
Dolgarrog Hydro-Electric Works: **Dolgarrog, Conwy**



Archaeological Assessment

GAT Project No. 2158

Report No. 900

November, 2010

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Prepared for
Capita Symonds

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By

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G2158 HYDRO-ELECTRIC PIPELINE, DOLGARROG

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DOLGARROG HYDRO-ELECTRIC PIPELINE (G2158)

ARCHAEOLOGICAL ASSESSMENT

SUMMARY

An archaeological assessment was carried out on land adjacent to a hydro-electric pipeline which ran from a reservoir at Coedy to the Electricity Power Station at Dolgarrog, Conwy. A complex and well preserved landscape settlement pattern was identified on the hill slopes above Dolgarrog, dating from the 16th century until the Victorian era, for which a significant amount of evidence survives in the form of farmsteads, structures and associated field systems. The field systems consisted of irregular enclosures created from the 16th to 18th centuries, generally around or close to the homesteads on mid slope terraces, and a more regular field pattern created as a result of 19th century Parliamentary enclosure, which extended into the more upland areas. No demonstrably earlier sites were identified, although some of the settlement pattern identified today may well have had its origins in the later Middle Ages, and the terracing and field systems could be earlier, even prehistoric, in date. Prehistoric sites are known in the wider Conwy valley area, although none were certainly identified in the study area itself.

From the early years of the 20th century the landscape was transformed with a rapid industrialisation, as a result of the establishment of a hydro-electricity station to power the Aluminium works which had been built in the valley below. In addition to the Coed Ty dam, reservoir, and early 20th century main water pipes bringing water supply from the reservoir to the turbines at the hydro-electric works, further structures relating to the were noted. Further evidence of water management in the form of leets was noted. The remains of an early 19th century tramway and associated sheds and were also noted within the study area.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was asked by Capita Symonds to carry out an archaeological assessment in advance of the replacement of the present over ground pipe which feeds Dolgarrog Hydro Electric Power Station (centred on NGR SH 76556718). The proposed development area is shown on *Halcrow* drawing no WSEDOL/001/JPA, and the study area is shown on fig.1.

1.1 Acknowledgements

The staffs at Conwy Archives are thanked for their help with providing archive material. Ashley Batten of Gwynedd Archaeological Planning Service (GAPS) is thanked for his help and guidance with this project. Iwan Parry of GAT who assisted on the field survey, provided much useful help and advice.

2 DESIGN BRIEF AND SPECIFICATION

Gwynedd Archaeological Trust provided a project design to Capita Symonds (Appendix II). The Trust was asked to undertake a basic assessment which, at this stage, would fall between a scoping report and a full assessment. It would consist of a desk-based study involving secondary sources and aerial photographs but not primary archive sources. A rapid field search to gauge the potential for sites within area would be undertaken, though this was not a full search by transect, but a targeted field visit to known sites and the pipeline route.

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. A rapid search of the archives held by the Conwy Archives, Llandudno and Bangor University was undertaken, though a full search was not carried out at this time.

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. Information about an upland survey carried out by *Cambrian Archaeological Projects* (CAP) in 2002 over part of the study area was obtained from this source.

Sites, buildings and find spots listed in the GAT HER were identified (Fig. 2, Appendix 1), with PRN referring to the unique Primary Record Number given to each individual site.

3.2 Field Search

The field search was undertaken by two members of staff on 25th October 2010, when the area of the proposed development was examined. A full field search was not undertaken, but sufficient ground was covered to identify known sites and some 30 additional sites. Wooded areas were not assessed in detail, and regular transects were not walked. A full assessment will require additional field walking to be undertaken.

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 below.

3.3.1 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. These require environmental sampling which should be carried out during the pipeline works.

3.3.2 Definition of Impact

The impact of the road development on each site 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.

3.3.3 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.

3.3.4 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:

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.

4 ARCHAEOLOGICAL RESULTS

4.1 Topographic description

The geology of the area is dominated by Ordovician slates, with contemporary and intrusive igneous formations (Roberts 1979). The steep escarpment of the Conwy valley is caused by an igneous formation. Boulder clay, containing pockets of peat, lines the hanging valleys. Peat also covers much of the uplands, whilst the floor of the valley is covered with alluvial deposits (Geological Survey of England and Wales, sheets 9 and 10).

The soils reflect the geological and climatic conditions, and are badly drained and acidic (Smith and George 1961). Land use, outside the industrial activities around Dolgarrog itself, is restricted to pasture and meadow in the flood plain, and rough grazing for sheep on the uplands, with woodland on the escarpment.

4.2 Archaeological and historical background

4.2.1. Earlier Prehistoric

An Early Neolithic chambered tomb at Porth Llwyd was badly damaged in the Dolgarrog dam disaster in 1925 (PRN 1544), and a worked flint flake (PRN 4615) was found close to this tomb. No other prehistoric sites are known within or immediately adjacent to the study area, although a large number are known from the wider area on the west side of the Conwy valley. Two ring cairns (PRNs 684 and 685) have been located close to the farmstead of Fachell and three other cairns with evidence of cists (PRN 3765, 5181 and 3779) are positioned in a line up the ridge from Bwlch Cowlyd to Pen Llithrig y Wrach, with PRN 3779 on the ridge. A standing stone (PRN 5280) is located next to the track along the south-eastern slope of Moel Eilio, a track that may have been in use in the medieval period. These features are of probable Bronze Age date.

4.2.2 Late Prehistoric / Romano-British

There is some evidence of late prehistoric settlement in the vicinity of the study area. Within the later Abbey Grange a large settlement (PRN 705) is thought to have continued in use until the 3rd century AD. A number of isolated round huts on the upland pasture (PRN 3775 and 5622 in Cwm Eigiau; PRN 3766 on Bwlch Cowlyd) may have formed part of a transhumance system, which is also suggested by their presence close to later *hafotai*.

It is likely that the present road along the west side of the Conwy valley (B5106) follows the former Roman road (PRN 17,703) from the Roman fort at Caerhun to the fort at Bryn y Gerfeliau between Bettws y Coed and Capel Curig (Davidson and Gwyn 1995, 4). The Roman fort at Caerhun lies about 2.5km north of the northern boundary of the study area.

4.2.3 Medieval

The documented history of the immediate area effectively begins in 1198 when Llywelyn Fawr granted the lands of Ardda and Dar-las (effectively the modern civil parish of Dolgarrog) to the monastery he was founding at Aberconwy, for use as a Grange (Gresham 1939). In 1284 Edward I transferred the monastery to a new site at Maenan, contiguous with the lands of Ardda and Dar-las. The boundary of the Grange extended from Llyn Cowlyd along the ridge to the summit of Pen Llithrig y Wrach (*ibid.*, 158), descending a stream and joining the Afon Eigiau before crossing the end of Llyn Eigiau and heading towards the Afon Conwy. The boundaries of the township of Dolgarrog are co-terminus with this. To the north of township of Dolgarrog lay the commote

of Arllechwedd Isaf, extending from the left bank of the Conwy estuary to the confluence with the Afon Porthllwyd adjacent to the Ardda lands (Jones-Pierce 1944, 162).

Previously known medieval settlement and farming activity close to the study area seems to have concentrated in three main areas: in the area of Ardda (on the south side of Moel Eilio), within the far west end of Cwm Eigiau, and in the northern parts of Waun Bryn Gwenith. The most significant of these is the remains of the medieval township of Ardda, which is mentioned in the mid 15th century *Bangor MS. 1939* detailing with social structure within the *gwely*, but was occupied as late as the 17th or 18th century (Jones-Pierce 1944). The surviving ruined buildings, consisting of single long huts, field walls, banks and enclosures are probably of the mid to later period of occupation of the site (RCAHMW 1956), although it is possible that some of the field boundaries and some of the buildings on the southern slopes of Penardda date from the period when this area was a monastic grange. However most of the evidence concerning these sites comes from the Tudor or 17th century era (Withers 1995). The likely socio-economic structure of the settlements is discussed by T. Jones-Pierce (1944).

A number of trackways cross the study area, including one that headed north-east past Pen Bryn Brwynog, along the ridge, and crossed the Afon Porth Llwyd at Pont Newydd (Feature 9). These would have formed part of the early route across the uplands towards Capel Curig from Llanbedr (GAT 2001).

It is possible that some of the field boundaries and some of the buildings on the southern slopes of Penardda date from the period when this area was a monastic grange, although most of the evidence concerning them appears to come from the Tudor or 17th century era (Withers 1995).

4.2.4 Post-Medieval to Modern (1500-1850)

The medieval land structure within the study area became fragmented owing to letting and re-letting of land whereupon they became assimilated within the process of 16th century estate buildings, creating large estates such as Gwydir and Glynllifon. They were settled with tenants and run as individual farms rather than as components of a wider agricultural landscape, although transhumance continued for some time (Longley 2006, 61-82).

The farms on the uplands consisted of scattered medium sized holdings which were generally established on the slopes of the hill, making use of the lands both on the river meadow and on the upland pastures (Butler 1981, 34). This characteristic pattern of settlement has been shown to have evolved from the late Middle Ages and in the century or so after 1500 when the settlement patterns of earlier agrarian systems decayed, to be replaced by consolidated farmsteads. Encroachments on the waste and on common land were prompted by population pressure and legal and social changes associated with Wales incorporation into the English state following the Acts of Union of 1536-1542. Survival of enclosures and associated small paddocks around the farmsteads, probably dating from the sixteenth century, have been identified just to the north of the study area in Caerhun and Llanbedr y Cennin parishes (Withers 1995), and similar field patterns are apparent here. These suggest scattered islands of settlement, each with a contiguous scatter of small fields, with the holdings marked out clearly, which can be seen on maps from 1777 onwards at Ffridd Eithinog (*ibid.*, 43). This pattern is particularly apparent around Pont Newydd and Ffridd Ddu farmsteads within the study area. The relict walls are sometimes associated with long huts (Hooke, 1997, 94), and two have been identified within the study area (Features 13 and 36). Excavation of similar sites has suggested a variety of structural types and for evidence of internal sub divisions, with very shallow foundations (Smith and Thompson 2006, 128-132). The field boundaries, which survive as 'wandering walls', survive amongst the more regular field systems created by the mid 19th century Parliamentary Enclosures (Davies 1979, 42-44). An upland survey of Eastern Snowdonia, carried out by *Cambrian Archaeological Projects* (CAP) identified a number of sites of this date both within the study and the wider area (Jones 2003).

Until recent times, the parish of Caerhun lay to the north of the Porth Llwyd and the Afon Ddu, with Llanbedr y Cennin parish as an island within it. Between the Porth Llwyd and the Afon Ddu, from the summit of Pen Llithrig y Wrach to the foot of the escarpment, was the township of Dolgarrog, which formed part of Llanbedr parish although physically separated from it. The meadows on the floor of the Conwy valley, as far as the site of the old Abbey on the eastern side of the river, were extra-parochial, and south of the Afon Ddu were the united parishes of Trefriw and Llanrychwyn. The lands of the Abbey and nearly all of Dolgarrog township were owned by Lord Newborough of Glynllifon, and formed one of the dispersed holdings of his former estates (Fig. 3). The land to the north-west, within the extensive parish of Caerhun formed part of the Gwydir estate

(Jones and Gwyn 1989, 21). The tithe map of 1847 for the township of Dolgarrog shows the holdings (Fig. 4) and the associated tithe apportionment is given below:

Landowners	Occupiers	Number on Plan	Name and Description of Land and Premises	State of Cultivation	Quantities in Statute Measure A R P
Lady Erskine	Henry Jones and others	24	Ardda	Arable, Pasture and Meadow	561 28
Lord Newborough	Edward Elias	12,12a,12b	Coed Sadwrn	“	144 2 35
	John Williams	10,10a	Coch hir	“	81 22
	John Jones and others	11	Coch bach	“	55 2 -
	William Roberts	9	Pyll du	“	172 3 14
	Robert Williams others	8	Eilio	Pasture and Meadow	215 4
	David Hughes	3	Hafod y rhiw and part of Llyneigiau	“ [Lake 2-0-0]	102 3 9
	Elinor Davies	2	Cedryn	Pasture and Meadow	478 28
	Owen Thomas	1	Cowlyd Part of Llyn Cowlyd	“ [Lake 83-0-0]	578 3 12
	John Griffith	5	Garregwen	Pasture and Meadow	141
	William Edwards and William Williams	6	Siglen and Pant	Arable, Meadow and Pasture	131 2 12
	William Hughes	7	Penbryn brwynog	“	166 37
	John Williams	14	Fulling Mill	Waste	2 1 13
	Richard Williams	15 and 15a	Tyn y Gerddi	Arable and Meadow	11 3 33
	Moses Jones	23 and 23a	Pant Teg	Arable and Meadow	21 16
	William Thomas	22	Cefn Morfa	Meadow	8 2 18
	Himself	13	Wood	-	108 2 26
	John Jones	16,16A,16B	Ty Newydd	Arable	17 2
	Richard Roberts	17,17A,17B	Ty ucha'r Ffordd	Arable[17] Meadow [17A and 17B]	17 2 17
	David Roberts	18, 18A	Tan y Ffordd	Arable [18] and Meadow [18A]	9 1 2
	William Hughes	19,19A	Tyddyn Isa	Arable and Pasture [19], Meadow [19A]	14 2 35
	William Roberts and Robert Roberts	20, 20A	Glanrafon	Arable and Pasture [20] and Meadow [20A]	11 1 16
	Owen Owens and others	21	Pladurian hirion	Meadow	10 3 32
	Tenants in Ardda	4	Eilio Mountain	Common	235 3 1

Use was made of the Afon Ddu as a source of water to power mills. It has been suggested that a *pandy* (fulling mill) located at SH 77416630 dates from the monastic period at Dolgarrog, although the first reference to this is in 1575 (Jack 1981, 88). The mill became the property of the Glynllifon estate and is recorded in the Glynllifon

archive (Gwynedd Archives, Caernarfon) between 1787 and the break-up of the estate in the mid 20th century. A painting of this mill by William Muller hangs in the Williamson Art Gallery, Birkenhead.

The current B5106 road, running down the west side of the Conwy valley was turnpiked in 1777, which may be when the present Dolgarrog Bridge was built.

4.2.5 Modern (1850 to present)

Industrialisation in the wider area began in 1863 when a branch line under the aegis of the London and North Western Railway was constructed, although no stations were initially provided between Tal y Cafn to the north and Llanrwst to the south. Quarry workings were opened at Cedryn and Cwm Eigiau and a short-lived railway was opened to transport slate to quays on the River Conwy. The landscape prior to the building of the Hydro-Electric Works and reservoir at Coedty is shown on the 25 inch 1st edition Ordnance Survey Map of 1891 (Fig. 5), where a farmstead is shown at Coed Ty bach, which was submerged by the reservoir.

The beginning of the 20th century saw the establishment of an aluminium works supplied by its own hydro-electric power station at Dolgarrog. In 1908 the *Aluminium Corporation Ltd.* bought up much of the land and water rights in Dolgarrog, the Abbey and Maenan and established an aluminium reduction works on the valley floor in 1908. Work on the dam at Coedty started in May 1908, and by 1911 the aluminium works was powered by a hydro-electricity station which derived its water from Llyn Eigiau and the Afon Ddu (Fig. 8), although the work was not complete by the time of the survey for the Ordnance Survey 3rd edition 25 inch map (Fig. 6). This descended from a penstock at SH76476686 which gave a head of 890' with a second pipe added in 1924 to carry water from the reservoir to the turbines at the Hydro-Electric works (Jones and Gwyn 1989, 163). The increased need for aluminium resulted in the expansion of the works and a standard gauge rail link from the branch line to the works in 1916, which remained in operation until about 1960. The history of the Aluminium works and the Hydro-Electric power station at Dolgarrog is described in detail in Eric Jones and David Gwyn's 1989 book *Dolgarrog-An Industrial History*.

In 1916 a 2 foot gauge line from the Aluminium works up to the Ardda farm boundary to the end of the leat terminating at Cowlyd. The track bed of this tramway survives as a lane (Feature 43) and its yard was located at Coed Sadwrn within the study area (Jones and Gwyn 1989, 178-183). The tramway continued in operation for about fifty years.

The expansion of works at Dolgarrog during and after the First World War created a need for housing, which resulted in the straightening of the main road through Dolgarrog and expansive housing linear development carried out, with the Aluminium works acting as the landlord.

In 1925 the dam at Coedty was overwhelmed and burst, resulting in the deaths of sixteen people in Dolgarrog (Jones and Gwyn 1989), and also partly destroyed the Porth Llwyd Neolithic chambered tomb. In the 20th century the design of the hydro-electric works benefited from the Colwyn Bay based architect Sidney Colwyn Foulkes, whose design works included the Tafolog Wier, to the north of the study area, but part of the water catchment works. A map produced in advance of improvement works at the Power Station, shows the pipelines lets, and narrow gauge line (Fig. 7)

4.3 Statutory and non-statutory designations

The study area lies within the Lower Conwy Valley Landscape of Outstanding Historic Interest in Wales (Ref: HLW (Gw) 4) (Cadw/ICOMOS 1998), which is described as a *topographically diverse landscape straddling the lower Conwy valley and adjacent uplands on the north eastern flanks of the Carneddau ridge in north Snowdonia, containing extensive and well-preserved relict evidence of land use, communications and defence from the prehistoric period onwards. The area includes: Neolithic chambered tombs; Bronze Age funerary and ritual monuments; Iron Age hillforts, settlements and field systems; a Roman fort and road; medieval motte, settlements and field systems; Parliamentary Enclosures; an early hydro-electric power station and aluminium works.*

The study area lies within the Dolgarrog (2017) Historic Landscape Character Area, described as an area of 1920s ribbon development, and Coed Dolgarrog (2018), an area of ancient woodland with water management features (GAT 2001, 30-31).

The northern part of the study area lies within the Snowdonia National Park. There are no Scheduled Ancient Monuments or listed buildings within the study area.

4.4 The Archaeological Survey (Fig. 2)

Forty-eight features have been identified directly within or contiguous with the study area, defined as the outline shown on Fig. 2 and within 30m of it; the features are located on Fig. 2. The total number of sites identified is limited owing to the restricted scope of the investigation. These are initially described listed below with recommendations for further assessment and mitigatory measures, where appropriate. The recommendations reflect the information currently provided by Capita Symonds, and assume impact only within a suggested easement around the pipeline of 60m. Any change to the boundary of the proposed development area will require the recommendations below to be changed also.

A 'C' after the grid reference indicates that the reference is for the centre of the feature or field system, and A after the grid reference indicates the general area of the feature, which may however extend over a wider area.

Feature 1 Coed Sadwrn Cottage

SH 76126707

Period: Post-medieval

Category: B Impact: None

A cottage was recorded here in 1956 and described as being of former *crogloft* type, about 6m by 3.7m and constructed of mortared rubble, with a farm building to the south-west of one build with the house. The fireplace, at the north-east end was 2.3m by 1.2m deep, with a large beam slightly cambered and chamfered (RCAHMW 1956, 74).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 2 Coed Ty Mawr Structure

SH 75706667

Period: Post-medieval

Category: E Impact: Unknown

Location of a roofed structure marked on the 25 inch 1st Edition Ordnance Survey Map of 1891 (Fig.?), but absent on the 2nd edition map of 1901. No remains were noted on the ground.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 3 Coed Ty Mawr Sheepfold

SH 75786681

Period: Post-medieval

Category: C Impact: Unknown

Remains of a former stone built sheepfold located at the edge of the track, 8m by 6m. It is divided into two units by 1m high stone wall along the central line. The main enclosure wall is 1.5m to 1.75m high and 0.75m wide, with an entrance at the NW corner.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 4 Coed Ty Mawr Farmhouse

SH 75776676

Period: Post-medieval

Category: B Impact: Unknown

The remains of a former stone building are located alongside the track way c.18m by 7.5m. It was built on a stone platform above the track. It is divided into two large bays, with two enclosures at either end. The access is along the SE facing side of the building. A ground plan of the farmhouse is included in the East Snowdonia Uplands Survey Report (Jones 2003, Appendix 1).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 5 Coed Ty Mawr Well

SH 75786679

Period: Post-medieval

Category: E Impact: Unknown

The location of a well marked on the first edition Ordnance Survey Map of 1891 (Fig. 5). It appears to have been within a square enclosure, approximately 5m across.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 6 Llyn Coedty Structure

SH 75786679

Period: Post-medieval

Category: C Impact: Unknown

A small corrugated iron structure is located at the top of Llyn Coedty dam. It is likely associated with dam as does not appear on OS maps earlier than the Provisional edition. It is approximately 10m x 5m., and would appear to be reservoir pump house or valve house.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 7 Ffrith Ddu House

SH 75666696

Period: Post-medieval

Category: B Impact: Unknown

The remains of a small farmstead consisting of a former farmhouse, now in ruins with a small outbuilding also in ruin were noted. Partial demolition appears to have taken place, but there are standing remains to a height of about 1m. A significant amount of rubble is spread over the whole area and it is difficult to interpret the whole ground plan. A collection of small paddocks survive around the building.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 8 Pont Newydd Sheepfold

SH 75756706

Period: Post-medieval

Category: C Impact: Unknown

The remains a small dry stone walled structure, about 6m square in the field corner, with south wall surviving to a height of about 1.5m, and probable entrance to the east. It appears likely to have been a former sheepfold, and is marked as unroofed on the 1st edition Ordnance Survey map of 1891. It has been suggested that it could be a former field barn (Jones 2003). Its incorporation into the 19th century field system (Feature 19), suggests that it is of that date.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 9 Coed Sadwrn Track

SH 75876713

Period: Post-medieval

Category: D Impact: Unknown

A trackway leading towards Coed Sadwrn

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 10 Llyn Coedty Leat

SH 75576673-75686789

Period: Post-medieval

Category: C Impact: Unknown

An early 20th century leat orientated NE-SW, associated with the hydro-electric works, running from Llyn Coedty reservoir towards Rowlyn Isaf, in a concrete channel about 8m wide. It cuts through the former field systems of Bont Newydd and Ffrith Ddu.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 11 Pont Newydd Cottage (Plate 2)

SH 75806715

Period: Post-medieval

Category: B Impact: Unknown

The remains of a former cottage and garden. The cottage, approximately 5m by 4m, remains partially roofed and used for storage. Two ancillary buildings are attached at either end which are unroofed but still stand to full height. There is a surviving fireplace at the eastern, unroofed portion of the main building. The entrance faces south and the structure is enclosed with a low wall that incorporates a yard to the north.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 12 Pont Newydd Privy (Plate 8)

SH 75826720

Period: Post-medieval

Category: B Impact: Unknown

The remains of a small 3m square structure, which is ruined and unroofed. The standing remains are about 1m high. The area is covered in a significant amount of rubble and it is difficult to identify the floor plan, but its location to the rear of Pont Newydd cottage suggests that it was a former privy or *ty bach*, and possible storage area.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 13 Hafod or Long Hut

SH 76256697

Period: Medieval

Category: B Impact: Unknown

The foundations of a former building, approximately 12m by 5m, with entrance to the south, are noted at this location. It appears to have some evidence of surviving internal sub-divisions, including a possible high end to the east. It lies within an area of early field systems (Feature 14)

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 14 Hollow Way and Field System above Coed Sadwrn

SH 76256695 C

Period: Medieval and Post-medieval

Category: B Impact: Unknown

An elaborate field system leading towards Coed Sadwrn from the valley below, and including feature 13. This may of varying dates and to have been in use over a long period of time.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 15 Modern Bridge

SH 75876713

Period: Modern

Category: C Impact: Unknown

A modern concrete bridge faced with stone crossing the leat (feature 10). It probably dates originally from the construction of the Hydro-Electric works, but is built on the line of a road that may have medieval or post-medieval origins, leading from the valley to the farms of Pont Newydd, Ffrith Ddu and Coed Ty Mawr

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 16 Drystone wall field boundary (Plate 4)

SH 75726718

Period: Post-medieval

Category: C Impact: Unknown

A wandering drystone wall, up to two rough courses wide and high. It probably forms the boundary to Pont Newydd Cottage fields or paddocks and to be of 18th century or earlier in date (Withers 1995).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 17 Probable Clearance Cairn

SH 75766716

Period: Probably Post-medieval

Category: E Impact: Unknown

A probable clearance cairn of stones, although it may be a prehistoric cairn

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 18 Drystone wall

SH 75756716

Period: Post-medieval

Category: C Impact: Unknown

A well built drystone wall, surviving up to six courses high, of loose rounded boulders. The wall is up to 1m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment. It probably forms a later sub division of some of the wandering wall systems.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 19 Drystone wall

SH 75736700 C

Period: Post-medieval

Category: C Impact: Unknown

A well built drystone wall, surviving up to six courses high, of loose rounded boulders. The wall is up to 1m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment. It probably forms a later sub division of some of the wandering wall systems, and incorporates the sheepfold (Feature 8).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 20 Drystone wall

SH 75656699

Period: Post-medieval

Category: B Impact: Unknown

A wandering drystone wall, up to two rough courses wide and a single course high surviving. It probably forms part of the early fields and paddocks associated with Ffrith Ddu farmhouse and to be of 18th century or earlier in date.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 21 Ridge and Furrow Cultivation

SH 76026706 A

Period: Post-medieval

Category: C Impact: Unknown

There is evidence for ridge and furrow cultivation on the ridges below Pen Ardda

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 22 Clearance Cairn

SH 75656699

Period: Post-medieval

Category: E Impact: Unknown

A pile of stones, probably created as a result of post medieval field clearance, although it is possible that it represents prehistoric funerary or other activity.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 23 Drystone wall (Plate 5)

SH75576690 C

Period: Post-medieval

Category: C Impact: Unknown

A well built drystone wall of loose rounded boulders. The wall is up to 1m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment. It probably forms a later sub division of the land subsequent to some of the wandering wall systems noted (Features 16 and 20).

Recommendations for further assessment: None
Recommendations for mitigatory measures: Avoidance

Feature 24 Coedty Reservoir

SH 7543 6661 C

Period: Modern

Category: B Impact: None

Reservoir and dam built in 1908-11 as part of the Hydro-Electric installation on formerly marshy and waterlogged land, which contained a small farmstead, shown on the Ordnance Survey 1st edition map of 1891 (Fig.?).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 25 Pipe (Plate 1)

SH 75526674-76566718

Period: Modern

Category: B Impact: Considerable

A riveted and welded 6 foot pipe running from the reservoir at Coedty to its junction with other pipes at Marble Arch, and thence down to the works. It was built on concrete piers and a plinth. Despite some problems (Jones and Gwyn 1989, 74) the current pipe was constructed 1924 (Jones and Gwyn 1989).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Basic Recording

Feature 26 Drystone boundary wall

SH 75596679

Period: Post-medieval

Category: C Impact: Likely

A well built drystone wall of loose rounded boulders, although now somewhat collapsed. The wall is up to 0.5m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment. It probably forms a later sub division of the land subsequent to some of the wandering wall systems noted (Features 16 and 20).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Basic Recording

Feature 27 Drystone wall

SH 75676690

Period: Post-medieval

Category: C Impact: Unknown

A well built drystone wall of loose rounded boulders. The wall is up to 1m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment. It probably forms a later sub division of the land subsequent to some of the wandering wall systems noted (Features 16 and 20).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 28 Drystone wall with possible inscribed stone (Plate 3)

SH 75736698

Period: Post-medieval

Category: E Impact: Unknown

A much collapsed drystone wall, probably associated with Ffrith Ddu farmhouse. It included a rough boulder, about 1.3m high and 0.4m wide, inscribed with a possible Latin Cross orientated slightly north north west-south south east. The stone is broken along its western side.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 27 Drystone wall

SH 75676690

Period: Post-medieval

Category: C Impact: Unknown

A well built drystone wall of loose rounded boulders. The wall is up to 1m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment. It probably forms a later sub division of the land subsequent to some of the wandering wall systems noted (Features 16 and 20).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 29 Drystone wall

SH 75736703

Period: Post-medieval

Category: C Impact: Unknown

A well built drystone wall of loose rounded boulders. The wall is up to 1m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment. It probably forms a later sub division of the land subsequent to some of the wandering wall systems noted (Features 16 and 20).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 30 Remnant of wall forming part of structure

SH 75766680

Period: Post-medieval

Category: E Impact: Unknown

A well built mortared wall of angular rubble. Its character appears to be of 19th century date, and built on a regular straight alignment to the south-east of the track way. It probably formed part of a currently unidentified structure associated with Coedty Mawr farm.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 31 Terracing and Revetment

SH75816698 A

Period: Post-medieval

Category: B Impact: Likely

Revetment walling and terracing north-west of Coed Ty Mawr. It is probably associated with early field systems around the former farmstead of Coed Ty Mawr and may be medieval or early post-medieval in origin.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Archaeological Strip, Map and Sample in advance of disturbance to area

Feature 32 Cairn

SH75826694

Period: Probably post-medieval

Category: E Impact: Unknown

Stones which were probably gathered together into a cairn as part of field clearance were noted at this location. It is possible however that they represent the remains of a prehistoric burial cairn.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 33 Possible trackway across the terracing

SH75776694 C

Period: Post-medieval

Category: B Impact: Unknown

A track way crossing the revetment walling and terracing north-west of Coed Ty Mawr (Feature 31). It is probably associated with early field systems around the former farmstead of Coed Ty Mawr and may be medieval or early post-medieval in origin.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 34 Field boundary

SH75906709

Period: Post-medieval

Category: B Impact: Likely

A drystone wall, up to two rough courses wide and high. It appears to be of the earlier, pre-enclosure type, although somewhat straighter than many of the other examples seen, and may be of 16th to 18th cent. date.

Recommendations for further assessment: *Topographic survey*

Recommendations for mitigatory measures: *Basic Recording and watching brief during construction work, to check for the presence of relict buried soils beneath any disturbed sections of the wall*

Feature 35 Ridge and furrow cultivation

SH 75766689 A

Period: Post-medieval

Category: C Impact: Unknown

There is evidence for ridge and furrow cultivation on the ridges below Coed Ty Mawr, probably associated with the former farmstead there which may have early origins.

Recommendations for further assessment: *None*

Recommendations for mitigatory measures: *Avoidance*

Feature 36 Possible long hut (Plate 7)

SH 75966718

Period: Possibly Medieval or early post medieval

Category: E Impact: Possibly Considerable

A possible long hut 12m by 5.8m orientated north-east south-west, with an entrance on south-east side. It is built of rough coursed angular shale slabs, about 0.7m wide, with a built up dias at the north-east end. It appears associated with an early, possibly 16th cent. wandering wall field system (Feature 37), and probably represents the location of a former homestead.

Recommendations for further assessment: *Topographic Survey followed by trial trenching*

Recommendations for mitigatory measures: *Await results of trial trenching*

Feature 37 Wandering wall field system

SH75986718 A

Period: Medieval-Post-medieval

Category: B Impact: Likely

A wandering drystone wall, up to two rough courses wide and a single course high surviving. It probably forms part of the early fields and paddocks associated with the probable homestead identified as Feature 36 and to be of 18th century or earlier in date. Such walls have been suggested to be 16th century in origin (Withers 1995).

Recommendations for further assessment: *Topographic Survey*

Recommendations for mitigatory measures: *Basic Recording and watching brief during construction work, to check for the presence of relict buried soils beneath any disturbed sections of the wall*

Feature 38 Probable Clearance Cairn

SH75936710

Period: Post-medieval

Category: E Impact: Considerable

Stones which were probably gathered together into a cairn as part of field clearance were noted at this location. It is possible however that they represent the remains of a prehistoric burial cairn.

Recommendations for further assessment: *Trial Trenching*

Recommendations for mitigatory measures: *Await results of trial trenching*

Feature 39 Terrace and boundary walls

SH75936710 C

Period: Medieval to post-medieval

Category: E Impact: Unknown

Possible terracing, field systems and boundary walls above Coed Sadwrn Cottage. This survives both sides of the track leading to Coed Sadwrn cottage.

Recommendations for further assessment: *None*

Recommendations for mitigatory measures: *Avoidance*

Feature 40 Cairns

SH76176698

Period: Possibly prehistoric or post-medieval

Category: E Impact: Unknown

Two adjacent cairns, with possible kerb stones and about 5m across, were identified at this location. It is possible that they represent the remains of prehistoric burial cairns, and the kerb stones give further credence to this claim. It is also possible that they are later in date, possibly as a result of field clearance.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 41 Field boundary wall

SH76116702C

Period: Post-medieval

Category: C Impact: Unknown

A drystone wall, up to two rough courses wide and high, and orientated north-south at Coed Sadwrn. It appears to be of the earlier, pre-enclosure type, although it has a straight course and may be a 19th century field sub-division.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 42 Field boundary wall

SH76306702C

Period: Post-medieval

Category: C Impact: Unknown

A drystone wall, up to two rough courses wide and high, and orientated north-south at Coed Sadwrn. It appears to be of 19th century date.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 43 Trackway

SH75856696-76436699

Period: Modern

Category: C Impact: Unknown

A track way leading from the road at SH75856696 past Coed Sadwrn cottage before heading south past Pen Ardda. May originally date from post-medieval times, but for some of its length formed the track bed for the Llyn Cowlyd tramway.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 44 Field Boundary wall

SH76306711

Period: Post-medieval

Category: C Impact: Unknown

A drystone wall, up to two rough courses wide and high, and orientated north-south at Coed Sadwrn. It appears to be of the earlier, pre-enclosure type of possible 16th 18th cent. date, and associated with farmyards at Coed Sadwrn cottage.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 45 Field Boundary wall

SH76296702

Period: Post-medieval

Category: C Impact: Unknown

A well built drystone wall of loose rounded boulders. The wall is up to 1m high in places. Its character appears to be of 19th century date, and built on a regular straight alignment.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 46 Former locomotive shed (Plate 6)

SH76366711

Period: Modern

Category: B Impact: Unknown

Former corrugated iron locomotive shed on the Llyn Cowlyd tramway (Jones and Gwyn 1989) built probably in 1916, and formed part of the Coed Sadwrn yard (Jones and Gwyn 1989, 180-181).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 47 Field boundary wall

SH75986723

Period: Medieval to post-medieval

Category: B Impact: Unknown

A drystone wall, up to two rough courses wide and high, and orientated north-south at Coed Sadwrn. It appears to be of the earlier, pre-enclosure type which may be of 16th to 18th cent. date, and associated with farmyards at the homestead identified as feature 36.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

Feature 48 Coed Ty Bach

SH75556662

Period: Medieval to post-medieval

Category: E Impact: None

A former farmstead is noted at this location, within enclosures of wandering walls of possible 16th to 18th century date. It is of unknown but probably post-medieval date, and was submerged when the Coedty Reservoir was built in 1908-1911. It may formerly have been associated with Coed Ty Mawr farm.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

5. SUMMARY OF ARCHAEOLOGICAL POTENTIAL

5.1 Location Summary

The study area consists of 50ha of upland plateau to the west of Dolgarrog, Conwy above a steep escarpment, centred on NGR SH 76556718 at a height of 290m OD (Fig. 1). The area consists of dispersed settlement on mid slope terraces above the river valleys.

The geology of the area is dominated by Ordovician slates, with contemporary and intrusive igneous formations (Roberts 1979). The steep escarpment of the Conwy valley is caused by an igneous formation. Boulder clay, containing pockets of peat, lines the hanging valleys. Peat also covers much of the uplands, whilst the floor of the valley is covered with alluvial deposits (Geological Survey of England and Wales, sheets 9 and 10).

5.2 Environmental Remains and Soil Morphology

The peats of the uplands have a high potential for preserving a good pollen record, especially those in small bogs near farmsteads. However, the present works will not damage any peat bogs or effect the drainage regime of the area beyond that currently done by the Hydro-Electric works, so it will have no impact on this preserved record. Most of the area to be crossed by the scheme seems to have fairly thin soils, mostly at least occasionally disturbed by ploughing. Relict soils might be preserved under later field walls, especially those that may have been in use since the medieval period. The study of recovered palaeo-environmental remains might provide further understanding of the transhumance system employed in the upland regions around Dolgarrog (Casteldine 2006, 149).

5.3 Artefactual Potential

The potential for the survival of prehistoric artefacts is unknown. However finds found in association with medieval upland settlement, identified in the survey and in significant quantity in the surrounding area (Withers 1995, Hooke 1997), is usually very limited in Wales. Artefacts associated with post-medieval and modern archaeology are moderately likely to survive.

6. SUMMARY OF RECOMMENDATIONS

1.0 Summary

Number	Name	Importance	Impact	Recommendation for further evaluation	Mitigation recommendations
1	Coed Sadwrn Cottage	B	None	None	Avoidance
2	Coed Ty Mawr Structure	E	None	None	Avoidance
3	Coed Ty Mawr Sheepfold	C	None	None	Avoidance
4	Coed Ty Mawr Farmhouse	B	None	None	Avoidance
5	Coed Ty Mawr Well	E	None	None	Avoidance
6	Llyn Coedty Structure	C	None	None	Avoidance
7	Ffrith Ddu House	B	None	None	Avoidance
8	Pont Newydd Sheepfold	C	None	None	Avoidance
9	Coed Sadwrn Track	D	None	None	Avoidance
10	Llyn Coedty Leat	C	None	None	Avoidance
11	Pont Newydd Cottage	B	None	None	Avoidance
12	Pont Newydd Privy	B	None	None	Avoidance
13	Hafod/Long Hut	B	None	None	Avoidance
14	Hollow way and Field System above Coed Sadwrn	B	None	None	Avoidance
15	Modern Bridge	C	None	None	Avoidance
16	Drystone wall	C	None	None	Avoidance
17	Possible clearance cairn	E	None	None	Avoidance
18	Drystone wall	C	None	None	Avoidance
19	Drystone wall	C	None	None	Avoidance
20	Drystone wall	B	None	None	Avoidance
21	Ridge and Furrow Cultivation	C	None	None	Avoidance
22	Clearance Cairn	E	None	None	Avoidance
23	Drystone wall	C	None	None	Avoidance
24	Coedty Reservoir and dam	B	None	None	Avoidance
25	Pipe	B	Considerable	None	Basic Recording
26	Drystone wall	C	Likely	None	Basic Recording
27	Drystone wall	C	None	None	Avoidance
28	Drystone wall with possible Inscribed Stone	E	None	None	Avoidance
29	Drystone wall	C	None	None	Avoidance
30	Wall remnant	E	None	None	Avoidance

31	Terracing and Revetment	B	Likely	None	Strip, Map and Sample in advance of groundworks
32	Cairn	E	None	None	Avoidance
33	Possible Trackway across the Terracing	B	None	None	Avoidance
34	Drystone wall	B	Likely	Topographic survey	Basic Recording and watching brief
35	Ridge and Furrow Cultivation	C	None	None	Avoidance
36	Possible long hut	E	Possibly Considerable	Topographic Survey followed by Trial Trenching	Await results of Trial Trenching
37	Field System	B	Likely	Topographic Survey	Basic Recording and Watching Brief
38	Probable Clearance Cairn	E	Considerable	Trial Trenching	Await results of Trial Trenching
39	Terrace and boundary walls	E	None	None	Avoidance
40	Cairns	E	None	None	Avoidance
41	Drystone wall	C	None	None	Avoidance
42	Drystone wall	C	None	None	Avoidance
43	Trackway	C	None	None	Avoidance
44	Drystone Wall	C	None	None	Avoidance
45	Drystone Wall	C	None	None	Avoidance
46	Former Locomotive Shed	B	None	None	Avoidance
47	Field Boundary Wall	B	None	None	Avoidance
48	Coed Ty Bach Farmstead	E	None	None	Avoidance

2.0 General Recommendations

A significant number of new sites were identified during the scoping study (of the 48 sites listed above only 15 were identified on the HER and NMR). The information obtained through this scoping assessment has therefore demonstrated requirement for a more detailed assessment and evaluation in order to ensure that all archaeological sites along the route have been identified and appropriate mitigation recommended.

It has, however, been possible to identify mitigation recommendations for the sites identified to date, and these are given above as site specific recommendations. In addition there is a strong likelihood of relict archaeology surviving below ground for which no traces are visible above ground. A programme of archaeological strip, map and sample is therefore recommended in advance of direct impact which has the potential to damage below ground archaeology. However the ground beneath and immediately adjacent to the pipe is likely to have been heavily disturbed with very low potential for survival of archaeological remains (Fig. 8), and therefore a watching brief is recommended here.

2. CONCLUSIONS

The archaeological assessment identified a complex landscape settlement pattern on the hill slopes above Dolgarrog, dating from the late medieval to the Victorian era, for which a significant amount of evidence survives in the form of farmsteads and associated field systems. These consisted of irregular enclosures, probably created during the 16th to 18th centuries, generally around the homesteads on mid slope terraces, and a more regular field pattern created as a result of 19th century Parliamentary enclosure, which extended into the

more upland areas. No demonstrably earlier sites were identified, although some of the settlement pattern identified today may well have had its origins in the earlier Middle Ages.

The survival of prehistoric archaeology within the study area is likely although no specific sites have been identified. Some of the terracing and field systems may be of prehistoric origin.

From the early years of the 20th century the landscape was transformed by rapid industrialisation, as a result of the establishment of a hydro-electricity station to power the Aluminium works which had been built in the valley below. In addition to the Coed Ty dam, reservoir, and early 20th century main water pipes, water supply in the form of leets was noted. The remains of an early 19th century tramway and associated sheds were also noted within the study area.

3. ARCHIVE

The archive consists of historic maps, plans and aerial photographs, along with notes and digital images taken on the field visit. The archives is held by GAT under project code **G2158**

7. REFERENCES AND OTHER SOURCES CONSULTED

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Tithe Map and Schedule of the Parish of Trefriw 1841

Tithe Map and Schedule of Dolgarrog and Ardda Townships, Parish of Llanbedr y Cennin 1847

Gwynedd Archives, Caernarfon

GAS XD2/8356-7 *Plans and Schedule of Lord Newborough's Estates c.1815*

GAT Historic Environment Record

National Library of Wales

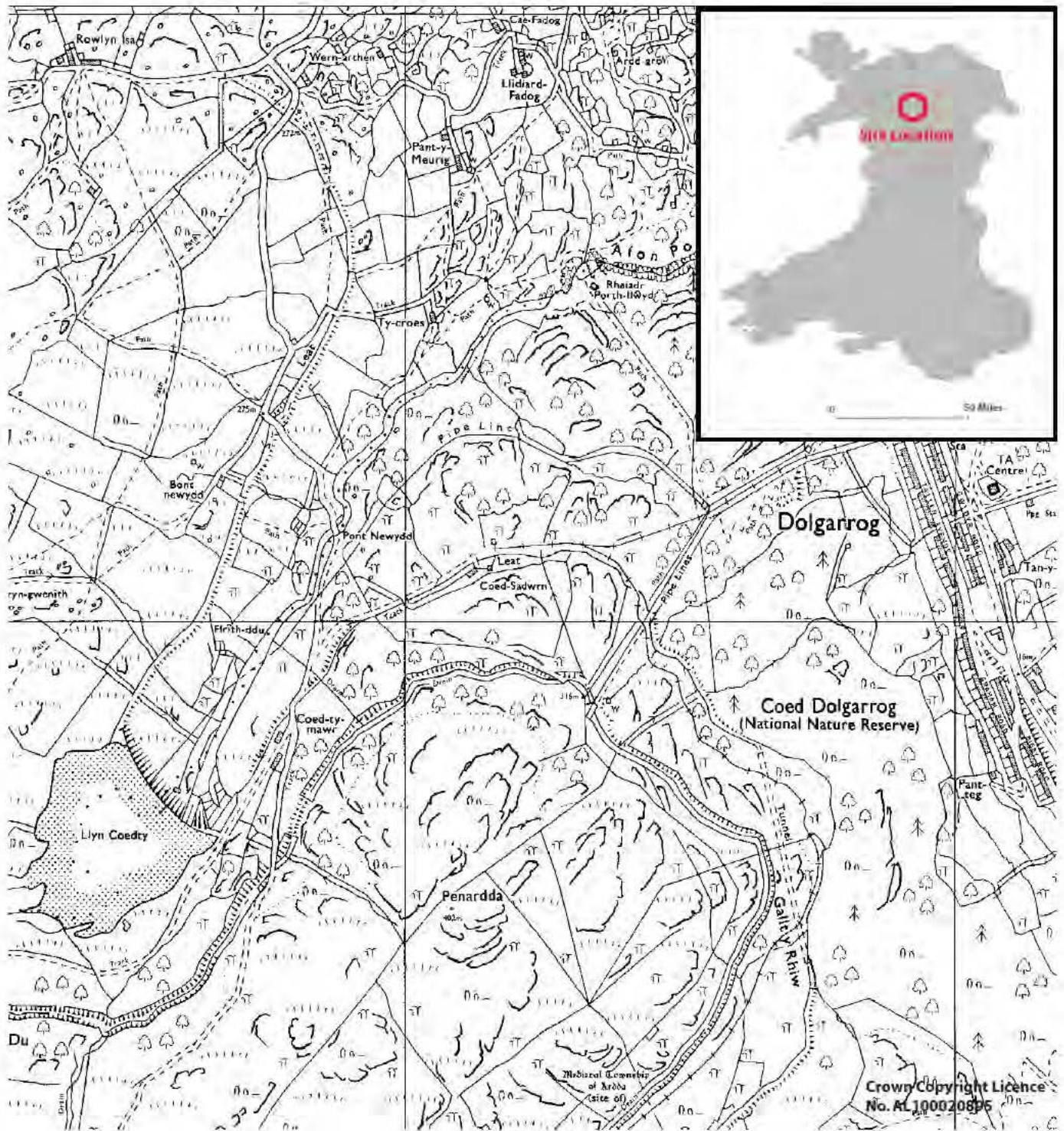


Fig. 1 Site Location. Base map taken from Ordnance Survey 1:10 000 sheet SH76 SE

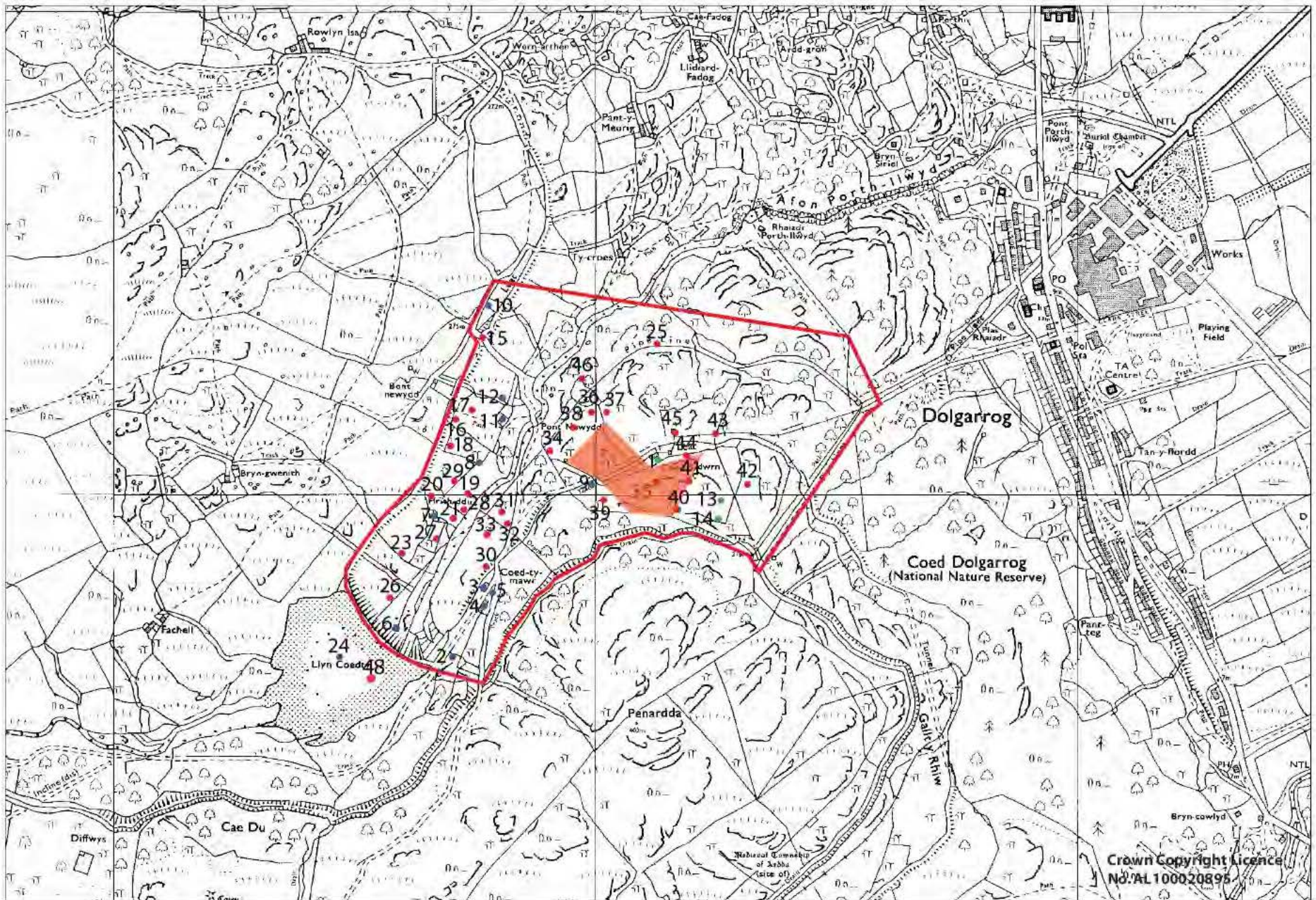


Fig. 2 Sites identified on the Gwynedd HER (Green Dots), RCAHMW survey (Blue Dots) and Walk-Over Survey (Red Dots). Map taken from Ordnance Survey 1:10 000 sheets SH 76 SE and SW.



Fig. 3 The Abbey Demesne, from *Plans and Schedule of Lord Newborough's Estates* c.1815 (GAS XD2/8356-7). Study area shown in red

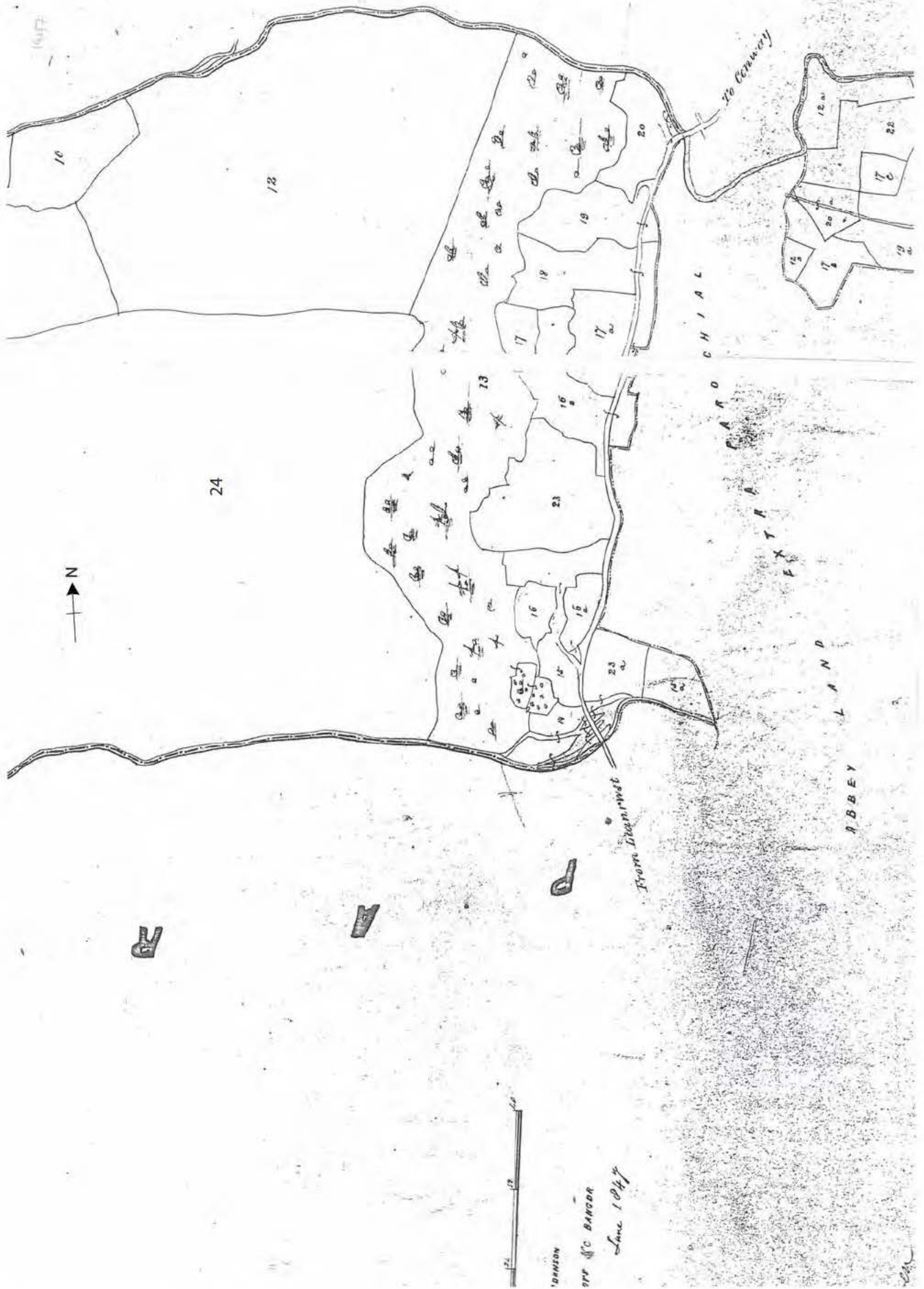


Fig. 4 Extract from the Dolgarrog Tithe map of 1847. Field 12 is referred to as Coed Sadwrn (Conwy Archives)

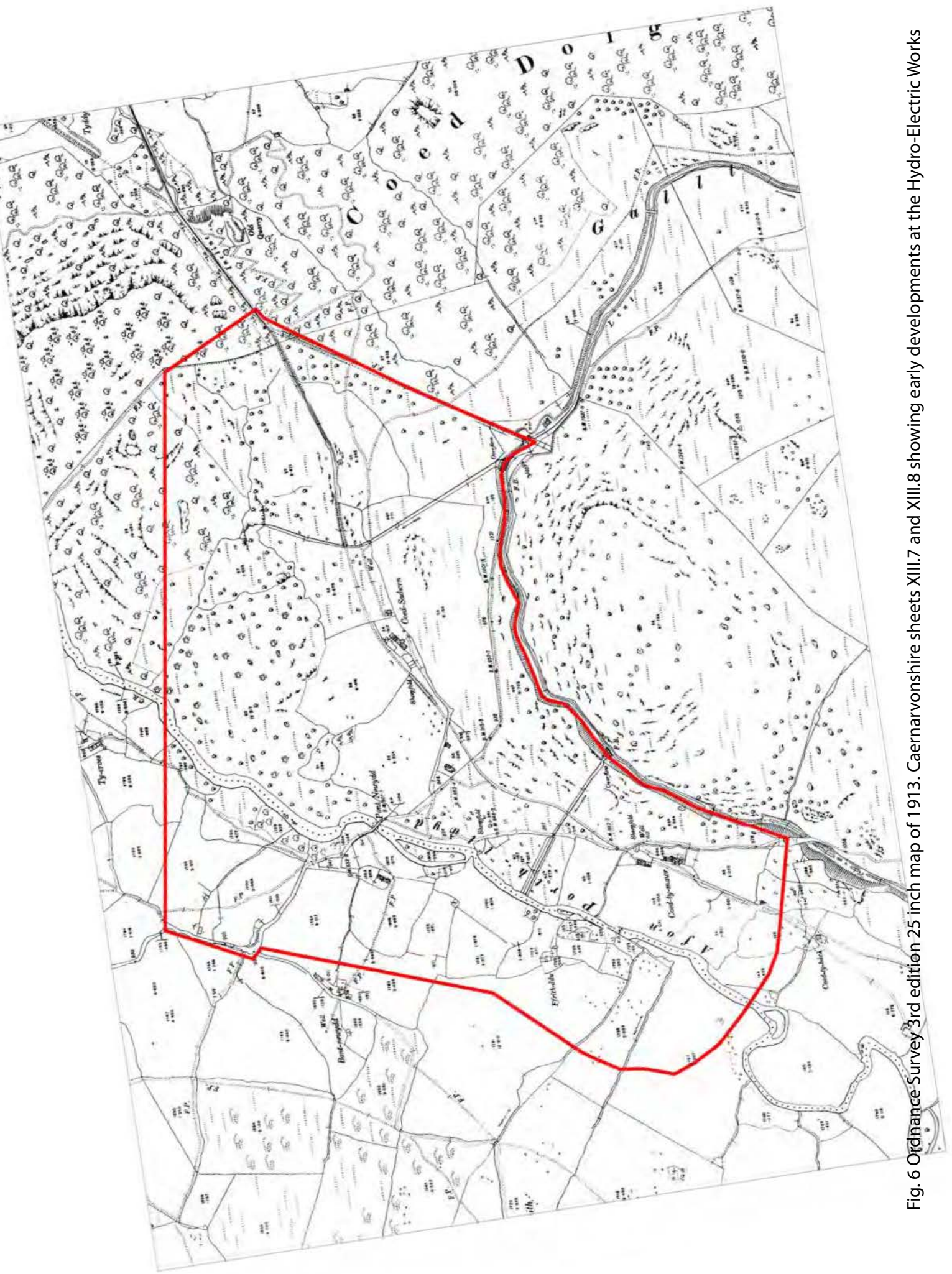
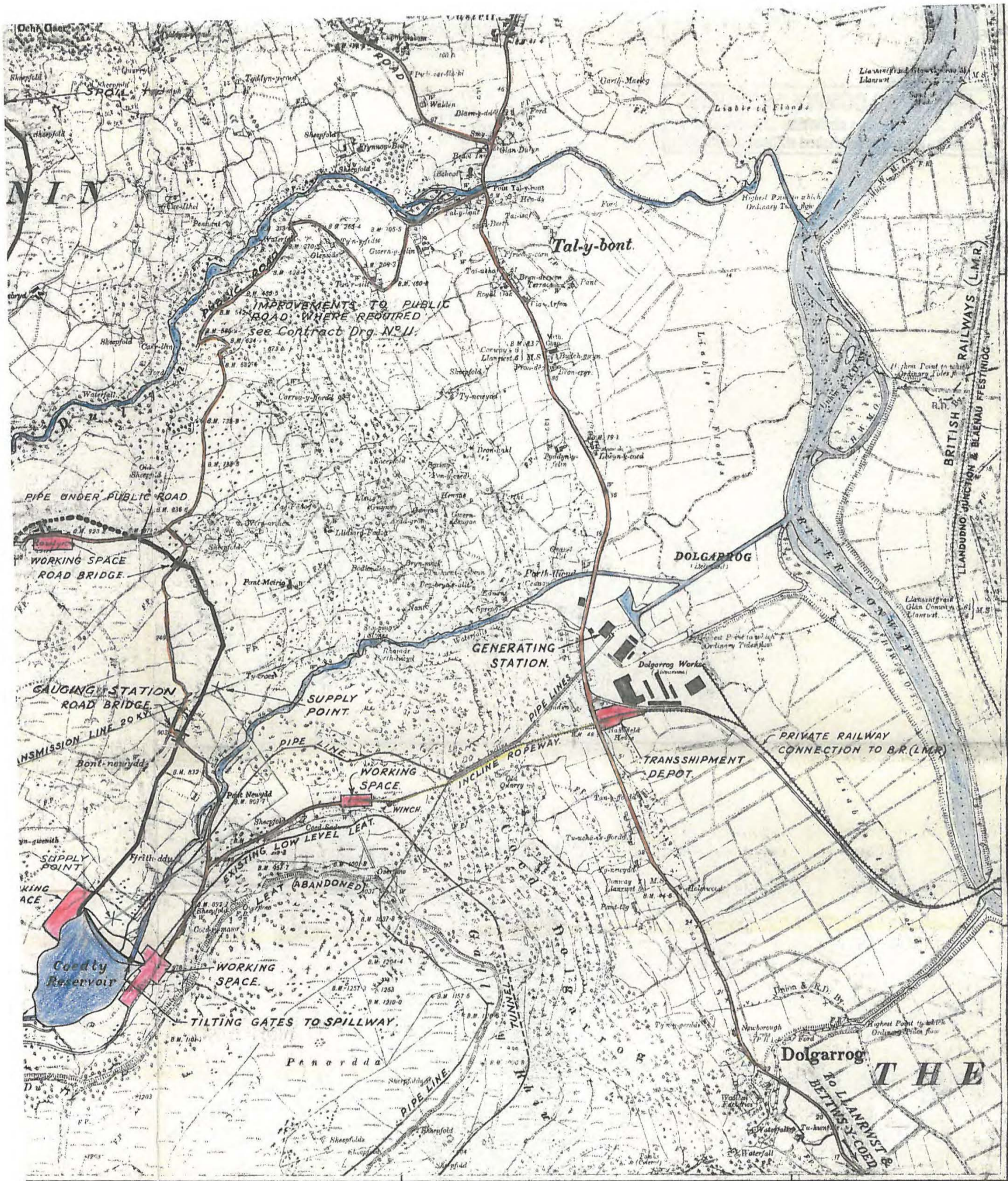


Fig. 6 Ordnance Survey 3rd edition 25 inch map of 1913. Caernarvonshire sheets XIII.7 and XIII.8 showing early developments at the Hydro-Electric Works



1000 2000 3000 4000 5000 5280 Feet
 1/4 1/2 3/4 1 Mile.
 inches to One Statute Mile or 880 Feet to One Inch - 10560

BRITISH ELECTRICITY AUTHORITY
 MERSEYSIDE AND NORTH WALES DIVISION.
DOLGARROG HYDRO-ELECTRIC WORKS
EXTENSION TO CATCHMENT
GENERAL PLAN

CONTRACT DRG. NO. 1. **DRG. NO. B. 46525**
 FREEMAN, FOX & PARTNERS
 68, VICTORIA STREET, S.W.1.

Fig. 7 British Electricity Authority plan showing Hydro-Electric Works at Dolgarrog, dating from the 1950s. Sidney Colwyn Foulkes Collection, Conwy Archives (C/Maps 21/2/11/1/2).

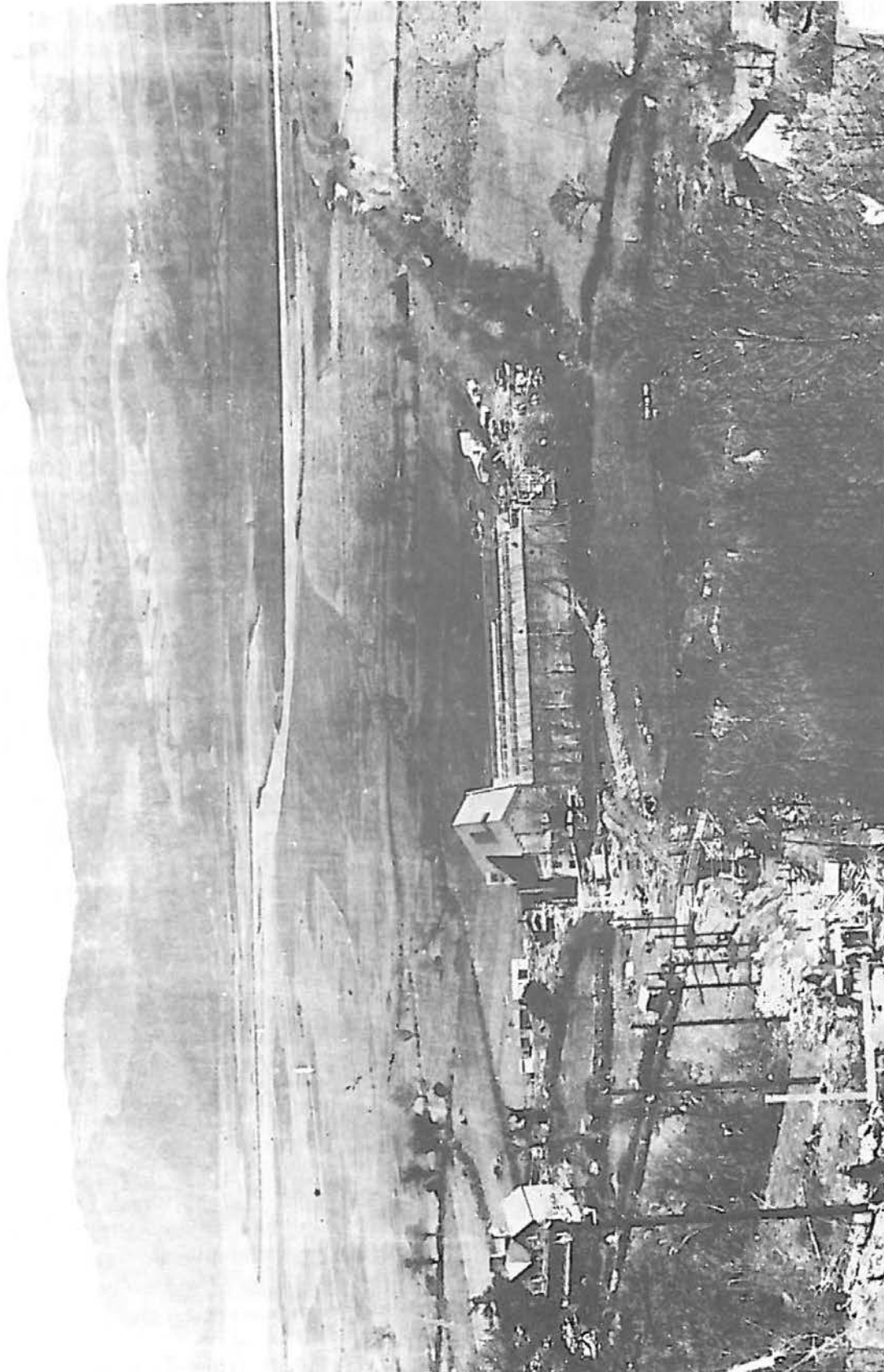


Fig. 8 View down the incline in 1908 during the initial pipeline construction (taken from Jones and Gwyn 1989, 43 [fig. 9])



Plate 1 The pipeline (Feature 25) as it crosses the Afon Porth Llwyd



Plate 2 Pont Newydd Cottage (Feature 11) from the south-west. Scale 1m



Plate 3 Possible cross inscribed stone (Feature 28)



Plate 4 Pre-enclosure wall of 16th-18th century date, from the north (Feature 16). Scale 1m



Plate 5 19th century wall probably associated with Parliamentary Land enclosure of the 1850s (Feature 23).
Scale 1m



Plate 6 Former engine shed of the Llyn Colwyd Tramway at the former Coed Sadwrn Yard



Plate 7 Possible medieval long hut (Feature 36). Scale 1m



Plate 8 Probably privy structure associated with Pont Newydd Cottage (Feature 12). Scale 1m

APPENDIX 1

Sites Located on Gwynedd HER within Study Area						
PRN	NPRN	SITENAME	NGR	SITETYPE	PERIOD	FORM
1637	60058	HAFOD (REMS. OF), ABOVE COED SADWRN	SH76256697	FOUNDATIONS	Medieval	BUILDING - RUINED
1638	60059	HOLLOW WAY & FIELD SYSTEM, ABOVE COED SADWRN	SH76256695	HOLLOWAY	Medieval	STONE BUILT FEATURE
12990	0	TRACK TO COED SADWRN	SH75876715	TRACK	Post- Medieval	CARTOGRAPHIC
12974	0	PONT NEWYDD BRIDGE	SH75876715	BRIDGE	Post- Medieval	CARTOGRAPHIC
12955	0	COED SADWRN COTTAGE	SH76126707	COTTAGE	Post- Medieval	STONE BUILT FEATURE
12973	0	COED TY MAWR	SH75756663	FARM	Post- Medieval?	

APPENDIX 2

HYDRO-ELECTRIC PIPELINE
DOLGARROG

PROJECT DESIGN FOR
ARCHAEOLOGICAL ASSESSMENT

Prepared for

Capita Symonds

September 2010

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

HYDRO-ELECTRIC PIPELINE, DOLGARROG

PROJECT DESIGN FOR ARCHAEOLOGICAL ASSESSMENT (G2158)

Prepared for Capita Symonds, September, 2010

1. PROJECT BACKGROUND

It is proposed to replace the upper part of the present over ground pipeline which feeds Dolgarrog Hydro Electric Power Station with a new pipe which is to be buried below ground. Gwynedd Archaeological Trust has been asked by Capita Symonds to provide a cost and project design for carrying out an archaeological assessment of an area of land just under 50ha which includes the route of the pipe and access routes. The assessment is to form part of a wider Environmental Impact Assessment.

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

Curatorial responsibility for this project lies with Snowdonia National Park Authority. The curators should be consulted prior to the start of the project.

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. PROGRAMME OF WORK

3.1 Introduction

Stage 1 - This stage will consist of a desk-based study of all readily available secondary documentary, cartographic, pictorial, and aerial/ground photographic sources in order to provide a historical framework for any surviving archaeological remains.

Stage 2 - This stage will consist of a field survey of the whole development area in order to identify both specific sites and broader areas of archaeological sensitivity.

Stage 3 Evaluation - The requirement for any further archaeological work at this stage will be dependant upon the results of stages 1 and 2 and the final layout of the proposed works.

Stage 4 Mitigation - Similarly, the requirement for further archaeological work and mitigation recommendations at this stage will depend upon the results of all prior archaeological reporting. A separate brief and report on the results will be required for this stage. The brief and report may be combined with stage 3 in some circumstances.

3.2 Stage 1 - Desk-based assessment

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

The regional Historic Environment Register (HER, Gwynedd Archaeological Trust) 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 repositories will not be examined at this stage of the assessment. Recommendations will be made for further desk-based assessment if required.

3.3 Stage 2 - Field survey

This part of the assessment will involve targeted field walking to assess 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.

Field walking will be carried out along the route of the pipeline and any proposed access routes. Field walking will also be undertaken where other direct impact may occur.

Located sites or finds will be accurately fixed by means of GPS satellite navigation and/or related to fixed local topographic features and the OS national grid by means of measured survey.

The character, function, condition, vulnerability, potential dating and relationship to other features of each identified site or find will be described fully. The importance of the site or find will be assessed in terms of local, regional or national significance.

Photographs in high resolution digital format of each recorded site or artefact/object identified will be taken. Both specific photographs of the site and wider angle views of the site within its landscape context will be included.

Access onto land is to be arranged by the Clients.

3.4 Stage 3 - Field Evaluation

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 geology for geophysical survey. A further brief and report will be necessary for this stage. The brief and report may combine with, and include the results of, stage 4.

3.5 Stage 4 - Mitigation

This stage will essentially include a specific mitigation strategy based on the results of the preceding stages. The mitigation strategy will be prepared by the archaeological curator and will seek to preserve all archaeological sites in situ, within the framework of the development. The mitigation strategy may commonly include any or all of the following components:

a) Preservation in-situ by exclusion. Sites identified as being within 50m of any proposed ground disturbance must be clearly and robustly marked and/or fenced off to protect them from accidental damage during construction. The location, marking and/or fencing of archaeological sites must be completed in the presence of a monitoring archaeological contractor who will be engaged by the developer to oversee this work. Every exclusion area must be completed prior to construction commencing on the site and must remain in place for the duration of all construction works.

b) Preservation by record. Where damage is unavoidable specifically targeted programmes of intensive archaeological investigation will be recommended which may include measured/drawn survey or full excavation.

c) Watching brief. A watching brief should be maintained over the whole development area during the early stages of any new ground disturbance so that previously unrecorded features revealed by this work can be monitored and recorded where necessary.

A separate brief and report on the results will be required for this stage. The brief and report may be combined with stage 3 in some circumstances.

3.6 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. DISSEMINATION AND ARCHIVING

For the purposes of this project the full site archive will be deposited within one month of the completion of the final report. The archive will be deposited at a time and location to be agreed with the curator. Normally the paper/drawing/digital archive will be deposited with the regional curator and the regional HER and the finds at an appropriate local museum.

The archive will include all site notes, finds, documents, drawings, photographs, digital data and a copy of the final report and any prior draft versions. In the archive deposition statement, located at the rear of the interim and final clients report, all of the above items must be clearly quantified in tabular form and their ultimate location and proposed date of deposition stated.

5. PERSONNEL

The work will be supervised by Mr Andrew Davidson, Principal Archaeologist. 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.

6. MONITORING AND TIMING

Monitoring meetings can be arranged during the course of the project if required.

7. 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.

8. OTHER

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

9. SOURCES CONSULTED

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



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GWYNEDD
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