# WASTE WATER TREATMENT WORKS AT PENRHOS, HOLYHEAD

## ARCHAEOLOGICAL ASSESSMENT

G1744

Report number: 452

Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

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Prepared

For Symonds Group Ltd

By

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Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

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#### PROPOSED WASTE WATER TREATMENT WORKS, PENRHOS, HOLYHEAD

ARCHAEOLOGICAL ASSESSMENT (G1744)

#### 1 INTRODUCTION

Symonds group Ltd has asked the Gwynedd Archaeological Trust to undertake an archaeological assessment and evaluation of a plot of land (centred on SH 25708110) to the south-west of the disused heliport at Penrhos, Holyhead, in advance of the construction of a waste water treatment works. This site constitutes the study area of the present document.

#### 2 SPECIFICATION AND PROJECT DESIGN

An initial report was requested from Gwynedd Archaeological Trust, assessing the likely archaeological impact of the plans and suggesting mitigatory measures. This was followed by a programme of field evaluation.

#### 2.1 Desktop assessment

The basic requirement was for a desk-top survey of the corridor of interest in order to assess the likely impact of the scheme on the archaeological and heritage features within the area proposed waste water treatment works. The importance of known archaeological remains was to be assessed and areas of archaeological potential to be identified. Measures to mitigate the effects of the treatment works on the archaeological resource were to be suggested.

Gwynedd Archaeological Trust's proposals for fulfilling these requirements were as follows:

#### a) to identify and record the cultural heritage of the area to be affected

*b) to evaluate the importance of what was identified (both as a cultural landscape and as the individual items which make up that landscape)* 

c) to recommend ways in which damage to the cultural heritage can be avoided or minimised

#### 2.2 Field Evaluation

An archaeological field evaluation is defined as 'a limited programme of non-intrusive and /or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or under water. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate' (*Standard and Guidance for Archaeological Field Evaluation*).

The aims of the field evaluation are:

- a) to identify and record the buried cultural heritage within the defined study area;
- b) to evaluate the importance of what has been identified;
- c) to recommend ways in which impact upon the cultural heritage can be avoided or minimised.

#### 3 METHODS AND TECHNIQUES

#### 3.1 Desk-top Study

Consultation of maps, computer and written records and reference works relating to the study area and its environs, which make up the Sites and Monuments Record, was undertaken at Gwynedd Archaeological Trust. Records (including early Ordnance Survey maps, tithe maps and schedules, estate maps and papers and reference works - see bibliography) were also consulted in the library and the archives of the University of Wales, Bangor, and the county archives at Llangefni. Aerial photographs were inspected at the offices of the Countryside Council for Wales.

#### **3.2 Field Evaluation**

The study area comprises a roughly rectangular plot of land with dimensions of 155m x 60m with its longest axis orientated north-east to south west. The north-western boundary stands 10m from the fence surrounding the former Holyhead Heliport. The north-western side of the area is fairly level and is covered by dense gorse and blackthorn scrub. The land rises across the south-eastern portion of the study area before leveling out towards the south-eastern boundary. The north-eastern half of the higher land is covered by immature pine and assorted hardwoods with very dense bramble undergrowth. The woodland on the south-eastern side is more mature, consisting of 30 year old pines with occasional sycamore regrowth. The woodland in both cases is unmanaged and has never been thinned. Rough tracks had been cut into the woodland and scrub around the approximate limits of the site and through parts of the interior.

The evaluation was carried out at the end of April 2002 and the overgrown nature of the study area put certain constraints on the methodology. It was necessary to carry out the evaluation in the spring time which coincides with the nesting season of most native species of birds. Severe constraints were therefore put on further clearance of scrub and woodland. The usual initial phases of a programme of field evaluation comprise a walk-over survey of the study area and its environs in order to assess any sites identified during the desk-based study, and to assess any other sites which may exist as above ground features. This is usually followed by geophysical survey which aims to detect buried archaeological features using a series of non invasive remote sensing techniques. In this case the effectiveness of the initial field visit was somewhat limited because some parts of the immature conifer and gorse scrub areas were not accessible. The tracks that had already been cut into the woodland and scrub allowed adequate view of the land for a few metres to either side and all but the most dense areas of undergrowth could be visually inspected. Limited clearance during trial excavation allowed visual inspection of most of the overgrown areas.

Effective geophysical survey cannot be carried out in woodland or dense scrub. It was therefore not possible to carry out a geophysical survey of any part of the study area.

The final phase of an archaeological field evaluation normally consists of a programme of trial excavation Buried archaeological deposits cannot always be detected from the surface, even with geophysics, and trial trenching allows a representative sample of the development area to be investigated. These trenches typically measure between 10m and 20m long by 2m wide. The turf and topsoil is removed by mechanical excavator, and the resulting surface cleaned by hand and examined for features. Anything noted is further examined, so that the nature of any remains can be understood, and mitigation measures can be recommended. A full written, drawn and photographic record is produced of all excavations. The site archive will be retained at Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, LL57 2RT.

It was felt that the positioning of the trenches in the existing tracks would provide a good sample over most of the area. It was however recommended that three additional tracks should be cut into the densest parts of the undergrowth in order to provide a representative sample (see Fig. 3, trenches 12 to 15). These tracks were cleared under ecological supervision.

A total of 320 sq. m was excavated, typically in trenches measuring 10m by 2m. A total of 15 trenches were excavated, two of which were extended beyond the standard 2m x 10m. These were distributed fairly evenly around the site. The results from the first few trenches identified areas of varying archaeological potential. Several areas of very low archaeological potential were identified and these were less intensively sampled in the latter part of the programme. The position of the trenches was recorded at the end of the fieldwork using a total station.

#### 3.3 Report

All available information was collated from both the desk-based assessment and the field evaluation. On this basis, recommendations for further evaluation are given in the relevant sections of this report.

#### 3.2.1 Categories

The categories listed below follow the guidelines given in *Planning and the Historic Environment: Archaeology* (Welsh Office circular 60/96). The allocation of a site to a category defines the importance of the archaeological resource of that site.

The following categories were used to define the importance of the archaeological resource.

#### Category A - Sites of National Importance.

This category includes Scheduled Ancient Monuments and Listed Buildings (grades I and II\*) as well as those sites that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both.

Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

#### Category B - Sites of Regional Importance

These sites are those which would not fulfill the criteria for scheduling or listing (grades I or II\*), but which are nevertheless of particular importance within the region. Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

#### Category C - Sites of District or Local Importance

These sites are not of sufficient importance to justify a recommendation for preservation if threatened, but nevertheless merit adequate recording in advance of damage or destruction.

#### Category D - Minor and Damaged Sites

These are sites, which are of minor importance, or are so badly damaged that too little remains to justify their inclusion in a higher category. For these sites, rapid recording either in advance or during destruction, should be sufficient.

#### Category E - Sites needing further investigation

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A-D, are temporarily placed in this category, with specific recommendations for further evaluation. By the end of the assessment there should be no sites remaining in this category.

This is used when the location of the site is unknown, but thought to be in the vicinity of the proposed

#### 3.2.2 Definition of field evaluation techniques

Field evaluation is necessary to allow the reclassification of the category E sites, and to allow the evaluation are areas of land where there are no visible features, but for which there is potential for sites to exist. Two principal techniques can be used for carrying out the evaluation: geophysical survey and trial trenching.

#### Field visit

This part of the assessment involves visiting the study area and its environs, assess any sites identified during the desk-based study, and to assess any other sites which may exist as above ground features. All sites noted are photographed and their present condition recorded.

#### Geophysical survey

This technique involves the use of a magnetometer, which detects variation in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetised iron oxides, which tend to be concentrated in the topsoil. Features cut into the subsoil and back-filled or silted with topsoil contain greater amounts of iron and can therefore be detected with the gradiometer. Strong readings can be produced by the presence of iron objects, and also hearths or kilns.

Other forms of geophysical survey are available, of which resistivity survey is the other most commonly used. However, for rapid coverage of large areas, the magnetometer is usually considered the most cost-effective method. It is also possible to scan a large area very rapidly by walking with the magnetometer, and marking the location of any high or low readings, but not actually logging the readings for processing.

#### Trial trenching

Buried archaeological deposits cannot always be detected from the surface, even with geophysics, and trial trenching allows a representative sample of the development area to be investigated. Trenches of an appropriate size can also be excavated to evaluate category E sites. These trenches typically measure between 20m and 30m long by 2m wide. The turf and topsoil is removed by mechanical excavator, and the resulting surface cleaned by hand and examined for features. Anything noted is further examined, so that the nature of any remains can be understood, and mitigation measures can be recommended.

#### 3.2.4 Definition of Mitigatory Recommendations

Below are the measures that may be recommended to mitigate the impact of the development on the archaeology.

None:

No impact so no requirement for mitigatory measures.

#### Detailed recording:

Requiring a photographic record, surveying and the production of a measure drawing prior to commencement of works.

Archaeological excavation may also be required depending on the particular feature and the extent and effect of the impact.

#### Basic recording:

Requiring a photographic record and full description prior to commencement of works.

#### Watching brief:

Requiring observation of particular identified features or areas during works in their vicinity. This may be supplemented by detailed or basic recording of exposed layers or structures.

#### Avoidance:

Features, which may be affected directly by the scheme, or during the construction, should be avoided. Occasionally a minor change to the proposed plan is recommended, but more usually it refers to the need for care to be taken during construction to avoid accidental damage to a feature. This is often best achieved by clearly marking features prior to the start of work.

#### Reinstatement:

The feature should be re-instated with archaeological advice and supervision.

#### 4 ARCHAEOLOGICAL BACKGROUND

#### 4.1 Topographic description

The study area is situated on Holy Island (in Welsh, Ynys Cybi), off the western coast of Anglesey, to which currently it is joined by the Stanley Embankment, and also by the bridge at Four Mile Bridge (Pont Rhyd y Bont). Holyhead (Caer Gybi) is the principle town on Holy Island, and the proposed development lies to the south-east of the town. The study area lies to the north-west of the aluminium works, and is bounded to the south-west by the railway.

Geologically Anglesey is composed largely of Pre-Cambrian rocks, most notably the Mona Complex. These bedded rocks have undergone intense pressures leaving them deformed and folded, and volcanic events have resulted in their interbedding with lavas, ashes and tuffs. These make up much of the bedrock of Holy Island.

The bedrock under the study area is composed of pale green chlorite schists, part of the New Harbour Group of the Mona Complex. Boulder clay overlies this, with the bedrock outcropping in places, and occasional patches of glacial gravels. The soils formed over these substrates are brown earths of the Rocky Gaerwen and Trisant types (Geological and soil survey maps). These soils can carry crops or excellent pasture, and were frequently chosen for settlement in the prehistoric period. The rocky Gaerwen soils are shallow with frequent rock outcrops, and farms and fields tend to be smaller on these soils than on deeper soils.

Like much of Holy Island, the topography of the study area and its environs is characterized by north-east to south-west aligned rocky ridges within intervening boggy hollows.

#### 4.2 Archaeological and historical background

The town of Holyhead expanded in size and importance after the development of the port for use by packet boats to Ireland, but it has a long history, and this is reflected in its archaeology.

#### 4.2.1 Prehistoric

There is evidence of Neolithic, Bronze Age and later prehistoric activity. Two Neolithic tombs lie within the vicinity of the study area – these are discussed below. Four Neolithic polished stone axes have been found in the northern part of Holy Island. Those found closest to the study area are two axes from the Graiglwyd axe factory, above Penmaenmawr, found when excavating the pit for a new turntable at the locomotive sheds near Kingsland in 1926 (PRN 2507, SH 2504 8165), and one axe of unspecified stone found at Penllech Nest (PRN 2506, SH 251 816).<sup>1</sup>

Two Bronze Age barrows were prominently situated on top of Holyhead Mountain (PRN 1760, SH 219 829), though little can be seen of them now. There are others at Garn (PRN 3804, SH 21408276) and Gorsedd Gwlwm (PRN 3798, SH 227 816), and a cemetery of three barrows at Porth Dafarch (PRN 1772-6, SH 234 801). A barrow was recently discovered under the early Christian cemetery at Ty Mawr (SH 2520 8135). The Ty Mawr standing stone is one of several such stones in this part of Holy Island. There is another to the south, next to Stanley Mill (PRN 2009, SH 2664 7888), and a rare pairing of two stones just over 3m apart, to the west at Plas Meilw (PRN 2748, SH 227 809).<sup>2</sup>

#### 4.2.2 Iron Age and Roman

The island has several notable Iron Age and Roman period sites. Holyhead is dominated by its mountain, to the north-west of the town. The summit is enclosed by a stone rampart wall forming the hillfort of Caer y Twr (PRN 1760, SH 219 829). A much smaller promontory fort, Dinas on the south coast of Holy Island (PRN 807, SH 223 794), is probably also Iron Age. This promontory is surrounded by high cliffs and a low bank runs along the edge of the chasm, which separates it from the mainland. These forts were probably defensive refuges, and the population lived in more hospitable areas. Towards the foot of the south-western slope of Holyhead Mountain are a group of huts near another Ty Mawr (PRN 1755, SH 211 820) and a similar hut group overlie the Bronze Age barrows at Porth Dafarch (PRN 2754, SH 234 801). Excavation at Ty Mawr, an area of 140 hectares immediately adjacent to the study area on the opposite side of the railway, revealed intense activity from the first millennium BC to the third century AD, as well as earlier prehistoric and post-Roman settlement evidence.<sup>3</sup>

A Roman fort was constructed at Holyhead towards the end of the third century or later, as a naval base against Irish raiders.<sup>4</sup> A Roman coin hoard was found in the area in 1710. The coins were buried in a brass vessel, and all dated to the fourth century (PRN 2503, SH 26 81). To the north of the aluminium works, on the shore of

<sup>3</sup> Gwynedd Archaeological Trust, *Land at Ty Mawr, Holyhead: Archaeological Assessment* (Report 389, November 2000 [and revisions] for Symonds Group Ltd), *Ty Mawr Development Study, Holyhead:* 

<sup>&</sup>lt;sup>1</sup> F. Lynch, *Prehistoric Anglesey; the Archaeology of the Island to the Roman Conquest* (Llangefni, 1991), p. 62. <sup>2</sup> Lynch, *op cit.*, p. 152, p. 155.

Archaeological Evaluation (Report 428, November 2001, for Symonds Group Ltd).

<sup>&</sup>lt;sup>4</sup> F. Lynch, 'The celtic Iron Age and the Roman occupation', in M. Richards, *An Atlas of Anglesey* (Llangefni, 1972), p 24.

Penrhos Beach, Stanley (1868) recorded a 'Danish fort'. The site (PRN 2509) is now under the main road, and all traces of it have been destroyed, so it is not known whether the fort was Iron Age, Roman or actually attributable to the Vikings.

#### 4.2.3 Post-Roman and medieval

Holy Island was of considerable importance in the early Christian period, with the *clas* (monastic church) site of Caer Gybi large enough to attract the attention of the Vikings in 961.<sup>5</sup> The foundation of this monastic community by St. Cybi is traditionally dated to the mid sixth-century AD, and it was presumably located within the Roman fort; the present church on the site dates from the thirteenth century. There is an unusual concentration of possible and confirmed early Christian sites on the island. These include a cemetery of long-cist graves, dating to approximately the sixth to the eighth century AD, discovered during the construction of the A55 dual carriageway, to the north-west of Ty Mawr Farm. At this site the graves were located around, and cut into, the remains of a Bronze Age barrow. Another cemetery, of similar date, lies to the south-west of the study area, at Tywyn y Capel, the site of a medieval chapel on the shore of Trearddur Bay.<sup>6</sup> There were early Christian cist burials found at Porth Dafarch.

#### 4.2.4 Modern period

The Modern period is characterised by the development of Holyhead as a point of departure for Ireland and by the developments of land transport links, a number of which pass near the study area, to give access to the harbour.<sup>7</sup>

The use of the harbour at Holyhead is already apparent in the reign of Elizabeth I, when it became the departure point for the Royal Mail to Ireland. During the Commonwealth, the town was garrisoned, and regular packet boats sailed to Ireland.

The passage of the Act of Union with Ireland in 1800-01 made Holyhead the principal port for Ireland, which in turn led to clamour from Irish MPs now obliged to sit in Westminster, about the state of the roads. The road from the Menai ferries to Holyhead had been turnpiked in 1765 and much improved,<sup>8</sup> but transport was still difficult until Telford built the new London to Holyhead road (the A5). The Stanley Embankment carries the road over the Afon Lasinwen, the tidal strait between Holy Island and Anglesey, replacing the ferries and fords (GAT 251). The embankment was designed by Thomas Telford, and built by Dargan, who subsequently made his name as the greatest of the railway contractors in Ireland. Work started in 1822 and it was opened in 1823, the final stage in the link between London and Holyhead.

In 1848 the Chester and Holyhead Railway was opened on an alignment which now forms the south-western boundary of the study area. The engineer was Robert Stephenson. The railway subsequently became part of the London and North Western Railway and its successors, the London Midland and Scottish and British Railways.

These developments were facilitated by the Stanley family of Penrhos, owners of most of the land within which the proposed developments falls, as well as much land elsewhere in Holyhead and in Anglesey. The Stanleys were a family of more than local consequence; Whigs, and later Liberals, in politics, members of the family served in government and in the church, though the third baron converted to Islam. The influence of one member of the family on government was less obvious but more fraught with consequence; Venetia Stanley's liaison with Asquith was crucial in determining the development of the First World War. Active 'improving' landlords, the surveys they carried out of their estate form the major source of evidence for the study area.

The landscape is currently dominated by the Anglesey Aluminium industrial complex. This was built in the late 1960s and the 125,000 tonne per annum smelter is one of the largest suppliers of aluminium in the UK. The study area is now bounded to the north-east by an industrial estate and the disused Holyhead heliport. The 1979 O.S. map shows no field boundaries in the study area and an unfenced road running from north-east to southwest across the centre of the area. No buildings were shown on any edition Ordnance Survey map and it was initially assumed that the field boundaries had been cleared as part of the forestry work. Preliminary results from

<sup>&</sup>lt;sup>5</sup> N. Edwards, 'Anglesey in the early Middle Ages: the archaeological evidence', *Transactions of the Angleey Antiquarian Society* (1986), pp. 19-42.

<sup>&</sup>lt;sup>6</sup> Edwards, *op. cit.*, p. 31.

<sup>&</sup>lt;sup>7</sup> D. Lloyd Hughes and D.M. Williams, *Holyhead: The Story of a Port* (privately published, 1981), *passim*.

<sup>&</sup>lt;sup>8</sup> H. Ramage, *Portrait of an Island* (Llangefni, 1987), p. 38.

the trial excavation (see below) suggested that this was incorrect and there had been development across some of the study area. The former estate manager for Anglesey Aluminium, Mr Glyn Morris of Treaddur Bay, was contacted. He confirmed that much of the north and north western sides of the study area contain the remains of a construction camp comprising site offices, accommodation blocks and other buildings associated with the erection of the Anglesey Aluminium complex. He reported that the area had been levelled prior to the construction of the camp and that the majority of the concrete building bases and the road had been left in place when the camp was demolished in the 1970s upon the completion of the aluminium works. The impact of the initial levelling process upon the archaeological resource was not known and it was recognised that there was a potential for the discovery of buried ground surfaces beneath the construction camp.

#### 4.3 Results of the desk-top study

The Sites and Monuments Record maintained by the Gwynedd Archaeological Trust confirmed that there are no identified sites within the study area.

Documentary and map sources confirm that within the Modern period the study area was owned in part by the Stanley family and in part by a number of other landowners. A map of *c*. 1769 indicates that the study area included part of the Stanley's Ty'n y Pwll farm.<sup>9</sup> The field boundaries have been superimposed on a modern map in Fig. 1, and identify the fields as in the original document as D1, D2 and D3. These are identified in a schedule as, respectively 'Cae Ffynnon' (*spring* or *fountain field*), 'Cae Rodyn' (cae'r odyn, *kiln field*) and 'Cae Pomin' or 'Cae Rornin' (possibly a minim error for 'cae ronin', cae'r onnen, *field of the ash tree* in contemporary Welsh). The remainder of the study area is identified as 'Mr Jone's', presumably a local landowner or freeholder, though Lord Boston also held some land nearby.<sup>10</sup>

By 1817, when the area was once again surveyed on behalf of the Stanley family, some changes are evident, in that Jone's land is identified as the property of Lord Newborough of Glynllifon, a Caernarvonshire-based peer with a number of lands in Anglesey (Fig. 2). The purchase was evidently fairly recent, since the lands are not included on Newborough's own estate survey of 1815.<sup>11</sup> D1 of 1769 is here 100 'Cae Mawr' (*big field*), D2 of 1769 is 101 and 102 'Cae'r Gors' (*field of the marsh*).

The Holyhead tithe map of 1840 records no significant changes, though Lord Newborough's property at Glan y Gors had been enclosed by this stage – effectively the south-east facing moiety of the site. An undated map in the Newborough collection confirms that the estate undertook the drainage of Glan y Gors at some stage in the nineteenth century.<sup>12</sup> By 1900 the 25" ordnance survey (Fig. 3) records significant changes in the field pattern, possibly representing different agricultural practices in the light of the construction of the railway and the Telford road through the surrounding area. The incorporation of the area into the Anglesey Aluminium estate in the late 1960s heralded a series of major changes to the area to the north of the railway line. Close to a square kilometre of landscape features were removed to make way for the smelter.

<sup>&</sup>lt;sup>9</sup> Ty'n y Pwll translates as *house in the pool* or *dip*. A contemporary map also gives Tyddyn y pwll, *smallholding in the pool* or *dip* – UWB Penrhos II 772, general map.

<sup>&</sup>lt;sup>10</sup> University of Wales, Bangor, dept of mss, Penrhos II, Map 5.

<sup>&</sup>lt;sup>11</sup> Caernarfon Record Office, XD2/8356.

<sup>&</sup>lt;sup>12</sup> Caernarfon Record Office, XD2A/426.

#### 4.4 Conclusions of the desk-top study

The study area lies within the immediate vicinity of areas of intense activity in the late Prehistoric, Romano-British and early Medieval periods. Though no sites have been identified to be recorded on the Sites and Monuments record, the study area is potentially rich in archaeology.

Archival sources have confirmed that the development of the study area since the mid-eighteenth century reflects changes in agricultural practices and landownership in the Modern period.

#### 5. LANDSCAPE CHARACTERISATION AND SETTING

The study area stands about 400m to the north-west of Ty Mawr standing stone and 600m m to the north of Trefignath burial chamber both of which are Scheduled Ancient Monuments. A further ruined possible burial chamber stands further to the south-east. The setting, visibility and intervisibility of pre-historic funerary and ritual monuments is essential to their interpretation. The development area would have probably been visible from the two scheduled monuments but modern developments namely the railway and A5 expressway have effectively isolated this area from the landscape to the south-east. The development area now stands between the Anglesey Aluminium complex and an industrial estate, has been topographically changed and has lost most of its landscape features. The development will still be visible from the monuments on Holyhead mountain but as so much of the historical context of the surrounding developed area has been lost the additional impact can only be seen as minimal.

#### 6. **RESULTS OF THE FIELD VISIT AND TRIAL EXCAVATIONS**

The field visit was carried out in advance of the trial excavation. Parts of the site were inaccessible due to the dense scrub and undergrowth although further access was made possible during the trial excavation. It was noted that all field boundaries shown on the pre-1970s maps had been removed with the exception of a length of very overgrown stone and earth boundary towards the south-west of the study area. No additional archaeological sites were identified.

The trial excavations were carried out at the end of April 2002. A total of 15 trenches were excavated, 11 of these were positioned along the original tracks through the scrub and woodland and four were dug along three additional tracks that were cleared during the field work. It was found, during the total station survey at the end of the fieldwork, that the track along the south-eastern side of the development area had been positioned a few metres outside the area boundary. As a result three trenches fell just outside the study area. The track runs along level ground immediately above the slope that runs down to the line of the former road. A level area such as this has a fairly high potential for the discovery of archaeological remains. Significantly sloping ground in most circumstances would be seen as having a lower potential. The trenches in the level area therefore form a relevant part of the overall assessment of the archaeology in this area.

#### Trench 1

This trench was dug in one of the racks through the scrub at the north of the study area. About 0.35m of humic topsoil was removed revealing a concrete slab covered with green flooring tiles bounded by redeposited subsoil and clean grey schistose silt and broken stone. The trench was extended to 17m allowing a test pit to be dug into the redeposited natural. Uncontaminated natural orangey brown compacted silt was reached at 1.2m. The building bases are as described by the former estate manager (including the green tiles) and are the remains of the construction camp. The topsoil and upper part of the subsoil appear to have been removed during the leveling of the site. This area can thus be assumed to have a low archaeological potential.

#### Trench 2

This trench was dug in the mature pine woodland, principally to discover the level of disturbance caused by the tree roots and the original planting operations. Between 0.35m and 0.52m of topsoil was removed revealing undisturbed somewhat variable subsoil. The subsoil at the south-east consisted of firm reddish orange gravel and silt. Very hard grey silts and shattered bedrock were revealed in the lower north-western half of the trench. No archaeological features were discovered. It was however noted that there was negligible root penetration into the subsoil and that the forestry plantation did not appear to have significantly decreased the potential for the discovery of archaeological remains in this area.

#### Trench 3

Trench 3 was dug on a track that was a few metres outside the northern eastern end of the study area and within the immature conifer plantation. Topsoil was removed to a depth of 0.5m revealing moderately soft clean orange silt containing frequent large angular stones. The edge of a tarmac road was uncovered at the north-western end of the trench. The trench was hand cleaned revealing no archaeological features apart from a small modern hole containing a piece of concrete. The orange silt seemed to be unusually soft for natural subsoil and it was suspected that it could be redeposited material. A test pit was therefore dug towards the north-western end of the trench. This revealed a 1.2m deep sequence of orange silts and clays with hard grey stony silt at the bottom. There was no evidence to suggest that this anything other than a sequence of natural glacial deposits. There was a little more penetration into the subsoil by tree roots than in trench 2, presumably due to its soft silty composition. It was however, not enough to significantly decrease the potential for the discovery of archaeological remains in this area.

#### Trench 4

Trench 4 was dug along the track just to the south-east of the study area and within the dense immature conifer plantation. The topsoil was fairly thin in this trench. Between 0.25m and 0.4m was removed to reveal three zones of natural grey, brown and orange-brown gravelly silts. The subsoil at the south was fairly soft and there was some insignificant root penetration. No archaeological remains were identified in this trench.

#### Trench 5

This trench was dug along the track just inside the south-eastern edge of the survey area. Between 0.3 and 0.35m of topsoil were removed, revealing bedrock or the top of a very large boulder in the centre of the trench with natural orange-brown silty gravel to either side. This was cut by a linear feature towards the north-east of the trench. The cut was sectioned and was found to be 1.5m wide and 0.2 to 0.4m deep with a somewhat irregular U shaped profile. It was filled with dark brown loam containing late 19<sup>th</sup> century pottery and an iron wedge or small hammer head. The position and orientation of this feature corresponds closely with a field boundary shown on the 1900 25" map.

#### Trench 6

Trench 6 was dug along the track on the south-east side of the site. The track at this point runs through fairly level immature pine woodland 12m outside the survey area. Between 0.45m and 0.5m of topsoil was removed, revealing poorly cemented natural brownish orange silty gravel at the south-west end of the trench and firm midorange silts in the north-eastern half of the trench. No archaeological remains were identified in this trench.

#### Trench 7

This trench was dug just to the south-east of the northernmost part of the study area. A tarmac road was initially discovered so the trench was abandoned and dug a few metres to the north-west. A small amount of loose humic topsoil was removed revealing grey compact shattered schist and silt. This contained some contaminants and was thus recognised as ballast, brought in to level the site. The material was very similar to natural subsoil identified in trench 2. It is presumed that this material was locally derived and was probably imported from the Aluminium works construction site. A test pit was dug to a depth of 1.9m revealing a mixture of redeposited subsoils before reaching very hard clean orange silt at a depth of 1.5m. This silt was free from the root holes and bioturbation found in the upper part of the subsoil. It must therefore be assumed that this was removed along with the topsoil when the site was leveled.

#### Trench 8

Trench 8 was dug along the track running down-slope through the edge of the dense immature conifer plantation. Bands of natural brown and orange silt and gravel were revealed after the removal of 0.35m of topsoil. No archaeological remains were identified in this trench.

#### Trench 9

This trench was dug in the immature conifer plantation 12m to the north of trench 8. Between 0.35m and 0.45m of topsoil was removed to reveal natural hard yellowish stony silt. A small patch of gleying at the subsoil/topsoil interface at the northern end of the trench yielded a few small pieces of charcoal but no artifacts. Part of a roughly circular feature was identified on the eastern edge of the trench. The southern end of the trench was extended by 1.5m to the east in order to reveal the full extent of the feature. The feature was found to be roughly circular in plan with a diameter of 1.0m. It was excavated and found to be a 0.4m deep pit with slightly curving sides forming a close to V-shaped profile. It was filled with single deposit of compact brown loam with two 30cm long stones sitting at the bottom of the pit. No finds apart from occasional flecks of charcoal, a small flint pebble and a nodule of black chert were recovered. The flint and chert occur naturally in the glacial drift and may not be significant. The absence of modern material in the fill along with its compact nature suggests that the pit is not modern. Pits of this size and character are commonly found on Iron Age or Romano-British settlement sites (e.g. Melin y Plas, Smith 2001) but also occur as part of sites from most archaeological periods. The shallow sides and lack of large quantities of stones suggest that it is not a post hole. Possible functions include quarrying for clean subsoil, the deposition of rubbish or a hole for planting a tree. The lack of evidence from the fill and lack of associated features do not allow the pit to be dated with any certainty. No other features were present in the excavated area.

#### Trench 10

Trench 10 was dug along one of the tracks through the gorse scrub in the central part of the site. A 0.3m deep layer of loose humic topsoil was removed, revealing compacted grey broken schist. This appeared to be similar to material used as infilling ballast found elsewhere on the site. A test pit was dug to a depth of 1.2m revealing very clean compact orange silt at 1.0m with no signs of root penetration or other disturbance. This indicates that the upper part of the subsoil and the topsoil had been removed during the landscaping of the area in the 1960s.

#### Trench 11

Trench 11 was dug along the track through the gorse at the south-western end of the site. The survival of a earth and stone field boundary in this area suggests that this was not leveled to form part of the construction camp. The road must have passed through the 25m wide strip of level land between the field boundary and the forested slope. The depth of topsoil varied between 0.3m at the west and 0.7m at the south and contained occasional pieces of concrete and other building debris. This was removed revealing variable grey and brown clayey subsoil. The surface of the subsoil showed signs of modern disturbance, presumably associated with the construction of the road, particularly on the south side of the trench.

#### Trench 12

An extra track was cleared into the dense immature woodland. The land slopes gently to the north-west at this point. A standard 10m x 2m trench was dug. Between 0.45 and 0.5m of topsoil was removed revealing featureless orange brown natural silt.

#### Trench 13

The area of mature conifers was noted as having some archaeological potential during the initial survey. The lower part of the plantation is fairly flat and contains some vague undulations that do not appear to be a result of ploughing. A short track was cleared into the level area and a trench was excavated. There was a surprising depth of topsoil here ranging from 0.5m at the south-west to 1.0m at the north east. Examination of the section cut through the soil profile revealed several lumps of subsoil suggesting that soil had been imported to this location, presumably in the late 1960s. The subsoil consisted of banded brown and orange silty gravel marked by north-south orientated plough scarring. No other archaeological remains were identified in this trench.

#### Trench 14

Another track was cleared into the dense immature conifers. Trench 14 was dug close to the beginning of the track in land sloping to the north-west. About 0.3m of poor topsoil was removed to reveal shattered schistose bedrock along with occasional pockets of natural gravel. No archaeological remains were identified in this trench.

#### Trench 15

The original aim of the track containing trench 14 was to provide access to the south-eastern part of the gorse scrub with the minimum of disturbance to nesting birds. This objective was achieved but the mechanical excavator immediately found a tarmac surface implying a very low archaeological potential. Trench 15 was therefore excavated in gently sloping ground in the conifer woodland. Shattered bedrock and natural orange silty gravel was revealed after the removal of 0.4m of topsoil. No archaeological remains were identified in this trench.

#### 6.1 Conclusions of the field visit and trial excavations

The development area can conveniently be divided into two areas with differing potential for the survival of archaeological remains. The lower, north-western two thirds of the study area, at present characterised by its covering of gorse scrub, was found to have been leveled and landscaped during the construction of a road and construction camp for Anglesey Aluminium. The topsoil and an undetermined portion of the upper subsoil was stripped during this process. Only the narrow south-western part of this area appears to have escaped the leveling process. The tarmac road, however, continues through this area. This was cut well into the subsoil and trial trenching suggests that the thin strip of less disturbed land between the road and the field boundary has little potential for the survival of any archaeological features. The majority of the north-western part of the study area can therefore be assumed to be archaeologically sterile apart from the remains of the construction camp.

The wooded south-eastern third of the study area initially slopes up steeply from the now buried tarmac road. This slope is presumably largely artificial, having been created when the construction camp was benched into the slope. Above this the land slopes gently upwards towards the south-east with a break of slope close to the southeastern edge of the study area. This area was planted with pine trees in the 1970s and 1980s. All field walls have been cleared from this area but the identification of archaeological features and occasional plough scars cut into subsoil demonstrates that the sub-surface archaeological resource remains largely undisturbed despite the forestry plantation. The initial field visit could not accurately assess all of this area because of the impenetrable undergrowth. The additional tracks that were cut into the woodland during the trial trenching enabled access into the larger blocks of previously inaccessible woodland. There were no visible archaeological features but occasional level areas, particularly at the south of the study area were seen to be potentially of archaeological interest. The trial trench sampling rate was therefore increased in the wooded area and decreased in the area of the former construction camp. The eleven trial trenches in the wooded area revealed only two archaeological features, a field boundary ditch, containing late 19th century pottery and an undated pit of possible Iron Age character. The dense sampling frequency and complete lack of finds predating the 19th century from the topsoil suggests that there are no major archaeological sites within the area. There remains the possibility, however, that smaller discrete sites could have eluded the trial trenching.

#### 7. SITE GAZETTEER

#### *Feature 1* 18<sup>th</sup> century field system

Category D

Direct impact: Significant

Indirect impact: Not relevant

The line of most of the field boundaries in the estate bordering the study area remained virtually unchanged between the 1769 estate survey and the construction of Anglesey Aluminium in the 1960s. Most of the field walls or banks were removed at this time and only a 55m length of overgrown stone bank remains, standing a few metres to the north-west of the study area. The survival of associated subsurface features has been demonstrated, a ditch on the correct alignment was recorded in trial trench 2. *Recommendations for further assessment: None* 

Recommendations for mitigatory measures: Preservation of remaining boundary in situ

#### Feature 2 Pit, possibly Iron Age

Category C

Direct impact: Considerable

Indirect impact: Not relevant

A feature was excavated in trial trench 9 and was found to be 1m diameter, 0.4m deep pit with slightly curving sides forming a close to V-shaped profile. No datable finds were recovered from the feature but it was noted that there was no modern material in it. Pits of this size and character are commonly found on Iron Age or Romano-British settlement sites but also occur on sites from most archaeological periods.

Recommendations for further assessment: None Recommendations for mitigatory measures: Watching brief in surrounding area to check for associated features

 Feature 3
 1960s construction camp

 Category D
 Direct impact: Considerable

 Indirect impact: Not relevant
 Much of the north and north-western sides of the study area contain the remains of a construction camp comprising site offices, accommodation blocks and other buildings associated with the erection of the Anglesey Aluminium complex.

 Recommendations for further assessment: None

 Recommendations for mitigatory measures: Watching brief and basic recording.

#### 8. SUMMARY OF IMPACTS AND RECOMMENDATIONS

The following table lists the archaeological sites within the development area along with their perceived archaeological value and summarises the impact of the development, need for further assessment and recommended mitigatory measures.

Feature	Category	Direct impact	Indirect Impact	Further	Mitigatory
	of importance			assessment	measures
1. 18 <sup>th</sup> century	D	Significant	Not relevant	None	Preservation of
field system					remaining
					boundary in situ
2. Pit, possibly	С	Considerable	Not relevant	None	Watching brief
Iron Age					
3. 1960s	D	Considerable	Not relevant	None	Watching brief
construction					and basic
camp					recording

#### 9. SUMMARY AND CONCLUSIONS

The development area stands within a rich historic landscape containing elements from prehistory to the modern industrial age. The surrounding industrial and transport features i.e. the railway, the A55 expressway, Anglesey Aluminium and the industrial estate effectively isolate this area from its earlier historical context. Desk top study and field evaluation of the study area revealed that approximately two thirds of it had been leveled and built over in the late 1960s during the construction of the Anglesey Aluminium industrial complex thus making the survival of any archaeological remains unlikely. Only three archaeological features, all of minor or local importance, were identified in the remaining part of the study area. It was recommended that part of one site be preserved *in situ* and that watching briefs be carried out around the other two sites along with basic recording where necessary.

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10.1.2 Caernarfon Record Office

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XD2/8356	Newborough estate survey, 1815

LNWRplan1Plan of parts of the Chester and Holyhead Railway main line, 1846LNWRplan8aPlan of parts of the Chester and Holyhead Railway main line, 1843

10.1.3 University of Wales, Bangor, dept of mss

Penrhos II 772	Survey of Penrhos estate, 1769 – map 5 shows Ty'n y Pwll
Penrhos II 775	Map and schedule of Penrhos estate, 1769
Penrhos II 803	Schedule of Penrhos estate, 1817
Penrhos II B804	Map of Penrhos estate, 1817

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Fig. 1 1769 estate survey overlaid onto modern OS map



Fig. 2 1817 estate survey overlaid onto modern OS map



Fig. 3 25" Ordnance Survey, 1900 overlaid onto modern OS map





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