Sea-levels would gradually have been rising throughout the Mesolithic period. Mesolithic exploitation is likely to have been based on seasonal movement between camps, exploiting a variety of different resources including marine and estuarine environments. There is currently no record of activity from these periods within the study area, and with subsequent rising sea-levels some of the best evidence may currently be below-water.
- 2.4.2 By the Neolithic period (c.4400 – 2300 BC) sea-levels had reached something approximating current levels and the Waterway would have been established in much of its current form by that time. This is generally considered to be a period when human groups were beginning to establish more permanent settlements, although evidence of this is scarce in this general area. There are some indications of maritime trade and communication routes using the Waterway during this period, with possible associations with Ireland and western England. The HER records two possible Neolithic finds within the study area, a stone axe-head found re-deposited in a bottle dump in the Llanstadwell area (PRN 102609) and a flint flake from the south side of the Haven (PRN 8500).
- 2.4.3 During the Bronze Age (c.2300 – 700 BC) the appearance of burial mounds and burnt mounds may suggest population levels were increasing, or at least the physical evidence of their presence survives better. Evidence of settlement during this period has been found in the wider area, once again at Priory Farm cave, but also during excavations at the former Esso Oil Refinery (Crane 2004) and on Dale Point (Benson & Williams, 1987). Evidence of Bronze Age activity within the search area however is scarce and based largely on place-name evidence. Place-names have been used to suggest the possible locations of standing stones at 'Maen Dewi' (PRN 10488) near Steynton and 'Longstone' (PRN 4500) to the northeast of Waterston, and burial mounds at 'Fenny Garn' (PRN 3214) on the south side of the Haven and 'Mount Meadow' (PRN 4507) to south of the former Gulf Oil Refinery. The latter was excavated and revealed no evidence of a Bronze Age burial although it is also claimed that a Bronze Age round house and finds were recorded in an adjacent field, but these finds are not listed on the HER. During the site visit an unrecorded standing stone (Photo 39) was noted at SM 9187 0531 (BMH03). The provenance of this stone is

unknown, it may be prehistoric in date, although later stones are known to have been erected as boundary stones or cattle rubbing stones. Burnt mounds are recorded to the northeast of Waterston (PRNs 3185, 3191); these are mounds of heated stone and charcoal that may have been used to heat water, and are often dated to the Bronze Age.

#### Iron Age (c.700 BC – AD 43) & Roman (AD43 - AD410)

- 2.4.4 Evidence of activity during the Iron Age is far more extensive within the study area, and throughout the Waterway. This activity, as with much of southwest Wales, is dominated by defensive sites, and there are twelve such sites recorded within the search area, defended by the natural topography, augmented by a series of banks and ditches. These consist largely of coastal sites, although some do lie inland. Due to the strategic importance of the Waterway throughout its history many of these Iron Age sites have been re-used during the medieval and post-medieval periods, sometimes making their interpretation difficult. Few have been excavated, or survive to the extent that internal arrangements can be fully understood, but their proliferation may suggest an increase of settlement in the area.
- 2.4.5 Castle Pill, which lies immediately to the west of the Blackbridge development, is surrounded by three or four defended enclosures, although some may have been either re-used or created in the medieval and Civil War periods. One lies at the mouth of the Pill, on the western bank (PRN 3170), another further up on the western bank (PRN 3175) with a third at the head of the Pill (PRN 3367). The place name 'Camp Meadow', and its location on a promontory, may indicate another defended enclosure overlooking the Blackbridge site from the east (PRN 12110). There is a possibility that this latter site, if it proves to be 'real', may be affected by the pipeline and track-work associated with the proposed development.
- 2.4.6 Very little is currently known about the subsequent use of the Waterway during the Romano-British period. The few finds of this period from this location may suggest the area saw little change from the preceding late Iron Age. Evidence within the search area is confined to a few stray finds (PRNs 3177, 11804 & 11849). However, Ptolemy's Geography, written in the 2<sup>nd</sup> century AD, clearly indicates the Romans had a good knowledge of the coast of Wales, and there is likely to have been a flourishing coastal trade during this period. The relatively recent identification of a fort and settlement at Wiston indicates the occupation and settlement of Pembrokeshire is not well understood and further evidence is likely to come to light.

#### Early Medieval (c. AD 410 – AD 1066)

- 2.4.7 Coastal trade may have been disrupted by the later Roman period as raiding from Ireland increased, but following the collapse of Roman administration this area is likely to have formed strong trade and cultural links with Ireland. Evidence of settlement during this period is scarce, although their existence can often be inferred from religious sites and later medieval village morphologies. Many of the old churches along the Waterway are likely to have their origins in this early medieval period, and early medieval cemeteries have also been identified. St Tudwal's church in Llanstadwell

(PRN 46820), which lies within the search area, is one such church site with likely early medieval origins.

- 2.4.8 There is some evidence of a Norse influence on the area during this period. It is known that Vikings sheltered in the Waterway between c.790 and 1066. Hubba, a Viking chieftain, wintered in the Haven with 23 ships in 854 AD, and this Norse connection is also reflected in many of the local place-names, such as Hubberston and Freystrop. Evidence of iron smelting and corn drying were uncovered in archaeological excavation at the former Esso Refinery (Crane, 2004a), and were radiocarbon dated to around 780-890 AD, which may be evidence of Viking over-wintering, or otherwise evidence of a smelting technology that was thought to have been lost in Wales following the collapse of the Roman Empire (Poucher 2008). Evidence of similar corn-drying activity was also recorded in excavations of a former coastal farmstead within the search area, associated with the former Gulf Oil Refinery (Crane, 2004b), which was radiocarbon dated to AD 720 – 960 (PRN 102357).

#### Medieval

- 2.4.9 Subsequent to the Norman conquests of the late-11<sup>th</sup> century local power centres were focused on a series of coastally-sited castle-boroughs, such as Pembroke, Haverfordwest and Carew, which provided them with defensible sites with easy access to the Waterway. A more locally significant power centre was established at the head of Castle Pill, where a castle (PRN 3178) was established, possibly re-using Iron Age defences. This site became the centre of a relatively large and important medieval manor.
- 2.4.10 Many of the settlements in the area also have their origins in the medieval period. Some, such as Pembroke, Haverfordwest and Angle, display the characteristics of planned town layout, with burgage plots aligned off a main street, whilst others display a more radial development around a central focal point, often a church. The HER records only two medieval settlements within the search area, one focused on Newton (PRN 12904), to the south of the former Gulf Oil Refinery, and another possible site at Lewiston Hill (PRN 8467) on the south side of the Cleddau. However, it is likely that villages such as Waterston, Honeyborough and Llanstadwell were also established during this period, along with other sites making use of the coastal resources such as Hubberston Pill and Castle Pill. Fish-traps recorded within Castle Pill (PRNs 34906 & 43973) may be evidence of this exploitation. Field systems were also established surrounding these settlements, such as at Waterston (PRN 6418) which included mixed agricultural land subdivided amongst the local farmers based in the village, with open grazing on more outlying land. The medieval field systems can still be seen in various places today, although to the south of Waterston the agricultural land has been supplanted by the extensive refinery development.

#### Post-medieval

- 2.4.11 The early post-medieval period within this area saw the decline of the castle at the head of Castle Pill as an important manorial centre. By 1577 the caput of the manor was transferred elsewhere and it is likely the castle, and any surrounding settlement



appears to have either been abandoned or gradually relocated along the banks of the Pill, to be later subsumed into Neyland. The Pill itself however appears to have been used as an important anchorage throughout this period, the importance reflected in the fact that at least one, and possibly two, gun emplacements were established during the Civil War (PRNs 3170 & 3367) to protect the ships anchored within the Pill. These gun emplacements were established by Royalist forces, one of which was armed with '18 great ordnance'. The Welsh Port Books also record many ships being 'of Pyll' throughout the 16<sup>th</sup> century, indicating the continued importance of the pill as an anchorage and possible ship-building area.

- 2.4.12 Elsewhere within the study area, settlement during the earlier post-medieval period appears largely focused on small rural sites, such as Newton (PRN 45248), Wear Point (PRN 34843) and possibly Newton Noyes (NPRN 416748), or small fishing villages such as Hubberston. Llanstadwell is likely to have seen some expansion during this period, and it is possible that some settlement had developed around Neyland by the 18<sup>th</sup> century. However, an expanding fishing industry in the mid-18<sup>th</sup> century meant that Neyland became one of the largest herring ports in Wales, and the Admiralty was attracted to site, establishing a naval shipbuilding site there in c.1760.
- 2.4.13 In 1782 Sir William Hamilton inherited a large amount of property in this area and exploited a need for a supply base in the area for naval activity and long-distance trade. Hamilton applied to Parliament and in 1790 was granted the right to establish a port on his property, centred on the Hubberston Pill. In 1793 Quaker Whalers from Nantucket were attracted to settle at the newly emerging port, and in 1797 the Navy Board were also persuaded to establish dockyards in the Pill. Settlement expanded in the Hakin area, but a new settlement laid out in a distinctive grid-iron plan was established on the eastern side of the Pill, which became known as Milford Haven. The naval docks were defended by two batteries, each with their own barracks.
- 2.4.14 The naval port outgrew its location and were transferred to a new purpose-built site at Pembroke Dock in 1812-14. The steam packet service to Ireland also moved from Milford Haven to near Pembroke Dock in 1832 and the region's major railway terminus was built in Neyland in 1856, all of which contributed to a decline in Milford Haven. A town improvement bill of 1857 led to the building of the Black Bridge, as well as Hakin Bridge, opening up the town to easier overland access. The Milford Docks Company was formed in 1874 and new docks were opened in the 1880s, initially used by transatlantic ferries before becoming the home to a large and successful fishing fleet. Small shipyards were established in the area, most notably within Castle Pill. Milford Haven became one of the chief fishing ports in Britain, leading to the establishment of a fish market, ice factories and smoke houses. Settlement also began to increase, eventually linking the formerly dispersed villages surrounding the original town. As part of this later-19<sup>th</sup> century development a jetty (PRN 26089) was built at Newton Noyes allowing ships to offload in deeper water, and a railway (PRN 34525) established linking it to Milford Haven. Industry subsequently developed around the head of the jetty (Figures 12&13) with the establishment of an Oil and Manure Works (NPRN 416749).
- 2.4.15 At Pembroke Dock a similar planned settlement was laid out around the naval docks in the early 19<sup>th</sup> century, and growth was rapid. The docks were extended twice and by the mid-19<sup>th</sup> century it had become one of the world's most important naval

shipbuilding centres. The population was boosted by the presence of the Royal Marines, and subsequent troops posted in several barracks throughout the area. Forts, defensible barracks and Martello towers were built by the mid-19<sup>th</sup> century to defend Pembroke Dock.

2.4.16 By the mid-19<sup>th</sup> century work began on constructing a series of forts throughout the Waterway to defend against possible seaborne attack. Initially a series of forts were built around the mouth of the Cleddau. This was extended from the late 1850s to 1890s to incorporate a number of new forts further up the Waterway, including South Hook, Popton, Hubberston, Chapel Bay and Scoveston.

2.4.17 Elsewhere throughout the Waterway general industrial development led to an increase in settlement, ports and quays. Coal was beginning to replace charcoal as a fuel source during the 17<sup>th</sup> century, but it was largely in the 18<sup>th</sup> and 19<sup>th</sup> centuries that coal mining became an important industry in the area. The mines themselves were concentrated along the coal measures in the upper Cleddau area, but the increased river traffic led to the development of quays further downriver to offload the coal onto larger ships for the coastal trade. Quarrying was another major industrial activity during this period, with a variety of stone available, from hard millstone grit and sandstones, through to softer limestones and siltstones. An extensive local coastal trade developed in processing the quarried limestone in particular, as can be seen by the numerous lime-kilns dotting the coastline.

### Modern

2.4.18 A decline in the coal and quarrying industries in the early 20<sup>th</sup> century led to a reduction in much of the industrial traffic on the Haven, and the scaling down and abandonment of many of the former quarry and coal quays. Maritime industry became somewhat turbulent throughout the 20<sup>th</sup> century. During the early 20<sup>th</sup> century Castle Pill became increasingly industrialised, eventually becoming the site of a major ship breakers yard in the 20<sup>th</sup> century, with possible associations with Newton Noyes jetty (NPRN 576). By the early 20<sup>th</sup> century larger ship technology meant the facilities available at Pembroke Dock were becoming outdated and the dockyards closed in 1926. A severe decline in the fishing industry in the mid-20<sup>th</sup> century also led to a stagnation in Milford Haven.

2.4.19 The Waterway retained a strong military presence throughout the 20<sup>th</sup> century however. The series of forts that were constructed in the mid to late-19<sup>th</sup> century were soon outdated, in some cases almost obsolete as soon as they came into operation. However, the outbreak of World War I led to the construction of submarine mining establishments at Pennar Point and Chapel Bay fort, as well as the establishment of airfields for airships and aircraft, including a Royal Navy airship station at Castle Pill. The dockyards of Pembroke Dock were also partly re-opened, becoming a Sunderland flying boat station in 1930, and the two wars of the 20<sup>th</sup> century meant a military presence remained in Pembroke Dock.

2.4.20 Prior to the outbreak of World War II enormous investment had been occurring into the infrastructure of industrial sites in the Waterway to allow for a rapid military expansion should war become inevitable. As mentioned, a Sunderland flying boat



station had already been established in Pembroke Dock in 1930, and in the run-up to the war several new airfields were constructed. A variety of extensive military installations were established, including gun batteries, searchlight batteries and armaments depots amongst others. Alongside these major installations more discreet features were also built, such as pillboxes, machine-gun posts, tank traps and other features.

2.4.21 The Royal Navy Armaments Depot at Blackbridge (referred to as both RNAD Blackbridge and RNAD Milford Haven) was part of the expansion of the armed forces infrastructure, once it was clear that Germany was re-arming. The Blackbridge site was acquired by the Admiralty for a mine manufactory and depot in the 1930s, and large-scale development works commenced in 1935 (Photos 5-14). The site itself was opened in 1939, built in parallel with another site at Tracwn. A series of photographs held within the Scolton Manor Museum archives document the construction of the RNAD depot (Photos 1-14). These photos clearly document large-scale landscape transformations involved in establishing the site, likely to have removed, or severely impacted upon, any pre-existing archaeological remains within the footprint of the main manufacturing and engineering complex. The site was divided into two main areas. The main manufacturing complex was constructed within the coastal valley at the eastern end of the site, consisting of the filling factory with magazines built underground into the valley slopes to the north and south. Gun cotton and torpex were the main explosive used, although the site manufactured and processed a range of naval armaments throughout its operation. A large concrete blast wall separated this area from the rest of the site to the west, which contained a range of large stores, component manufactories and laboratories, offices, and a variety of other ancillary structures. The high ground above the site contained a series of emergency water supply reservoirs, with the area directly above the underground magazines further protected by a series of earthworks, gun emplacements, sentry posts and a defensible fenceline. The site played a vital role in the Royal Navy mining and munitions activity during the war, built to store large stocks of ammunition away from areas of likely attack, and all mine laying activity was supplied through this site. It remained in use as a key site for the Royal Navy (Figure 14) until its final closure in the late 1980s (Photos 15-22). The manufactory area to the east of the blast wall was demolished in 1990, and the area landscaped to return it to a more natural state. Photographs documenting this demolition indicate both the comprehensive nature of the demolition work, and also the significant depth of demolition material and imported topsoil that are likely to cover this area. A large number of the remaining structures on the site were demolished when the site was under council ownership and had gone out of active use.

2.4.22 The arrival of major oil refinery sites in the lower Haven in the mid to later-20<sup>th</sup> century provided a major boost to employment and population levels in the area. In 1957 work began on the huge Esso Oil refinery, opening in 1960, and large tankers began to navigate the deep waters of the Waterway. A BP jetty was built in 1961 on the south side of the river, with the adjacent Texaco Oil Refinery opening in 1964. Construction work began on the Gulf Oil Refinery in the 1960s, which began taking tankers in 1968 (Photos 40 & 41). The Amoco Oil refinery opened in 1973.

### **3 POTENTIAL IMPACTS**

#### **3.1 Sources of Potential Direct Effects**

- 3.1.1 The working practices during site preparation and construction that have the potential to generate direct effects on heritage assets, and which have been considered in the Assessment, include:
- Enabling works, such as installation of contractor's compound, construction of access roads, parking areas, storage areas, borrow pits and associated services;
  - Landscaping and terracing works;
  - Topsoil stripping;
  - Foundation excavation;
  - Construction of roads and infrastructure;
  - Service installation;
  - Building renovation;
- 3.1.2 Without mitigation, the direct effects from these working practices would be permanent and irreversible.

#### **3.2 Sources of Potential Indirect Effects**

- 3.2.1 Operational effects that have the potential to generate indirect effects on heritage assets, and which have been considered in this Assessment, include:
- Alteration to the visual setting or tranquillity of heritage assets; and
  - Alteration to the visual setting or tranquillity of the more holistic 'historic landscapes'.

#### **3.3 Archaeological Remains**

##### **Blackbridge Development**

- 3.3.1 At Blackbridge a significant number of assets have been identified within the proposed development area, and are largely the result of the survey work undertaken in the 1990s to document the former Blackbridge RNAD site. Maps, plans and photographs (both on the ground and aerial) and brief descriptions of all standing buildings compiled. Since that time a large number of these buildings have been demolished. Those buildings that have been demolished are now included as archaeological remains, with extant buildings included in the subsequent standing buildings sections. Additional sites and areas of archaeological potential are also included. These assets are all undesignated sites. No designated assets considered under the Archaeological Remains category (Scheduled Ancient Monuments) will be affected directly by the proposed development.

- 3.3.2 A total of 114 assets exist that are related to the development of the Blackbridge RNAD site, of which 33 are classed as intact, or largely intact and included in subsequent sections. Therefore 81 sites have either been partially or largely demolished, or consist of earthwork features, and are included here (Photo 36). The RNAD site as a whole is labelled as **PRN 28801**, whilst individual buildings and features within this site are listed in Appendix 1. Construction began on the Blackbridge RNAD site in 1935, which became operational in 1939. The site remained in use after the end of the war and continued in use by the Royal Navy until the late 1980s, being decommissioned in 1989/90 (Photos 20-22). The site is of great importance for the role it performed for the Royal Navy (including supplying mines vital to the D-Day landings), being one of only four such sites nationwide (with nearby Tracwn, as well as depots in Plymouth and Portsmouth). The individual buildings have been documented and photographed in previous surveys and subsequently demolished to ground level, and, in the case of the filling factory, extensively demolished (Photos 23 & 24). The flooring and subsurface remains of these buildings are not considered to hold the same intrinsic importance, and are individually therefore considered to be of Low value. The impact of the development will be varied on the individual assets and they cover a wider area than will be encompassed by the proposed buildings, but due to the scale of the development it is likely this impact can be general considered to be Major.
- 3.3.3 Prior to the establishment of the RNAD site the area was crossed by a railway connecting Newton Noyes jetty to Milford Haven, via Blackbridge (the pre-existing jetty still stands and is included in the subsequent section). The railway (**PRN 34525**) was established in the 1880s and used for mineral traffic. Late 19<sup>th</sup> and early 20<sup>th</sup> century maps also record an associated engine shed at SN 9184 0506. This railway was incorporated into the RNAD site, however, comparisons of photographs of the RNAD site in operation during the 1950s and 60s (Photos 1-4, 17 & 18), compared to the current visible remains (Photos 25-36), suggest the original railway line is likely to have been replaced during the operational life of the Depot. Associated features such as the engine shed were removed, with subsequent intensive development likely to have destroyed any remains of this structures. Therefore this site is considered to be of Low value. The proposed development, namely the Dryer Hall (building No.10) and access route improvements, will affect various sections of the original route of this railway, although due to the likely very limited survival of original elements of this railway, this is considered to be a Minor impact.
- 3.3.4 By the late 19<sup>th</sup> century a small industrial area (**NPRN 416749**) had been established at the head of Newton Noyes jetty. A lease agreement of 1891 suggests the site consisted of a factory, workshop, sheds and other ancillary buildings. By the early 20<sup>th</sup> century this formed part of the Oil & Manure Works, the manure presumably being guano brought in to the Newton Noyes jetty from overseas. An additional 'Works' building was added to the northwest by 1917. The Oil & Manure Works appears to have ceased operations in the 1930s when the land was acquired by the Admiralty. A Board of Trade map of 1936 appears to show the site as either abandoned or partly demolished, and photographs of the construction of the RNAD site document the demolition of a rather ornate structure, believed to be remains of the Works. The architectural detail suggests an unusual industrial building, and therefore it is considered to be of Medium value. The degree of development works undertaken for

the RNAD is likely to have removed much of this site however, therefore the proposed development is considered to have a Minor impact on this asset.

- 3.3.5 Within the base of the small coastal valley to the north of the jetty there was located a pre-existing farmstead of Newton Noyes (**NPRN 416748**). A farmstead, or dwelling, appears to have been at this location for some time. The site is marked as early as Bowen's map of 1729, labelled as 'The Noise'. Given that Newton farm to the east (PRN 45248) was shown to have medieval origins, it is possible that this site may also have its origins in the same period. By the time the site is first accurately depicted on maps in the mid-19<sup>th</sup> century it appears to consist mainly of a farmhouse, with a range of farm-buildings to the northeast. The farmhouse faced west, towards the sea, with gardens arranged to the front and rear, possibly enclosed by walls, and a series of smaller fields surrounding the site within the valley. The site appears to have survived up until the building of the RNAD site, although it is possible it had lost its farming associations and farm buildings during the early 20<sup>th</sup> century with the development of the adjacent industrial site. Due to its potential early origins this site is considered to be of Medium value. It is clear that extensive development has been undertaken in this area, which is likely to have both removed any remains of the farmstead, but also of associated farm buildings and even field enclosures, therefore further development is considered to have a Negligible impact.
- 3.3.6 Early 20<sup>th</sup> century mapping illustrates other features that may be associated with the Newton Noyes house/farmstead site or adjacent industrial works. To the southeast of the farmstead an ice house (**BMH 01**) is shown on the 1906 Ordnance Survey map and some subsequent maps. As an area of intensive development associated with the RNAD site it is unlikely any remains associated with this site survive. To the west a boathouse (**BMH 02**) is also noted on later plans, although it is separated from Newton Noyes house by the mineral railway. This area has also since been extensively redeveloped by the establishment of Blackbridge RNAD, and it is unlikely any remains of this boathouse survive. Both these features are considered to be of Low value, and due to the likelihood that remains have been removed, the proposed development is considered to have a Negligible impact.
- 3.3.7 An area of high ground to the east of the Blackbridge site is named on the tithe map as 'Camp Meadow' (**PRN 12110**). The use of the name 'Camp' would suggest a possible military site, which given the coastal location has been suggested as a reference to an Iron Age defended enclosure. No positive evidence of this site has since come to light, but if it does prove to be an Iron Age defended enclosure then it would be considered to be of Medium value. The access route and service corridor pass through this area, both of which have the potential to impact on the site should it exist, although given that the exact location of any site is unknown this impact is considered to be Minor.
- 3.3.8 The route of the proposed access route and service corridor follows a pre-existing trackway. Part of this trackway has been identified in association with Newton Farm to the east, and is considered to have potential medieval origins (**PRN 45245**). This is considered to be a feature of Low value. The proposed works will affect c.120m of this trackway, which extends further to the east. Improvement works are likely to result in the removal of any associated archaeological remains, which is considered to be a Moderate impact.

- 3.3.9 During a site visit a standing stone (**BMH 03**) was identified at SN 9187 0531. The provenance of the site is unclear, similar standing stones have been identified as Bronze Age monuments although now used as boundary stones or cattle-rubbing stones. This particular stone has not been identified previously, and aerial photographs of the early 1950s show a series of 'elephant' huts at this location, used for munitions storage, with no clear evidence of a standing stone in place at that time. It would also seem unlikely such a feature would be left standing in such an area of activity. As a potential Bronze Age monument the value of this asset is considered to be Medium, although clearly this value will be reduced if the site proves to be a recent installation. No development is proposed at this location, although there remains a potential impact from the movement of construction traffic and other associated works. The impact is considered to be Minor.

#### Waterston Development

- 3.3.10 At the Waterston site there are few assets listed within the regional HER. In the area of the Aquaculture Units within the bounds of the former Gulf Oil Refinery several features have been identified related to the WWI defence of the Milford Haven Waterway. A series of defensive positions, barbed-wire entanglements and barracks are recorded from Llanstadwell westwards, through the Waterston area. The full extent of these sites is not currently understood, but they largely appear to lie beyond the area of proposed development, the closest being **PRN 107716**, c.100m to the west of the Aquaculture Units, and all within the intensively developed refinery area. These features are considered to be of Low value. The development is likely to have removed any evidence of these features, and is therefore considered to have a Negligible impact.
- 3.3.11 The village of Waterston is likely to have medieval origins, and was surrounded by a distinctive field system (**PRN 6418**) that may have initially been laid out during the medieval period. The surrounding agricultural land extended both to the east and south, encompassing all proposed development areas. These features are considered to be of Low value. This field system has been supplanted by the Refinery development, and therefore the development is therefore considered to have a Negligible impact.
- 3.3.12 This area to the east of the village includes a field described on the mid-19<sup>th</sup> century tithe apportionments as 'Church Park' (**PRN 4503**). There is no indication that this name denotes the site of a former church, it would appear more likely that the land may have once belonged to a local church. This area is considered to be of Low value. The proposed cheese and packaging factory developments are located in this area (Photo 42), although this is considered to have a Negligible impact on this site.
- 3.3.13 Only one new feature has been identified through research associated with the Waterston site. On early 20<sup>th</sup> century mapping a new farmstead, called Springfield (**BMH 04**), was established on the south side of the Hazzelbeach Road. The proposed services corridor between the Aquaculture units and the cheese and packing factories crosses this site. The farmstead however was removed with the development of the refinery in the 1960s, and the site currently lies underneath the substantial bank that surrounds the northern edge of the refinery with no above-ground remains evident.

This site is considered to be of Low value. The services corridor appears to avoid the main buildings relating to the farmstead complex, therefore the impact is considered to be Minor.

#### Indirect (Visual) Impacts

- 3.3.14 In the wider study area the potential indirect (visual) impacts of the proposed development on designated assets have been assessed, namely Scheduled Ancient Monuments (SAMs) spread throughout the Waterway. All such sites are considered to be of High value. A Zone of Theoretical Visibility was used to define eighteen assets that may be indirectly affected, and this was further refined through site visits.
- 3.3.15 West Pennar Camp (**PE262**), a prehistoric defended enclosure, is located on high ground along the southern edge of the Cleddau. This position afford views north across the Waterway that encompass the Blackbridge development site, Waterston is likely to be hidden by existing structures. The site is however c.2.5km to the northeast, and partially obscured by topography and intervening structures. The impact is therefore considered to be Negligible.
- 3.3.16 West Popton Camp (**PE264**) is a similar coastal prehistoric defended enclosure on the south side of the Cleddau. This site has clear views across the Waterway of the Blackbridge development, which will form a dominant feature in views from this site, and further industrialise the general coastal setting of this feature, albeit not in its immediate vicinity (Photo 45). This is considered to be a Minor impact.
- 3.3.17 Fort Hubberston (**PE338**), a mid to late-19<sup>th</sup> century fortification, occupies a prominent position above Hakin, 2.3km to the west of the Blackbridge development. The eastern side of this fort has extensive views east along the Waterway, encompassing the full extent of the Blackbridge development. The development will not effect views of this monument or its setting, therefore the impact is considered to be Minor.
- 3.3.18 Fort Scoveston (**PE339**), part of the same mid to late-19<sup>th</sup> century fortification of the Waterway, lies just over 900m to the north of the Waterston development. Views towards Waterston are likely to encompass the proposed cheese and packaging factories, as well as partial views of the 60m stack within the Blackbridge development. However, views of the stack will be distant, and the Waterston development is likely to be largely lost amongst the backdrop of the Refinery complex and adjacent village, therefore the impact is considered to be Negligible.
- 3.3.19 Enclosure & Earthworks at Lewiston Hall (**PE400**) is a prehistoric coastal enclosure at the mouth of Martin's Haven on the south side of the Cleddau. The site lies almost directly to the south of the Blackbridge development, although views in that direction are restricted by coastal tree cover, with the main views being eastwards. Therefore the impact is considered to be Negligible.
- 3.3.20 Fort Popton (**PE446**) is part of the mid to late-19<sup>th</sup> century fortification of the Waterway. It occupies a prominent position on the south side of the Cleddau, with clear views across the Waterway, encompassing the Blackbridge development 2.5km to the northeast (Photo 46). The development does not affect views of this site



however, nor does it interrupt the visual links between these 19<sup>th</sup> century fortifications, therefore the impact is considered to be Negligible.

3.3.21 Castle Pill (**PE541**) is a medieval castle site, possibly re-using an Iron Age defended enclosure, and itself potential re-used as a fortified position during the Civil War. This is the closest SAM to the Blackbridge development, c.1km to the north at the head of Castle Pill. However, views of the development are limited to the top of the 60m stack (Building No.6) through dense tree cover (Photo 44). This is considered to be a Negligible impact.

3.3.22 A number of sites are considered to have partial views of the proposed development, largely of the 60m stack (Building No. 6). However, the distance of these views and lack of impact on the setting of these monuments has led to the conclusion that the proposed development will have no impact on these monuments. These sites include:

- Corston Beacon Round Barrow (**PE059**), a Bronze Age funerary monument, c.5km to the south
- Burton Burial Chamber (**PE066**), a Neolithic funerary monument c.4km to the northeast
- South West Dockyard Tower (**PE332**), a 19<sup>th</sup> century Martello Tower 3.7km to the east (Photo 47)
- Stack Rock Fort (**PE334**), a 19<sup>th</sup> century fortification 5km to the west
- South Hook Fort (**PE337**), a 19<sup>th</sup> century fortification 4.2km to the west
- Defensible Barracks, Pembroke Dock (**PE379**), 19<sup>th</sup> century barrack buildings 4.3km to the southeast
- American War of Independence Redan at Bath House (**PE452**), a late 18<sup>th</sup> century coastal fortification 4.3km to the east

3.3.23 Site visits confirmed that some sites, although lying within the ZTV, have no views of the development due to intervening topography, vegetation and building cover. These include:

- Long Stone Burial Chamber (**PE135**)
- Paterchurch Tower, Pembroke Dock (**PE380**)
- Hakin Observatory (**PE387**)
- Burton Beach Overlord Hard (**PE531**)

### **3.4 Historic Buildings**

#### Introduction

3.4.1 33 heritage assets have been identified as Historic Buildings within the area of proposed development at the Blackbridge site, none have been identified within the area of proposed development at the Waterston site, which may be both directly and indirectly affected. No historic Buildings have been identified within the area of proposed development at the Waterston site. In addition 227 further assets have been identified outside the area of proposed development that may be indirectly affected, these sites comprise Listed Buildings that lie within the ZTV.

### Potential Direct Impacts

- 3.4.2 The earliest standing building within the Blackbridge development area is Newton Noyes jetty (**PRN 26089**), which was originally constructed in 1872 as a steel jetty from a masonry pier, housing a 1m gauge railway and three cranes. The jetty was modified in the later 19<sup>th</sup> century and then substantially reinforced and extended when the RNAD site was established. This site is of Medium importance as a surviving example of late-19<sup>th</sup> century industrial maritime activity utilising the deep waters of the Cleddau. The feature will be retained within the proposed development, refurbished to house a covered conveyor and pneumatic towers. This work is considered to have a Minor impact.
- 3.4.3 The remaining standing buildings are all exclusively associated with the development of the Blackbridge RNAD site from the late 1930s onwards. Five large buildings form the core of the most visual elements that still survive on the site. Four of these buildings will be refurbished and retained within the proposed development. These comprise the former Bulk Store (**PRN 26001**) and attached large component store (**PRN 26010**) to the north, along with a workshop block (**PRN 26003**) to the south and a former office block (**PRN 26078**) to the west. All four buildings were part of the original layout of the RNAD site in the late 1930s and survive as standing structures although they have been largely stripped of all internal fixtures and fittings. Due to their importance to the RNAD site, and the relative importance of that site as a whole, these buildings are all considered to be of Medium value. The Bulk Store (PRN 26001) will be converted into the Pyroliser Building (Building No.1) and Storage Area (Building No.2) which will include extensive refurbishment and an increase in height. The large component store (PRN 26010) will be refurbished and used as a Grinding Hall (Building No. 3). The workshop block (PRN 26003) will be refurbished as the Control Building (Building No. 12). The office block (PRN 26078) will be retained and refurbished as offices (Building No. 14). These are considered to be Minor to Moderate impacts.
- 3.4.4 A fifth standing building currently forms part of this visible core of remaining structures, namely the assembly shop for buoyant mines (**PRN 26006**). Although this building is still standing (but stripped of internal fixtures and fittings), structural defects means this building is to be demolished and replaced by the Engine House (Building No.5) within the proposed development. This building is considered to be of Medium value, and its demolition is considered to be a Major impact.
- 3.4.5 A further three buildings are still standing, in varying degrees of repair. Towards the western end of the site stands a former timber store (**PRN 26002**), now roofless with vegetation growing inside the building. Adjacent to this lies a small brick building (**PRN 26062**) with a partly tumbled wall that was used as the toilet block for the nearby workshop. This building was a later (c.1970) addition to the site. At the entrance to the site lies the former guardhouse (**PRN 26076**), still in use as the security office. These buildings are less characteristic elements of the RNAD site, and are considered to be of Low value. No specific reference is made to these structures within the development proposals: it is assumed they will be largely retained and the impact is likely to be Minor.
- 3.4.6 Towards the eastern end of the site a series of nine Magazines were dug into the valley slopes and placed in rock-cut cavities containing concrete wall and served by a 1m



gauge railway and road (**PRNs 26050 – 26058**). At the entrance to the tunnels that led to these magazine were the Fan Houses (**PRNs 26040 – 26048**), consisting of brick arched tunnel entrances, enclosed by large steel doors, with a flat concrete roof and air induction chimneys. These structures are considered to be of Medium importance for the role they performed in the site as a whole. Due in part to the presence of bats, these structures will remain intact and undisturbed, the proposed development is therefore considered to have a Negligible impact.

- 3.4.7 Spread throughout the site are a series of water reservoirs, built as part of an emergency water supply during the original establishment of the site in the late 1930s. These reservoirs are of varying sizes, and include a large open reservoir to the east (**PRN 26030**), along with a variety of semi-sunken brick and concrete tanks enclosed by fencing (**PRNs 26034, 26064, 26096 & 26102**). These are considered to be of Low value. No specific reference is made to these features within the proposed development but it is assumed from the plan provided that all will be retained. The proposed development is therefore considered to have a Negligible impact.
- 3.4.8 The RNAD site was protected by a defensible fenceline, and the areas above the underground magazines were further protected by earthworks and defensive positions on the higher ground above them. A number of sentry posts were also erected in this area, three of which survive (**PRNs 26060, 26075 & 26084**). These structures are considered to be of Low value. The impacts on these structures however is variable. PRN 26060 lies in the area of proposed greenhouses (Building No. 16), which is likely to result in the removal of this structure, which will therefore have a Major impact. PRN 26075 lies in an undeveloped area, therefore the impact is considered to be Negligible. PRN 26084 lies adjacent to the Algae Bioreactor Units (Building No. 15), and therefore direct impacts are likely, this is considered to be a Moderate to Major impact depending on whether the development requires the demolition of this structure.

#### Indirect (visual) Impacts

- 3.4.9 In the wider study area the potential indirect (visual) impacts of the proposed development on designated assets have been assessed, namely Listed Buildings (LBs) spread throughout the Waterway. According to the DMRB criteria Grade I and II\* listed buildings are considered to be of High value, Grade II listed buildings are considered to be of Medium value. A Zone of Theoretical Visibility was used to define 227 assets that may be indirectly affected, which was further refined through site visits. Due to the large numbers involved, many sites were grouped together using a combination of location and visible impacts, these groups along with outlying individual sites are discussed below.
- 3.4.10 **Group A** comprises 43 listed buildings all located within the Milford Haven Docks area (Photo 48). These buildings comprise individual bollards and capstans, and one crane, lining the edge of the docks, all of which are Grade II listed. This area has views eastwards that encompass much of the Blackbridge development site. However, the development does not affect views of these features and is considered only to have a Negligible impact on the setting of these structures.

- 3.4.11 **Group B** comprises 48 listed buildings all located within the main settlement of Milford Haven. These buildings comprise a mix of domestic, commercial, religious, financial, educational, maritime and memorial buildings, as would be expected in a late post-medieval coastal urban setting. One building is Grade II\* listed (LB ref. no. 12905), the remainder are Grade II listed. Although lying within the ZTV a site visit confirmed that the proposed development will not be visible from this area due to the density of urban development, therefore the proposed development is considered to result in No Change to these structures.
- 3.4.12 **Group C** comprises 100 listed buildings all located within Pembroke Dock. Similar to Group B, these buildings comprise a mix of buildings typical to a late post-medieval/early modern urban setting, as well as military and industrial structures. The area includes one Grade I listed building (LB ref. no. 14341) and 14 Grade II\* listed buildings (LB ref. nos. 6415, 6436, 6441, 6454, 6455, 6458, 14354, 14377-81, 14393 & 14420). Also similar to Group B, due to the density of the urban setting, there is no visual relationship with the proposed development, which is considered to result in No Change to these structures.
- 3.4.13 **Group D** consists of a collection of five Grade II listed buildings at Brownslate farm, some 5km to the southeast of the proposed development. These buildings occupy north-facing slopes with general northward views that would encompass the 60m stack within the Blackbridge development. However, at such a distance the proposed development is considered to result in No Change to these structures.
- 3.4.14 Of the remaining 32 Listed Buildings within the ZTV, nine are also Scheduled Ancient Monuments, and these impacts are described in section 3.3 (**LB ref. nos. 6448, 12920, 12922, 14353, 14371, 14372, 17168, 82592 & 83214**). A further 18 sites either had no views of the proposed development due to surrounding topography, vegetation and building cover (**LB ref. nos. 6568, 6598, 12824, 12916, 12917, 12919, 12933, 12935, 17161, 82530 & 82591**), or were considered to be at such a distance that any view would still result in No Change in terms of impact on the sites or their settings (**LB ref. nos. 6437, 6562, 12924, 12930, 12931, 12934 & 82698**).
- 3.4.15 Around 500m to the north of the Blackbridge development lies Castle Hall, which includes a collection of four Grade II listed buildings that have a limited view of the 60m stack (**LB ref. nos. 12909, 12910, 12911 & 12912**). These buildings consist a stable block, main gateway and arched entries. The ground rises to the south which blocks views of the main development and most of the stack, the impact of which is further reduced through tree and hedgerow cover. The development does not impact on any views of these listed buildings. Therefore the impact is considered to be Negligible.
- 3.4.16 Close to the waterfront at Hakin Point lies the Grade II listed King's Arms public house (**LB ref. no. 12923**) (Photos 49 & 50). Due to its near-waterfront location it has good views along the Cleddau which incorporates much of the proposed development area at Blackbridge. The development is not considered to impact on the setting of this building, but due to the prominence it will have in the views from the building it is considered to have a Minor impact.

### 3.5 *Historic Landscapes*

- 3.5.1 The proposed development lies within the Milford Haven Waterway (HLW (D) 3) ), as listed in the Register of Landscapes of Historic Interest in Wales (Cadw et al 1998). This landscape is divided into a large number of Historic Landscape Character Areas (HLCAs). The proposed development lies within, and will have a direct impact on, Historic Landscape Character Area **307 Milford Haven** (Blackbridge site) along with **310 Gulf Oil Refinery** and **348 Waterston - Honeyborough** (Waterston site). Alongside these areas, the proposed development has been identified as having an indirect (visual) impact on a further four Historic Landscape Character Areas, namely **322 Scoveston & Burton**, **314 Texaco Oil Refinery**, **341 Rhoscrowther** and **306 Pembroke Dock**.
- 3.5.2 HLCA 307 Milford Haven is described as a largely urban landscape centred on the late-18<sup>th</sup> century grid-pattern planned town and associated 19<sup>th</sup> century docks. Large 20<sup>th</sup> century housing estates and light industrial developments surround the older core of the town. HLCA 310 Gulf Oil Refinery is a very distinctive industrial character area drawn specifically around the late 20<sup>th</sup> century industrial complex of the former Gulf Oil Refinery and a small industrial estate (Photo 43). HLCA 348 Waterston – Honeyborough is a largely agricultural landscape with dispersed farms and strip fields, but includes the village of Waterston and hamlet of Honeyborough.
- 3.5.3 The direct impact of the proposed development on these areas is described and assessed in the accompanying ASIDOHL2 study (Stage 2), which has six grades of impacts, ranging from Very Slight to Very Severe. Similarly, the indirect (visual) impact of the proposed development on these areas is described and assessed in Stage 3, based on the same grades of impacts. **These grades of impact do not necessarily equate with those used in the DMRB, so should not be considered as having values corresponding to similar terms used elsewhere in this ES (see 3.5.7 below).**
- 3.5.4 The proposed development is graded as having a ‘Slight’ direct impact on HLCA 307 Milford Haven, ‘Slight’ direct impact on HLCA 310 Gulf Oil Refinery and ‘Moderate’ direct impact on HLCA 348 Waterston - Honeyborough.
- 3.5.5 The indirect (visual) impact on the same HLCAs are graded as having a ‘Moderate’ impact on HLCA 307 Milford Haven, ‘Moderate’ impact on HLCA 310 Gulf Oil Refinery and ‘Slight’ impact on HLCA 348 Waterston – Honeyborough. The indirect impact is also graded as having a ‘Slight’ impact on HLCA 322 Scoveston – Burton, ‘Slight’ impact on HLCA 314 Texaco Oil Refinery, ‘Slight’ impact on HLCA 341 Rhoscrowther and ‘Slight’ impact on HLCA 306 Pembroke Dock.
- 3.5.6 The value of the HLCAs are described and assessed in Stage 4, again based on a six-point scale from Very Low to Very High, and is considered to have be of ‘High’ value for HLCA 307 – Milford Haven, ‘ and ‘Considerable’ value for the remaining HLCAs.
- 3.5.7 Converting the ASIDOHL2 study grades to those used in the DMRB guidance is not straightforward, as the ASIDOHL2 study uses calculations based on a wide range of criteria to determine the value of each individual HLCA. The DMRB provides more simplified criteria, with all areas considered to be of *High* value as they lie within the registered Historic Landscape. In terms of the magnitude of impact the ASIDOHL2 study combines the direct and indirect effects (Stages 2 & 3) and scores the impact on

a scale of 1 to 10, which it divides into five categories. The DMRB uses a similar division of categories, although the lowest impact is considered to be No Change. When converted into the equivalent DMRB scoring system, the suggested impacts are as follows;

- HLCA 307 Milford Haven - Minor
- HLCA 310 Gulf Oil Refinery - Negligible
- HLCA 348 Waterston-Honeyborough - Negligible
- HLCA 322 Scoveston & Burton – No Change
- HLCA 314 Texaco Oil Refinery - No Change
- HLCA 341 Rhoscrowther - No Change
- HLCA 306 Pembroke Dock - No Change

3.5.8 Aside from the historic landscape character areas and registered Historic Landscape, one historic park and garden has also been identified as lying within the ZTV of the proposed development. Castle Hall (PGW (Dy) 16 (PEM)) is a Grade II\* listed historic garden, listed as an early 19<sup>th</sup> century landscaped garden and pleasure grounds, including terraces associated with the former house, fine entrances, a grotto, lake and garden structures. Several Grade II listed buildings are also associated with these gardens and grounds. This garden is considered to be of *High* value. However, only a small area of the grounds will be affected, and only by the stack with the majority of the development hidden by topography. It is likely that the stack will also be largely hidden from view by intervening vegetation cover, both in terms of views from the garden and views of the garden. Therefore the impact is considered to be Negligible.

## 4 IMPACT SIGNIFICANCE

### 4.1 Archaeological Remains

Table 1: Summary of Significance of Impact on Archaeological Remains

Asset	Value	Magnitude of impact	Significance of impact
<b>Blackbridge development</b>			
PRN 28801 Blackbridge RNAD site (earthwork & surface/below-ground remains)	Low	Major	Slight / Moderate
PRN 34525 Railway	Low	Minor	Neutral / Slight
NPRN 416749 Oil & Manure Works	Medium	Minor	Slight
NPRN 416748 Newton Noyes farmstead	Medium	Negligible	Neutral / Slight
BMH 01 Ice House	Low	Negligible	Neutral / Slight
BMH 02 Boathouse	Low	Negligible	Neutral / Slight
PRN 12110 'Camp Meadow'	Medium	Minor	Slight
PRN 45245 Trackway	Low	Moderate	Slight
BMH 03 Standing Stone	Medium	Minor	Slight

<b>Waterston development</b>			
PRN 107716 WWI defensive features	Low	Negligible	Neutral / Slight
PRN 6418 Waterston Field System	Low	Negligible	Neutral / Slight
PRN 4503 'Church Park'	Low	Negligible	Neutral / Slight
BMH 04 Springfield farmstead	Low	Minor	Neutral / Slight
<b>Indirect (visual) impacts only, combined development</b>			
PE262 West Pennar Camp	High	Negligible	Slight
PE264 West Popton Camp	High	Minor	Moderate / Slight
PE338 Fort Hubberston	High	Minor	Moderate / Slight
PE339 Fort Scoveston	High	Negligible	Slight
PE400 Enclosure & Earthworks at Lewiston Hall	High	Negligible	Slight
PE446 Fort Popton	High	Negligible	Slight
PE541 Castle Pill	High	Negligible	Slight

## 4.2 Historic Buildings

Table 2: Summary of Significance of Impact on Historic Buildings

<b>Asset</b>	<b>Value</b>	<b>Magnitude of impact</b>	<b>Significance of impact</b>
PRN 26089 Newton Noyes jetty	Medium	Minor	Slight
PRN 26001 Bulk Store	Medium	Moderate	Moderate
PRN 26010 Large component store	Medium	Moderate	Moderate
PRN 26003 Workshop block	Medium	Moderate	Moderate
PRN 26078 Office block	Medium	Minor	Slight
PRN 26006 Assembly shop	Medium	Major	Moderate / Large
PRN 26002 Timber store	Low	Minor	Neutral / Slight
PRN 26062 Toilet block	Low	Minor	Neutral / Slight
PRN 26076 Guardhouse	Low	Minor	Neutral / Slight
PRNs 26050 – 26058 Magazines	Medium	Negligible	Neutral / Slight
PRNs 26040 – 26048 Fan Houses	Medium	Negligible	Neutral / Slight
PRNs 26030, 26034, 26064, 26096 & 26102 Reservoirs	Low	Negligible	Neutral / Slight
PRN 26060 Sentry post	Low	Major	Slight / Moderate
PRN 26075 Sentry post	Low	Negligible	Neutral / Slight
PRN 26084 Sentry post	Low	Moderate	Neutral / Slight
<b>Indirect (visual) impacts only, combined development</b>			
Group A Milford Haven Docks	Medium	Negligible	Neutral / Slight
Group B Milford Haven	High	No Change	Neutral

Group C Pembroke Dock	High	No Change	Neutral
Group D Brownslate farm	Medium	No Change	Neutral
LB ref. nos. 12909, 12910, 12911 & 12912 Castle Hall	Medium	Negligible	Neutral / Slight
LB ref. no. 12923 King's Arms	Medium	Minor	Slight

### 4.3 Historic Landscapes

Table 3: Summary of Significance of Impact on HLCAs within the Registered Historic Landscape

Historic Landscape Character Area	Value		Magnitude of impact		Significance of Impact	
	ASIDOHL	Equivalent DMRB	ASIDOHL	Equivalent DMRB	ASIDOHL	Equivalent DMRB
HLCA 307 Milford Haven	High	High	Medium	Minor	Moderate	Moderate/ Slight
HLCA 310 Gulf Oil Refinery	Considerable	High	Low	Negligible	Moderate	Slight
HLCA 348 Waterston - Honeyborough	Considerable	High	Low	Negligible	Slight	Slight
HLCA 322 Scoveston & Burton	Considerable	High	Very Low	No Change	Slight	Neutral
HLCA 314 Texaco Oil Refinery	Considerable	High	Very Low	No Change	Slight	Neutral
HLCA 341 Rhoscrowther	Considerable	High	Very Low	No Change	Slight	Neutral
HLCA 306 Pembroke Dock	Moderate	Medium	Very Low	No Change	Slight	Neutral

Table 4: Summary of significance of Impact on Registered Parks & Garden of Historic Interest

Asset	Value	Magnitude of impact	Significance of impact
Castle Hall (PGW (Dy) 16 (PEM))	High	Negligible	Slight

## 5 MITIGATION

### 5.1 Overview

- 5.1.1 Some mitigation measures for the proposed development have been incorporated into the scheme design. These measures include the re-use of many of the remaining buildings on the Blackbridge site in order to retain as many of the original buildings as possible, as well as the avoidance of any disturbance to the magazine and fan-house buildings that were built into the valley sides. The development of the site from its



current derelict degradation is also seen as a way of reinstating the site as a working industrial complex with employment links to the local population, and to ensure the continued maintenance of the re-used buildings on the site.

## **5.2 Archaeological Remains**

- 5.2.1 Within the Blackbridge development it appears unlikely that identified archaeological remains pre-dating the establishment of the RNAD site (with the exception of Newton Noyes jetty) are likely to survive. More peripheral sites may survive however, including PRN 12110 Camp Meadow, PRN 45245 Trackway and BMH 03 standing stone. The extent of any surviving remains relating to either PRN 12110 or PRN 45245 is unknown, and both may already have been affected by a pre-existing trackway. This trackway will be improved and the establishment of the service corridor is likely to lead to ground-disturbing works that may reveal archaeological remains if they are present, requiring archaeological recording by means of an archaeological watching brief.
- 5.2.2 BMH 03 standing stone is of uncertain provenance, however, no major development would appear to be planned in this location. There is however the potential for the site to be disturbed through general construction works and the passage of construction vehicles. Therefore to reduce the risk this site could be fenced off to ensure it remains *in situ* and undisturbed.
- 5.2.3 The RNAD site itself has been cleared of many of its former upstanding buildings in the late-20<sup>th</sup>/early 21<sup>st</sup> century. In some areas, such as the filling factory at the eastern end of the complex, the demolition works and subsequent landscaping has clearly been substantial and it is unlikely that meaningful remains will be uncovered during the proposed development works. Elsewhere on site buildings have been demolished to ground level, and it is likely that surface and below-ground remains may survive. Generally these footings, of mid to late-20<sup>th</sup> century date, will be of limited interest, however some features of significance may survive that could be recorded by means of an archaeological watching brief.
- 5.2.4 On higher ground at the eastern end of the site is an area that is currently covered in dense scrub, but one that was formerly protected by a defensible fence-line with several sentry posts and gun positions. Although several of these features have been recorded in previous surveys, this is not felt to have been comprehensive (R.Thomas, pers.comm.). Planned development works in this area include Building No.9 (exhaust gas conditioning and algae propagation) and Building No.15 (Algae Bioreactor Units), which are likely to result in the removal of many of the surface remains of these features. In order to achieve a better understanding and record of these features and the Wartime defensive arrangements for this site, it may be of value to undertake a more detailed survey of this area subsequent to any vegetation clearance. If sites are unable to be preserved *in situ* then detailed recording can be undertaken, and an archaeological watching brief maintained on any groundworks.
- 5.2.5 It appears unlikely that significant remains of the original line of the late-19<sup>th</sup> century mineral railway (PRN34525) survive within the proposed development area. However, the line of this railway has been maintained throughout the development of the RNAD

site, and this route should be preserved as an access route. The current proposals do maintain this line as an access route.

- 5.2.6 Within the Waterston development it is considered that the proposed development will have a negligible to minor impact on identified archaeological remains. Should development works impact on any remains these could adequately be recorded by means of an archaeological watching brief, although it may become apparent in this area that groundworks are unlikely to disturb any archaeological remains.
- 5.2.7 The main visual impact of the proposed development on surrounding sites of archaeological significance is largely from views of the Blackbridge development across or along the Cleddau. The re-use of existing buildings, and the re-use of the site as a whole as an industrial complex, help to reduce any visual impact, and no further effective mitigation is suggested.

### **5.3 Historic Buildings**

- 5.3.1 Within the Blackbridge development four existing buildings will be refurbished and re-used (PRN 26001, 26010, 26003 & 26078). This is likely to result in changes to the structures. Preservation *in situ* is not considered possible for the former Assembly Shop (PRN 26006), which will be demolished and replaced. Three further buildings also lie within the RNAD complex that may be disturbed through general construction works in the area (PRNs 26002, 26062 & 26076). It is also possible that three sentry posts (PRNs 26060, 26075 & 26084) may also be disturbed, and in some cases removed, during construction works. Prior to this disturbance a further record of their current appearance would be beneficial, requiring building survey work on all structures. However, these buildings have all largely been stripped of all internal fixtures and fittings, and the history documented in various previous surveys, and therefore it is considered that a basic photographic survey would retrieve the required information to ensure preservation through record.
- 5.3.2 Several extant reservoirs have been identified within the proposed development area (PRNs 26030, 26034, 26064, 26096 & 26102), these however should remain undisturbed within the development proposals. Should any subsequent work be planned on these features then they could also benefit from a photographic survey.
- 5.3.3 Newton Noyes jetty (PRN 26089) is the one standing structure that pre-dates the RNAD site. This feature will also be retained, although an enclosed conveyor and pneumatic towers will be added. Detailed recording of this structure as a whole will be difficult as few features survive along its upper surface, and plans exist detailing the original construction of the jetty. However, if further development works require the removal of any visible elements of the current structure then these should be recorded prior to their removal.
- 5.3.4 The visual impact on standing buildings of archaeological significance outside the development area is relatively limited, and no further effective mitigation is suggested.



## 5.4 Historic Landscapes

5.4.1 As mentioned, the re-use of existing RNAD buildings, and the re-use of the Blackbridge site as a whole as an industrial complex, help to mitigate the general visual impact of the proposed development. Due to the scale of the development at this site no further effective mitigation is suggested.

5.4.2 The development at Waterston is largely within a pre-existing industrial landscape, and also largely hidden from view by surrounding refinery development and a large earth bank to the north. The main visual element to this area of development would be the proposed cheese and packaging factories to the east of Waterston. This visual impact is not considered significant, but could be further reduced through screening by maintaining and enhancing surrounding hedegrows.

## 6 RESIDUAL IMPACTS

Table 5: Residual Impacts

Heritage Asset	Mitigation	Residual effects
<b>Archaeological Remains</b>		
PRN 28801 Blackbridge RNAD site - Surface & below-ground remains on lower area	<ul style="list-style-type: none"> <li>Preservation by record through Archaeological watching brief during any groundworks should more significant below-ground remains be revealed/disturbed</li> </ul>	Slight
PRN 28801 Blackbridge RNAD site - Surface & below-ground remains on upper area	<ul style="list-style-type: none"> <li>Detailed survey after any scrub and vegetation clearance</li> <li>Detailed recording of any site prior to removal to ensure preservation by record</li> <li>Archaeological watching brief during any groundworks to record any below-ground remains</li> </ul>	Moderate / Slight
PRN 34525 Railway	<ul style="list-style-type: none"> <li>Maintain the line as an access route</li> </ul>	Neutral
NPRN 416749 Oil & Manure Works	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks should any element survive/be disturbed</li> </ul>	Unchanged (Neutral / Slight)
NPRN 416748 Newton Noyes farmstead	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks should any element survive/be disturbed</li> </ul>	Neutral
BMH 01 Ice House	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks should any element survive/be disturbed</li> </ul>	Neutral

BMH 02 Boathouse	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks should any element survive/be disturbed</li> </ul>	Neutral
PRN 12110 'Camp Meadow'	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks in the vicinity</li> </ul>	Neutral / Slight
PRN 45245 Trackway	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks along the line of the trackway</li> </ul>	Neutral / Slight
BMH 03 Standing Stone	<ul style="list-style-type: none"> <li>Fence off during construction work</li> </ul>	Neutral
PRN 107716 WWI defensive features	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks should any element survive/be disturbed</li> </ul>	Neutral
PRN 6418 Waterston Field System	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Neutral / Slight)
PRN 4503 'Church Park'	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Neutral / Slight)
BMH 04 Springfield farmstead	<ul style="list-style-type: none"> <li>Archaeological watching brief during any groundworks should any element survive/be disturbed</li> </ul>	Neutral
PE262 West Pennar Camp	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)
PE264 West Popton Camp	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Moderate / Slight)
PE338 Fort Hubberston	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Moderate / Slight)
PE339 Fort Scoveston	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)
PE400 Enclosure & Earthworks at Lewiston Hall	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)
PE446 Fort Popton	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)
PE541 Castle Pill	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)

Building Remains		
PRN 26089 Newton Noyes jetty	<ul style="list-style-type: none"> <li>Recording of any visible (and accessible) features prior to their removal</li> </ul>	Slight
PRN 26001 Bulk Store	<ul style="list-style-type: none"> <li>Photographic survey prior to refurbishment to record any feature that would be changed</li> </ul>	Slight / Moderate
PRN 26010 Large component store	<ul style="list-style-type: none"> <li>Photographic survey prior to refurbishment to record any feature that would be changed</li> </ul>	Slight / Moderate
PRN 26003 Workshop block	<ul style="list-style-type: none"> <li>Photographic survey prior to refurbishment to record any feature that would be changed</li> </ul>	Slight / Moderate
PRN 26078 Office block	<ul style="list-style-type: none"> <li>Photographic survey prior to refurbishment to record any feature that would be changed</li> </ul>	Slight
PRN 26006 Assembly shop	<ul style="list-style-type: none"> <li>Photographic survey prior to demolition to ensure preservation by record</li> </ul>	Moderate
PRN 26002 Timber store	<ul style="list-style-type: none"> <li>Photographic survey prior to construction work</li> </ul>	Neutral / Slight
PRN 26062 Toilet block	<ul style="list-style-type: none"> <li>Photographic survey prior to construction work</li> </ul>	Neutral / Slight
PRN 26076 Guardhouse	<ul style="list-style-type: none"> <li>Photographic survey prior to construction work</li> </ul>	Neutral / Slight
PRNs 26050 – 26058 Magazines	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Neutral / Slight)
PRNs 26040 – 26048 Fan Houses	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Neutral / Slight)
PRNs 26030, 26034, 26064, 26096 & 26102 Reservoirs	<ul style="list-style-type: none"> <li>Photographic survey if they are to be disturbed during planned groundworks</li> </ul>	Neutral / Slight
PRN 26060 Sentry post	<ul style="list-style-type: none"> <li>Photographic survey prior to construction work and any planned demolition</li> </ul>	Slight / Moderate
PRN 26075 Sentry post	<ul style="list-style-type: none"> <li>Photographic survey prior to construction work</li> <li>Retain within the development if possible</li> </ul>	Neutral / Slight
PRN 26084 Sentry post	<ul style="list-style-type: none"> <li>Photographic survey prior to construction work</li> <li>Retain within the development if possible</li> </ul>	Neutral / Slight
Group A Milford Haven Docks	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Neutral / Slight )
Group B Milford Haven	<ul style="list-style-type: none"> <li>No mitigation required</li> </ul>	Neutral

Group C Pembroke Dock	<ul style="list-style-type: none"> <li>No mitigation required</li> </ul>	Neutral
Group D Brownslate farm	<ul style="list-style-type: none"> <li>No mitigation required</li> </ul>	Neutral
LB ref. nos. 12909, 12910, 12911 & 12912 Castle Hall	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Neutral / Slight )
LB ref. no. 12923 King's Arms	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Neutral / Slight )
<b>Historic Landscapes</b>		
HLCA 307 Milford Haven	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Moderate / Slight )
HLCA 310 Gulf Oil Refinery	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)
HLCA 348 Waterston - Honeyborough	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)
HLCA 322 Scoveston & Burton	<ul style="list-style-type: none"> <li>No mitigation required</li> </ul>	Neutral
HLCA 314 Texaco Oil Refinery	<ul style="list-style-type: none"> <li>No mitigation required</li> </ul>	Neutral
HLCA 341 Rhoscrowther	<ul style="list-style-type: none"> <li>No mitigation required</li> </ul>	Neutral
HLCA 306 Pembroke Dock	<ul style="list-style-type: none"> <li>No mitigation required</li> </ul>	Neutral
Castle Hall (PGW (Dy) 16 (PEM))	<ul style="list-style-type: none"> <li>No effective mitigation suggested</li> </ul>	Unchanged (Slight)

## 7 SUMMARY

7.1 In January 2016 Archaeology Wales was commissioned to provide a Cultural Heritage Impact Assessment as part of an Environmental Statement on the proposed development at the at Blackbridge, Milford Haven and at the former Gulf Oil Refinery at Waterston, Pembrokeshire.

7.2 This assessment was undertaken using the scoring system for assessing the magnitude of impact based on the Design Manual for Roads and Bridges (DMRB, Volume 11 Environmental Assessment, Section 3 Environmental Topics, Part 2, Cultural Heritage,

Ref. 9-2). This divides the cultural heritage resources into three sub-topics: Archaeological Remains, Historic Buildings and Historic Landscapes.

7.3 Twenty assets were identified within the Archaeological Remains category that may be affected by the proposed development, namely;

- PRN 28801 Blackbridge RNAD site (comprising 79 individual assets under this category);
- PRN 34525 Railway;
- NPRN 416749 Oil & Manure Works;
- NPRN 416748 Newton Noyes farmstead;
- BMH 01 Ice House;
- BMH 02 Boathouse;
- PRN 12110 'Camp Meadow';
- PRN 45245 Trackway;
- BMH 03 Standing Stone;
- PRN 107716 WWI defensive features;
- PRN 6418 Waterston Field System;
- PRN 4503 'Church Park';
- BMH 04 Springfield farmstead;
- PE262 West Pennar Camp (SAM);
- PE264 West Popton Camp (SAM);
- PE338 Fort Hubberston (SAM);
- PE339 Fort Scoveston (SAM);
- PE400 Enclosure & Earthworks at Lewiston Hall (SAM);
- PE446 Fort Popton (SAM);
- PE541 Castle Pill (SAM).

7.4 No designated archaeological asset (SAMs) will be directly affected by the proposed development.

7.5 The Blackbridge RNAD site as a whole covers a significant area of the proposed development. The earthworks and below-ground remains that fall within the archaeological remains category are considered to be of Low value. Due to the extent of the proposed development, this is considered to be a Major impact, of Slight to Moderate significance. This could be further reduced by post-vegetation-clearance survey work in identified areas to produce a full record of the RNAD features, and the use of an archaeological watching brief on identified assets that will be disturbed to ensure preservation through record.

7.6 The development may have a Minor impact on the former Oil & Manure Works NPRN 416749, a possible Iron Age enclosure of 'Camp Meadow' PRN 12110 and a possible standing stone BMH 03, all potentially of Medium value, and a Moderate impact on trackway PRN 45245, of Low value. The significance of the impact on these sites is considered to be Slight, which could be further reduced on NPRN 416749, PRN 12110 and PRN 45245 through the use of an archaeological watching brief to record any remains, should they exist. On BMH 03 the significance could be reduced by fencing off of the feature during construction works to avoid damage or disturbance.

- 7.7 The development may also have a Minor impact on Railway PRN 34525 and Springfield farmstead BMH 04, the low value of which results in a significance of impact considered to be Neutral / Slight. This could be further reduced through an archaeological watching brief during construction works to record any remains should they be present and/or disturbed. The line of the Railway should also be preserved as an access route, this however already forms part of the proposed works.
- 7.8 There is also considered to be a Minor indirect (visual) impact on two SAM sites, PE264 West Popton Camp and PE338 Fort Hubberston, the significance of which is considered to be Moderate to Slight. This impact is considered to be Minor through mitigation measures inbuilt into the proposed design scheme, no effective further mitigation measures can be suggested.
- 7.9 The impact on the remaining sites is considered to be Negligible, the significance of which is considered to be a Neutral to Slight on all non-designated assets, and Slight on all designated assets. The impact can be further reduced on the non-designated assets through the use of an archaeological watching brief to record any remains should they exist and/or be disturbed through groundworks associated with the development. No effective mitigation measure can be recommended to further reduce the indirect (visual) impact on the designated assets.
- 7.10 Eighteen assets (or groups of assets) were identified within the Historic Buildings category that may be affected by the proposed development, namely;
- PRN 26089 Newton Noyes jetty;
  - PRN 26001 Bulk Store;
  - PRN 26010 Large component store;
  - PRN 26003 Workshop block;
  - PRN 26078 Office block;
  - PRN 26006 Assembly shop;
  - PRN 26002 Timber store;
  - PRN 26062 Toilet block;
  - PRN 26076 Guardhouse;
  - PRNs 26050 – 26058 Magazines;
  - PRNs 26040 – 26048 Fan Houses;
  - PRNs 26030, 26034, 26064, 26096 & 26102 Reservoirs;
  - PRN 26060 Sentry post;
  - PRN 26075 Sentry post;
  - PRN 26084 Sentry post;
  - Group A Milford Haven Docks (Group of 43 Grade II Listed Buildings);
  - LB ref. nos. 12909, 12910, 12911 & 12912 Castle Hall (Grade II listed);
  - LB ref. no. 12923 King's Arms (Grade II listed).
- 7.11 No designated archaeological asset (Listed Buildings) will be directly affected by the proposed development.
- 7.12 The standing buildings that form part of the RNAD site have been considered individually. The proposed development will include the demolition of two of the 33 identified historic building assets on the site, PRN 26006 Assembly shop and PRN



26060 Sentry post, considered to be a Major impact. PRN 26006 is considered to be of Medium value due to its visual prominence and role within the former RNAD site, therefore the significance of this impact is considered to be Moderate to Large. PRN 26060 is less visible, built to a standard design and therefore considered to be of Low value, and as the result the significance of the impact is considered to be Slight to Moderate. As all standing buildings have been identified on plans, described in previous surveys, and are largely stripped of all fixtures and fittings, it is considered that a basic photographic survey of the standing building prior to demolition would be sufficient to ensure preservation by record, and therefore reduce the significance of the impact.

- 7.13 PRN 26001 Bulk Store, PRN 26010 Large component store, PRN 26003 Workshop block and PRN 26078 Office block are also considered to be of Medium value. These buildings will be retained and refurbished for a variety of different used within the proposed development, this is considered to be a Minor to Moderate impact, of Slight to Moderate significance. A photographic survey would be considered sufficient to ensure a record of these buildings prior to any refurbishment works.
- 7.14 Three further buildings are extant, to varying degrees, comprising a Timber store PRN 26002, Toilet block PRN 26062 and Guardhouse PRN 26076, all of Low value. These buildings appear to be retained within the development, therefore likely to have a Minor impact, the significance of which is considered to be Neutral to Slight. Again, a photographic survey would ensure a further record of these buildings should subsequent development works lead to a greater impact then has been considered.
- 7.15 Several Magazines (PRNs 26050 – 26058) and Fan Houses (PRNs 26040 – 26048), important elements of the RNAD site and considered to be of Medium value, have been built into the valley slopes. These buildings are to be left undisturbed, although surrounding development is considered therefore to have a Negligible impact, of Neutral to Slight significance.
- 7.16 Several semi-buried reservoirs are also recorded throughout the RNAD site (PRNs 26030, 26034, 26064, 26096 & 26102), of Low value. These features appear to be retained within the development, which is therefore considered to have a Negligible impact, of Neutral to Slight impact.
- 7.17 A Sentry Post (PRN 26075), also of Low value, would appear to be retained in the development which will therefore have a Negligible impact of Neutral to Slight significance. One further sentry post (PRN 26084) lies close to a developed area, which may therefore have a greater, Moderate, impact, although the low value of the building results in a similar significance of impact. Should development works impact on this structure then a photographic survey could ensure preservation by record.
- 7.18 Newton Noyes jetty PRN 26089, originally a late-19<sup>th</sup> century structure of Medium value, will be retained within the development and modified to carrying an enclosed conveyor. The feature was extensively strengthened during its use as part of the RNAD site, therefore further development is considered to have a Minor impact, of Slight significance. This feature is well documented, therefore mitigation can be

limited to recording any visible features that may be removed as part of the development.

- 7.19 There is also considered to be a Minor indirect (visual) impact on one Grade II listed building (King's Arms LB 12923), and a Negligible indirect impact on a group of Grade II listed buildings at Castle Hall (LBs 12909, 12910, 12911 & 12912) and on Milford Haven Docks (Group A). The significance of these impacts is considered to be Neutral to Slight. No effective further mitigation measures, other than those already inbuilt into the development proposals, can be suggested.
- 7.20 The proposed development area lies within the Milford Haven Waterway Landscape of Outstanding Historic Interest (HLW (D) 3). Seven individual Historic Landscape Character Areas were identified within that landscape that may potentially be affected by the proposed development, namely;
- HLCA 307 Milford Haven;
  - HLCA 310 Gulf Oil Refinery;
  - HLCA 348 Waterston-Honeyborough;
  - HLCA 322 Scoveston & Burton;
  - HLCA 314 Texaco Oil Refinery;
  - HLCA 341 Rhoscrowther;
  - HLCA 306 Pembroke Dock;

These areas are fully described and assessed in an accompanying ASIDOHL2 study, but in summary the significance of the impact of the proposed development is considered to be Slight to Moderate on HLCA 307 Milford Haven, Slight on HLCAs 310 Gulf Oil Refinery and 348 Waterston – Honeyborough, and Neutral on the remaining HLCAs. Due to the characteristics of the historic landscape and proposed development no further effective mitigation can be proposed to reduce the significance of this impact.

- 7.21 One Historic Park & Garden was also identified that may potential be affected, namely;
- Castle Hall (PGW (Dy) 16 (PEM)

This site lies within the ZTV of the proposed development, but the impact was considered to be Negligible after a site visit, which is considered to be of Slight significance. No further effective mitigation measures can be suggested to further reduce this impact.

## 8 Bibliography

Benson, DG & Williams, G.H. 1987, 'Dale Promontory Fort' in *Archaeology in Wales* 27, p43

British Geological Survey (BGS) Geology Viewer

<http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html>

(accessed 18/12/15)

Cadw, CCW & ICOMOS. 1998, *Register of Landscapes of Outstanding Historic Interest*

Cadw & ICOMOS. 2002, *Cardigan, Ceredigion and Pembrokeshire Part 1: Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales*

Cadw & CCW. 2007, *Guide to Good Practice on Using The Register Of Landscapes Of Historic Interest In Wales In The Planning And Development Process (Revised 2<sup>nd</sup> Edition)*

Crane, P. 2002, *Petroplus LNG Development – Environmental Impact Assessment: Archaeological Desk Based Assessment* Cambria Archaeology (now Dyfed Archaeological Trust) Report No.2002/62

Crane, P. 2004a, *Excavations Esso Oil Refinery*

Crane, P. 2004b, *Excavations at Newton, Llanstadwell, Pembrokeshire* Cambria Archaeology Report 2004/73

Dyfed Archaeological Trust Historic Environment Record

Highways Agency. 2007, *Design Manual for Roads and Bridges, Vol.II*

Murphy, K & Allen, B. 1998, *Coastal Survey 1997-8: Lower Milford Haven Pembrokeshire* Cambria Archaeology (now Dyfed Archaeological Trust) Report

Murphy, K & Ludlow, N. 2002, *Historic Landscape Characterisation of the Milford Haven Waterway* Cambria Archaeology (now Dyfed Archaeological Trust) Report No.2002/02

Poucher, P. 2008, *Milford Haven Waterway Ports & Harbours Project* Dyfed Archaeological Trust Report No.2008/38

Poucher, P. 2016, *Blackbridge & Waterston, Milford Haven, Pembrokeshire: ASIDOHL* Archaeology Wales Report No. 1426

Thomas, R.J.C. 1994, *Survey of 19<sup>th</sup> and 20<sup>th</sup> Century Military Buildings of Pembrokeshire* Unpublished report on behalf of PCNP, Welsh Development Agency and Cadw

### Map Sources

Anon 1842 Steynton Parish tithe map & apportionments

Anon 1849 Llanstadwell Parish tithe map & apportionments

Bowen, E 1729 Map of South Wales

Ive, P 1595 Milford Haven Chart

Ordnance Survey	1809	Original Surveyors map, Milford Haven
Ordnance Survey	1875	1 <sup>st</sup> edition 1;2500 map Pembrokeshire
Ordnance Survey	1908	2 <sup>nd</sup> edition 1;2500 map Pembrokeshire
Ordnance Survey	1937	3 <sup>rd</sup> edition 1;2500 map Pembrokeshire
Saxton	1578	Map of Pembrokeshire
Speed, J	1610	Map of Wales

### ***Aerial Photographs***

1946	RAF image (Reference: 106G-UK-1629) frame 3073-4. Black and white
1955	Vertical Meridian Airmaps SN20NE 220-200, 37598-37600, Black and white
1966	RAF image (Reference: 58 RAF 7509) 18/08/1966. Black and white
1993	RAF image (Reference: 39 RAF 6152) 04/05/1993. Black and white
2009	Google Earth image. Colour

### ***Archives***

#### **Pembrokeshire Record Office**

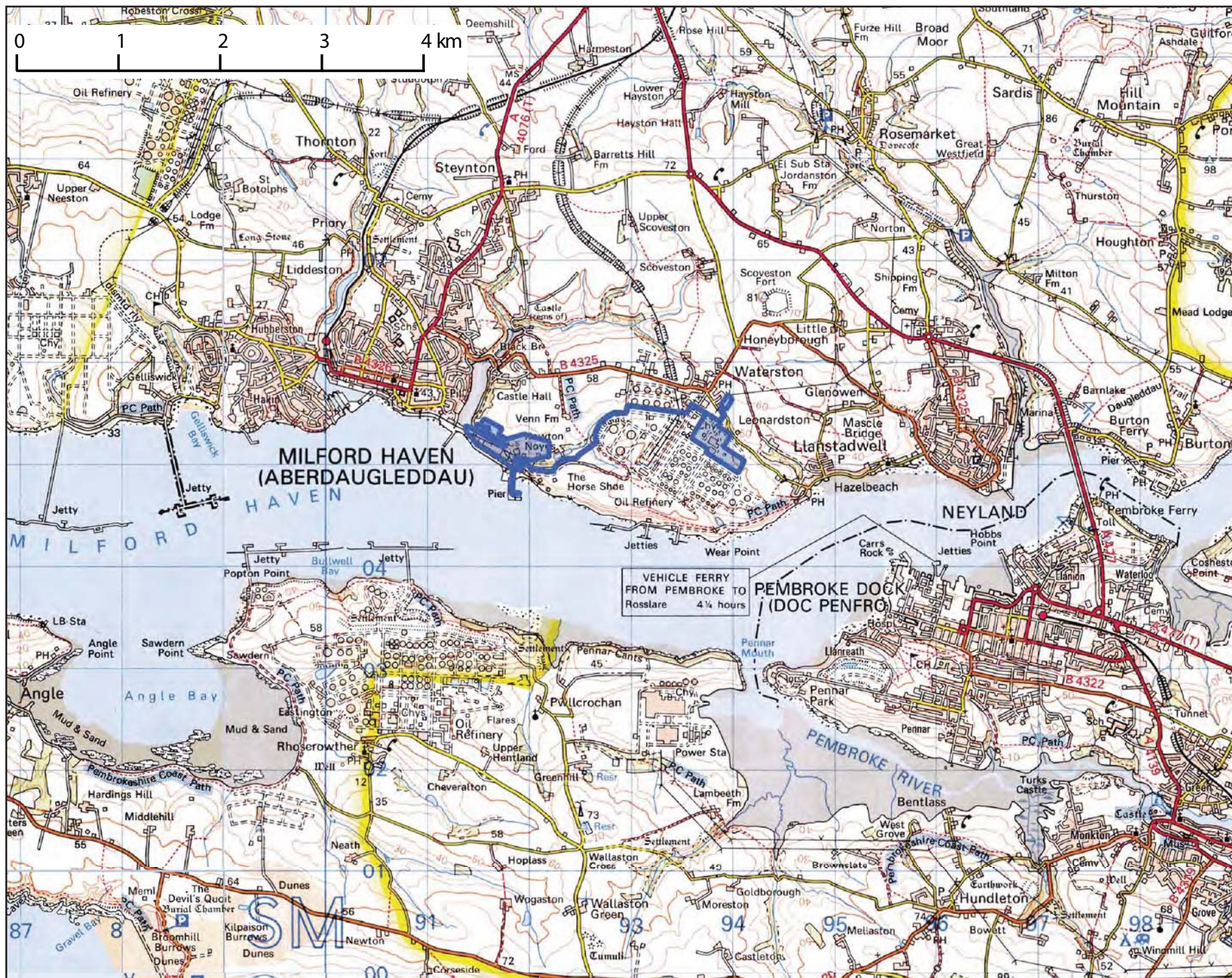
HDX/1214/3	(Postcards, early 20 <sup>th</sup> century)
HDX/1787/18	(Photo, Blackbridge c.1870)
D-BRB/48	(Building estimate, Newton Noyes pier & railway, 1860)
D-MHE/394	(Counterpart lease, Newton Noyes pier, 1881)
D-RTM/1/514	(land acquisition documents, Admiralty, 1930-35)
D-RTP/NEW/13	(Conveyance with plan, Newton Noyes, 1867)
D-RTP/NEW/53	(Counterpart Lease, Newton Noyes, 1797)
DB/42/24	(Records of Milford Haven Dock & Railway Co., re.land near Newton Noyes 1891)
DB/42/26	(As above, with plan, 1917)
HDX/789/1	(Postcards, early 20 <sup>th</sup> century)
HDX/1590/1	(Photos re. renewal of Newton Noyes pier, 1961)
HDX/1787/25	(Photo Newton Noyes pier, 1880)
PCC/PL/1/85	(Admiralty Charts, 1957-60)
T/MM/94	(Board of Trade Marine maps, 1936)
HDX/1546/73	("Mine Depot Memories" by Paul Williams)
HDX/1787/21	(Photo, railway line, late 19 <sup>th</sup> century)
PCC/FI/4/5	(Plan of RNAD site, water mains etc, c.1960)
HDX/1621/2	(Photos of Gulf Oil Refinery, 1966-68)

PCC/HT/1/38 (Plans of Gulf Oil Refinery, 1964)

Scolton Manor Museum Archives

1995.007 – Box of photographs relating to Milford Haven RNAD 1935-1970s





 Areas of proposed development

Figure 1: Location plan, 1:50,000 @ A4.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



- |  |   |   |
|--|---|---|
|  350MW green energy generation area |  Prawn farm area |  Car park        |
|  Greenhouse area                    |  Fish farm area  |  Cheese factory  |
|  |  Algae farm area |  Packing factory |
|  |  Research area   |   |



Figure 2: Areas of proposed development, original plan provided by Egnedol.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey





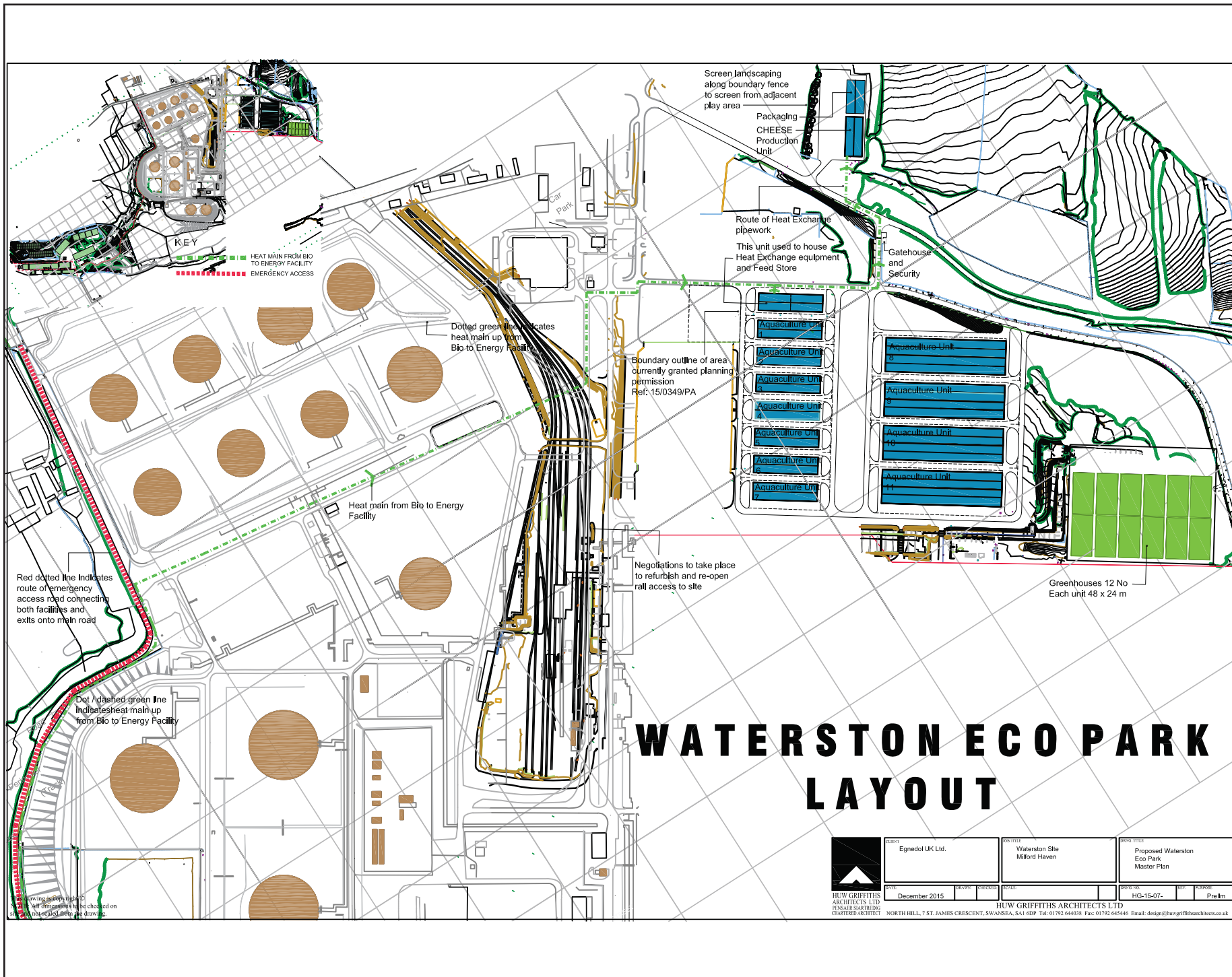
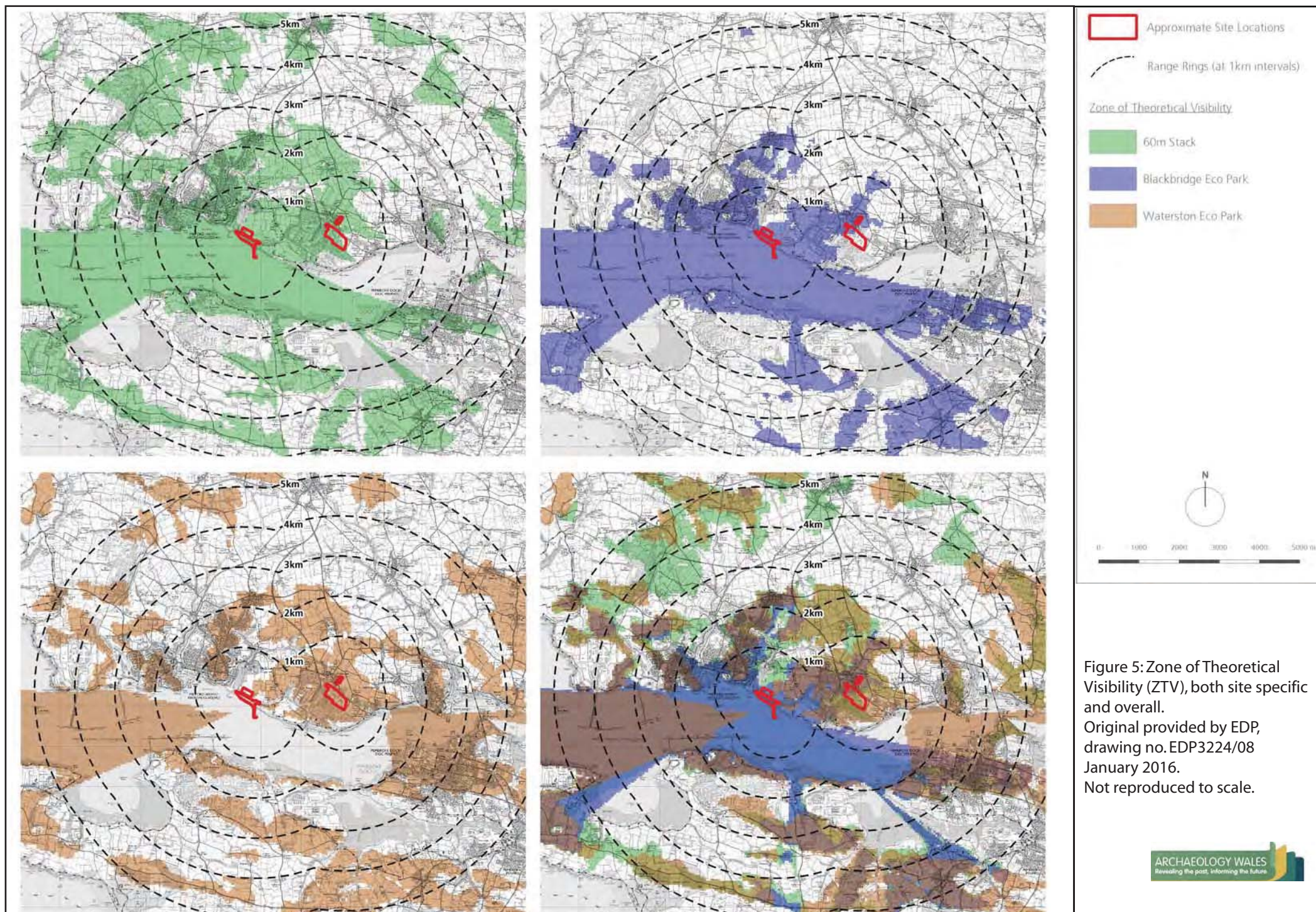
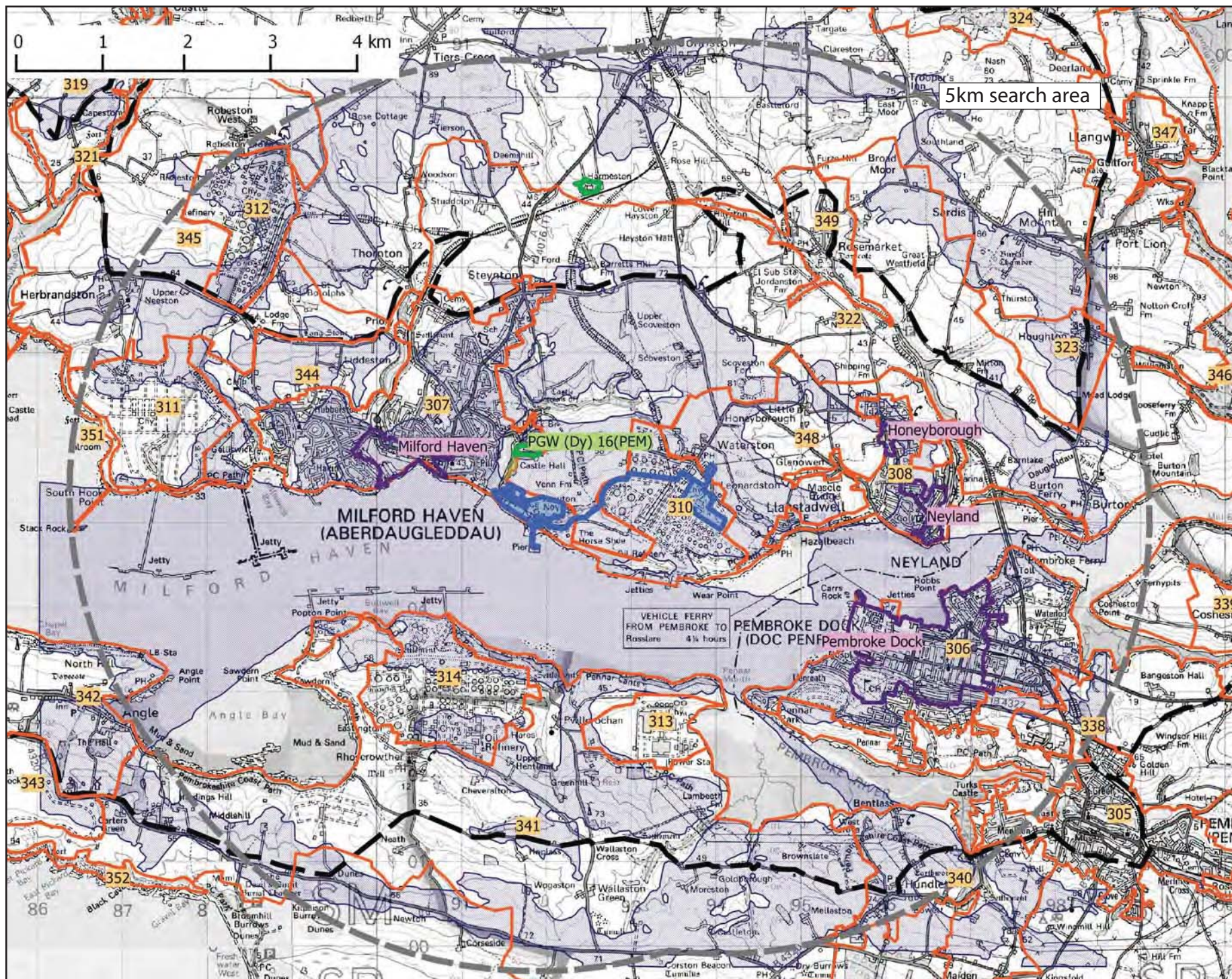


Figure 4: Proposed development layout at the Waterston site. Reduced from original scale.















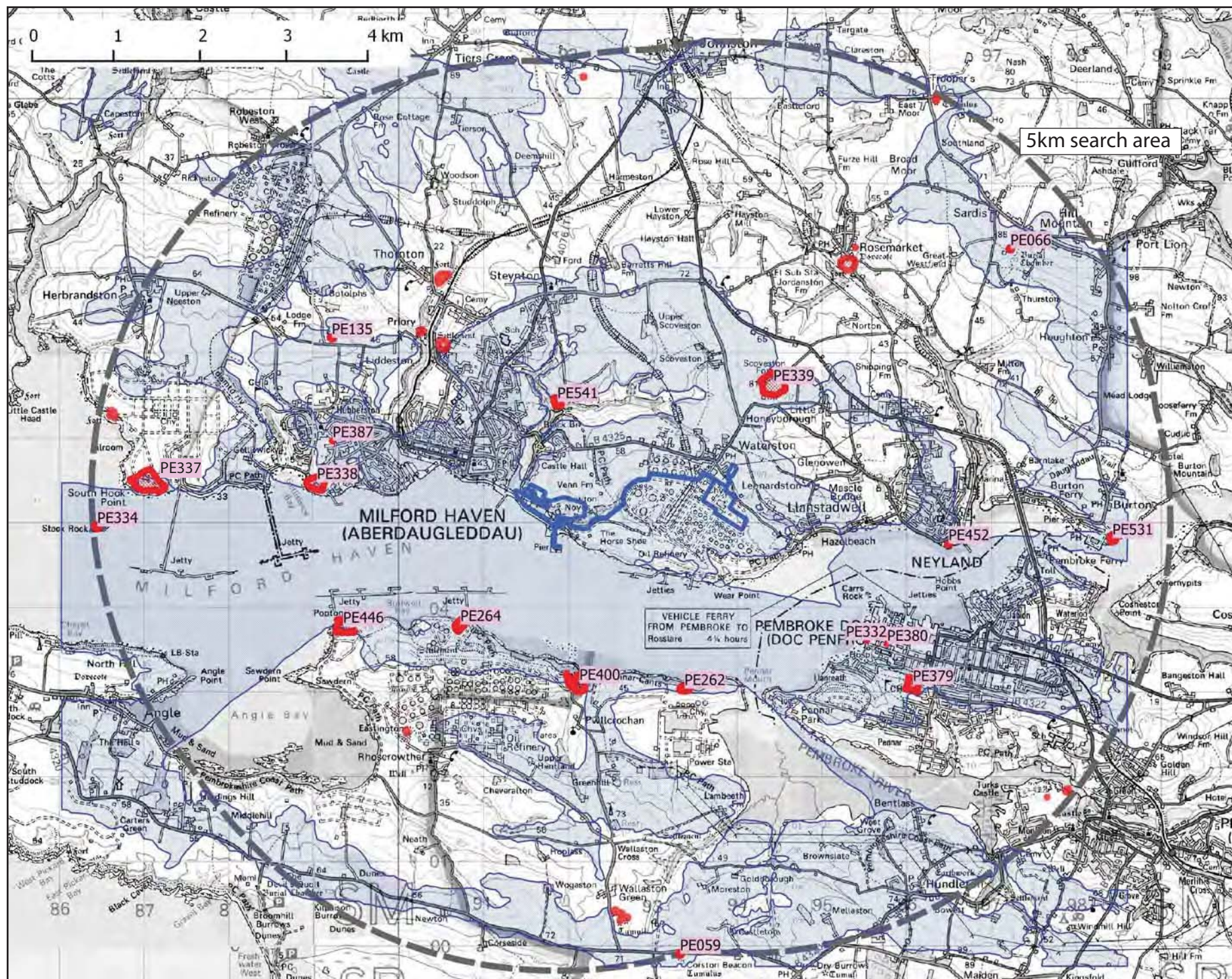
-  Areas of proposed development
-  Limit of combined ZTV
-  Historic Landscape Character Area (labelled by HLCA no.)
-  Registered Historic Landscape HLW (D) 3
-  Conservation Area
-  Historic Parks & Gardens (labelled by ref. no.)

Figure 6: Historic landscapes and areas 1:60,000 @ A4.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey





- Areas of proposed development
- Limit of combined ZTV
- Scheduled Ancient Monument (labelled by SAM no.)

Figure 7: Scheduled Ancient Monuments (SAMs). Only those mentioned in the text are labelled 1:60,000 @ A4.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



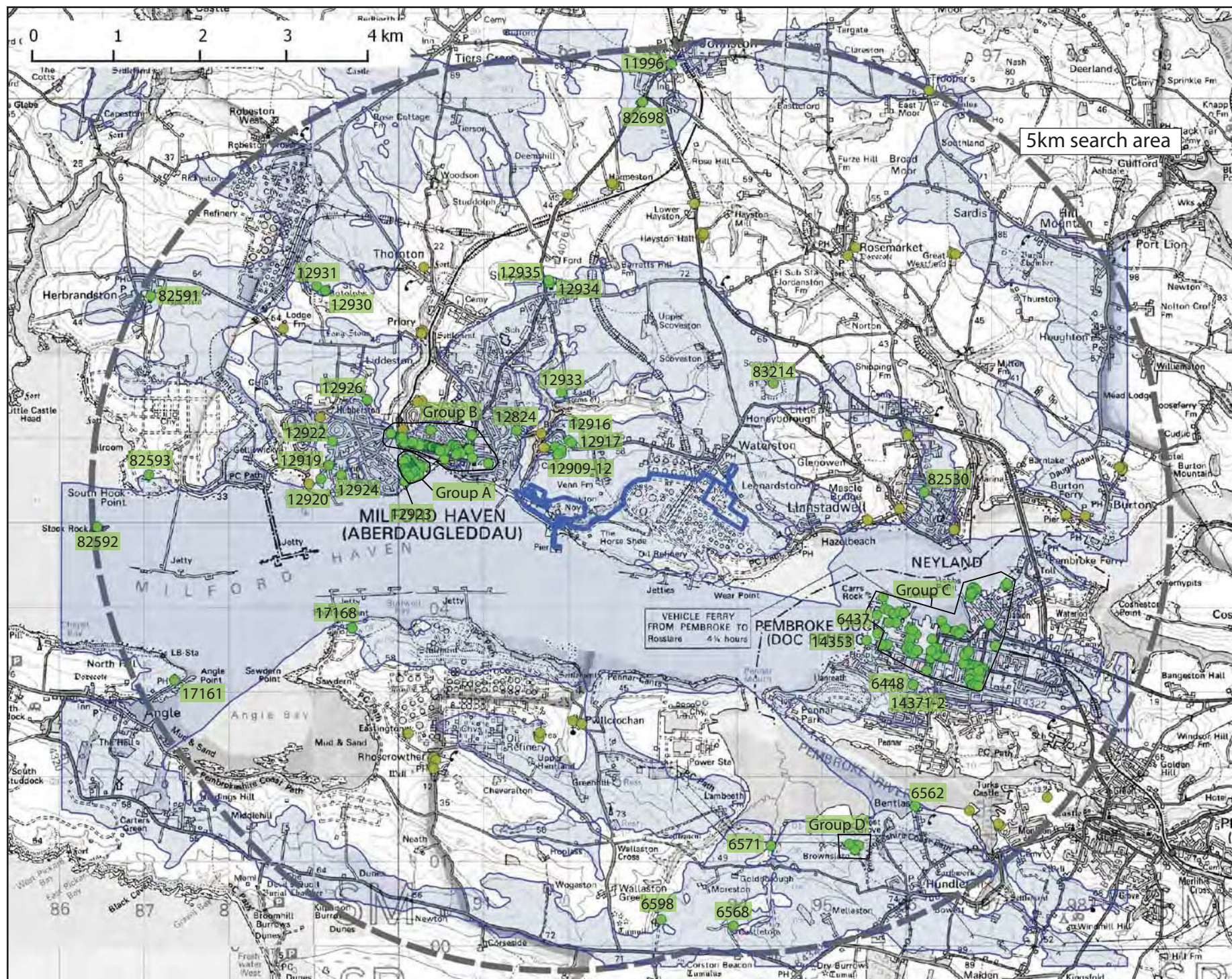


Figure 8: Listed Buildings. Only those mentioned in the text are labelled  
1:60,000 @ A4.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



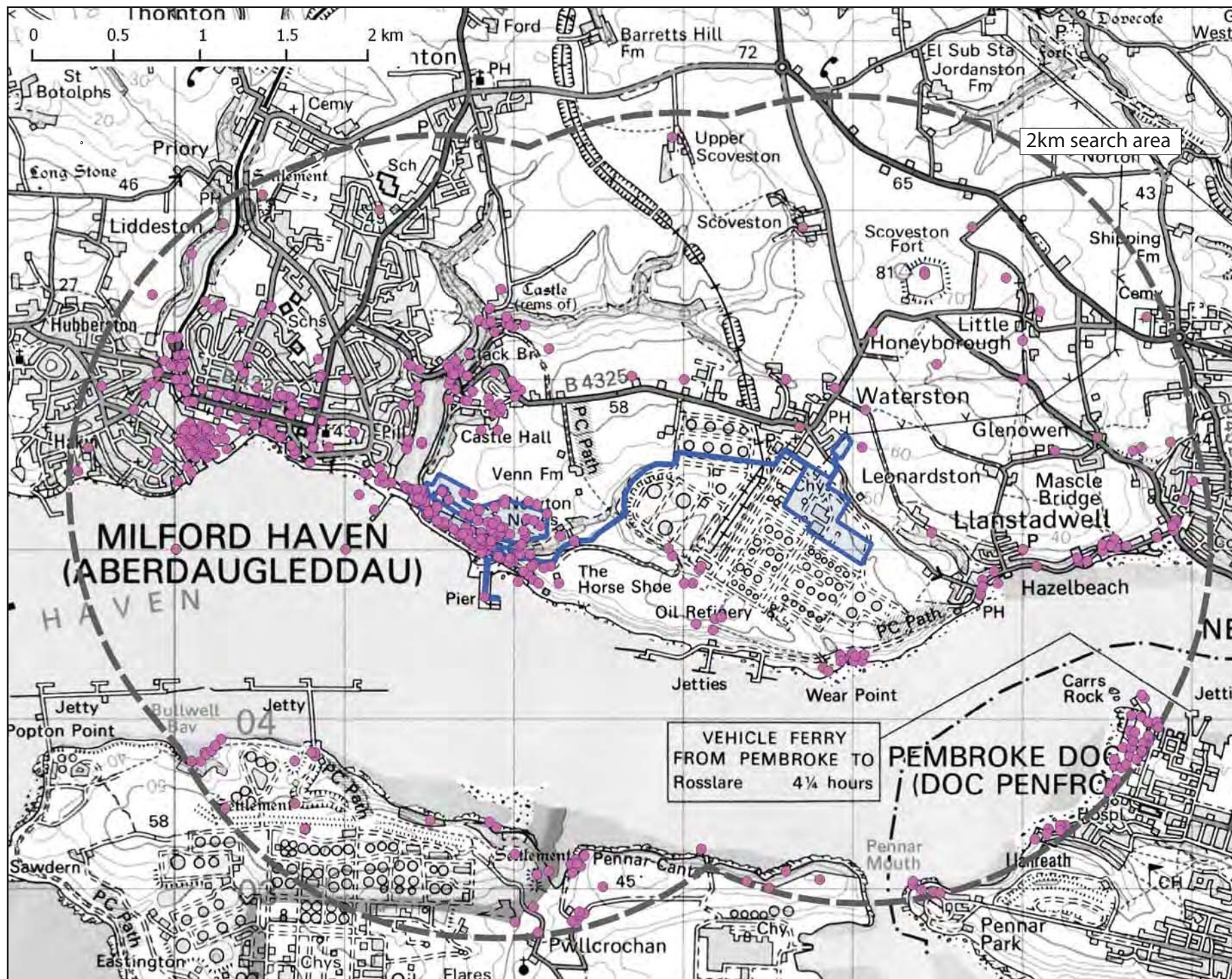


Figure 9: All sites recorded on the regional Historic Environment Record within 2km of the proposed development. 1:30,000 @ A4.

The Ordnance Survey has granted Archaeology Wales Ltd a Copyright Licence (No. 100055111) to reproduce map information; Copyright remains otherwise with the Ordnance Survey



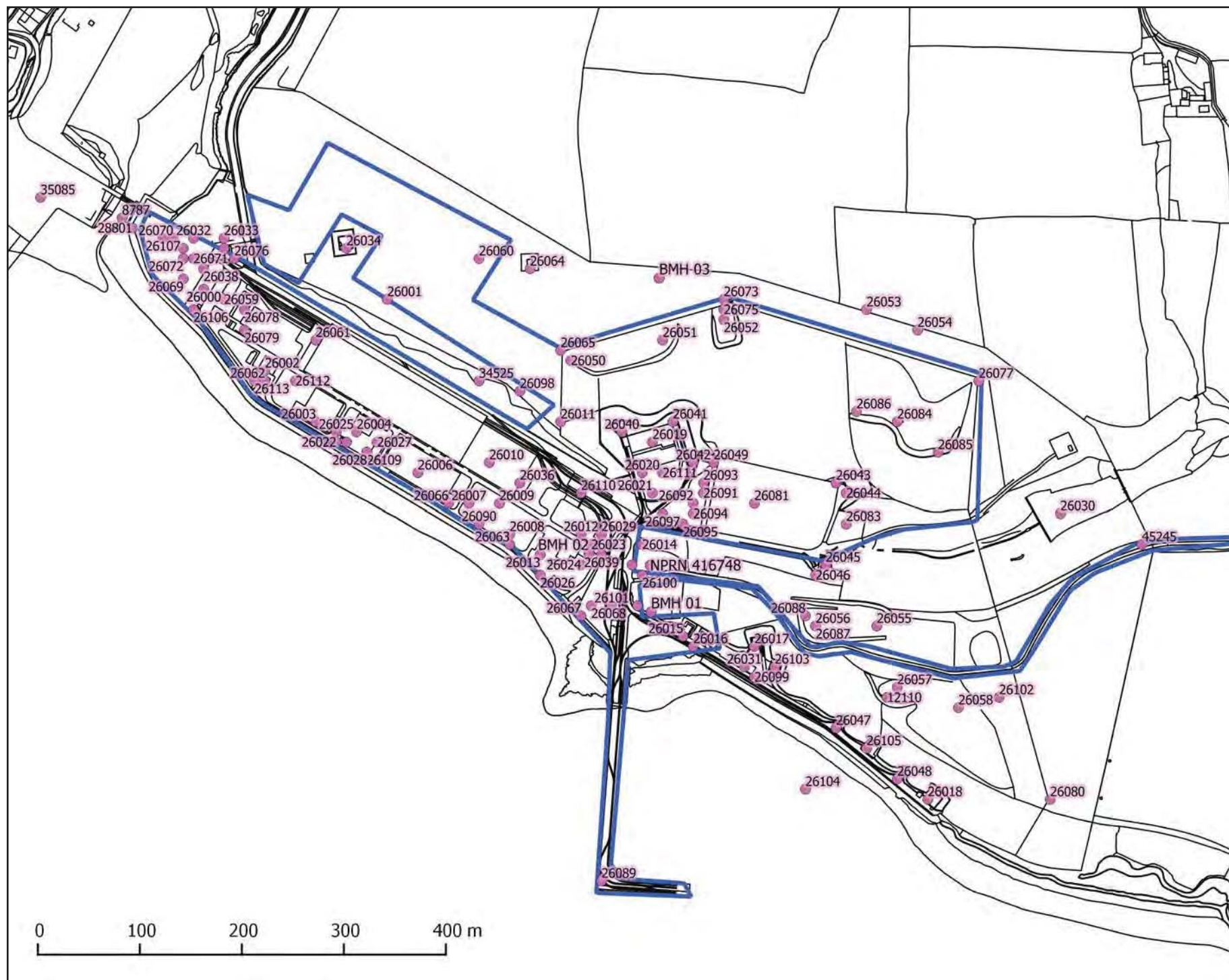
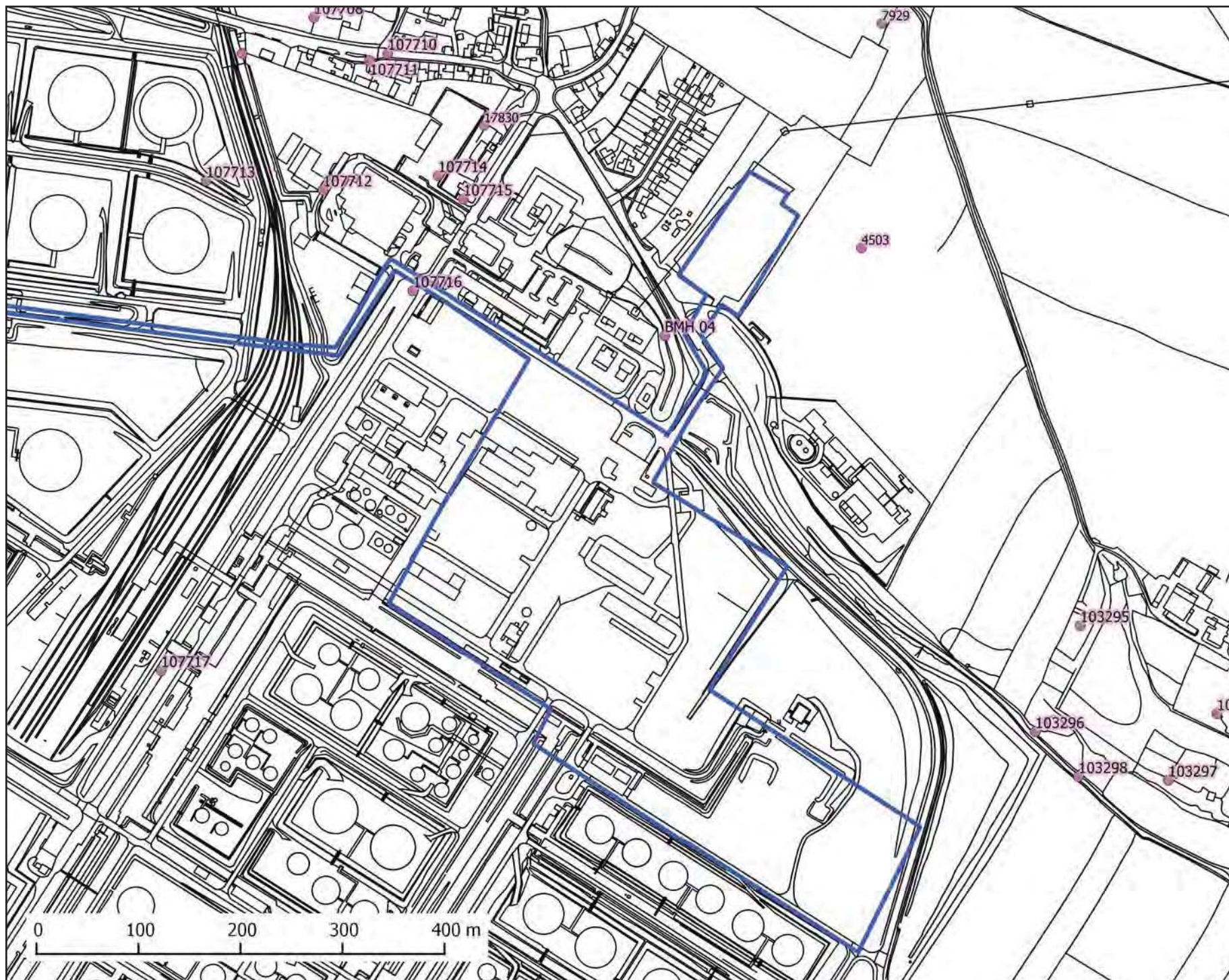


Figure 10: All sites recorded on the regional Historic Environment Record at the Blackbridge site, including relevant sites from the National Monuments Record and new sites identified during the study 1:5000 @ A4.





 Areas of proposed development


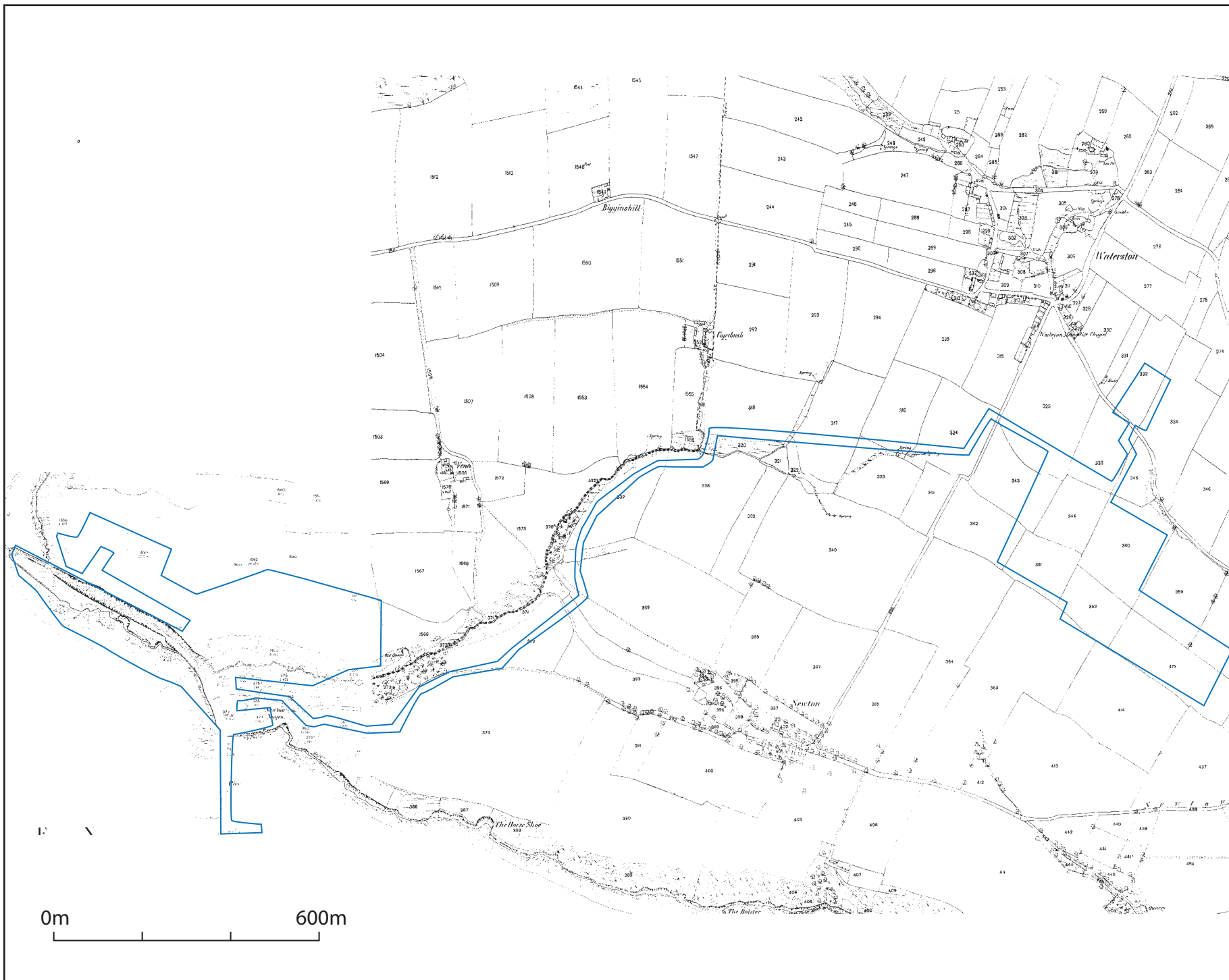
 Site recorded on the HER, NMR and new sites.  
(Labelled by reference in main text)

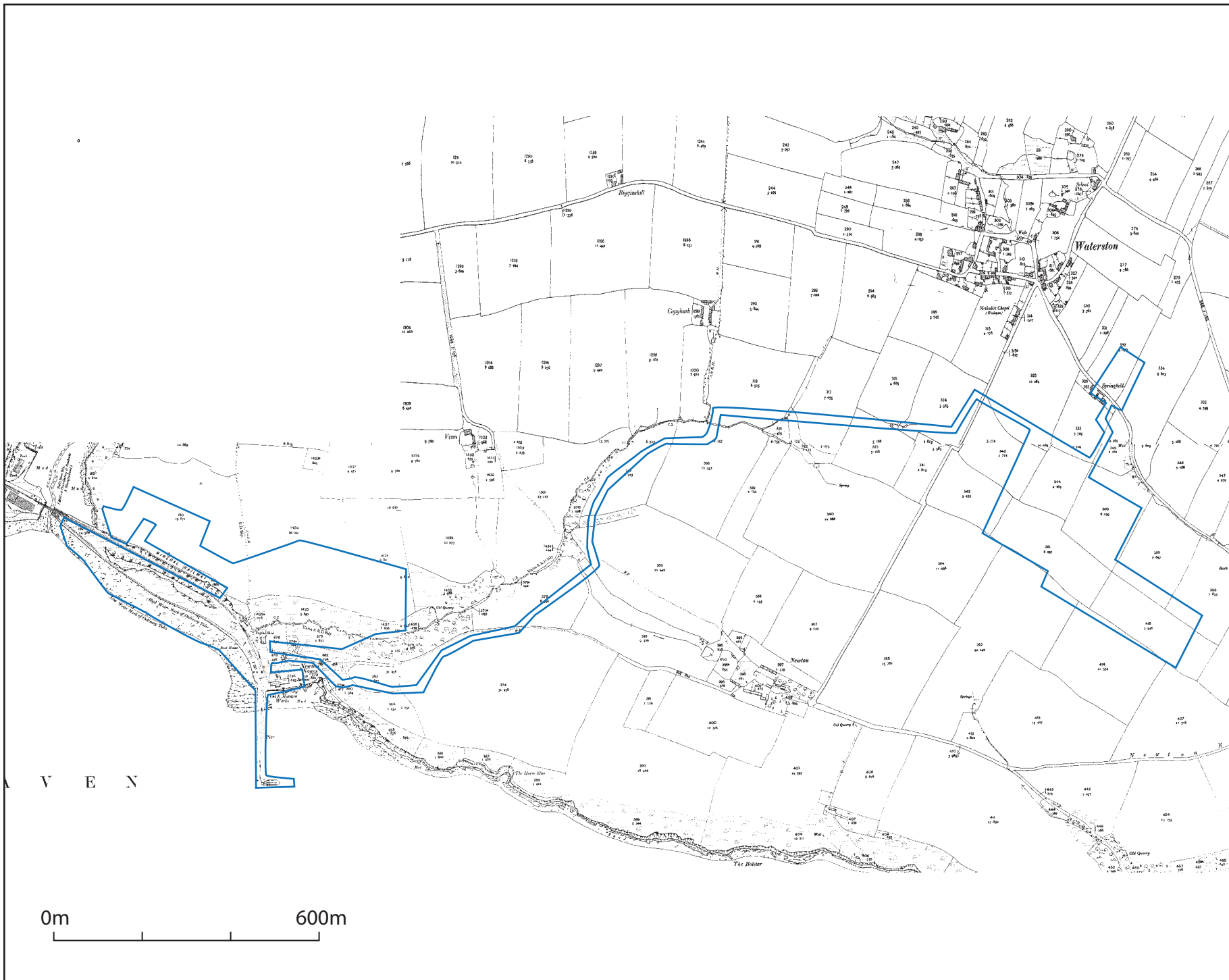
Figure 11: All sites recorded on the regional Historic Environment Record at the Waterston site, including relevant sites from the National Monuments Record and new sites identified during the study 1:5000 @ A4.





 Areas of proposed development

Figure 12: Proposed development site overlaid on the 1st ed Ordnance Survey map of 1875.



Areas of proposed development

Figure 13: Proposed development site overlaid on the 2nd ed Ordnance Survey map of 1908.



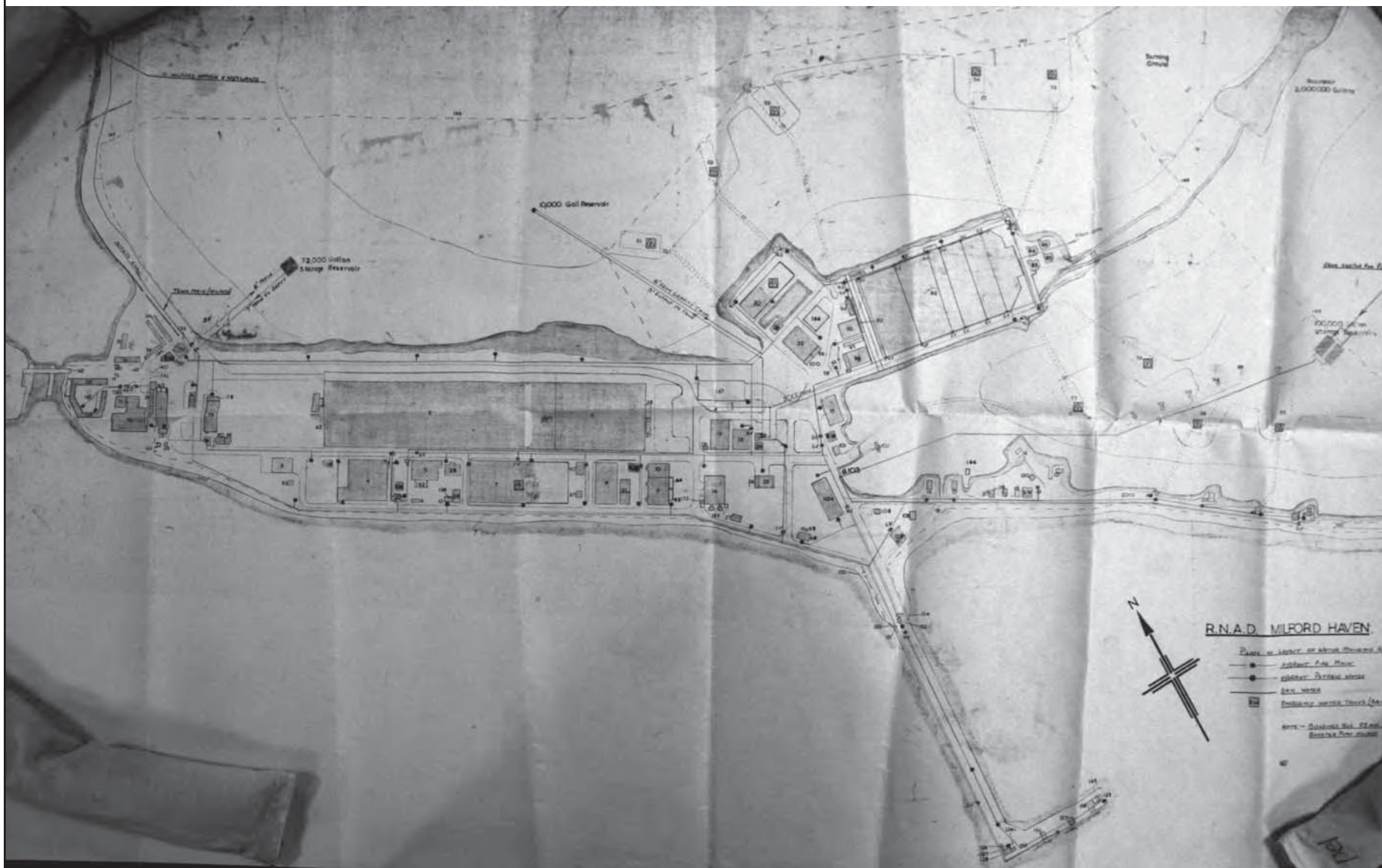


Figure 14: Water mains plan, c.1960, showing the layout of the RNAD site at Blackbridge. Pembrokeshire Record Office - PCC/FI/4/5.







Photo 1: Royal Naval aerial photograph, looking NW, early 1950s. Showing the Blackbridge RNAD site, with camouflage paint on the roof of the Bulk Store (PRN 26001). Image courtesy of Scolton Manor Museum.



Photo 2: As above, looking east. Image courtesy of Scolton Manor Museum.

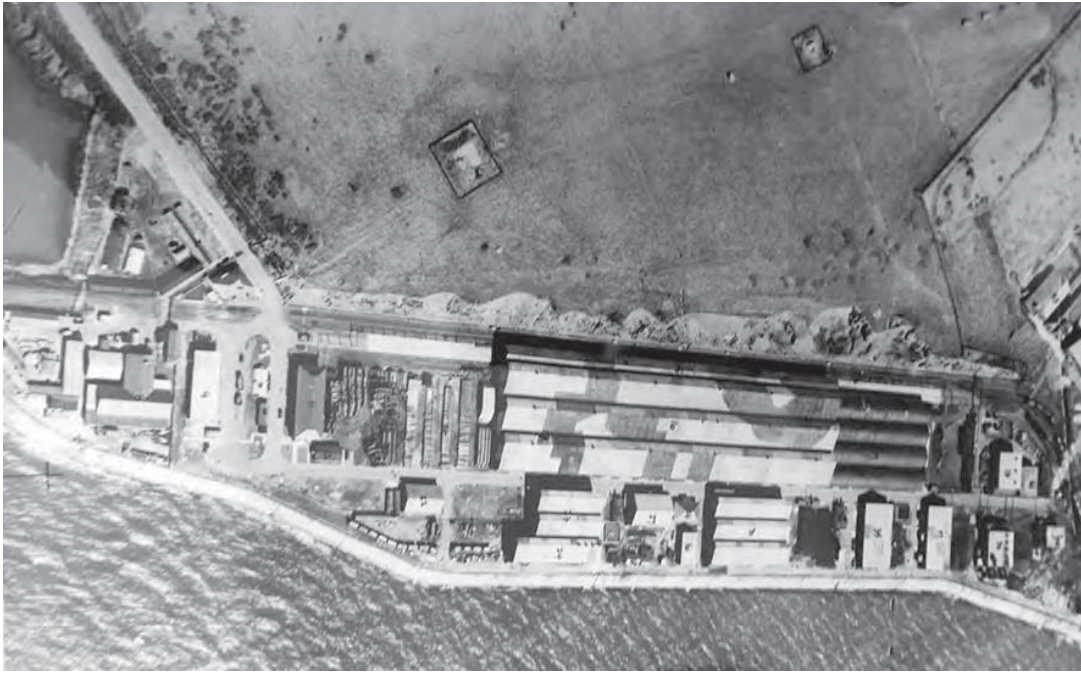


Photo 3: Royal Navy aerial photos, early 1950s, showing the Blackbridge RNAD site with camouflage paint on the Bulk Store PRN 26001. Image courtesy of Scolton Manor Museum.

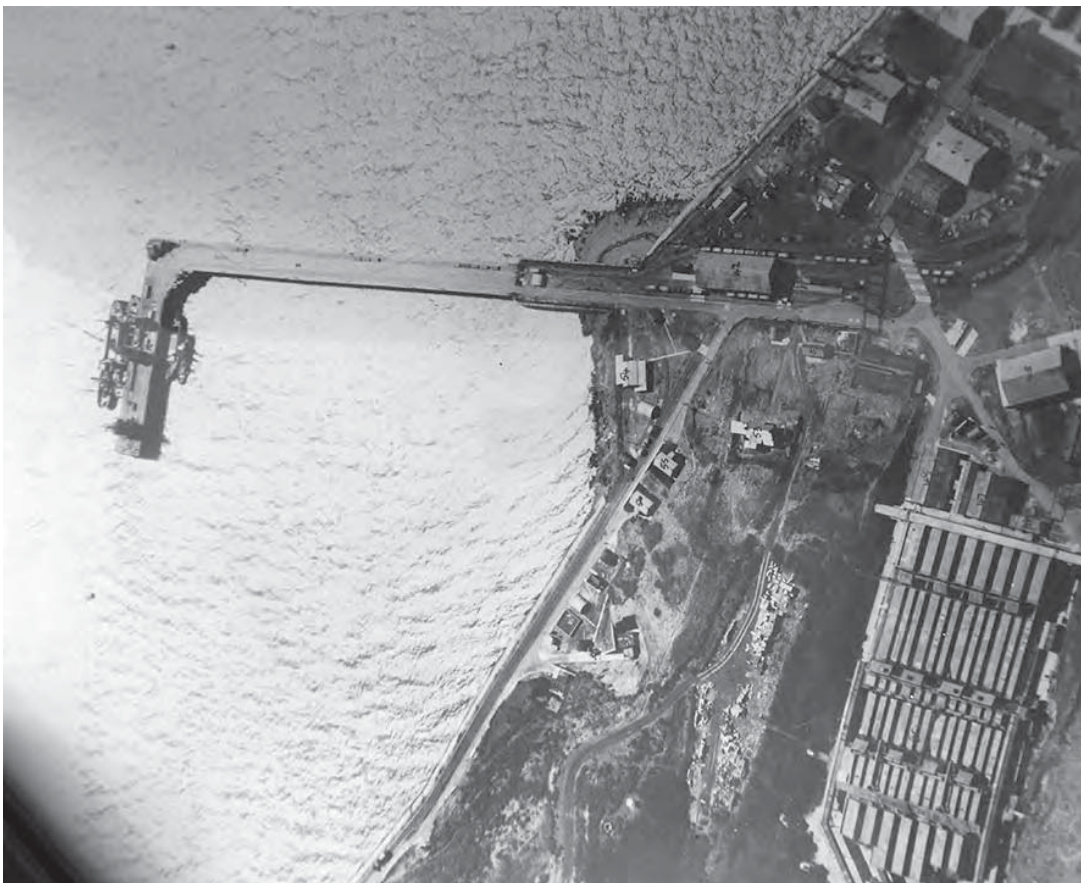


Photo 4: As above, showing Newton Noyes jetty (PRN 26089) and the filling factory (PRN 26081). Image courtesy of Scolton Manor Museum.





Photo 5: Photo taken during construction works in the 1930s, believed to show part of Newton Noyes farmstead prior to demolition (NPRN 416748). Image courtesy of Scolton Manor Museum.



Photo 6: Photo taken during construction works in the 1930s, believed to show part of the former industrial complex (PRN 416749) prior to demolition. Image courtesy of Scolton Manor Museum.



Photo 7: Photo taken in the mid-1930s during construction work on the RNAD site. Showing cutting of railway PRN 34525. The rock face to the left was quarried vertical, the outcrop to the right was removed and the Bulk Store built at that location. Image courtesy of Scolton Manor Museum.



Photo 8: The Bulk Store (PRN 26001) under construction, 1937. Image courtesy of Scolton Manor Museum.





Photo 9: Shoreline development to the east of the proposed development area. Image courtesy of Scolton Manor Museum.



Photo 10: Construction work in the area of the filling factory (PRN 26081), looking N, 1936. Image courtesy of Scolton Manor Museum.





Photo 11: As above, looking E. Image courtesy of Scolton Manor Museum.



Photo 12: Construction works 1938, showing the Bulk Store (PRN 26001) to the right, and the Assembly Shop (PRN 26006) on the left. Image courtesy of Scolton Manor Museum.



Photo 13: Extension works being undertaken on Newton Noyes jetty (PRN 26089) in association with the development of the RNAD site in 1937. Image courtesy of Scolton Manor Museum.



Photo 14: Postcard image of Newton Noyes jetty (PRN 26089) in the early-20<sup>th</sup> century. Pembrokeshire Records Office HDX/789/1.



Photo 15: Newton Noyes jetty (PRN 26089) in use, c.1972. Image courtesy of Scolton Manor Museum.



Photo 16: The Bulk Store (PRN 26001) in operation in the 1980s. Image courtesy of Scolton Manor Museum.





Photo 17: The interior of the Bulk Store (PRN 26001) in the early 1960s. Image courtesy of Scolton Manor Museum.



Photo 18: The interior of the Assembly Shop (PRN 26006) in the early 1960s. Image courtesy of Scolton Manor Museum.



Photo 20: General views of the Blackbridge RNAD site in operation in the 1980s. Image courtesy of Scolton Manor Museum.



Photo 21: General views of the Blackbridge RNAD site in operation in the 1980s. Image courtesy of Scolton Manor Museum.





Photo 22: View NW across the RNAD during operation in the 1980s. Image courtesy of Scolton Manor Museum.



Photo 23: Demolition works on the Filling Factory (PRN 26081), 1990. Image courtesy of Scolton Manor Museum.





Photo 24: Demolition works on the Filling Factory (PRN 26081), 1990. Image courtesy of Scolton Manor Museum.



Photo 25: SE facing shot of the Bulk Store (PRN 26001) on the left, present day.

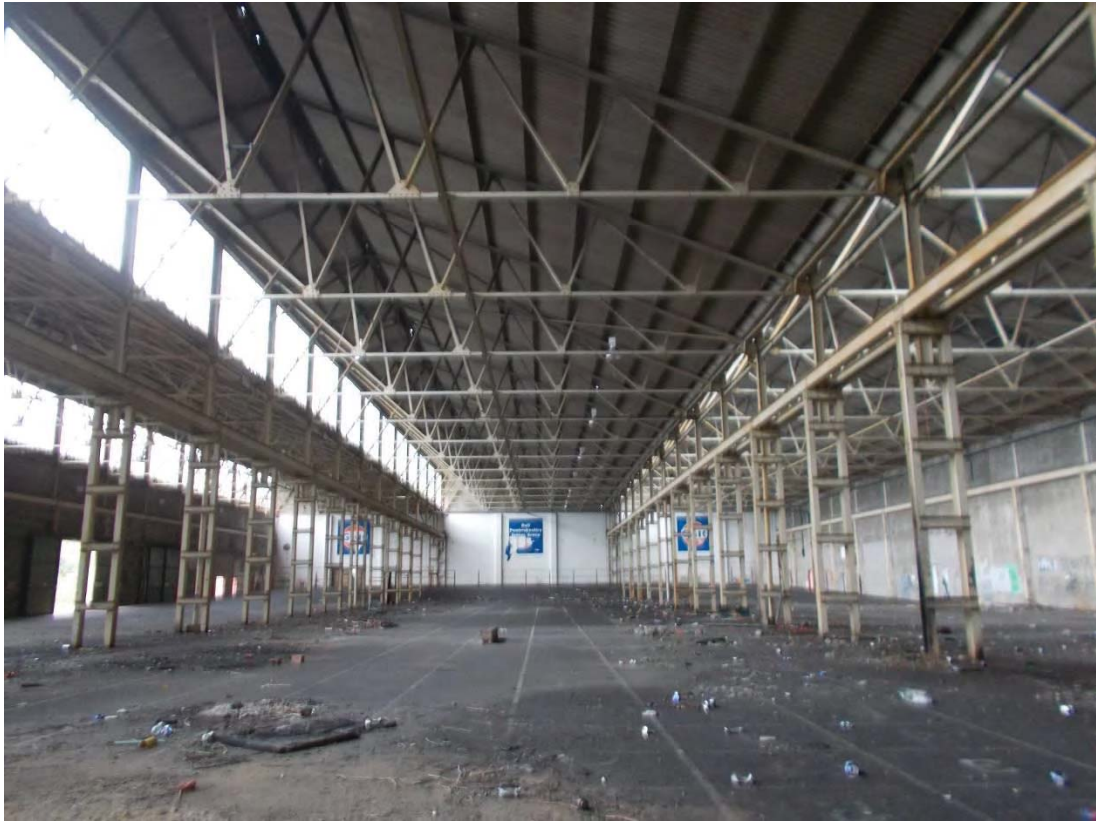


Photo 26: Interior of the Bulk Store (PRN 26001), looking NW. Present day.



Photo 27: North side of the Component Store (PRN 26010) and Bulk Store (PRN 26001). Present day.





Photo 28: NW facing shot of the Component Store (PRN 26010) on the right, and the Assembly Shop (PRN 26006) on the left. Present day.



Photo 29: Interior of the Component Store (PRN 26010). Present day.





Photo 30: SE facing shot of the Assembly Shop (PRN 26006). Present day.

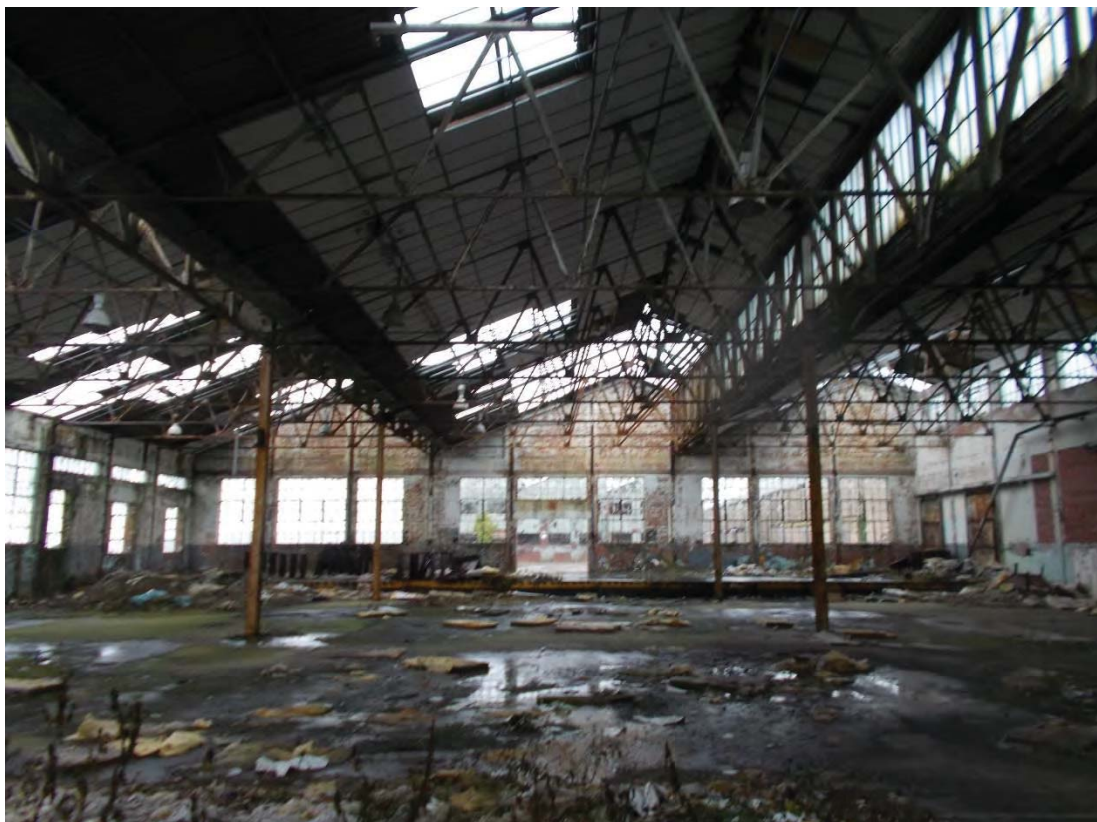


Photo 31: Interior of the Assembly Shop (PRN 26006). Present day.



Photo 32: NW facing shot of the Workshop Block (PRN 26003). Present day.

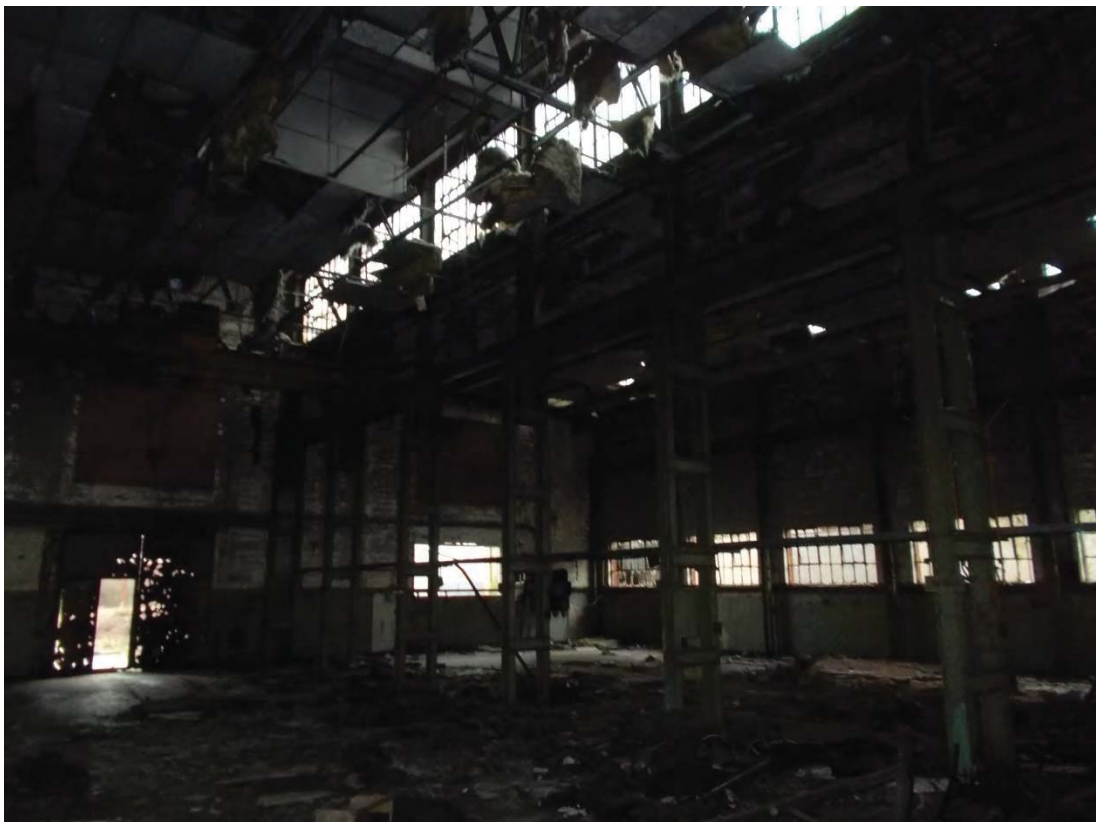


Photo 33: Interior of the Workshop Block (PRN 26003). Present day.





Photo 34: North facing shot of Office (PRN 26078). Present day.



Photo 35: W facing shot of Timber Store (PRN 26002) on the right, and toilet block (PRN 26062) on the left. Present day.





Photo 36: General view of the eastern end of the RNAD site. Present day.



Photo 37: SW facing shot of Sentry Post (PRN 26075) with scrub-covered area behind.



Photo 38: W facing shot of Sentry Post (PRN 26060), with Milford Haven in the background.



Photo 39: S facing shot of standing stone BMH 03. 1m scale.





Photo 40: Aerial photograph of the Gulf Oil Refinery under construction in the 1960s. Pembrokeshire Record Office HDX/1621/2.



Photo 41: As above





Photo 42: N facing shot of former car park and site of proposed Cheese and Packaging Factories at Waterston.



Photo 43: View S towards main development with the former Gulf Oil Refinery, showing blocked view.



Photo 44: View from Castle Pill SAM site PE541 towards Blackbridge development, showing impeded view.



Photo 45: NE facing view from SAM PE264 towards proposed development. Blackbridge site arrowed.





Photo 46: NE facing shot from SAM PE446 towards proposed development. Blackbridge site arrowed.



Photo 47: W facing shot from SAM PE 332, also LB 14353, towards proposed development. Blackbridge site largely hidden by headland, Waterston site indistinguishable from existing refinery development on the headland.





Photo 48: ESE facing shot from Milford Haven Docks, showing view from LB Group A. Blackbridge site arrowed.



Photo 49: The King's Arms, Grade II listed (LB 12923).



Photo 50: View ESE from The King's Arms towards proposed development. Blackbridge site arrowed.

# *Archaeology* *Wales*

## **APPENDIX I:**



### Appendix 1: Individual sites within the Blackbridge RNAD site (PRN 28001)

PRN	Description	Condition	Proposed development
26000	Motor transport workshop & garage. Rectangular single-storey, corrugated asbestos clad, 7 bays, brick W wall. Pitched gable roof on steel trusses, roller garage door to E. 1939	Demolished to ground level.	No development shown.
26001	Bulk Store. Rectangular, 32 bayed, triple pile with saw-toothed corrugated roof. Steel-framed reinforced concrete walls, 12 double-steel doors in S wall, railway loading bay against N wall. 1939	<b>Extant</b> , derelict, stripped of internal features. Race track established at E end. Railway loading bay removed (rails still present).	Building retained, converted into Pyroliser Building – extensively refurbished and increased in height (change of roof).
26002	Timber Store. Rectangular single-storey brick building with pitched gable roof of corrugated asbestos on steel trusses. Steel door on gable end. 1939.	<b>Extant</b> , roofless. Scrub growing internally.	No development shown, building appears to be retained on plan.
26003	Workshop block. Square single-storey triple pile steel-frame building with brick walls. 12 bays long. Saw tooth roof of corrugated asbestos. 1939.	<b>Extant</b> , stripped of internal fixtures and fittings.	Building to be refurbished as the Control Room (Building No. 12)
26004	Painting Shop. Rectangular single-storey brick building with pitched gable roof of corrugated asbestos. 1939	Demolished to ground level.	Area to become Gas Storage Area (Area No.7).
26005	Oil & Paint Store. Small rectangular single-storey brick building with pitched gable roof of corrugates asbestos 1939.	Demolished to ground level.	Area to become Gas Storage Area (Area No.7).
26006	Assembly shop for buoyant mines. Rectangular single-storey, triple pile brick building with 20 bays. Saw tooth roof of corrugated asbestos. 1939.	<b>Extant</b> . Largely stripped of internal features	To be demolished and replaced by Engine House (Building No.5)
26007	Small components store. Rectangular single-storey brick building, 9x4 bays. Pitched gable roof of corrugated asbestos. 1939	Demolished to ground level.	No development shown
26008	Test shop. Rectangular single-storey brick building, 9x3 bays. Pitched gable roof of corrugated asbestos, steel windows with concrete lintels. 1939	Demolished to ground level.	No development shown
26009	Water tank. Emergency water supply, low square brick-built open water tank. 1939.	Covered by a mound of rubble.	No development shown
26010	Large component store. Rectangular single-storey steel-framed building with brick walls. 20 bays and quadruple pile. Curved asbestos roof. 1939	<b>Extant</b> . Stripped of internal fixtures & fittings.	Building retained as the Grinding Hall (Building No.3), refurbished to top of barrel roof.
26011	Battery charging house.	Uncertain, possibly mis-located, but	Unknown

	Single-storey brick building, 5 bays, pitched gable corrugated asbestos roof. 30 light steel windows. 4 bay flat-roofed annex to the S. 1939	presumed to be demolished to ground level	
26012	Dockyard store. Rectangular single-storey brick building, pitched gable roof corrugates asbestos. 1939	Demolished to ground level.	Under Dryer Hall (Building No. 10)
26013	Boiler House. Rectangular, single-storey brick building, 5 x 4 bays. Pitched gable roof, corrugated asbestos. Brick lean-to on N wall, 2 chimney bases to S. 1939.	Demolished to ground level, rubble present	No development shown
26014	Package store. Rectangular brick building, flat roof. 1939	Scrub covered, demolished to ground level. Outline visible.	Close to access track improvements and conveyor route
26015	No.1 Laboratory Room. Rectangular single-storey building, pitched gable roof. Set into cliff, concrete blast wall to E. 1939.	At least partly demolished.	Overlaid by Transformer Yard Area (Area No.18)
26016	No.2 Laboratory Room. Rectangular single-storey building, pitched gable roof. Set into a rock cut opening, blast wall to the west. 1939	At least partly demolished.	Overlaid by Transformer Yard Area (Area No.18)
26017	No.3 Lab Room. 1939.	Presumed at least partly demolished	No development shown
26018	No.4 Laboratory room. 1939	Uncertain. Presumed at least partly demolished	No development shown
26019	Ground mine shop. 1939.	Scrub covered area, but appears to have been demolished to ground level	Area appears largely undeveloped, although may be affected by Stack construction (Building No.6)
26020	Air compressor House. 1939.	Scrub covered area, but appears to have been demolished to ground level	Areas appears undeveloped, but lies between Stack and Storage Building development.
26021	Sinker Shop, sling store and outside party's clothing store. Rectangular 5-bay building, pitched gable roof, corrugates asbestos, with lean-to. 1939.	Presumed demolished to ground level	Close to Storage Building (Building No.4) and access track improvement, potential disturbance.
26022	No.2 booster pump house. 1939	Demolished to ground level.	Area to become Gas Storage Area (Area No.7).

26023	No.1 electricity sub station. Square single-storey brick building, flat asphalted concrete roof, double steel doors to S. 1939.	Demolished to ground level.	Under Dryer Hall (Building No.10)
26024	Locomotive shed in eastern bay, fire-engine shed in western bay. Rectangular double-pile brick building. Pitched gable roof, corrugated asbestos. Large rolling steel door to N. 1939.	Demolished to ground level.	No development shown
26025	Emergency water supply tank. Square low brick-built water tank. 1939	No remains visible.	Area to become Gas Storage Area (Area No.7).
26026	Electricity substation. 1939	Demolished to ground level.	No development shown
26027	Ablutions block. Rectangular single-storey brick building. Hipped slate roof, porch entrance to N. 1939.	Demolished to ground level.	Area to become Gas Storage Area (Area No.7).
26028	Laundry. Rectangular single-storey brick building, 4 bay. Pitched gable roof of corrugated asbestos. 1939	Demolished to ground level.	Area to become Gas Storage Area (Area No.7).
26029	No.1 booster pump house. 1939.	Demolished to ground level.	Under Dryer Hall (Building No.10)
26030	Emergency water supply tank, brick built. 1939. Possibly mis-located, maps show larger reservoir here.	Uncertain	Retained in development, largely unaffected
26031	Emergency water supply tank. Square low brick walled open tank. 1939	Uncertain	No development shown.
26032	Darts Hall. 1950	Demolished	Area developed for car parking
26033	Table tennis hut. 1950	Demolished	No development shown
26034	Emergency water supply. Square, semi-sunken concrete tank, enclosed by fencing. 1939.	<b>Extant</b> , disused.	Area undeveloped, retained.
26035	Rectangular building, single-storey brick built, 4x1 bay. Flat concrete roof. 1950.	Uncertain, mis-located	Uncertain, mis-located
26036	Lean-to, southern part EEM store, north part MED office. Rectangular single-storey 7 bay lean-to. 1939.	Demolished to ground level.	Attached building to be refurbished, Dryer Hall (Building No.10) built in close proximity.
26037	Emergency water tank. Irregular plan, low brick wall open water tank. c.1950.	Uncertain	Possibly affected by improved access
26038	Three latrine buildings. Rectangular, single storey, gabled slate roof	Demolished to ground level	Area developed for car parking
26039	Sentry post. Small 2.26m square brick building. 1939.	Demolished to ground level.	On line of access track



			improvements and close to corner of Dryer Hall (Building No.10)
26040	No.1 Fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.1 magazine. 1939.	<b>Extant.</b> scrub covered.	Retained in development.
26041	No.2 Fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.2 magazine. 1939	<b>Extant,</b> scrub covered.	Retained in development.
26042	No.3 fan house, Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.3 magazine. 1939	<b>Extant,</b> scrub covered.	Retained in development.
26043	- No.4 fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.4 magazine. 1939	Scrub covered, presumed <b>extant.</b>	Retained in development.
26044	No.5 fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.5 magazine. 1939	Scrub covered, presumed <b>extant.</b>	Retained in development.
26045	No.6 fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.6 magazine. 1939	Scrub covered, presumed <b>extant.</b>	Retained in development.
26046	No.7 fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.7 magazine. 1939	Scrub covered, presumed <b>extant.</b>	Retained in development.
26047	No.8 fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.8 magazine. 1939	Uncertain, presumed <b>extant</b>	No development shown
26048	No.9 fan house. Brick arched tunnel entrance enclosed by large steel doors. Flat concrete roof, air induction chimney. Leads to No.9 magazine. 1939	Uncertain, presumed <b>extant</b>	No development shown
26049	Switch house. 1939	Demolished to ground level	In close proximity to Storage Building (Building No.4)
26050	No.1 magazine, reached by a long tunnel which dog-legs to the NW. 1939.	<b>Extant.</b>	Retained underground.
26051	No.2 magazine, reached by a long tunnel which dog-legs to the N. 1939.	<b>Extant.</b>	Retained underground.
26052	No.3 magazine, reached by a long tunnel which dog-legs to the NNW. 1939.	<b>Extant.</b>	Retained underground.

26053	No.4 magazine, reached by a long tunnel which dog-legs to the NE. 1939.	<b>Extant.</b>	Retained underground.
26054	No.5 magazine, reached by a long tunnel which dog-legs to the NNE, 1939.	<b>Extant.</b>	Retained underground.
26055	No.6 magazine, reached by a long tunnel which dog-legs to the SE. 1939.	<b>Extant</b>	Retained underground.
26056	No.7 magazine, reached by a long tunnel which dog-legs to the S. 1939	<b>Extant</b>	Retained underground.
26057	No.8 magazine, reached by a long tunnel which dog-legs to the NE. Rock cut chamber cavity, lined by 12 bay concrete walls carrying a travelling crane, served by 1m gauge railway and road. 1939	Presumed <b>extant</b>	Retained underground.
26058	No.9 magazine, reached by a long tunnel which dog-legs to the NNE. 1939.	Presumed <b>extant</b>	Retained underground.
26059	Office. Curved asbestos hut, brick end walls and porched entrance to N. 1939.	Demolished.	Possibly affected by line of improved access.
26060	Sentry post. Small, 2.26m square, brick built with detached blast wall. 1939	<b>Extant</b>	Underlies area of Greenhouses (Building No.16)
26061	Lean-to office against Bulk Store 26001. Rectangular single-storey cement rendered, 3 bay. c.1960.	Demolished to ground level	On edge of building to be extensively refurbished, but retained.
26062	Men's latrine for the Workshop. Single-storey brick building, 2x1 bay. Flat corrugated asbestos roof. c.1970.	<b>Extant</b> , part tumbled S wall. Internally stripped.	No development shown.
26063	Drying & rest room. Lean-to against test shop (26008), rectangular single-storey brick building. c.1940.	Demolished to ground level.	No development shown
26064	Emergency water tank. Square, semi-sunken concrete tank, enclosed in fencing. 1939	<b>Extant.</b>	No development shown
26065	Hollow bastion formed by the inner dacoit security fence, overlying magazine. 1939	Line no longer visible	Line would be removed by Exhaust Gas Conditioning and Algae Propagation (Building no.9).
26066	Women's latrine. Small, rectangular, single-storey brick building with pitched gable roof of corrugated asbestos. 1939.	Demolished to ground level	Overlaid by Engine House (Building No.5)
26067	Sling store. Rectangular, single-storey brick building, pitched gable roof. 1939	Demolished to ground level	Partly overlaid by MV Room (Building No.17)

26068	Inflammable store. 1939	Demolished	Overlaid by MV Room (Building No.17)
26069	Canteen. Large, single-storey brick building, T-plan. Gabled slate roof. 1939	Demolished to ground level.	Area developed for car parking
26070	Recreation room. 1939	Demolished to ground level.	Area developed for car parking
26071	Vegetable store.	Demolished to ground level	Area developed for car parking
26072	Potato store.	Demolished to ground level	Area developed for car parking
26073	Hollow bastion formed by the inner dacoit security fence, contains sentry post 26075. 1939.	Line still evident	Area undeveloped.
26074	Weighbridge. 1939	Demolished to ground level. Photo 1296	Area developed for car parking
26075	Sentry post, small 2.25m square, brick built with rear blast wall. 1939.	<b>Extant</b>	Area undeveloped
26076	Guardhouse. Single-storey L-plan brick building, hipped slate roof with central brick stack. Projecting bay windows to N, main door to E. Now used as security office. 1939.	<b>Extant</b>	Not shown on plan
26077	Hollow bastion formed by the inner dacoit security fence. 1939.	Uncertain, scrub-covered.	Sections overlaid by new access track and Algae Bioreactor Unit (Building 15)
26078	Office, with medical centre/surgery. Rectangular two-storey brick building, 9x3 bays. Hipped slate roof with gables. Main entrance to W, medical centre entrance to N, porched doorway to S. Pitched gable roofed extension to E. 1939	<b>Extant.</b> Stripped of internal fixtures and fittings, woodblock flooring present.	Building to be retained and refurbished.
26079	Inspection department office. Rectangular prefab reinforced concrete hut, 11x6 bay. Brick porched doorways, gently pitched felted concrete roof. 1939.	Demolished to ground floor. Photo 1294	No development shown
26080	Hollow bastion formed by the inner dacoit security fence. 1939	Uncertain, presumed extant	No development shown
26081	Filling factory. 1939.	Demolished	Storage Building (Building No.4)
26082	Blast wall. Large reinforced concrete wall spanning the valley, with rounded access arches. 1939.	Scrub covered, at least partly demolished	Storage Building (Building No.4) to be built over site.
26083	Four small interlinked structures, function unknown. 1939	Demolished	Storage Building (Building No.4) to be built over site.



26084	Sentry post. Small, 2.26m square brick building with rear blast wall. 1939.	Uncertain	Adjacent to Algae Bioreactor Units (Building 15)
26085	Weapons pit, earthen pit with low curved wall and machine gun mounting. 1940-45.	Derelict, scrub-covered	No development planned.
26086	Weapons pit, earthen pit with low curved wall. 1940-45.	Derelict, scrub-covered	Adjacent to Algae Bioreactor Units (Building 15)
26087	Weapons pit. Earthen pit, enclosed by curved drystone wall. 1940-45	Derelict, scrub covered	No development shown.
26088	Sentry post. 1939-45.	Demolished	No development shown.
26089	Steel jetty from masonry pier. L-plan, deck carries 1m gauge railway, formerly had 3 cranes. Built 1872.	<b>Extant</b>	Refurbished to accommodate an enclosed conveyor and pneumatic towers (Building No.11)
26090	Overflow store. Rectangular single-storey brick building 1939.	Demolished to ground level.	No development shown
26091	Shelter store. 1939.	Demolished	Storage Building (Building No.4) to be built over site.
26092	Storehouse. Rectangular brick building, single-storey. Pitched gable roof of corrugated asbestos. 1939.	Demolished, scrub covered	Storage Building (Building No.4) to be built over site.
26093	Magazine section office. 1939	Demolished to ground level.	Storage Building (Building No.4) to be built over site.
26094	Latrine for the filling factory. Rectangular brick building, gable roof of corrugated asbestos. 1939.	Demolished, scrub covered	Storage Building (Building No.4) to be built over site.
26095	Shifting room and laboratory laundry. Single storey brick building. 1939	Demolished, scrub covered	Storage Building (Building No.4) to be built over site.
26096	Emergency water tank. Square semi-sunken, low brick-walled tank.	<b>Extant</b>	No development shown
26097	Air raid shelter and lab paint store. Pre-cast concrete-panelled building. 1939	Uncertain, scrub-covered	Close to Storage Building (Building No.4) and conveyor route
26098	Weapons pit, earth pit, used for light anti-aircraft weapons. 1940	Uncertain	Close to Greenhouse development
26099	Sentry post. Small 2.26m square brick building with detached rear blast wall. 1939.	Uncertain, possibly mis-located	No development shown
26100	Internal Transport Office. Rectangular, single-storey building, 3-bays long. 1939	Demolished	In area of access track improvement,

			and services corridor.
26101	Explosives workshop. Rectangular single-storey brick building, 8 bays. Pitched gable roof, corrugated asbestos. 1939	Demolished to ground level, outline still visible	Lies in area of small MV room (Building No.17) and access track improvements and conveyor route.
26102	Water reservoirs. Two semi-sunken water tanks with pitched gable roofs. 1939	<b>Extant</b>	No development shown
26103	No.1 detonator store. Rectangular single-storey concrete building. Set in rock-cut enclosure. 1939	At least partly demolished	No development shown
26104	Firework store. Small, single-storey brick building. Corrugated asbestos roof. 1939	Uncertain, mis-located	No development shown
26105	Primer store. Rectangular single-storey building. Protected by concrete blast wall. 1939.	Uncertain	No development shown
26106	Shelter for 2 petrol pumps. Steel-framed building, clad in corrugated sheeting, open-fronted. 1939	Demolished	No development shown
26107	Forman of works office. Single-storey northern range of Works Dept compound. 1939.	Demolished to ground level.	Area developed for car parking
26108	Works Dept store, forms W and S ranges of the Works Dept compound. 1939.	Demolished to ground level.	Area developed for car parking
26109	Annex to house the air compressor. Small, rectangular brick annex to W wall of factory laundry 26028. 1939.	Demolished to ground level.	Area developed as the Gas Storage Area (Area No.7).
26110	Transfer shed. Large rectangular single-storey shed, steel-frame with corrugated sheeting. Large roller doors in gable walls. Steel-framed windows on side walls. c.1950.	Demolished to ground level, rubble present	Overlaid by Drying Hall (Building No.10)
26111	Tested components shop. Large square single-storey brick building. Gabled roof, corrugated asbestos. c.1950.	Presumed demolished, scrub covered	Storage Building (Building No.4) to be built partly over site.
26112	Clocking station. Small, single-storey timber framed building, clad in planks, with gabled felt roof. 1939	Demolished. Photo 1291	No development shown
26113	Oil & Paint store. Rectangular, single-storey brick building. Gabled roof of corrugated asbestos.	Uncertain	No development shown

# *Archaeology Wales*

**Archaeology Wales Limited**

The Reading Room, Town Hall, Great Oak Street,  
Llanidloes, Powys SY18 6BN

**Tel: +44 (0) 1686 440371**

Email: [admin@arch-wales.co.uk](mailto:admin@arch-wales.co.uk)

Company Directors: Mark Houlston MIFA & Jill Houlston

Company Registered No. 7440770 (England & Wales).

Registered office: Morgan Griffiths LLP, Cross Chambers,  
9 High Street, Newtown, Powys, SY16 2NY