
Bala WTW, Ty'n y Cae: **Bala, Gwynedd**



Archaeological Assessment

GAT Project No. 2173

Report No. 920

February, 2011

Bala Water Treatment Works

Archaeological Assessment

Report No. 920

Prepared for

Caulmert Ltd

February 2011

By

Robert Evans

G2173 BALA WATER TREATMENT WORKS, TY’N Y CAE, LLIDIARDAU, BALA

ARCHAEOLOGICAL ASSESSMENT

Project No. G2173

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CONTENTS		Page
Summary		3
1.	Introduction	3
2.	Project brief and specification	3
3.	Methods and Techniques	4
4.	Archaeological Results	4
5.	Summary of Archaeological Potential	8
6.	Summary of Recommendations	8
7.	Conclusions	9
8.	Archive	9
9.	References	10

APPENDIX 1 Sites on the Gwynedd HER within 500m of the study area

APPENDIX 2 Definitions of terms

Figures

Fig. 1. Site Location. Base map taken from OS 1:10 000 series sheet SH 83 NW and NE. Scale 1:10 000. Study area shaded in red

Fig. 2 Location of features mentioned in the text (blue squares), and site on the Gwynedd HER (green dot). The study area is outlined in red and the proposed development and compound area highlighted in yellow. Map taken from OS 1:10 000 series sheet SH83 NE. Scale 1:2000

Fig. 3 Tithe Map of the parish of Llanycil of 1839, with the study area outlined in red (Gwynedd Archives)

Fig. 4 Map taken from sale catalogue of 1881 showing Ty'n y Cae farm (Gwynedd Archives Z/DDD/1/29). Not to scale.

Fig. 5 1st Edition 25inch Ordnance Survey map of 1888, Merionethshire Sheet XIII.16 Scale 1:2500. The study area is outlined in red

Fig. 6 Black and Veatch drawing number 168853-00-3001 showing the proposed development area (red) and compound and storage area (green)

Plates

Plate 1 Drystone wall (Feature 1) from the south. Scale 1m

Plate 2 Clearance Cairn (Feature 2). Scale 1m

Plate 3 Collapsed dry stone wall (Feature 3) from the south. Scale 1m

Plate 4 Recent clearance cairn (Feature 4), from the east. Scale 1m

Plate 5 View of the Water Treatment Works from the west showing north-south slope and terracing, with Feature 3 in the foreground. Scale 1m

Plate 6 Feature 9 from the south east. Scale 1m

BALA WATER TREATMENT WORKS, LLANDECWYN (G2173)

ARCHAEOLOGICAL ASSESSMENT

SUMMARY

An archaeological assessment has been carried out on land at Ty'n y Cae, Bala in advance of improvements to the Bala Water Treatment Works. The land was observed to form part of two former fields, and to slope from north to south to a stream to the south. Two phases of field system were identified, one of probable 18th century or earlier date, and one of 19th century date. No new archaeological sites were identified, although the mid slope terracing was thought a possible location for settlement in medieval and earlier times. A programme of evaluation has been recommended within the area of proposed construction. A wider area will be required for compound and storage, and it is recommended that this area be stripped of topsoil under archaeological supervision, and a protective membrane laid down with stone on top to preserve any archaeology which may lie buried beneath.

1. INTRODUCTION

Gwynedd Archaeological Trust (GAT) was asked by *Caulmert Ltd* on behalf of their clients Black and Veatch Ltd., and Dwr Cymru Welsh Water to carry out an archaeological assessment in advance of the construction of an extension to the Water Treatment Works (WTW) at Ty'n y Cae, Bala (NGR SH 86603805) (Fig. 1). The proposals involve the purchase of a 2765m² 'L' shaped area to the west and south of the WTW for expansion involving the construction of a new treatment building, and the temporary use of an additional 4488m² area as a compound and storage area. The proposals for land usage are shown on *Black and Veatch* drawing No. 168853-00-3001, with the study area incorporating a slightly larger area, which is shown on Fig. 2.

1.1 Acknowledgements

The staffs at Gwynedd Archives, Dolgellau and the National Library of Wales are thanked for their help with providing archive material. Ashley Batten of Gwynedd Archaeological Planning Service is thanked for his help and guidance.

2. DESIGN BRIEF AND SPECIFICATION

A detailed brief has not been prepared for this scheme, however an archaeological assessment was required by the Snowdonia National Park Authority (SNPA). 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. The archives held by the Meirionnydd Record Office, Dolgellau and Bangor University were also consulted. 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. 2), with PRN referring to the unique Primary Record Number given to each individual site.

3.2 Field Search

The field search was undertaken during February 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 Bala WTW is located on improved pastureland on the southern slopes of Mynydd Nodol at a height of about 344m OD. It is located on the land of the former farm of Ty'n y Cae, on a minor road running west-east from its junction with the A4212 about 6km to the west near Llidiardau. It is located close to the interface between improved pastureland and the open moorland of Mynydd Nodol to the north. The soils consist of Humic Rankers of the Bangor Association (BGS 1983), overlying shale bedrock.

4.2 Archaeological and historical background

4.2.1. Prehistoric and Roman sites

Evidence of prehistoric activity close to the study area is largely absent. The nearest identified site is a probable Bronze Age cairn on the higher ground at Ffridd Felin, about 1km to the north-west (PRN 3444; SH 85503885). There is some evidence for settlement on the lower ground, such as the area around Llyn Tegid, in

the form of stray artefact finds rather than settlement sites, including two stone axe hammers and a perforated stone axe of the earlier second millennium BC. These are usually found in valley bottoms, close to rivers or lake shores (Gresham 1967, 41). Most evidence for settlement is concentrated around the western fringes of the uplands with less evidence for the inland areas, and this is true for this area of upland Merionydd (GAT 2007).

No Roman sites have been identified close to the study area, although the Roman Fort at Llanfor is located 7.5km to the east (PRN 24707), consisting of a 3.8 ha fort and polygonal enclosure and a large temporary camp. A possible timber vicus is thought to have been associated with it. It was superseded in the later Roman period by the stone-built fort at Caer Gai, above the north shore of Llyn Tegid.

4.2.2 Medieval

During the medieval period the study area lay within the commote of Penllyn and close to the township of Streflyn, one of eight townships within the parish of Llanycil. The medieval parish is described as extending ‘in length nearly nine miles from Bala lake, in a north-westerly direction, and is about four miles in breadth, from north-east to south-west’, with the area around Mynydd Nodol described as ‘generally hilly, and the soil indifferent’ (Lewis 1833). An inquisition taken in 1308 reported that after the death of Maredudd ap Cynan ap Cynan ap Owain Gwynedd in 1212, Merionydd was divided between his two sons, Llewellyn Fawr and Llywelyn Fychan (Carr 2001, 704). There is evidence that during the campaign of Edward I to defeat Llywelyn in 1282-3, cattle were removed from the vaccaries in Penllyn to feed the English armies, and it was some time before the area recovered from this. It has been suggested that between 1292-3 and 1318 a decline in the population of Penllyn of up to 50% took place (Hughes 1993, 366). This suggests that settlement was probably quite sparse, although the ‘wandering’ walls identified within the landscape may reflect settlement patterns that have their origins in the late medieval period, after recovery from the depopulation.

Settlement in the medieval period appears to have been scattered, and there was probably settlement in the area of Ty’n y Cae and Tyddyn Ronnen on the southern slopes of Mynydd Nodol in medieval times.

4.2.3 Post-Medieval and Modern

The site of the Water Treatment works formed part of the small farm of Ty’n y Cae, which was part of the larger Fronheulog estate. The first known reference to the property dates from 1724, when the title of the property is established to William Hanmer and his wife, and it clearly forms part of the estate from that date (NLW Fronheulog MSS 172). In 1814 the estate was in the hands of John Davies, the son of Gabriel Davies of Messrs Davies and Anwyl, a firm of Bala solicitors. The property of Ty’n y Cae is described below, as shown on the Tithe Apportionment for the parish of Llanycil of 1839. The plan numbers refer to the fields noted on the tithe map (Fig. 3), and the field currently containing the WTW is highlighted in bold.

Landowner	Occupier	Plan Nos.	Name and Description of Land and Premises	State of Cultivation	Quantities in Statute Measures A R P
John Davies Esq.	David Jones	1514	Tyn y Cae House and Field	Building and Arable	2 1 4
		1515	Buarth Ffynon and Girndion	Arable	2 3 30
		1516	Fridd Bach	Pasture	1 2 -
		1517	Buarth cerrig	“	2 15
		1518	Fridd Bach and Croft	Arable	5 3
		1519	Werglodd	Meadow	3 1 11
		1520	Allotment of Common	Rough pasture	3 2 37
		1521	Fridd	“	5 - -
		1522	Allotment on Mynydd Nodol	“	59 - 11

The 1841 census for the property shows David Roberts as the tenant, with his wife Jane and three children aged between twelve and 7 (National Archives HO 107/1430/25). The estate passed from the hands of the Davies family following the marriage of Catherine Janett Williams of Fronheulog and widow of John Davies of Fronheulog (they were married in 1838) with Owen Richards, a doctor from Bala, in 1857. In 1860 the tenant Jane Roberts, probably the widow of David, paid £5-0-7½d rent quarterly for the property, but by 1874 David Roberts was paying £5-5-0 (Z/DP5/387).

In 1881 Ty'n y Cae was sold, when it was described as being 'in the occupation of David Roberts, as a yearly tenant, at the annual rent of £15, tenant paying all outgoing's' (Gwynedd Archives, Z/DDD/1/29). The extent of the farm is similar to that shown in 1839, and is shown in detail on a map accompanying the sale catalogue (Fig. 4). By 1881 David Roberts, a son of the 1841 tenants, was occupying the property with a servant (National Archives RG11/5543), and in 1901 Anne Roberts was living alone in the property as a widow. The property was occupied by small households over much of the 19th century, but by 1911, a new family of seven, the Jones, were occupying the property.

The remains of a former quarry (PRN 21096; NGR SH 86403810; Fig. 2) have been identified about 260m west of the Bala WTW, although little is known about this site.

4.3 Statutory and non-statutory designations

The study area is located within the Snowdonia National Park. There are no Scheduled Ancient Monuments or listed buildings within 500m of the study area. About 750m east of the Bala WTW are the Grade II listed Lliidiardau Calvinistic Methodist Chapel and Chapel House (Cadw Ref: 25814) and the school room (Cadw Ref 25815).

4.4 The Archaeological Survey (Fig. 2)

The study area consists of two fields, clearly indicated on the tithe map and OS maps (fig's 3 and 5) with an additional small triangle of land on the west side created by the alignment of a track (fig 5). The Afon Bleiddyn forms the southern boundary, and the road the northern boundary. The dividing field boundary (feature 3 below; fig 2) is of a different character to the eastern boundary (feature 1), being 'wandering' in character as opposed to straight, and from its character it is likely to pre-date feature 1. The dividing wall is partially ruinous, and the two fields are now essentially one single field, with the water treatment works occupying the north-east corner.

The features identified below are all part of the post-medieval agricultural landscape, consisting of field walls and clearance cairns. The features are listed below and are located on Fig. 2 with recommendations for further assessment and mitigatory measures, where appropriate. The recommendations reflect the information currently provided by Dwr Cymru Welsh Water, and assume impact only within the defined proposed development area (as outlined on fig. 2). Any change to the boundary of the proposed development area will require the recommendations below to be changed also.

It appears that services, associated with the Water Treatment Works and adjacent Sewage Treatment Works, are located within the proposed development area (Feature 8). These may result in any potential archaeological deposits having been previously disturbed in places.

Feature 1 Dry Stone Wall (Plate 1)

SH 86703808 C

Period: Post-medieval

Category: C Impact: Likely

A dry stone wall 1.3m high, consisting of rough field stones up to 0.5m by 0.3m and bowing in places. The wall terminates when it reaches the stream to the south. It appears to be of 19th century date, and is shown on the 1st edition 25 inch Ordnance Survey map of 1889 (Fig. 5)

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance or Basic Recording

Feature 2 Clearance Cairn (Plate 2)

SH 86673798

Period: Post-medieval

Category: D Impact: None

Probable clearance cairn, 4.5m by 2.8m, with the stones appearing to have been placed around a natural rock outcrop. This strongly suggests clearance rather than any other archaeological feature. It also appears to contain modern material including two sherds of Buckley ware pottery, and there appears to be no evidence for burnt stone.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

Feature 3 Relict Dry Stone Wall (Plates 3, 5)

SH 86623805 C

Period: Post-medieval

Category: B Impact: Considerable

A relict dry stone wall, approximately 1.8m wide, and surviving to a height of 0.8m in places, but significantly tumbled. It is constructed of small to large field stones, and wanders more than the neighbouring walls. It turns noticeably west at the bottom of the slope close top the river. It has a gate opening 1.6m wide about half way along its length. It may be 18th century or earlier in date and appears to have formed part of a pre 19th century field system. It is shown on the 1st edition 25 inch Ordnance Survey map of 1889 (Fig. 5).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Basic record and excavation across the line of the wall

Feature 4 Clearance Cairn (Plate 4)

SH 86563802

Period: Post-medieval

Category: D Impact: Likely

A recent clearance cairn, approximately 6m in diameter, consisting mainly of field stones, but also some Macadamised material. It possibly consists of cleared dry stone wall material, possibly the demolished remains of part of Feature 5.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

Feature 5 Relict Dry Stone Wall

SH 86553803

Period: Post-medieval

Category: C Impact: None

A row of large field stones, up to 0.9m by 0.5m run parallel to the stream (NW-SE) at the south-west end of the study area. They appear to have formed a southern fragment of a relict boundary wall seen on the Ordnance Survey 1st edition 25 inch map of 1889 (Fig. 5), which ran north south, east of the lane, before turning eastwards when it reached the stream and running parallel to it before crossing it and heading southwards. Fragments of this wall survive on the southern bank of the stream. It was subsequently replaced by a new wall bounding the lane to the west, which terminated when it reached the river (Feature 6).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Basic record

Feature 6 Dry Stone Wall

SH 86523807 C

Period: Post-medieval

Category: C Impact: None

A North-east south-west running dry stone wall leading from the road in the north down to the stream. It is not shown in its current form on the 1st edition 25 inch Ordnance Survey map of 1888 (Fig. 5). It is likely to be a replacement for an earlier, possibly 18th century wall which ran on the same alignment to the north and heads south and further to the east, and is shown on the 1888 map. It is built of medium to large field stones and has made use of exposed bedrock in its construction.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 7 Dry Stone Boundary Wall

SH 86573809 C

Period: Post-medieval

Category: C Impact: Likely

An east west wall bounding the study area to the north, forming the road boundary to the north. It has been somewhat truncated to the east by the construction of the water treatment works. It is constructed of medium sized field stones and appears to pre date feature 6, as it has been truncated at its western end, and an opening created. The cartographic evidence suggests that it formerly formed part of the earlier field system including features 3, 5 and 7.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Basic Record

Feature 8 Manhole Cover

SH 86593808

Period: Modern

Category: D Impact: Unkown

A modern manhole cover, which is indicative of services related to the WTW crossing the study area. The extent of these is currently unknown.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

Feature 9 Probable Rock outcrop (Plate 6)

SH 86573802

Period: Post-medieval

Category: E Impact: None

A probable rock outcrop with a small amount of stone clearance associated with it. It is however close to the stream and appears to be a discrete feature with no evidence of modern activity, and may indicate a focus for earlier activity.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance- it lies outside the area of proposed works

5. SUMMARY OF ARCHAEOLOGICAL POTENTIAL

5.1 Location Summary

The Bala WTW is located on improved pastureland on the southern slopes of Mynydd Nodol at a height of about 344m OD. It is located on the land of the former farm of Ty'n y Cae, on a minor road running west-east from its junction with the A4212 about 6km to the west near Llidiardau.

No medieval or earlier archaeological sites have been identified during the assessment and field visit; however the terraced slopes above the stream are a possible location for medieval and earlier settlement. The potential for the recovery of archaeological remains is considered to be low to moderate.

5.2 Environmental Remains and Soil Morphology

The topsoils on the agricultural land next to the water treatment works are likely to be quite shallow in places. There will however be deeper areas, and the significance for the preservation of environmental remains is unknown, though unlikely to be high.

5.3 Artefactual Potential

The potential for the survival of medieval or earlier artefacts is unknown, but it is likely that post medieval finds might be encountered, pottery having been found on one of the clearance cairns (Feature 2).

6. SUMMARY OF RECOMMENDATIONS

6.1 Summary of Specific Recommendations

Number	Name	Importance	Impact	Recommendation for further evaluation	Mitigation recommendations
1	Drystone wall	C	None	None	Avoidance
2	Clearance Cairn	D	None	None	Avoidance
3	Drystone wall	B	Considerable	None	Basic record and excavation
4	Clearance Cairn	D	None	None	Avoidance
5	Relict Drystone wall	C	None	None	Avoidance
6	Drystone wall	C	None	None	Avoidance
7	Drystone boundary wall	C	Likely	None	Basic record

8	Manhole cover	D	Unknown	None	None
9	Probable rock outcrop	E	None	None	Avoidance

6.2 Summary of impacts

The proposed development is shown on fig. 6. The greatest impact will occur within the area of the proposed extension, where excavation will be undertaken up to and below the rock. Any archaeology within this area will therefore be destroyed, including feature 3.

The compound area will be stripped of topsoil (approx. 250mm), and *terram* and stone put on top to protect the surface. The area will be reinstated afterwards. The aim is to protect any buried archaeology within this area.

6.3 General Recommendations

In addition to the specific recommendations noted above, the following general recommendations are made:

- Evaluation excavations are recommended for the area of direct impact around the present works (as shown on fig. 6). This would include trenching across feature 3.
- A mitigation strategy for this area would be agreed following the results of the evaluation.
- A watching brief is recommended during top soil stripping within the compound area.

7. CONCLUSIONS

The assessment carried out on land adjacent to the Bala WTW identified that the land consisted of moderately sloping land facing south with mid-slope terracing that is probably natural in origin. It formed part of the farm of Ty'n y Cae, a smallholding located 100m to the north-west. Areas of rock outcropping were also noted within the fields.

The field boundaries indicate evidence for at least two phases of construction, the earlier possibly 18th century and the latter 19th century. The land within the current WTW is considered to have been disturbed during construction, with no potential for archaeological survival.

No sites of medieval or earlier date were identified in the assessment, although the topography of the site was considered to have potential for medieval and earlier settlement.

A programme of evaluation has been recommended within the area of proposed construction. A wider area will be required for compound and storage, and it is recommended that this area be stripped of topsoil under archaeological supervision, and a protective membrane laid down with stone on top to preserve any archaeology which may lie buried beneath.

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 **G2173**.

One copy of the bound report will be sent to the SNPA 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

Bowen, E.G. and Gresham, C. A. 1967 *History of Merioneth Vol. 1*

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Hughes, R.E. 1993 'Land, Agricultural Resources and Population in parts of Penllyn in 1318', *J Merioneth Hist. and Rec. Soc.* XI Part IV, 355-378

IFA 1994 *Standard and Guidance for Archaeological Desk-based Assessment* (rev. 2001).

GAT Historic Environment Record

Gwynedd Archives, Dolgellau

Tithe Map of the Parish of Llanycil, Merionethshire 1839

Z/DDD/1/29 *Sale Catalogue of 17 Freehold Farms in pas. Llanycil, Llandderfel and Llandrillo inc.....Tyn y Cae.*

Z/DP5/387 *Fronheulog Estate Rental Book 1860-1874*

National Archives

Census Returns for 1841, 1881, 1901 and 1911 for Ty'n y Cae. Seen at www.ancestry.co.uk

National Library of Wales

Fronheulog MSS 172 *Abstract of the title of the trustees for sale under the marriage settlement of William Hanmer Esq.*

RCAHM Wales Aberystwyth



Figure 1. Site Location. Base map taken from OS 1:10 000 series sheet SH 83 NW and NE. Scale 1:10 000. Study area shaded in red

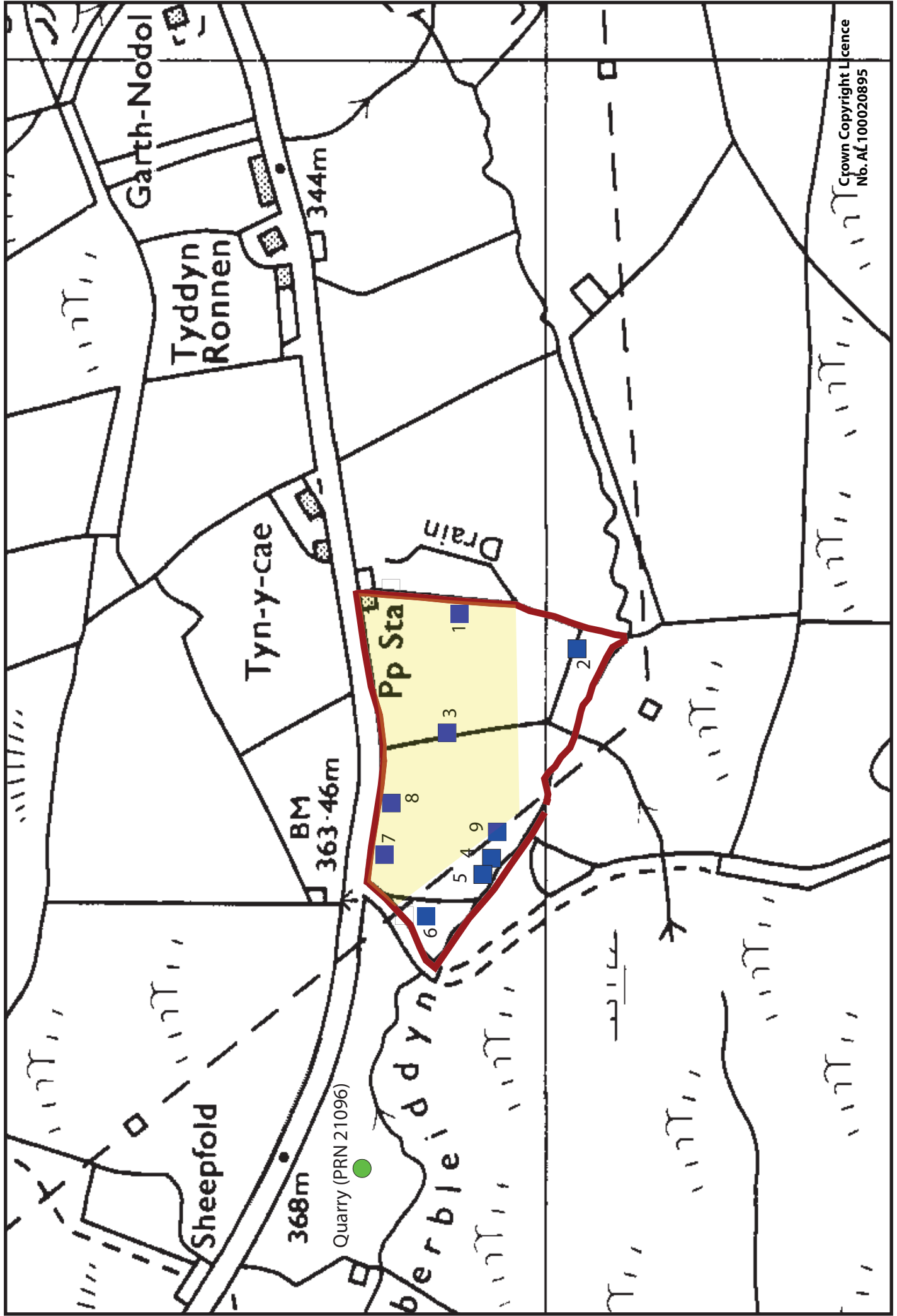
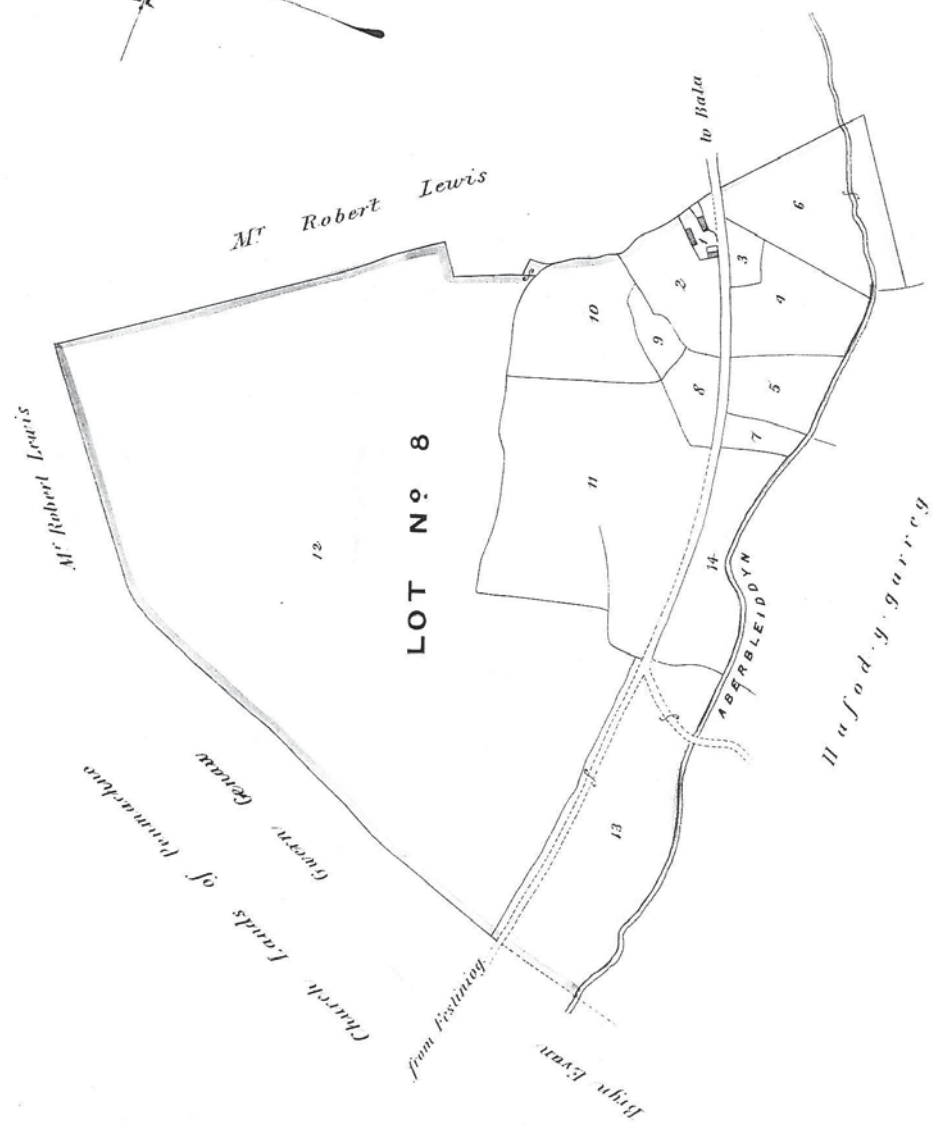
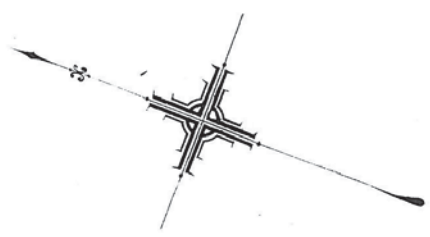


Fig. 2 Location of features mentioned in the text (blue squares), and site on the Gwynedd HER (green dot). The study area is outlined in red and the proposed development and compound area highlighted in yellow. Map taken from OS 1:10 000 series sheet SH83 NE. Scale 1:2000



Fig. 3 Tithe Map of the parish of Llanycil of 1839, with the study area outlined in red (Gwynedd Archives)

TYN·Y·CAE
 Situate in the Parish of Llanycil
COUNTY OF MERIONETH.



Scale - 6 Chains to an Inch.

Fig. 4 Map taken from sale catalogue of 1881 showing Ty'n y Cae farm (Gwynedd Archives Z/DDD/1/29). Not to scale

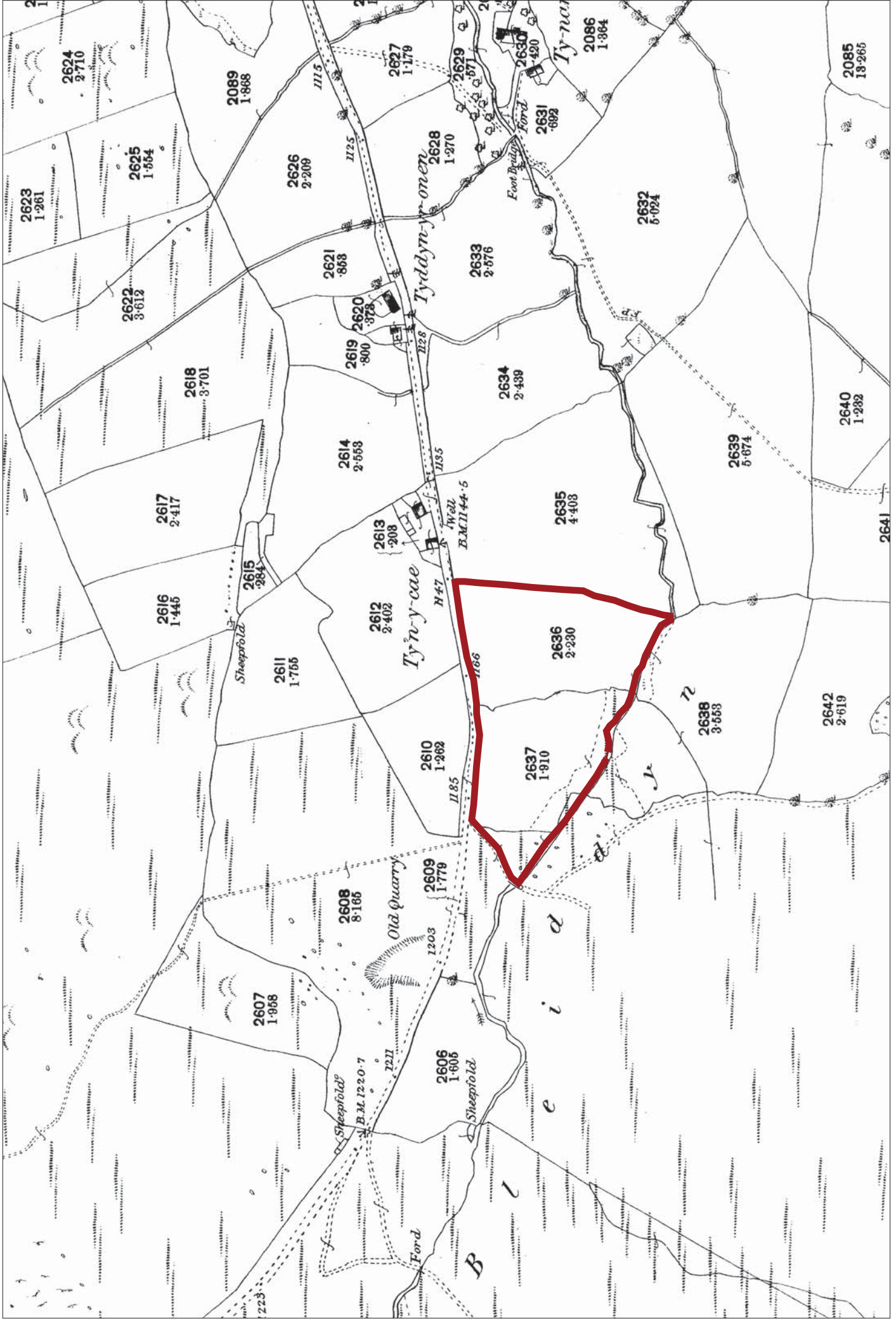
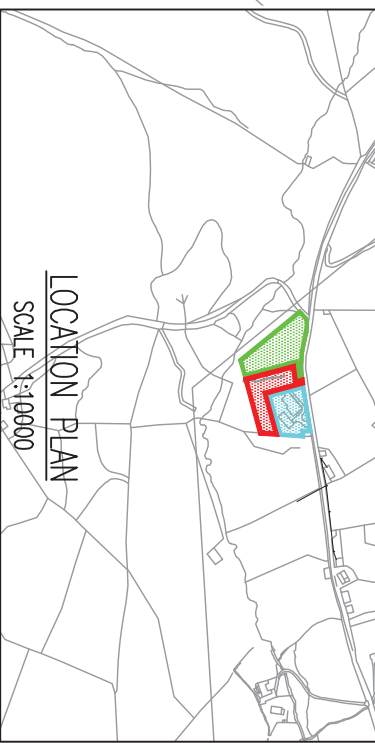


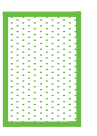
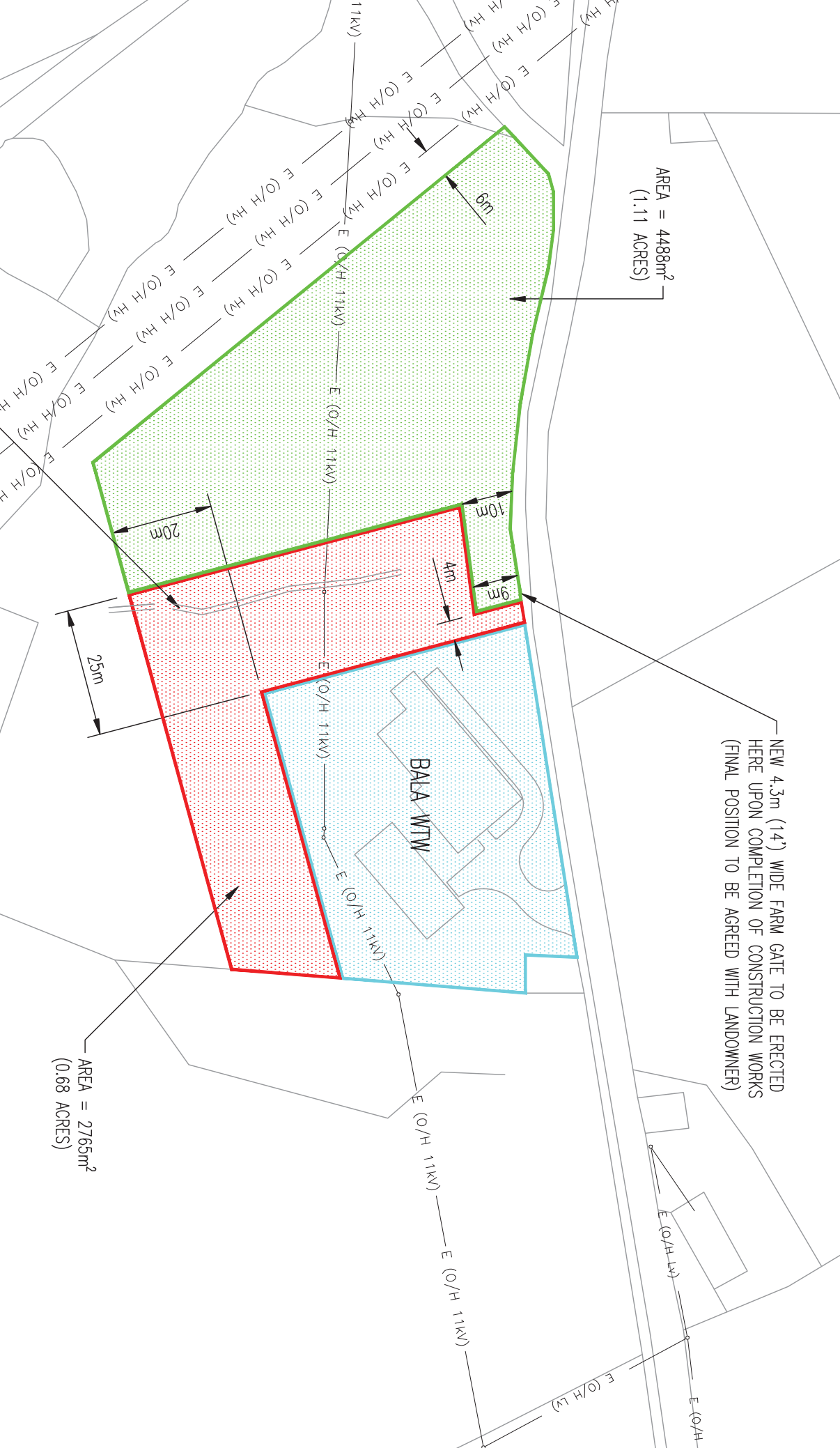
Fig. 5 1st Edition 25 inch Ordnance Survey Map of 1888. Merionethshire sheet XIII.16. Scale 1:2500. The study area is outlined in red



NEW 4.3m (14') WIDE FARM GATE TO BE ERECTED
HERE UPON COMPLETION OF CONSTRUCTION WORKS
(FINAL POSITION TO BE AGREED WITH LANDOWNER)

AREA = 4488m²
(1.11 ACRES)

AREA = 2765m²
(0.68 ACRES)



Rev	Dm	Chd	Apnd
A	SRS	NDT	IB 1
B	SRS	PJB	IB 1

FOR

Date: 10.1

Drawing Scale: AS 5

Original Size: 2



BALA

LAND

Drawing Title:



Plate 1 Drystone wall (Feature 1) from the south. Scale 1m



Plate 2 Clearance Cairn (Feature 2). Scale 1m



Plate 3 Collapsed dry stone wall (Feature 3) from the south. Scale 1m



Plate 4 Recent clearance cairn (Feature 4), from the east. Scale 1m



Plate 5 View of the Water Treatment Works from the west showing north-south slope and terracing, with Feature 3 in the foreground. Scale 1m



Plate 6 Feature 9 from the south east. Scale 1m

APPENDIX 1

Sites on the Gwynedd HER, the RCAHMW CARN database and listed buildings, within 500m of the study area

PRN	NPRN	SITENAME	NGR	CLASS	SITETYPE	PERIOD
21096	61673	QUARRY, TYN Y CAE	SH86403810	Industrial	QUARRY	Post-Medieval

APPENDIX 2

Definitions of terms used within the report

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.



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TRUST

Craig Beuno, Ffordd y Garth, Bangor, Gwynedd. LL57 2RT
Ffon: 01248 352535. Ffacs: 01248 370925. email: gat@heneb.co.uk