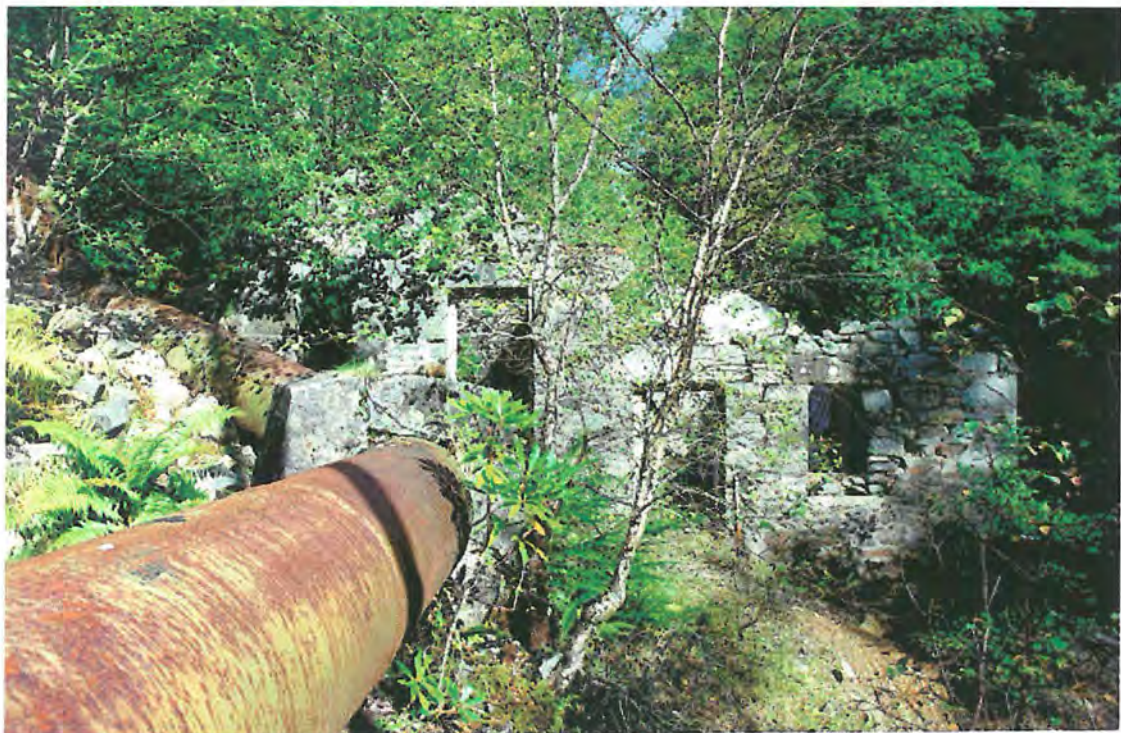


Mawddach Hydro-Power Scheme

Archaeological Assessment

G1570



Prepared for Shawater Ltd.

by

Ymddiriedolaeth Archaeolegol Gwynedd

Gwynedd Archaeological Trust

Report No. 347

Event PRN
40472

MAWDDACH HYDRO-POWER SCHEME

ARCHAEOLOGICAL ASSESSMENT (G1570)

Report No. 347

Prepared for Shawater Limited

by

S. Jones

Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

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MAWDDACH HYDRO-POWER SCHEME

ARCHAEOLOGICAL ASSESSMENT

1 INTRODUCTION

The proposed hydro-power scheme will extract water from the Afon Mawddach at SH 7360 and convey the water to a proposed powerhouse and outfall at SH 7357 2747. Gwynedd Archaeological Trust (Contracts Section) has been asked by Shawater Ltd to carry out an archaeological assessment of the proposed scheme route.

2 ASSESSMENT BRIEF

An initial report was requested from Gwynedd Archaeological Trust, assessing the likely archaeological impact of the scheme and suggesting mitigatory measures.

The basic requirement was for a desk-top survey and field search of the proposed area in order to assess the impact of the proposals on the archaeological and heritage features within the area concerned. The importance and condition of known archaeological remains were to be assessed and areas of archaeological potential and new sites to be identified. Measures to mitigate the effects of the proposed scheme on the archaeological resource were to be suggested.

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

- a) *to identify and record the cultural heritage of the area to be affected by the proposals;*
- b) *to evaluate the importance of what was identified (both as a cultural landscape and as the individual items which make up that landscape); and*
- c) *to recommend ways in which damage to the cultural heritage can be avoided or minimised.*

3 METHODS AND TECHNIQUES

3.1 Desk-top Study

This involved consultation of maps, computer records, written records and reference works, which make up the Sites and Monuments Record (SMR) located at Gwynedd Archaeological Trust. Records (including early Ordnance Survey maps, tithe maps, schedules, and reference works - see bibliography) were consulted in the Gwynedd Archives, Dolgellau and other records in the Gwynedd Archives, Caernarfon and the University of Wales Archives, Bangor.

3.2 Field Search

This was undertaken on the 7th of October 1999, when the whole of the proposed route of the pipeline was walked. Conditions were dry and bright, ideal for fieldwork.

Sites identified were marked on copies of 1:5,000 OS maps as accurate as possible without detailed surveying. Each site was described and assessed. Detail notes, sketch plans and photographs were made of the more important features.

3.3 Report

All available information was collated, and transferred onto a map at a scale 1:10,000. The sites were then assessed and allocated to the categories listed below. These are intended to give an idea of the importance of the site and the level of response likely to be required; descriptions of the sites and specific recommendations for further assessment or mitigatory measures, as appropriate, are given in the relevant sections of this report.

The criteria used for allocating sites to categories are based on those used by the Secretary of State when considering ancient monuments for scheduling; these are set out in Annex 3 to Planning Policy Guidance 16 (Wales): Archaeology and Planning.

3.4 Categories

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

Category A - Sites of national importance.

Scheduled Ancient Monuments, Listed Buildings and sites of schedulable or listable quality, *i.e.* those which would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both.

Sites which 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.

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 which are of minor importance or 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 whose importance 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 assessment. By the end of the assessment there should be no sites remaining in this category.

3.5 Definition of Impact

The impact has been defined as none, slight, likely, considerable or unknown as follows:

None:

There is no construction impact on this particular site. Sites identified as of particular importance are, where possible, avoided by the improvement proposals. Such sites have been identified in the tables.

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. a track or field boundary.

Likely:

In some instances the site in question would not fall within the direct line of the proposed development but could be affected by construction works and therefore may, subject to its nature be removed or damaged.

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 development.

3.6 Definition of Mitigatory Recommendations

None:

No impact so no requirement for mitigatory measures.

Detailed recording:

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

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

Basic recording:

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

Watching brief:

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

Avoidance:

Features which may be affected directly by the scheme, or during the construction of the scheme, should be avoided. Occasionally a minor change to the proposed route of the pipeline is recommended, but more usually it refers to the need for care to be

taken during construction of the pipeline to avoid accidental damage to a site. This is often best achieved by clearly marking sites prior to the start of work.

Reinstatement:

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

4 ARCHAEOLOGICAL FINDINGS AND RECOMMENDATIONS

4.1 Preliminary Topographic Assessment

The area of the proposed hydro-power scheme lies within an extensive area of past gold mining, the remains of which dominate the much of the landscape. The intake point is located approximately half way between the bridge, Pont Gilrhyd, and the waterfall at Rhaedr Mawddach. The river here cuts through a heavily wooded valley, which is steep on the eastern side, but has been terraced on the western side to improve access to a crushing mill, associated with the gold mining, lower down valley to the south-west. The mill itself lies at the confluence of the Afon Mawddach and Afon Cain and is surrounded by wooded slopes with dense bracken forming the undercover where the woodland becomes less dense.

4.2 Archaeological and Historical Background

During the medieval period, this area was part of the kingdom of Gwynedd, within the cantref of Dunoding and the commote of Ardudwy. The administrative unit of Dunoding is thought to derive from the name Dunawdd, a son of Cunedda which suggests fifth century origins (Lloyd, 1911, 238). The area covered by the survey was also within the smaller administrative unit known as a township, in this case the township of Trawsfynydd. At the end of the twelfth century Llywelyn Fawr granted the area to the Cistercian monks of Cymer Abbey:

'All the lands which are situated between the two rivers Cain and Mawddu we have given and granted to the aforesaid brethren.'

We know from this charter that the seventeen named lands were *gafaelion*, that is, they were held as bond land, and that each holding had a frontage on one or other of the two rivers which defined the area. The centre and eastern side of the region was bleak moorland and only suitable for the summer grazing of cattle.

John Evans' map of 1797 shows only Gwynfynydd farm in the vicinity, and a map showing the Mostyn family lands in Trawsfynydd shows no structure or features on the proposed pipeline route. The Tithe map from 1840 records a trackway running down from Gwynfynydd farm to Bont Gilrhyd and the area of the pipeline clear of structures and wooded.

Tithe map schedule for the parish of Trawsfynydd (1840):

No. on map	Owner	Tenant	Field name	Land-use
2175	Robert Roberts	Ditto	Gwasladgoed	wood, pasture
2176	Robert Roberts	Ditto	Caerwydd	
2177	Robert Roberts	Ditto	Pant y cafnau	wood, pasture

It was often said that Gwynfynydd was an old lead mine, but apart from some very minor trials this does not seem to be the case. Gold was discovered at Gwynfynydd in 1843, but the lodes received little attention until 1869, when Professor William Collett built a new mill. Unfortunately the expected yield of gold failed to materialise. In the 1880's William Prichard Morgan, known as the Welsh Gold King, took over operations at the mine, developing a policy of large scale underground stoping to increase yields, but no great bonanzas came to light and the yields could not have covered the costs. The mine is located up the valley, to the north, but the area at the confluence of the Afon Mawddach and Afon Cain was chosen for the stamp mill because of the availability of water for powering the mill. Power was generated primarily by a water wheel located between the mill and the stores, but the water supply was not always sufficient and additional power was generated by a steam engine. In 1888 the

water wheel was replaced by a turbine which drew its water from high up the river Cain to the west.

The mine closed in 1916 and the mill scrapped the next year. In the 1930's there was an attempt to reopen the mine and the mill was rebuilt, but burnt down in 1935 before it became fully operational.

Some exploration continued for many years, and it was reopened in the 1980's, both as a mine and as a tourist attraction. The mine finally closed in 1999.

4.3 The Existing Archaeological Record

The known archaeological remains on, or near to, the proposed pipeline route consist of industrial features and buildings associated with the gold mining. The main site being that of Gwyn-fynydd Mine itself (PRN 5517) which covers the area to the north-east of the pipeline route along the Afon Mawddach (PRN's 20903, 20910 & 20902). Two other smaller levels are located to the north-west (PRN's 20919 & 20901). Just to the south-west of the mill lies the gunpowder mills at Tyddyn Gwladys, which provided the explosive requirements of the mines.

On the slopes of Moel Gwynfynydd, to the north-west two earlier features are recorded: the house at Gwyn-fynydd (PRN 5518) and the site of a cairn (prehistoric?) (PRN 5513). Whilst to the north-east of the proposed pipeline there is a platform house (PRN 6189), probably from the medieval period and a bloomery/charcoal platform (PRN 5246), again probably from the medieval period.

Known sites on the Sites and Monuments Record

PRN 20903 - Gold mine

PRN 20910 - Gold Mine

PRN 5517 - Gold Mine - Gwyn-fynydd

PRN 20919 - Gold level, Pont Gwyn-fynydd

PRN 20901 - Gold Mine

PRN 5518 - House - Gwynfynydd

PRN 5513 - Carin - site of

PRN 20902 - Gold Mine

PRN 6189 - Platform House, Bedd y Coedwr

PRN 5246 - Bloomery/charcoal platform, Bedd y coedwr

4.4 The Archaeological Survey

This includes the pipeline route and its immediate borders, within c. 50m on each side. All features of human activity are recorded except those deriving only from current land-use. Features are numbered in sequence from the southern, the downhill end of the route upwards. The location of all the features is shown on the accompanying map.

1 Store SH 7356 2746

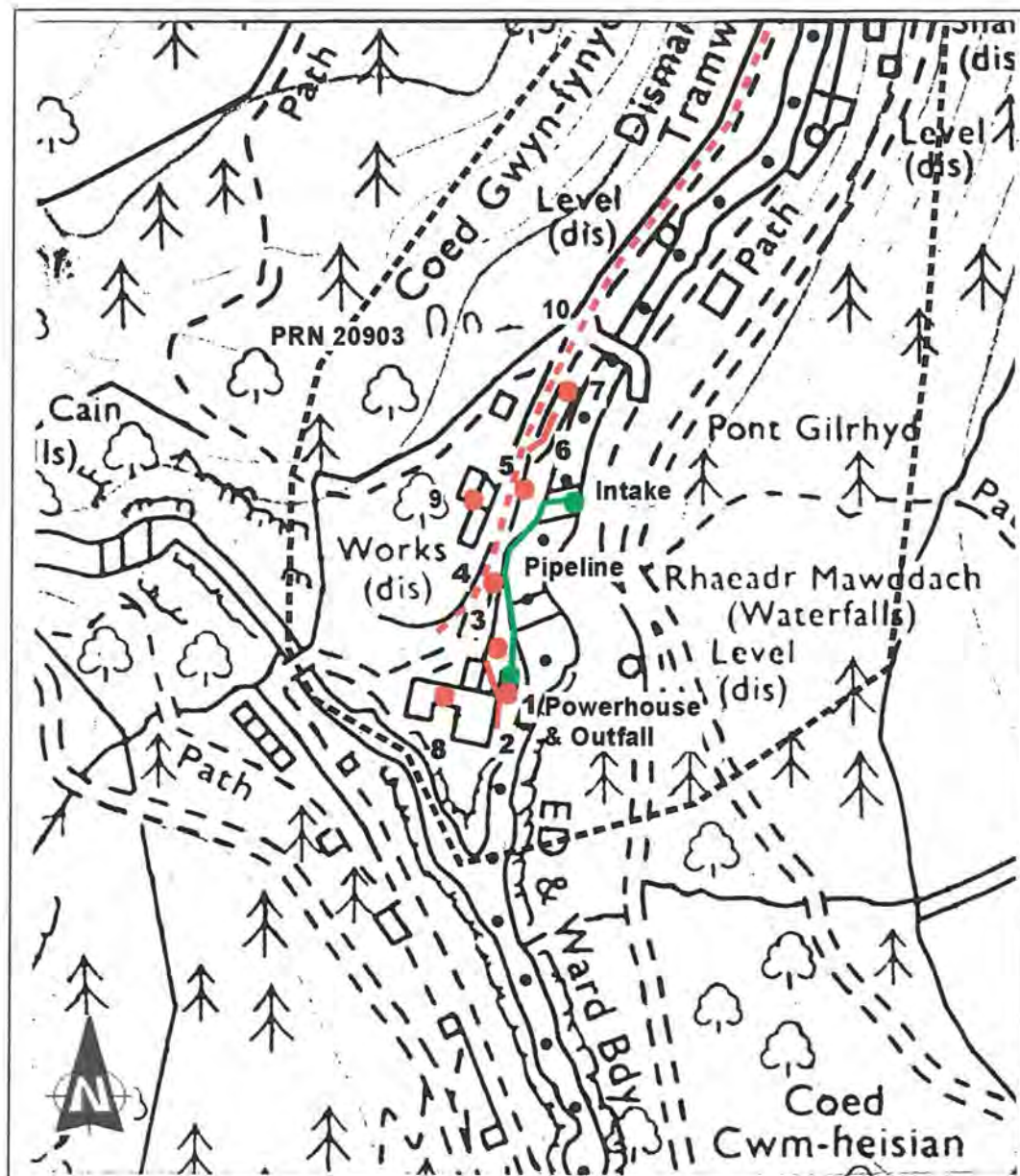
PRN 62226

Category B Impact: Considerable

The roofless remains of a stone and mortar built structure, divided into two compartments by an internal wall. There are two doorways in the southern wall and also two windows in the same wall and a third in the eastern wall. The interior of each compartment is approximately 9m by 4.5m in size but both interiors contain collapsed material from the roof and side walls and are overgrown. Each compartment has a chimney and hearth located on the western walls. The chimney in the western compartment is made of stone and brick and the one in the eastern compartment is constructed of brick.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Detailed recording and a watching brief



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Mawddach Hydro-Power Scheme

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2 **Iron water pipe** SH 7356 2745c 62227

Category B Impact: Likely

An iron water pipe, approximately 0.6m in diameter leading from near the location of the water wheel at the mill uphill to the sluice.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

3 **Walling** SH 7356 2748 62228

Category C Impact: Likely

Two short length of stone and mortar built walling, running parallel to one another, 4m apart. Probably the remains of a small structure recorded on the 2nd edition 1:2,500 OS map (1901).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Basic recording and watching brief

4 **Sluice and pool** SH 7355 2751 62229

Category B Impact: Considerable

A sluice gate leading into a rectangular, concrete and stone built pool of unknown depth and approximately 7m by 14m in size with an overflow chute on the eastern side. A leat, 2m wide, leads to the north accessing the river, it has two sluice gates, one is still in place at the start of the leat but the other has been reduced to the winding gear. The leat is approximately 35m long. It is recorded as a sluice on the 2nd edition 1:2,500 OS map (1901).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

5 **Stone walling** SH 73572754 62230

Category C Impact: Considerable

A stone and mortar built wall, 0.5m wide and 1.5m high located in overgrowth, running parallel with the river on the western bank. It has a gap in it, 1.5m wide near the northern end, a doorway? It is recorded as a structure or yard on the 2nd edition 1:2,500 OS map (1901).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

6 **Trackway** SH 7358 2758 62231

Category B Impact: Considerable

A grassed over, trackway, 4m wide, leading down from present track in a north-east/south-west direction to the location of the compressor house.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Watching brief

7 **Compressor House** SH 7359 2759 62232

Category D Impact: Considerable

A revetted platform, located directly on the river bank, no visible upright walls survive but it is probably the site of the compressor house, as shown on the 2nd edition 1:2,500 OS map (1901).

Recommendations for further assessment: None

Recommendations for mitigatory measures: Watching brief

8 **Gwyn-fynydd Mill** SH 7354 2745 62233

Category B Impact: Likely

The stone and concrete remains of the crushing mill, destroyed by fire in 1935. Recorded on the 2nd edition 1:2,500 OS map (1901) and the 2nd edition 1:10560 OS map of the same year.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

9 Offices SH 7355 2754

62234

Category B Impact: Unlikely

The stone and mortar remains of the offices associated with the mill and mines. Now hidden by dense bracken. Recorded on the 2nd edition 1:2,500 OS map (1901) and the 2nd edition 1:10560 OS map of the same year.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoidance

10 Dismantled Tramway SH 7356 2754C

62235

Category C Impact: Likely

A revetted trackway, running parallel with the river on the western side. In places the stone revetting is 3m high. This is part of the tramway system which transported material from the mine to the crushing mill. Recorded on the 2nd edition 1:2,500 OS map (1901) and the 2nd edition 1:10560 OS map of the same year. Now used as a vehicle track, there are no rails visible.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Watching Brief

5 SUMMARY OF RECOMMENDATIONS FOR MITIGATORY MEASURES

This lists the sites according to their perceived archaeological value.

Category A - National importance

Nil

Category B - Regional Importance

1	Detailed Recording & Watching Brief
6	Watching Brief
2, 4, 8 & 9	Avoidance

Category C - Local Importance

3 & 10	Brief Recording & Watching Brief
5	Avoidance

Category D/E - Minor or damaged sites

7	Watching Brief
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6 GENERAL RECOMMENDATIONS

6.1 The Construction Requirements

For the northern part of the route the pipeline could run parallel to the rocky river bank until the sluice, where it could either travel on the eastern side of the sluice down the falls of Rhaeadr Mawddach or run to the western side of the sluice along the disused tramway route and then follow the route of the old iron pipe (site 2). The location of the powerhouse would seem to involve the re-use of the store house (site 1).

6.2 Archaeological Recommendations

A total of 10 features were noted within the general area of the proposed pipeline route (c. 50m either side). All these features are directly associated with the workings of the crushing mill (site 8), whether it be transporting the mined material from the mine to the site or powering the stamps within the mill. These features, therefore, form an important part of the gold mine's history and should be preserved as a group. The sluice and the store house will be most directly effected by the proposals. The remaining features have been dismantled and are in such a ruinous state that where disturbance is likely (sites 6, 3, 10 & 7) detail recording and a watching brief will be sufficient mitigation.

6.2.1 Before construction

A There should be an archaeologist present during the marking out and fencing of the easement to advise on the exact route. This would seek to minimise the easement width at the points where it adjoins significant features.

B Archaeological advice should be sought before and during the creation of any temporary topsoil dumping areas.

6.2.2 During construction

A There should be a watching brief to allow close monitoring of works near to features specified in order to avoid damage but there is no requirement for a general watching brief along the majority of the route.

6.2.3 After construction

A Reinstatement of ground levels should be monitored.

B There should be allowance for production of a proper level of archiving and production of a report and drawings with a summary for publication, if the resulting information is suitable.

7 Bibliography

7.1 Unpublished Sources

Gwynedd Sites and Monuments Record, Bangor
Gwynedd Archives, Caernarfon
Gwynedd Archives, Dolgellau
University of Wales, Bangor, Archives

7.2 Maps

Ordnance Survey maps:

1:10,000	1978 SH 72NW
1:10560	2 nd Edition 1901 Merionethshire Sheet XXVII NW
1:2500	2 nd Edition 1901 Merionethshire Sheet XXVII.7
1 inch	1 st Edition c. 1838

Other maps

John Evans' Map 1797
Trawsfynydd Tithe Map 1840
Mostyn Estate Map 8624
Map of Mostyn Lands c. 1806 - 8634

7.3 Published Sources

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7.4 Aerial Photographs

No coverage available for this area.

8 NON-TECHNICAL SUMMARY

An archaeological assessment was carried out of the route of the proposed pipeline. This work involved a desktop study of existing records followed by a field walkover. The desktop study included examination of records which make up Gwynedd Sites and Monuments Record held at Gwynedd Archaeological Trust and searches of other records and maps held in archives at Dolgellau and Caernarfon as well as early OS maps and printed literature. The fieldwork involved walking all of the c. 100m of the route with observation of an area c. 50m on either side and brief recording and assessment of every feature except those which were clearly recent.

A total of 10 features were noted within the corridor of the route or immediately near it. All the features are related to the crushing mill located at the confluence of the Afon Mawddach and Afon Cain. A disused tramway, now used as a vehicle track, brought the mined material from the mine to the north to the crushing mill; which was powered by energy taken from the Afon Mawddach by the water pipeline and controlled by the sluice gate.

The proposed pipeline follows the river edge, but could be diverted to the west along the trackway to avoid the sluice and use the existing pipeline route to be conveyed to the powerhouse. The proposed location of the powerhouse corresponds to the location of the store house. If this structure is to be used, detailed recording and sympathetic reconstruction would be recommended.



Figure 1: The 'storehouse' (site 1), with the Rhaeadr Mawddach (waterfall) in the background.



Figure 2: The chimney located in the 'storehouse' (site 1).



Figure 3: The sluice gate and leat (site 4).

Figure 4: Location of the water wheel at the mill (site 8).



Appendix 1 – Maps Consulted

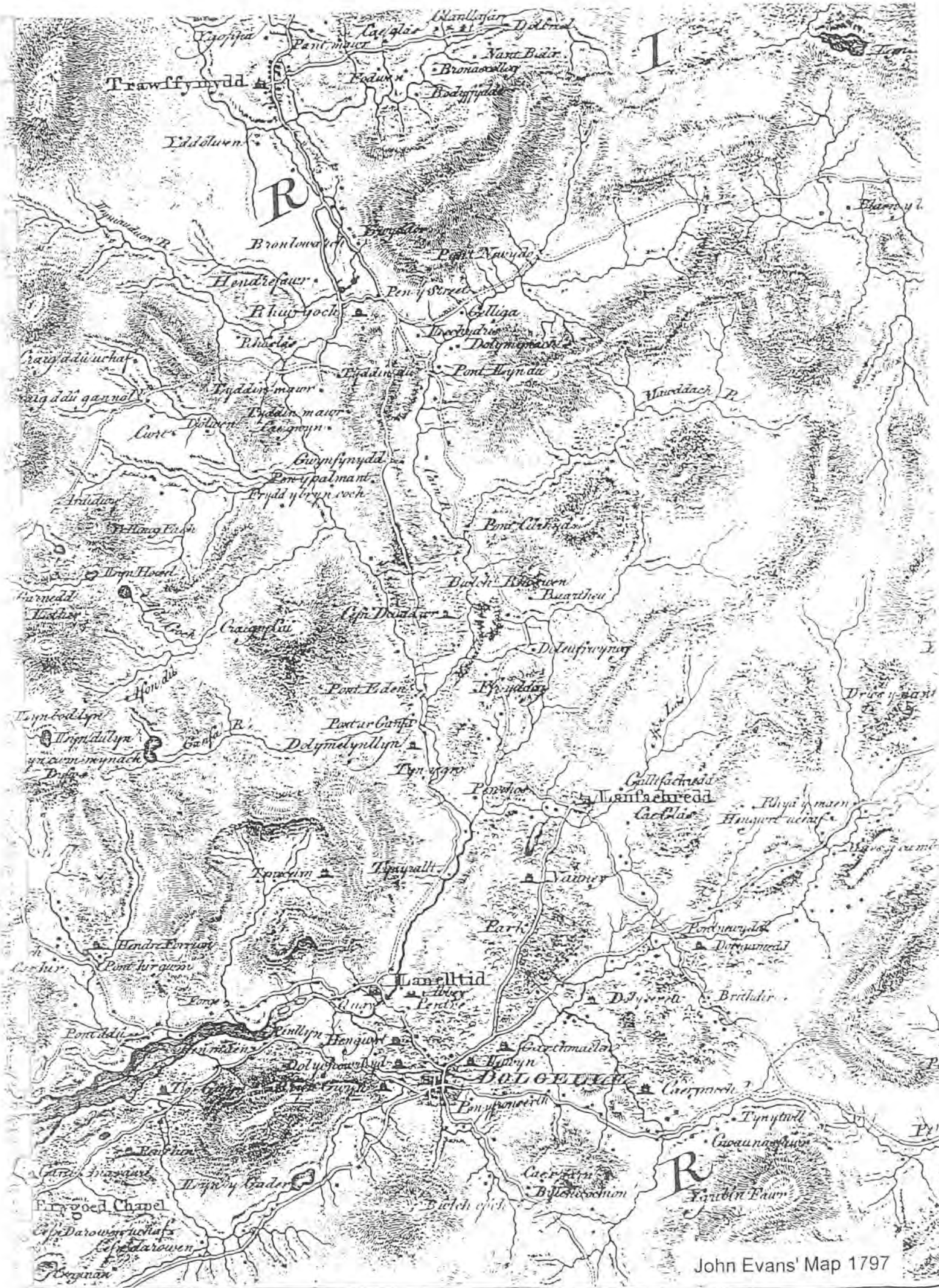
of one inch to a statute mile

restored to its place including the scale of one inch to a statute mile

1838

1838





John Evans' Map 1797

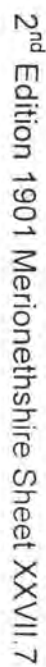


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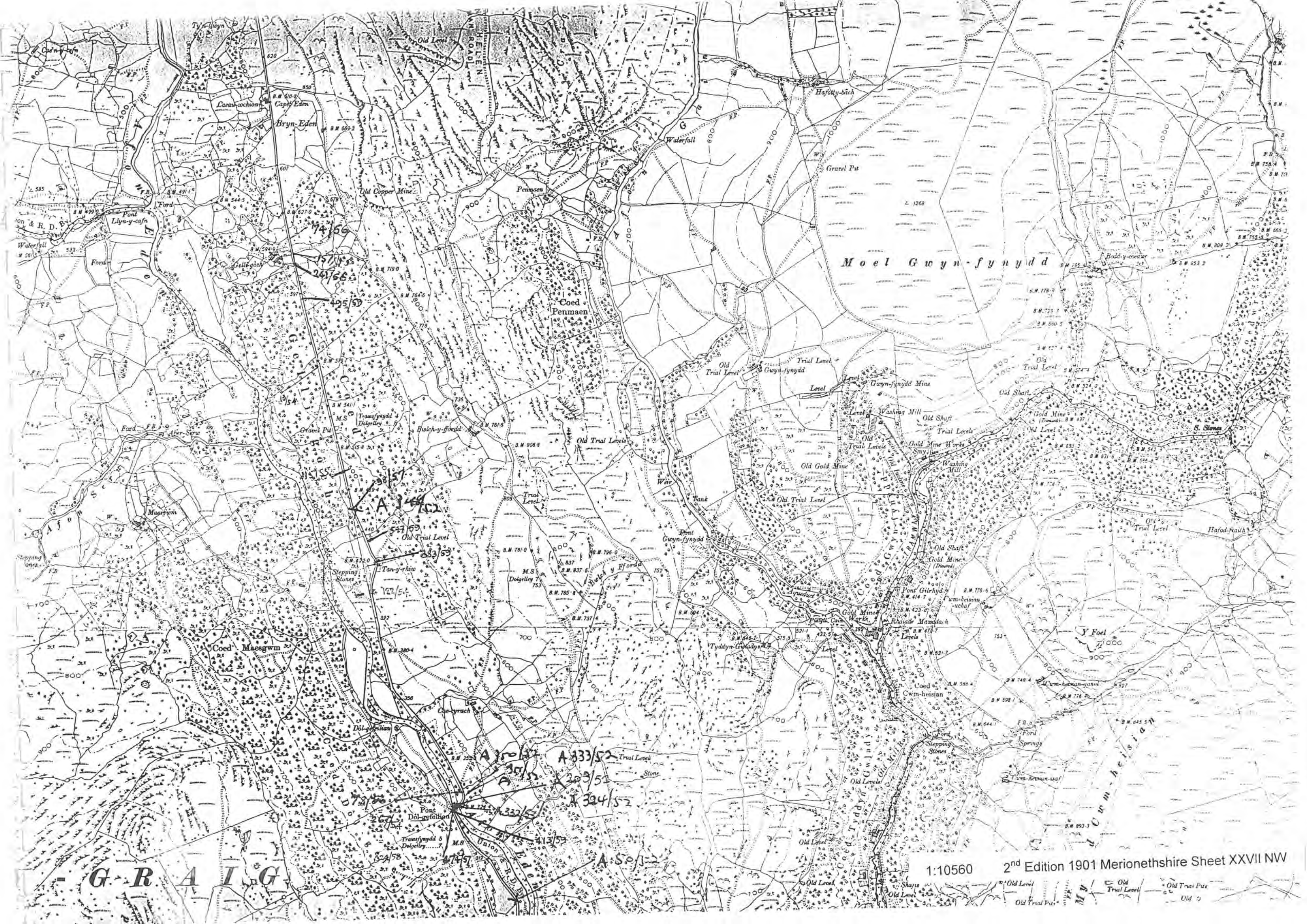
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27

DOLGELLAU RURAL No. 2 ED
Moel Hafodowen



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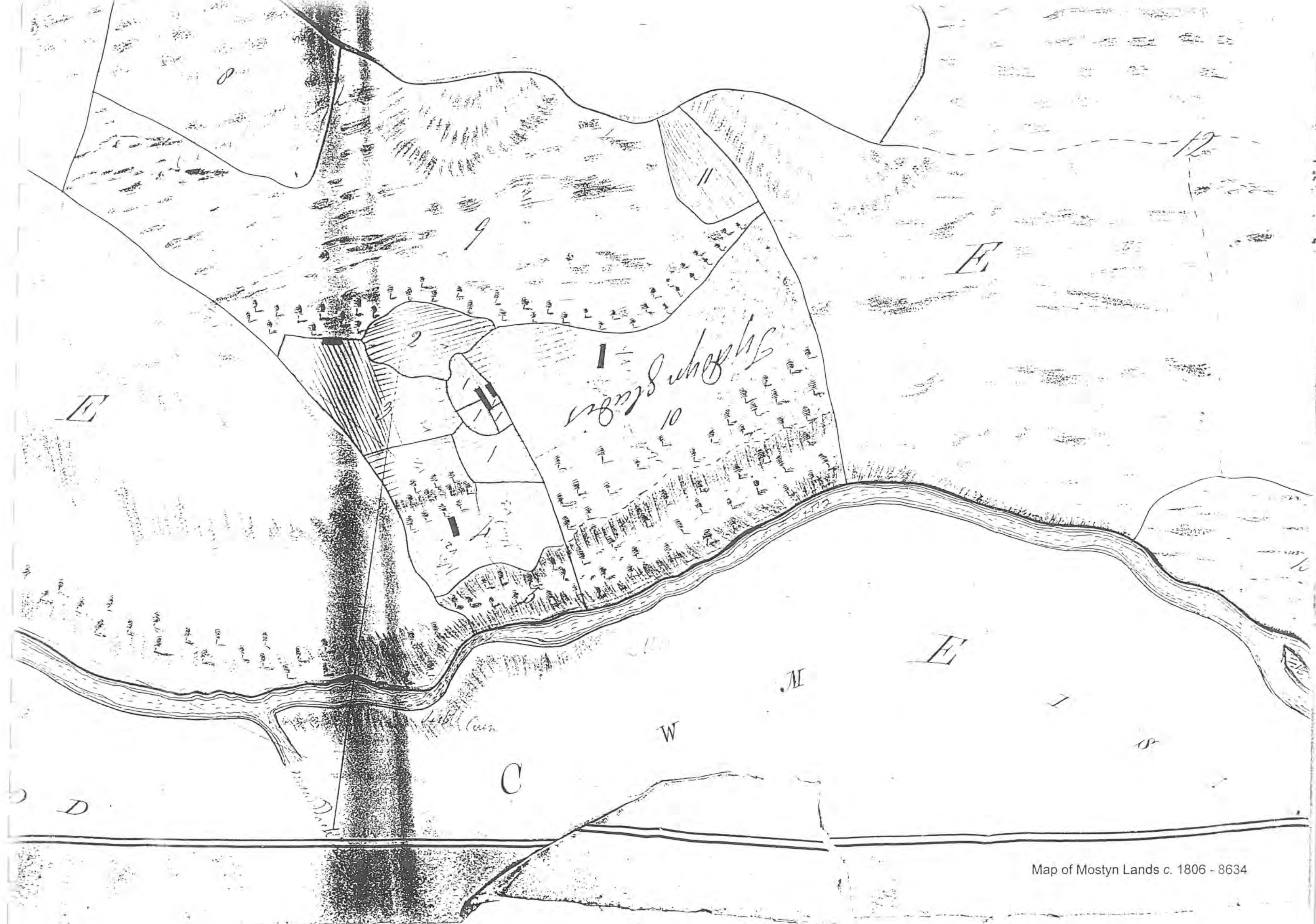


G. R. A. I. G.

1:10560

2nd Edition 1901 Merionethshire Sheet XXVII NW

Old Level
Old Trial Level
Old Trial Pass
Old Trial



Map of Mostyn Lands c. 1806 - 8634



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