

Peboc Biomass Energy Plant Llangefni, Anglesey

Archaeological Assessment



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Peboc Biomass Energy Plant Llangefni, Anglesey

Archaeological Assessment

Project No. 2207

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Report No.970

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Published by Gwynedd Archaeological Trust
Gwynedd Archaeological Trust
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Bangor, Gwynedd, LL57 2RT

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Mae Ymddiriedolaeth Archaeolegol Gwynedd yn Gwmni Cyfyngedig (Ref Cof. 1180515) ac yn Elusen (Rhif Cof. 508849)
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PEBOC BIOMASS PLANT, LLANGEFNI (G2207)

ARCHAEOLOGICAL ASSESSMENT

SUMMARY

An archaeological assessment was carried out at the site of the proposed Peboc Biomass plant, Llangefni. It identified a landscape of improved fields and hedgerows of 19th century date; associated with these was a complex of agricultural buildings to the north of the study area. No other archaeological sites were identified, but it was noted that Tregarnedd, a Scheduled moated site, lay to the east, and that evidence of prehistoric occupation was identified to both the south and the north of the development area. The proposed development is not expected to have any significant impact on known or Scheduled archaeological sites. The potential for the presence of buried archaeological remains was ranked moderate to high (although not necessarily substantial in character, possibly similar to remains identified at the Cefni Industrial Estate to the north), and a programme of archaeological field evaluation prior to commencement of construction works is recommended, as well as basic record of the agricultural buildings prior to demolition.

1 INTRODUCTION

Gwynedd Archaeological Trust has been asked by *Ecopellets Ltd* to carry out an archaeological assessment of a c.6.7ha L-shaped development area located within an industrial estate to the south-east of Llangefni, Ynys Môn (centred on NGR SH46147495), on at the site of a proposed Biomass Energy Plant development. Llangefni, Anglesey. The study area is shown outlined on Fig. 1. This report is produced in response to the requirements of *Gwynedd Archaeological Planning Service (GAPS)* set out in a brief dated 19th July 2011.

This report conforms to the guidelines specified in the brief and in *Standard and Guidance for Archaeological Desk-based Assessment* (Institute of Archaeology, 1994, rev. 2001, 2008).

1.1 Acknowledgements

The staff of the National Library of Wales are thanked for their help with providing archive material. Ashley Batten and Jenny Emmet of Gwynedd Archaeological Planning Service are thanked for their help and guidance.

2 DESIGN BRIEF AND SPECIFICATION

A detailed brief has been prepared this scheme, requiring that an archaeological assessment be produced, by the Gwynedd Archaeological Planning Service (GAPS, Appendix 3). This report conforms to that brief, and to the guidelines specified in *Standard and Guidance for Archaeological Desk-based Assessment* (Institute of Field Archaeologists, 1994, rev. 2001).

A desk-based assessment is defined as ‘a programme of assessment of the known or potential archaeological resource within a specified area or site on land, inter-tidal zone or underwater. It consists of a collation of existing written, graphic, photographic and electronic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional, national or international context as appropriate’. (*Standard and Guidance for Archaeological Desk-based Assessment*, IFA 2001, 2).

The aims of the assessment as given in the specification are:

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

To comply fully with the aims expressed above it can be necessary to undertake a programme of Field Evaluation following the Desktop study and Field Visit. This is because some sites cannot be assessed by desktop or field visit alone, and additional fieldwork is therefore required. This typically takes the form of

geophysical survey or trial excavation, although measured survey is also a possible option. A full programme of assessment and evaluation may therefore consist of:

- Desktop study
- Field walkover
- Initial report
- Field evaluation
- Draft report
- Final report

This phase of the project concerns the first three phases, and recommendations are made concerning further archaeological evaluation or mitigation.

3 METHODS AND TECHNIQUES

3.1 Desk top study

The desktop study comprised the consultation of maps, documents, computer records, written records and reference works, which form part of the Historic Environment Record (HER), located at Gwynedd Archaeological Trust (GAT), Bangor. Information about listed buildings was consulted by means of the CARN (Core Archaeological Index), which is the online index of the Royal Commission on Ancient and Historic Monuments, Wales. Relevant aerial photographs from the collection at RCAHM, Wales were examined.

Sites, buildings and find spots listed in the GAT HER were identified (Fig. 1), with GAT HER referring to the unique Primary Record Number given to each individual site.

3.2 Field Search

The field search was undertaken during August 2011, when the area of the proposed development was examined. Notes were taken, sketches and measurements were taken of sites of potential archaeological interest and a photographic record was made. Weather and ground conditions were good for a site visit.

3.3 Report

The available information was synthesised to give a summary of the archaeological and historic background and of the assessment and recommendations, as set out below. The separate features, their evaluation and recommendations are listed separately, and a summary of the overall assessment of the area is given at the end.

The criteria used for assessing the value of features was based upon those used by the Secretary of State for Wales when considering sites for protection as scheduled ancient monuments, as set out in the Welsh Office circular 60/96. The definitions of categories used for impact, field evaluation and mitigation are set out in Appendix 2.

4 ARCHAEOLOGICAL RESULTS

4.1 Topographic description

The site is located south of Llangefni and lies just beyond the north-east reach of the Malltraeth Marsh. It lies between 10m and 25m OD in a valley watered by the Afon Cefni. The geology of the area consists of a broad ridge valley between harder limestone rocks, filled with marine alluvium. The limestone is generally covered with glacial clays and soils of the brown earth group, although the limestone outcrops at higher levels.

4.2 Archaeological and historical background

4.2.1. Prehistoric and Roman sites

The ‘garnedd’ part of the Tregarnedd place name comes from a prehistoric burial mound (GAT HER 2733), described as ‘an extensive pile of stones, surrounded by a circle of stones about 86 yards in diameter [and]

removed in 1822' (Lewis 1833). A possible location of this at SH 46807470 was identified during investigations associated with the construction of phase 2 of the Bryn Cefni Industrial Park (Kenney 2002, Fig. 1). A prehistoric burnt mound and associated pit (Site 3 GAT HER 16073) was also identified during the construction of the industrial park (*ibid.*). The site of a possible prehistoric settlement has been identified at Ynys Cefni, a raised area on the edge of the Cefni estuary (GAT HER 2728). There are no known Roman sites within or close to the area proposed for development, although the site at Ynys Cefni may have been occupied in Roman times. The location of the study area on the edge of the Malltraeth Marsh would make it a favoured area for prehistoric settlement.

4.2.2 Medieval

The site lies relatively close to Tre-garnedd, to the south of which lies Capel Carnedd Maes Lidr (GAT HER 2675, SH 47307510), the site of a medieval chapel. The discovery and excavation of six Early Medieval long cist graves were encountered during excavations on the Llangefni to Penmynydd Water Pipe Replacement, and these may indicate the site of Capel Carnedd Maes Lidr, though there is insufficient evidence to confirm this (Davidson *et al.* 2010).

The 'Tre' part of the Tregarnedd place name indicates the probable presence of a medieval township, which was granted to Ednyfed Fychan by Llwelyn ap Iorwerth in the early 13th century (Jones-Pierce 1951). To the east of the site lies the farm of Llwyn Ednyfed (formerly known as Tregarnedd) adjacent to the water treatment works at Parc Bryn Cefni. It is a moated enclosure of medieval date, the construction of which is traditionally associated with a descendant of Ednyfed Fychan, Gruffydd ap Rhys, in the 14th century, although it may have been Gruffydd's father, Rhys, who was responsible for its construction (Carr 1992). It is the only known moated site on Anglesey, and is a Scheduled Ancient Monument (GAT HER 2727, SH 46867464, SAM Ref: A047). The enclosed area, about 100m square has surviving ramparts on its north-west and south-west sides, although partially covered by more recent farm buildings.

4.2.3 Post-Medieval

The township of Tregarnedd passed into the hands of the Mostyns through marriage into the Gloddaith family. It remained as part of that estate until 1750, when it was sold to Owen Williams of Castellior, from whom it passed to his son Thomas Williams (the Copper King) who lived at Tregarnedd for some years. The property was sold again in 1887 (Carr 1992).

The fields that lie within the study area are of late 19th century date, and are not shown on the Llangefni tithe map of 1840, and this is confirmed by the style of construction of the field boundaries, which are regularly laid out hedgerows with a limited number of species present including holly (Evans 2008). They are however present by the time of the 1st edition Ordnance Survey map of 1889 which shows the field boundaries unaltered from their present position, along with some 19th century farm buildings (Site 6) (Fig. 2, Plate 3).

The Llangefni Peboc Eastman plant, lying west of the current study area, manufactured chemicals, and was central to giving the area its industrial character in the 20th century. A new plant was constructed in 1970 on an existing operating chemicals site and included reactors, centrifuge, dryer hydrogenation, filtration and other ancillary equipment. It closed in 2008 and its operations were transferred to the United States of America. It is likely that there has been some ground disturbance in the study area as a result of the industrial developments.

4.3 Statutory and non-statutory designations

The Tre-Garnedd moated site (SAM AN 047) is a Scheduled Ancient Monument. There are no listed buildings within the study area. Sites noted on the Gwynedd HER are listed in Appendix 1.

4.4 The Archaeological Survey (Fig. 2)

The archaeological survey lists sites identified within the study area (outlined in red on Fig. 1) and within 200m of it.

SITE 1	GAT HER 2733	TUMULUS, TREGARNEDD		
Assessment of Importance	B	Impact: Already Destroyed	Site Status Reference	
A prehistoric burial mound 86 yards in diameter recorded by Lewis (1833), as having been destroyed in 1822. It consisted of an extensive mound surrounded by a circle of upright stones. Its probable site was identified by Kenney (2002), but is largely destroyed.				
Easting:	4680	Northing:	7470	
Recommendations for further assessment: None- Destroyed				
Mitigation Recommendations: None				

SITE 2	GAT HER 2727	MOATED SITE, TREGARNEDD		
Assessment of Importance	A	Impact: None	Site Status Reference	SAM AN 047
A homestead moat south-east of Llangefni on the edge of Malltraeth marsh, enclosing an area of about 100m. The northwest and southwest sides survive in a fair condition, the others significantly destroyed. In places the single bank inside the ditch survives to a height of about 2m above the inside area. Some of the site is covered by 19 th century farm buildings. It is the only known moated site on Anglesey.				
Easting:	4686	Northing:	7464	
Recommendations for further assessment: None				
Mitigation Recommendations: Avoidance				

SITE 3	GAT HER 16073	BURNT MOUND AND ASSOCIATED PIT, BRYN CEFNI		
Assessment of Importance	B	Impact: Already Destroyed	Site Status Reference	
A Bronze Age burnt mound and associated boiling pit were excavated at this location during the construction of phase II of Bryn Cefni Industrial Park.				
Easting:	4690	Northing:	7500	
Recommendations for further assessment: None- Destroyed				
Mitigation Recommendations: None				

SITE 4	GAT HER 2675	SITE OF CAPEL CARNEDD MAES LIDR		
Assessment of Importance	E	Impact: None	Site Status Reference	
The site of a medieval chapel and township are recorded in documentary sources within the Tregarnedd area. Its location is not known with certainty. The discovery and excavation of six Early Medieval long cist graves were encountered during excavations on the Llangefni to Penmynydd Water Pipe Replacement, and these may indicate the site of Capel Carnedd Maes Lidr, though there is insufficient evidence to confirm this (Davidson <i>et al.</i> 2010).				
Easting:	4730	Northing:	7510	
Recommendations for further assessment: None				
Mitigation Recommendations: Avoidance				

SITE 5	GAT HER 2728	POSSIBLE SETTLEMENT AT YNYS CEFNI		
Assessment of Importance	E	Impact: None	Site Status Reference	
The site consists of an oval shaped mound area, measuring approximately 33m by 25m and raised about 0.5m above the surrounding ground. It is mainly a natural feature, and has been heavily quarried, which has removed earlier evidence, described by Lewis in 1833. It is shown on aerial photographs (Phillips 2003).				
Easting:	4617	Northing:	7434	
Recommendations for further assessment: None				
Mitigation Recommendations: Avoidance				

SITE 6		AGRICULTURAL BUILDINGS (Plates 4-5)		
Assessment of Importance	B	Impact: Considerable	Site Status Reference	
A group of agricultural buildings located on a field boundary, with an opening in the hedgerow to the south. It consists of a gabled building orientated NNE-SSW, with only the southern half currently roofed. A yard area extends to the east. It appears to be late 18 th or 19 th century in date, with some 20 th century alterations, and is shown on the 25 inch 1 st edition Ordnance Survey Map of 1889.				
Easting:	4653	Northing:	7474	
Recommendations for further assessment: None				
Mitigation Recommendations: Basic Recording, to include a ground plan drawing				

5. SUMMARY OF ARCHAEOLOGICAL POTENTIAL

5.1 Location Summary

The site is located south of Llangefni and lies just beyond the north-east reach of the Malltaeth Marsh. It lies between 10m and 25m OD in a valley watered by the Afon Cefni. The geology of the area consists of a broad ridge valley between harder limestone rocks, filled with marine alluvium. The limestone is generally covered with glacial clays and soils of the brown earth group, although the limestone outcrops at higher levels. The site is situated to the east of the former Peboc Plant (Plate 6), north of the Llangefni Sewage Treatment Works (Plate 2), and south of the extension of the Parc Cefni Industrial Park within a zone of industrial development.

5.2 Environmental Remains and Soil Morphology

The agricultural lands consist of improved cultivated grassland (Plate 3). Evidence of 0.15m of a grey-brown silty clay topsoil was observed overlying 0.26m of clayey silt plough soil over a natural yellowish clay natural subsoil was observed during excavations at the Bryn Cefni Industrial Park site in 2002 (Kenney 2002), and similar depths are likely to be observed over the study area. Ground investigations on the site by *Courtaulds Engineering* in 1996 identified 0.2-0.3m of topsoil overlying a brown sandy clay glacial subsoil over weathered bedrock (Harwood 1996, 4). The potential for the survival of environmental remains in the drier areas above Malltraeth marsh is thought to be low, although some charred grains and seeds were identified during the Parc Bryn Cefni excavations.

5.3 Artefactual Potential

The potential for the survival of artefacts is unknown, but prehistoric and medieval artefacts may survive in associated with prehistoric or medieval features on the site. Isolated and unstratified finds of post-medieval and modern artefacts are likely to be recovered.

6. SUMMARY OF RECOMMENDATIONS

6.1 Summary of Specific Recommendations

Number	Name	Importance	Impact	Recommendation for further evaluation	Mitigation recommendations
1	Tumulus, Tregarnedd	B	None	None-Destroyed	None
2	Moated Site, Tregarnedd	A	None	None	Avoidance
3	Burnt Mound and Associated Pit, Bryn Cefni	B	None	None-Destroyed	None
4	Site of Capel Carnedd Maes Lidr	E	None	None	Avoidance

5	Possible Settlement at Ynys Cefni	E	None	None	Avoidance
6	Agricultural Buildings	B	Considerable	None	Basic Recording, to include a ground plan drawing

6.2 General Recommendations

The fields within the study area are bounded by regularly laid out hedgerows, which are clearly late 19th century in date, and are not shown on the tithe map of 1840 (Plates 3 and 6). No clear archaeological features were noted, however the known presence of Neolithic and Bronze Age monuments of some significance indicates a moderate to high potential for the survival of buried prehistoric archaeology.

Tre-Garnedd moat was reputedly once fed from the Afon Cefni, and if it did indeed have a connection with the Ynys Cefni site, there may have been a linking trackway. The early medieval cemetery site (site 4) is located to the north of the development area, and may have provided a focus for settlement (Davidson *et al.* 2010, 20-21).

A programme of archaeological evaluation is recommended across the site. This should be a phased programme of evaluation, of which the first phase would be **geophysical survey** across the entire site. This may be followed by trial excavation at a density to be confirmed once the results of the geophysical survey are known, but potentially at 5% sample of the area. Recommendations for the mitigation of any archaeological remains identified would follow the archaeological evaluation.

7. CONCLUSIONS

The archaeological assessment of the land at the proposed Peboc Biomass plant identified a landscape of improved fields and hedgerows of 19th century date. Associated with these was a complex of agricultural buildings (Site 6) to the north of the study area. No other archaeological sites were identified, and none were clearly visible on the aerial photographs, but it was noted that Tregarnedd, a Scheduled moated site, lay to the east, and that evidence of prehistoric settlement was noted to the south at Ynys Cefni, and Bronze Age archaeology in the form of a possible tumulus and a burnt mound was also identified to the north in advance of the building of the extension to Parc Bryn Cefni. The potential for the presence of archaeological remains was thought to be **moderate** to **high** and a programme of archaeological evaluation was recommended, along with basic recording of the agricultural buildings prior to demolition.

8. ARCHIVE

The archive consists of historic maps, plans and aerial photographs, along with notes and digital images taken on the field visit. The archive is currently held by GAT under project code **G2207**.

One copy of the bound report will be sent to the GAPS archaeologist, and a further copy sent to the HER Archaeologist at the curatorial division of Gwynedd Archaeological Trust, Bangor, for deposition in the Regional HER. A copy of the report will be provided to the National Monument Record, Royal Commission on the Ancient and Historic Monuments of Wales, Aberystwyth.

9. REFERENCES AND OTHER SOURCES CONSULTED

GAT Historic Environment Record

Bangor University Archives

Published Sources

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APPENDIX 1

Sites on the Gwynedd HER in the vicinity of the study area

PRN 16073

NAME Burnt Mound & Associated Pit, Bryn Cefni

NGR SH46907500

COMMUNITY Llangefni

PERIOD AND TYPE Bronze Age, BURNT MOUND

DESCRIPTION The pit was a timber-lined trough, open to the north, uphill side. It lies on the side of what was originally a slight natural gully prior to post-medieval farming improvements and recent landscaping. The gully must have held a small stream, probably originating from where there is a well. The trough appears to have been carefully positioned so that it could take water out of this gully by means of a shallow leat, while another feature provided the equivalent drain on the downhill side. At the west side of the trough was a hearth on which stones would have been heated to be placed in the trough to heat the water in it. The burnt mound itself here was well spread and of indefinite shape, compared to the most usual form of a crescent shape around the trough but this can be explained by the effects of post-medieval ploughing and possibly deliberate levelling. Despite the levelling of the burnt mound at Bryn Cefni, the good survival of the trough itself is important. It is one of the best preserved examples of such a trough in north Wales.

SUMMARY Excavations in 2002 revealed a burnt mound and pit at Bryn Cefni. The site is located on a low promontory on the edge of the Malltraeth Marsh, Anglesey. Burnt mound sites found in lowland locations are quite rare. A timber-lined trough was uncovered during the excavations, which lay on the slope of a slight natural stream, and appears to have been designed both to take water from the stream and drain away the excess via narrow gulleys. Next to the trough was a hearth on which stones would have been heated before they were placed in the water - in order to heat it - possibly for cooking. When stones had been used a number of times, they became fragmented, and were discarded nearby to form the burnt mounds we find today. Radiocarbon dating confirmed that the burnt mound and pit were of middle Bronze Age date. Debate continues as to whether such sites represent the remains of cooking sites. Some argue that leather tents may have been placed over the mounds to capture the steam, like saunas, whilst others associate burnt mounds with metal working, cloth fulling, and the preparation of basket-making materials.

PRN 2727

NAME Tre-garnedd Moated Site, Llangefni

NGR SH46867464

COMMUNITY Llangefni

PERIOD AND TYPE Medieval, MOATED SITE

DESCRIPTION Homestead moat traditionally ascribed to C14th. NW and SW sides in fair condition, remainder almost destroyed. Scheduled . NW and SW sides of moat in good condition and W corner water filled. No trace of building as shown on OS 25" "Tregarnedd, Remains of". Published survey (25") revised. Moat (N R). NW and SW sides are 65m and 100m long respectively and are up to 1.7m deep. Survey of 17.10.67 correct. Remains of homestead moat, originally about 100yds square but only NW and SW sides are at all complete. A square enclosure defined by an internal bank and ditch, which remain only on NW and SW sides. At W corner the bank remains standing to a height of some 3m above the bottom of the ditch, which is 5.5m wide and just over 1m above the level of the interior. At W end of the SW side the ditch/moat has been filled in and the track runs through to the farm buildings. The interior, about 100m square, has been much levelled and built over, and only the SW corner appears to have escaped relatively unscathed. Two large cattle sheds and a modern bungalow occupy much of the N part of the site. A section of the NE bank is visible where a ditch has been dug alongside the track which runs alongside the SE of the site. Plan and sketch. For further discussion. See FMW reports. FMW report 1992.

STATUS Scheduled Ancient Monument AN047

PRN 2728

NAME Settlement (Possible), Ynys Cefni, Llangefni

NGR SH46177434

COMMUNITY Llangefni

PERIOD AND TYPE Unknown, SETTLEMENT

DESCRIPTION Ynys Cefni, 1 mile SSE of Llangefni Church - a possible occupation site. Roughly circular limestone outcrop about 80yds x 100yds and 10 to 15ft high, partly quarried away on the N and W. Only visible sign of occupation is a bank 2-3ft high along the NE base. It is in poor condition. A saddle quern and muller were found here c.1863 during railway construction. Mound shows on AP's. Site as described by RCAHM, the low scoop slope in the NE probably the result of drainage work in the area. Nothing is known locally regarding the whereabouts of the finds, though there are several unprovenanced saddle querns in Bangor Museum.

PRN 2733

NAME Tumulus (Possible), Tregarnedd, Llangefni

NGR SH46807470

COMMUNITY Llangefni

PERIOD AND TYPE Prehistoric, BARROW

DESCRIPTION An immense carnedd from which Tregarnedd Farm took its name, perhaps 60ft diameter and nearly all removed. Remains partially planted - this will tend to preserve it. Nothing known of this site at Tregarnedd Farm and no sign of mound. Nearly all destroyed 1855 (Jones, Arch. Camb.) Recorded unlocated on Ordnance Survey 1970, but possibly identified in 2002 (Kenney 2002).

APPENDIX 2

Categories of importance

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

Category A - Sites of National Importance.

Scheduled Ancient Monuments, Listed Buildings of grade II* and above, as well as those 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 or county importance.

Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, 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.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened.

Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category.

For Category D sites, rapid recording, either in advance of 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 usually be no sites remaining in this category. In this case several areas of unknown potential have been allocated to this category.

Definition of Impact

The impact of the proposed development on each feature was estimated. The impact is defined as *none, slight, unlikely, likely, significant, considerable or unknown* as follows:

None:

There is no construction impact on this particular site.

Slight:

This has generally been used where the impact is marginal and would not by the nature of the site cause irreversible damage to the remainder of the feature, *e.g.* part of a trackway or field bank.

Unlikely:

This category indicates sites that fall within the band of interest but are unlikely to be directly affected. This includes sites such as standing and occupied buildings at the margins of the band of interest.

Likely:

Sites towards the edges of the study area, which may not be directly affected, but are likely to be damaged in some way by the construction activity.

Significant:

The partial removal of a site affecting its overall integrity. Sites falling into this category may be linear features such as roads or tramways where the removal of part of the feature could make overall interpretation problematic.

Considerable:

The total removal of a feature or its partial removal which would effectively destroy the remainder of the site.

Unknown:

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

Definition of field evaluation techniques

Field evaluation is necessary to fully understand and assess most class E sites and to allow the evaluation of 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. Topographic survey may also be employed where sites are thought to survive as earthworks.

Geophysical survey most often involves the use of a magnetometer, which allows detection of some underground features, depending on their composition and the nature of the subsoil. Other forms of geophysical survey, including resistivity survey and ground penetrating radar might also be of use.

Trial trenching allows a representative sample of the development area to be investigated at depth. Trenches of appropriate size can also be excavated to evaluate category E sites. Trenching is typically carried out with trenches of between 20 to 30m length and 2m width. The topsoil is removed by machine and the resulting surface is cleaned by hand, recording features. Depending on the stratigraphy encountered the machine may be used to remove stratigraphy to deeper levels.

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:

This requires a full photographic record and measured survey 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.

Strip, Map and Sample:

The technique of Strip, Map and Sample involves the examination of machine-stripped surfaces to identify archaeological remains. The stripping is undertaken under the supervision of an archaeologist. Stripping and removal of the overburden is undertaken in such a manner as to ensure damage does not take place to surfaces that have already been stripped, nor to archaeological surfaces that have not yet been revealed.

Stripping is undertaken in as careful a manner as possible, to allow for good identification of archaeological features. A small team of archaeologists will be responsible for subsequently further cleaning defined areas where necessary. Complex sites which cannot be avoided will need to be fully excavated.

Watching brief:

This is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.

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.

APPENDIX 3

PEBOC BIOMASS ENERGY PLANT, LLANGEFNI, GWYNEDD

PROJECT DESIGN FOR ARCHAEOLOGICAL ASSESSMENT (G2207)

Prepared for *Ecopellets Ltd*, July 2011

1. INTRODUCTION

Gwynedd Archaeological Trust has been asked by Ecopellets Ltd to provide a cost and project design for carrying out an archaeological assessment of a c.6.7ha L-shaped development area located within an industrial estate to the south-east of Llangefni, Ynys Môn (centred on NGR **SH46147495**).

The site consists of three fields of improved grassland with hedged boundaries and smaller areas of waste and landscaped ground associated with existing development. The site is situated between an industrial estate to the north and west, a sewage works to the south-east, and a fishery to the south, with various adjacent areas of grassland, and marshy grassland to the south. Although surrounded by industrial development, the site is identified as greenfield.

Ground investigations undertaken in connection with the present and previous proposals for the site indicate that the soils and geology of the site comprise a shallow topsoil of 20-30cm, overlying sandy clay glacial deposits, overlying weathered limestone bedrock.

The ground investigations identified various possible natural solution features within the bedrock.

The current planning application (**34C40Z/EIA/ECON**) pertains to the proposed development of the site for a biomass energy plant, including administrative accommodation, associated infrastructure, landscaping and storage/processing areas. The development includes three separate purpose designed buildings of maximum 35.5m height, a sub-station and two chimneys of 30m and 40m.

The archaeological assessment will be completed as part of this planning application.

A mitigation brief has been prepared for this scheme by Gwynedd Archaeological Planning Services (GAPS; ref.: **D1576**; reproduced as [Appendix I](#)); it is recommended that the content of this design is approved by GAPS.

This design will conform to the guidelines specified in the brief and in *Standard and Guidance for Archaeological Desk-based Assessment* (Institute of Field Archaeologists, 1994, rev. 2001, 2008).

2. ARCHAEOLOGICAL AIMS

A desk-based assessment is defined as “a programme of assessment of the known or potential archaeological resource within a specified area or site on land, inter-tidal zone or underwater. It consists of a collation of existing written, graphic, photographic and electronic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional, national or international context as appropriate” (IFA 2008, 2)

The aims of the assessment are:

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

To comply fully with the aims expressed above it can be necessary to undertake a programme of Field Evaluation following the Desktop study and Field Visit. This is because some sites cannot be assessed by desktop or field visit alone, and additional fieldwork is therefore required. This typically takes the form of geophysical survey or trial excavation, although measured survey is also a possible option. A full programme of assessment and evaluation may therefore consist of:

- Desktop study
- Field walkover
- Initial report
- Field evaluation
- Draft report
- Final report

This design is for the first **three** phases only, and recommendations will be made for any field evaluation required.

3. ARCHAEOLOGICAL BACKGROUND

According to GAPS mitigation brief **D1576** (para. 2.0):

The principal known archaeological resource of the immediate environs includes Tre-Garnedd medieval moated site (scheduled monument An047, the only known example of this type of monument on the island), the potentially contemporary possible motte of Ynys Cefni (PRN 2728), and the site of a substantial carnedd, or tumulus, adjacent to Tre-Garnedd moated site (PRN 2733). None of these sites has been subject to more than visual inspection, with the carnedd known only from antiquarian references.

However, recent archaeological investigations in connection with development adjacent to the Peboc site have confirmed the survival of buried archaeological remains in this area. These include a possible late prehistoric settlement identified from aerial photographs (see CAP report **277**) and a burnt mound (PRN **16073**).

The site is located on slightly higher ground above the former Malltraeth tidal salt marsh and as such is in a favourable position for settlement and other activity. Tre-Garnedd moat was reputedly once fed from the Afon Cefni, and if it did indeed have a connection with the Ynys Cefni monument, may have had a linking trackway. There is a potential for such features to exist within the site.

There is considered to be a good potential for buried archaeology associated with the known remains in undeveloped ground. The application site appears to be greenfield, although the extent to which it may have undergone some disturbance associated with the existing development, e.g. through installation of services, is unknown.

GAT has completed several assessment and mitigation project in the local area (GAT reports **302**, **432**, **738** and **885**). The most recent project work in the local area completed by GAT was for the *Gwalchmai booster to Bodffordd link water main and Llangefni to Penmynydd replacement: desk-based assessment and survey and mitigation report* (GAT reports **738** and **885** respectively), located c.500.0m to the north.

4. PROGRAMME OF WORK

4.1 Introduction

The project will develop an archaeological deposit model, which will take into account:

- The history of the site
- The potential impact of development on archaeological remains

- The potential impact of development on the setting of sites of archaeological importance
- The requirements for further assessment in the form of non-intrusive and intrusive field evaluation.

The project will be undertaken in four stages:

- Desk-based assessment
- Field visit
- Report compilation
- Project archive
-

4.2 Desk-based assessment

The desk-based assessment will involve a study of the following records

The regional Historic Environment Register (HER, GAT, Craig Beuno, Bangor, Gwynedd LL57 2RT)) will be examined for information concerning the study area. This will include an examination of the core HER, and secondary information held within the record which includes unpublished reports, the 1:2500 County Series Ordnance Survey maps, and the National Archaeological Record index cards.

The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth, SY23 1NJ) will be checked for sites additional to the HER, and if required additional supporting information will be examined at the NMR.

Information about Listed Buildings and Scheduled Ancient Monuments from Cadw will be examined in the regional HER, with supporting information from Cadw if required. The Register of Outstanding and Special Historic Landscapes and the Register of Parks and Gardens will be checked, and also the location of World Heritage Sites.

Secondary sources will be examined, including the Inventories of the Royal Commission on Ancient and Historical Monuments for Wales, and works held within the regional libraries. Indices to relevant journals, including county history and archaeology society journals and national society journals such as *Archaeologia Cambrensis* will be checked. Also at this stage 19th century topographical dictionaries, antiquarian tours and trade directories will be examined where relevant.

Evidence from aerial photographs will be collated. Vertical and oblique collections held by the NMR, CCW and Welsh Assembly Government will be considered for examination. All photographs examined will be listed in the assessment report.

Archive maps, where relevant, will be consulted in the National Library of Wales at Aberystwyth, and at the archives of the University College of Wales, Bangor (Archives Department, College Road, Bangor, LL57 2DG). This will include the relevant estate maps (e.g. Plas Newydd) and tithe maps and information from Land Tax Assessments. Where relevant antiquarian prints and photographs from the national and regional archives will be examined.

The regional archive (Ynys Môn Archives: formerly Shire Hall, Glanhwfa Road Llangefni, Ynys Môn LL77 7TW), is currently closed as part of a relocation programme. This archive will not be accessible during the course of the assessment.

Results from previous archaeological work within the area will also be reviewed.

4.3 Field survey

This part of the assessment will involve a walkover of the study area and assessing the sites identified during the desk-based study. Any additional sites noted will also be assessed. The location of potentially well-preserved environmental deposits will be noted.

The aims of this stage of the work are to:

- verify the results of the desk based assessment
- identify any further archaeological sites which may exist as above ground features
- assess the potential for the preservation of below-ground archaeology
- assess the impact upon the historic landscape
- photograph and record the present condition of all sites noted.

Access onto land is to be arranged by the Clients.

4.4 Field Evaluation/Further Works

Following desk-based assessments field evaluation work may also be required in order to further assess the presence or absence of remains, their extent, nature, quality and character before determining the appropriate mitigation strategy, whether it be preservation *in situ*, archaeological excavation or a combination of the two.

This might include a methodology for non-intrusive survey and or intrusive evaluation to determine the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be threatened by the proposed development.

Field evaluation needs to be carefully targeted in response to proposed impact and archaeological potential. It would usually be undertaken in stages, and might typically include:

- geophysical survey.
- a programme of trenching and/or test pits to investigate the deposit model in more detail.

Recommendations for any field evaluation considered necessary will be contained within the assessment report.

Specific attention will be paid during the assessment as to the suitability of the vegetation and geology for geophysical survey. Ground investigations undertaken in connection with the present and previous proposals for the site indicate that the soils and geology of the site comprise a shallow topsoil of 20-30cm, overlying sandy clay glacial deposits, overlying weathered limestone bedrock. The ground investigations identified various possible natural solution features within the bedrock (GAPS Brief **D1576**: para. 1.3, page 1).

The varying potential for the survival of archaeological remains will be identified as part of the assessment and these will be fed through to the design team so that direct impact of development will, where possible, be kept to areas of low archaeological potential, and areas of high archaeological potential avoided. Methods of the protection of remains *in situ*, will, if necessary, be considered.

4.5 Data processing and report compilation

Following completion of the stages outlined above, a report will be produced incorporating the following:

Non-technical summary

1. Introduction

2. Aims and purpose
3. Specification and Project Design
4. Methods and techniques, including details and location of project archive
5. Archaeological Background
6. Results of assessment in the form of a gazetteer
7. Assessment of impacts
8. Proposals for field evaluation and/or mitigation
9. Summary and conclusions
10. List of sources consulted.

Illustrations will include plans of the location of the study area and archaeological sites. Historical maps, when appropriate and if copyright permissions allow, will be included. Photographs of relevant sites and of the study area where appropriate will be included.

A draft copy of the report will be sent to the regional curatorial archaeologist and to the client prior to production of the final report.

4.6 Definition of category of importance

To assess the importance of sites and to allow the appropriate mitigatory action to be proposed for each, a framework of categories will be used with each site allocated to a particular category according to its relative importance:

Category A - Sites of National Importance.

This category includes Scheduled Ancient Monuments and Listed Buildings (Grade I and II*) as well as those sites which would meet the requirements for scheduling (ancient monuments) or listing (grade I and II* and certain grade II) 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 fulfil the criteria for scheduling, but may include Listed Buildings at grade II. They are sites 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. Sites that are Listed have legal protection, and it is recommended that all listed buildings are preserved *in situ*.

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 the most appropriate mitigation is often rapid recording either in advance or during destruction.

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. This category can also apply to areas as well as to individual sites.

5. DISSEMINATION AND ARCHIVING

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. All plans, photographs and descriptions will be labelled, and cross-

referenced, and lodged in an appropriate place within six months of the completion of the project. The location is to be agreed with the Curatorial Archaeologist.

Copies of the report will be sent to the regional HER (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT).

6. PERSONNEL

The work will be managed by John Roberts, Acting Head of Contracts. The work will be undertaken by one of the Trust's Archaeologists experienced in the relevant skills/periods required. Full details of personnel involved, with *curricula vitae*, can be supplied upon request.

7. MONITORING AND TIMING

Monitoring visits can be arranged during the course of the project with the clients and with the appropriate Development Control archaeologist.

8. HEALTH AND SAFETY

The Trust subscribes to the SCAUM (Standing Conference of Archaeological Unit Managers) Health and Safety Policy as defined in **Health and Safety in Field Archaeology** (2006). Risks will be assessed prior to and during the work.

9. OTHER

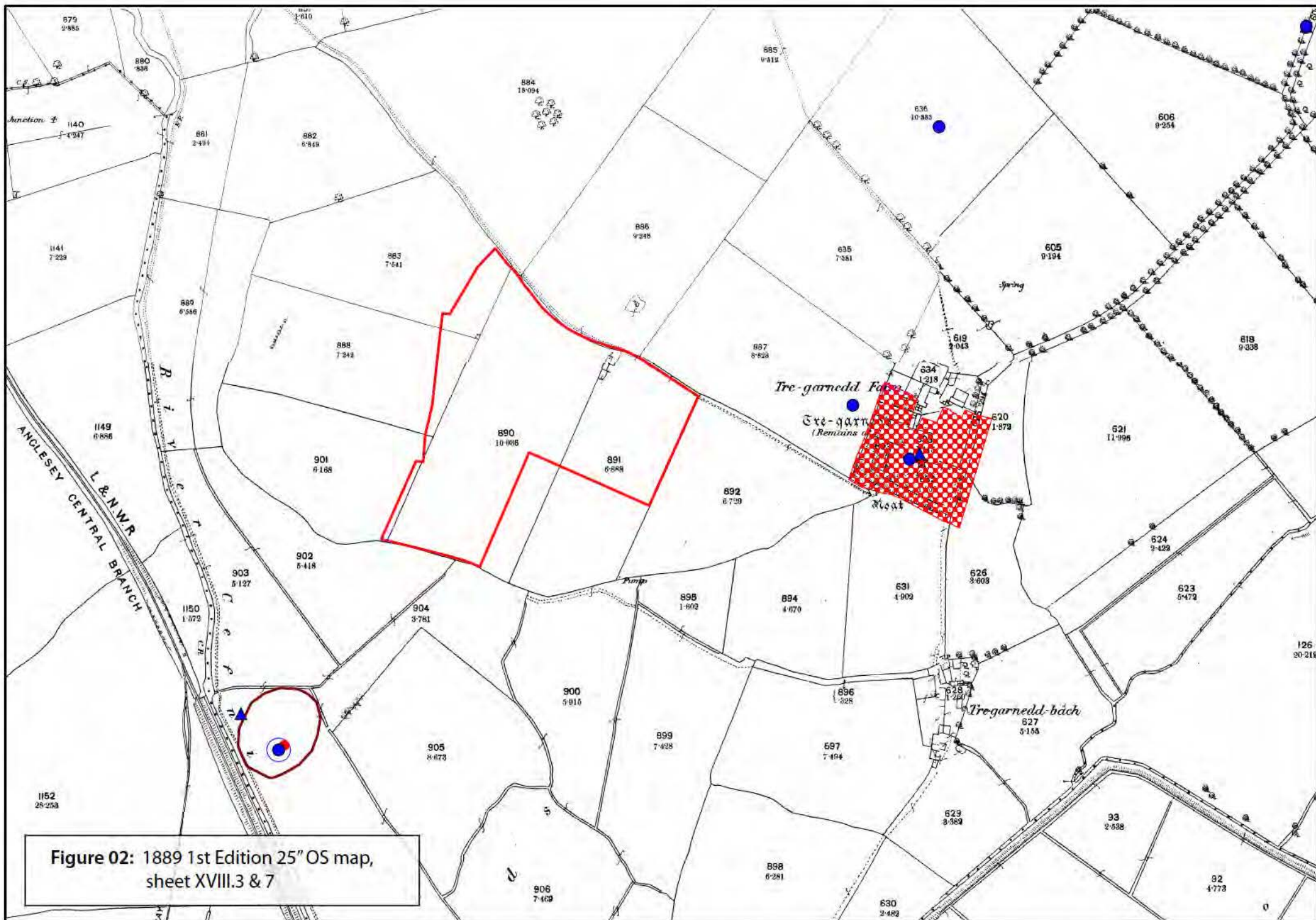
Any queries concerning the above should be directed to John Roberts at the Gwynedd Archaeological Trust Offices, Garth Road, Bangor. Telephone (01248) 352535ext234.

10. SOURCES CONSULTED

GAPS Mitigation Brief **D1576**

Standard and Guidance for Archaeological Desk-based Assessment (Institute of Field Archaeologists, 1994, rev. 2001 & 2008)

Figure 01: Site location with sites mentioned in the text



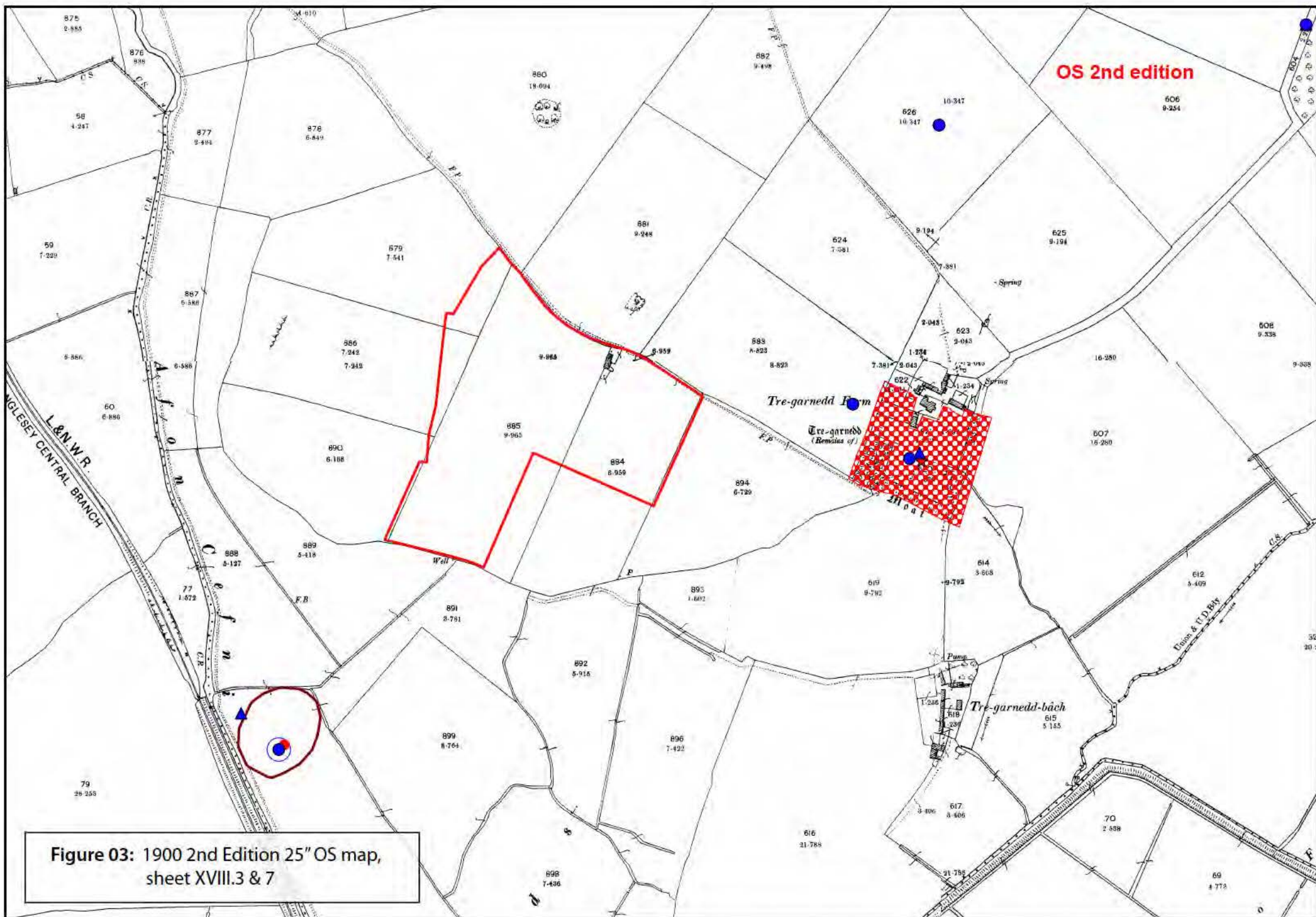


Figure 03: 1900 2nd Edition 25" OS map, sheet XVIII.3 & 7

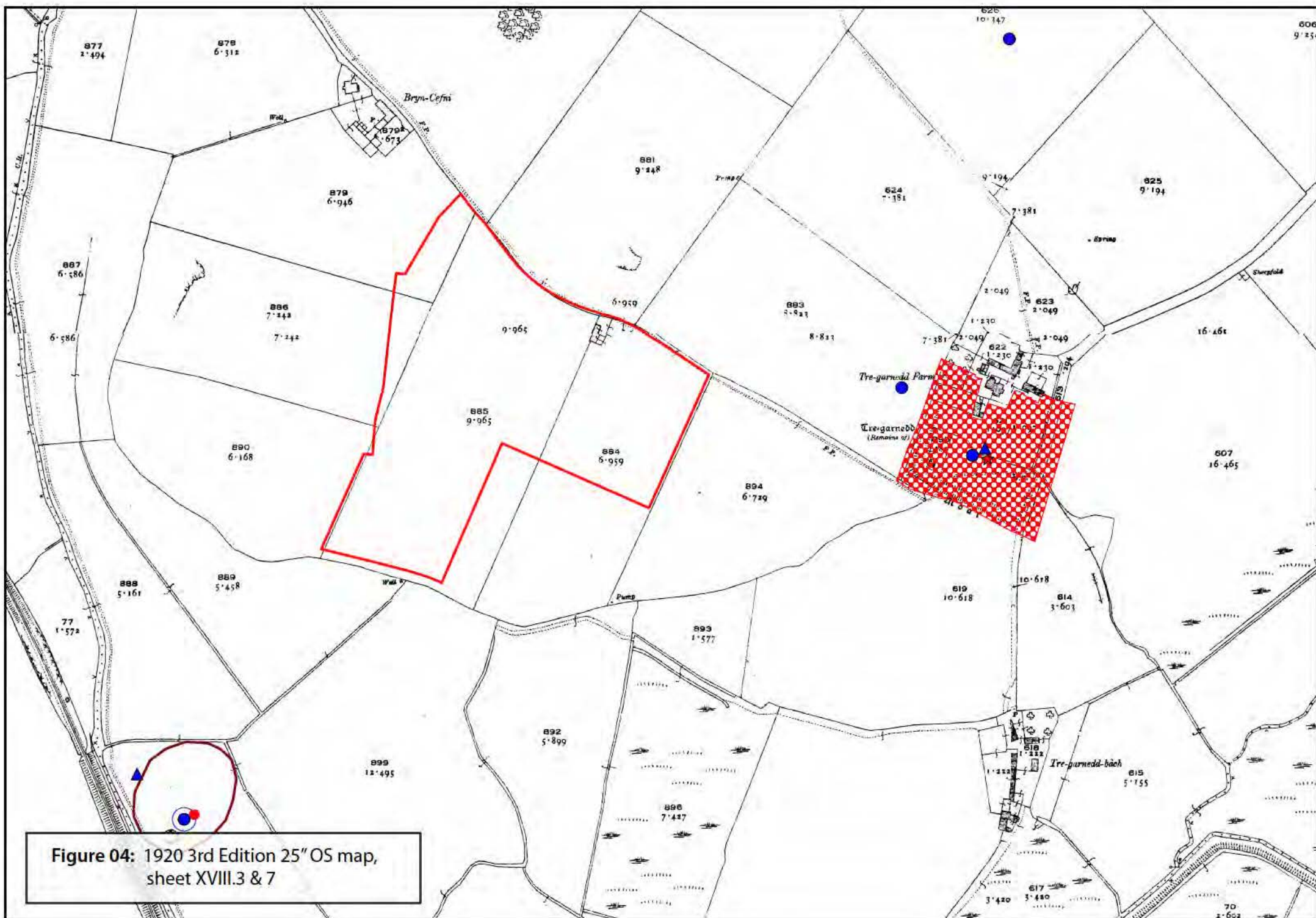




Plate 01: General view from the south looking east



Plate 02: General view looking north



Plate 03: Hedgerow between fields from the north



Plate 04: Farm buildings from the west (Site 6)



Plate 05: Farm buildings from the east (Site 6)



Plate 06: View on western edge of site showing remaining small portion of field adjacent to the Peboc Plant



Gwynedd Archaeological Trust
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