

Ogwen Hydro-Power Scheme

Archaeological Assessment



Prepared for Shawater Ltd.

by

Ymddiriedolaeth Archaeolegol Gwynedd

Gwynedd Archaeological Trust

Report No. 346

OGWEN HYDRO-POWER SCHEME

ARCHAEOLOGICAL ASSESSMENT (G1570)

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CONTENTS

| | |
|----------|---|
| 1 | INTRODUCTION |
| 2 | ASSESSMENT BRIEF |
| 3 | METHODS AND TECHNIQUES |
| 3.1 | <i>Desk-top Study</i> |
| 3.2 | <i>Field Search</i> |
| 3.3 | <i>Report</i> |
| 3.4 | <i>Categories</i> |
| 3.5 | <i>Definition of Impact</i> |
| 3.6 | <i>Definition of Mitigatory Recommendations</i> |
| 4 | ARCHAEOLOGICAL FINDINGS AND RECOMMENDATIONS |
| 4.1 | <i>Preliminary Topographic Assessment</i> |
| 4.2 | <i>Archaeological and Historical Background</i> |
| 4.3 | <i>The Existing Archaeological Record</i> |
| 4.4 | <i>The Archaeological Survey</i> |
| 5 | SUMMARY OF RECOMMENDATIONS FOR MITIGATORY MEASURES |
| 6 | GENERAL RECOMMENDATIONS |
| 6.1 | <i>The Construction Requirements</i> |
| 6.2 | <i>Archaeological Recommendations</i> |
| 7 | BIBLIOGRAPHY |
| 7.1 | <i>Unpublished Sources</i> |
| 7.2 | <i>Maps</i> |
| 7.3 | <i>Published Sources</i> |
| 7.4 | <i>Aerial Photographs</i> |
| 8 | NON-TECHNICAL SUMMARY |

Appendix I - Maps Consulted

OGWEN HYDRO-POWER SCHEME

ARCHAEOLOGICAL ASSESSMENT

1 INTRODUCTION

The proposed hydro-power scheme will extract water from the Afon Ogwen at SH 6270 6534 and convey the water via a buried pipeline to a proposed powerhouse and outfall at SH 6253 6570. 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, Caernarfon and the University of Wales Archives, Bangor.

3.2 Field Search

This was undertaken on the 22nd of September 1999, when the whole of the proposed route of the pipeline was walked. Conditions were good for fieldwork but dense vegetation in the wooded areas inhibited the identification of archaeological features.

Sites identified were marked on copies of 1:10,000 OS maps as accurate as possible without 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 placed in this category, with specific recommendations for further assessment.

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 geology of the proposed pipeline route consists of Cambrian rocks of shales, sandstones, quartzite and in particular slate. The route follows the course of the Afon Ogwen from the wide river in the south near the weir, into a deep ravine at Ogwen Bank, before the valley becomes shallower and wider as it approaches Pont Twr. The western bank of the Afon Ogwen is heavily wooded along most of the proposed pipeline route, and steep to near vertical in gradient. A quarry track follows the river until Mount Pleasant where it joins the quarry access road.

4.2 Archaeological and Historical Background

The proposed route follows the Afon Ogwen which forms part of the boundary between the parishes of Llandegai and Llanllechid, on the one hand, and Bethesda on the other. Bethesda parish, formed in the nineteenth century, was previously part of Llanllechid parish. The area contains notable monuments which include a prehistoric hillfort and Cochwillan, a fifteenth century hall-house. The area is also noted for Prehistoric/Roman-British hut settlements, although, modern field clearance has resulted in the reduction of many of these sites, and often little now survives above ground.

During the medieval period the area fell within the native Welsh administrative units of Arllechwedd (*cantref*) and Arllechwedd Uchaf (*commote*) and after the Conquest the county of Carnarvonshire. Just north of the proposed pipeline lies Ty'n Twr. Today the place name relates to a cruck framed house and the very disturbed ruins of a rectangular structure. Documentary evidence suggests that there was a tower present in the area around the thirteenth century; a site which may have been visited Edward I, who is known to have passed through the area. However, much of the site has been masked by nineteenth century garden features, but a small excavation there in 1994 revealed valuable evidence of medieval occupation.

The most dominant feature of the landscape in the area is the slate quarry of Penrhyn. Though the history of Penrhyn slate is known to date back to at least the fifteenth century, when Guto'r Glyn wrote a *cywydd* to Dean Kyffin of Bangor asking for a shipload of slates, systematic exploitation only dates from 1785 when the Liverpool merchant Richard Pennant, first Lord Penrhyn, united the Penrhyn and Cochwillan estates and reinvested the wealth accumulated on his slave plantation in Jamaica in a quarry on the slopes of Y Fronllwyd in a field known as Cae Braich y Cafn. His reserves of capital made possible the development of stepped workings on the hillside and other improvements, primarily a six-mile-long iron railway to the coast in 1800-01 and a water-driven slab mill along its course at Coed y Parc, which opened its doors in 1802.

The quarry soon developed into not only the largest slate quarry in the world, but into one of the largest man-made excavations anywhere. By the mid-nineteenth century workings also included a large stepped pit, from which raw blocks were raised by hydraulic lifts, and which emptied into the Afon Ogwen by means of a tunnel over a mile long.

A number of early maps of this area have been examined, which show the development of the slate quarry. On the earliest (Penrhyn Estate UCNW 2205) dated c. 1768, the area near Pont Twr is called *Ddol Isaf* (= lower meadow), the bridge itself is not recorded, but two paths converge on the location of the present bridge. On of these appears to follow the existing public footpath, south towards the present day location of the Quarry Hospital. The area,

south of Pont Twr on the western side of the Ogwen, is called Bryn Llwyd (= grey mountain) and has not yet been engulfed by slate waste.

4.3 The Existing Archaeological Record

The Gwynedd Sites and Monuments Record identifies a number of known archaeological sites along or near the proposed route of the pipeline and powerhouse.

The majority of these known sites are associated with the quarry, which economically and socially dominated this area. Most of these sites relate directly to the running of the quarry i.e. the railway and incline; the engine house, the waste tips and leats, whilst others such as the Tyn Twr School (PRN 5704) and the Penrhyn Quarry Hospital (PRN 5703) relate to the community which worked the quarry. The school is a two storey building with a small outbuilding at the rear, which was founded in 1830 and maintained by the quarry workers. The Hospital (now ruined) was built in 1842 and is one of a small number of hospitals constructed for quarrymen in North Wales and constitutes an important part of the history of the quarry.

At the southern end of the proposed route lies a weir (PRN 5694), with a series of stepped catch-ponds. At present its origin is unclear, but it is recorded on the 1914 OS map (1:2500).

Known sites on the Sites and Monuments Record

PRN 3664 - Motte, Ty'n Twr
PRN 5249 - Cruck Framed House, Ty'n Twr, Bethesda
PRN 5704 - Tyn Twr School
PRN 5702? - Quarry Railway and Incline, Penrhyn
PRN 5703 - Penrhyn Quarry Hospital
PRN 1709 - Tollbooth, Tyn Twr
PRN 5699 - Buildings, Bryn Llwyd
PRN 5698 - Engine House, Penrhyn Quarry
PRN 5697 - Wall, Ogwen Bank
PRN 5695 - Waste Tip Revetting & Slate Plinths, Penrhyn
PRN 5696 - Tank, Penrhyn Quarry
PRN 5694 - Weir, Pont Ogwen
PRN 4449 - Ogwen Bank Gardens

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 end of the route. The location of all the features is shown on the accompanying map.

1 Leat SH 6262 6540

Category C Impact: Likely

A rock cut leat, c.27m long and 1m wide, and built up at the western end with stone walls. It runs from the Afon Ogwen slightly inland forming a loop and then back into the river.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Basic recording

2 Stone plinths (PRN 5695) SH 6270 6533

Category C Impact: Considerable

A series of slate block built plinths, located along the river bank. Each measuring c. 1.5m * 2.0m * 1.5m, the plinths are spaced between 2m and 3m apart. They are most likely an industrial feature constructed for the support of a leat or aqueduct system.

Recommendations for further assessment: None
Recommendations for mitigatory measures: Basic Recording

3 Weir (PRN 5694) SH 6270 6536

Category B Impact: Likely

A weir with a series of stepped catch-ponds is located to the south of Pont Ogwen. The weir itself is marked on the 1914, 1:2500 OS map but its origin is presently unclear. On the south-western banks of the river there is a sluice gate made of slate slabs which is connected to the remains of an iron girder which supports a leat which runs to the north-west and site 4.

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

4 Leat and sluice gate SH 6267 6536

Category B Impact: Likely

A rock cut leat joins the iron girder supported leat from site 3 and runs along the river bank in a north-west direction into a tank (site 5). This is believed to be a water course for a underground pressure engine.

Recommendations for further assessment: None
Recommendations for mitigatory measures: Detailed recording and watching brief

5 Tank (PRN 5695) SH 6262 6537

Category C Impact: Likely

A brick built structure 10m long, 2m wide and 0.75m high. A flat roof of large slate slabs retains two cast-iron inspection covers in situ. Within the structure are pipes and tap fittings and it was noted that a brick-built dividing wall separates the structure in two.

The southern end of the feature is partially filled with debris, the northern end is flooded.

Recommendations for further assessment: None
Recommendations for mitigatory measures: Basic recording and watching brief

6 Slate revetted platform SH 6260 6539

Category D Impact: Likely

A platform with slate revetting on the north-eastern side, 1.3m high and 6m by 6m in size, located just off the modern trackway.

Recommendations for further assessment: None
Recommendations for mitigatory measures: Basic recording and watching brief

7 Slate walling SH 6258 6540

Category D Impact: Likely

A short length of slate built walling, 2 m high and 3m in length, emerging from a slate tip.

Recommendations for further assessment: None
Recommendations for mitigatory measures: Basic recording

8 Compressor House (PRN 5698) SH 6247 6555

Category B Impact: None

A large stone built building with collapsing roof, surrounded by high tip material on the west and northern sides. The structure houses a vertical two-cylinder 1500 cubic foot capacity compressor which survives in good condition and includes an identification plate which reads *Fullerton, Hogart and Barclay Ltd. Engineers, Paisley 1918*. This was operated by a pelton wheel still in situ built by Gilbert Gilkes of Kendal in 1929. A large pipeline (0.4m in diameter) enters the structures from dense undergrowth to the south-east. The good preservation of the machinery within the structure is of interest and justifies detailed recording and conservation if threatened. However, it is very unlikely that work on the proposed pipeline would effect the building or its contents.

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

9 Buildings, Bryn-Llwyd (PRN 5699) SH 6240 6560

Category C Impact: None

A small complex of buildings, the date and origins of which are not clear at present but they may represent farm buildings. It consists of a one storey, stone structure, now internally gutted and in a unstable condition with associated outbuildings. The immediate area has been much disturbed by recent quarrying activity *i.e.* vehicle tracks.

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

10 Enclosure SH6245 6563

Category D Impact: Considerable

A stone built enclosure, triangular in size located between the modern road and densely wooded river bank. It is c. 18m by 7m (at its widest point).

Recommendations for further assessment: None
Recommendations for mitigatory measures: Basic recording and watching brief

11 Small Quarries? SH 6246 6566

Category D Impact: Considerable

A couple of small stone quarries, located on the steeply falling ground of the western river bank, a possible trackway leads down from the road to them.

Recommendations for further assessment: None
Recommendations for mitigatory measures: Basic recording

12 Mount Pleasant

Category C Impact: Unlikely

The remains of dry-stone and some mortared walls, hidden in an area of overgrown woodland at the western side of the main quarry access road. The site is recorded on the 1889 1:2500 OS map as a complex of buildings within an enclosed area.

Recommendations for further assessment: None
Recommendations for mitigatory measures: Basic recording

13 Penrhyn Quarry Hospital Buildings (PRN 5703) SH 6246 6581

Category B Impact: None

The ruined remains of Penrhyn Hospital survive in woodland 100m west of the present main quarry access road. The main two storey building, built in 1842, survives in a ruinous state. The roof has been stripped and the supporting timbers have collapsed. The interior is partially filled by rubble and internal features are apparent. Smaller, associated buildings nearby are in a similar ruinous condition. The hospital, one of only three examples constructed in North Wales for quarry workers, constitutes an important aspect of the history of the Penrhyn Quarry and that of the North Wales slate industry as a whole.

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

5 SUMMARY OF RECOMMENDATIONS FOR MITIGATORY MEASURES

This lists the sits according to their perceived archaeological value.

Category A - National Importance

Nil

Category B - Regional Importance

| | |
|-----------|-------------------------------------|
| 13 | None |
| 8, 3 & 13 | Avoidance |
| 4 | Detailed recording & watching brief |

Category C - Local Importance

| | |
|-----------|----------------------------------|
| 1, 2 & 12 | Basic recording |
| 9 | None |
| 5 | Basic recording & watching brief |

Category D/E - Minor or damaged sites

| | |
|-----------|----------------------------------|
| 7,10 & 11 | Basic recording |
| 6 | Basic recording & watching brief |

6 GENERAL RECOMMENDATIONS

6.1 *The Construction Requirements*

The proposed pipeline route runs along the western edge of the Afon Ogwen, at the southern end, near the intake, this route will effect a number of river edge features associated with slate quarrying activities. Most notably the leats and sluice gates near Pont Ogwen. Where possible these features should be avoided, but if disturbance is envisaged detailed recording and a watching brief would be necessary. Similarly the slate plinths should be avoided where possible, but if disturbance is unavoidable they should be reinstated.

Further to the north a small enclosure and two small stone quarries will require basic recording prior to any disturbance, however, the larger structures: the Compressor house (site 8); Bryn-Llwyd (site 9); Mount Pleasant (site 12) and Penrhyn Quarry Hospital (site 13) do not lie within the construction corridor and will not be disturbed.

6.2 *Archaeological Recommendations*

A total of 13 features were noted within the general area of the proposed pipeline route (c. 50m either side). Most of the sites recorded can be avoided by suitable fencing of the easement and care during the construction and reinstatement. The most notable features likely to be directly effected by the pipeline construction are the leats and sluice gates near the weir and the intake point, these form part of a water control system, probably for generating power. Work in this area will require detailed recording and a watching brief. At the northern end of the route basic recording and a watching brief will be required for work near the small quarries (site 11) and the dry-stone built enclosure (site 10). The following recommendations are also made:

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
University of Wales, Bangor, Archives
Countryside Council for Wales

7.2 ***Maps***

Ordnance Survey maps:

| | |
|----------|-----------------------------------|
| 1:10,000 | 1978 SH66 NW |
| 1:10560 | 1888 Carnarvonshire Sheet XII. SW |
| 1:2500 | 1889 Carnarvonshire Sheet XXII.10 |
| 1 inch | 1 st edition c. 1838 |

Other Maps:

Llandegai Parish Tithe *circa* 1840's
Penrhyn Estate (UNNW 2215) Llandegai Parish, *circa* 1844 (1inch = 4 chains)

7.3 ***Published Sources***

GAT Report., 1991. *A5 Bethesda By-Pass, Gwynedd - Archaeological Assessment* Report No. 59

GAT Report., 1994. *Ty'n Twr, Bethesda - Archaeological Excavation* Report No. 96

GAT Report., 1995. *Penrhyn Slate Quarries - Archaeological Assessment* Report No. 176

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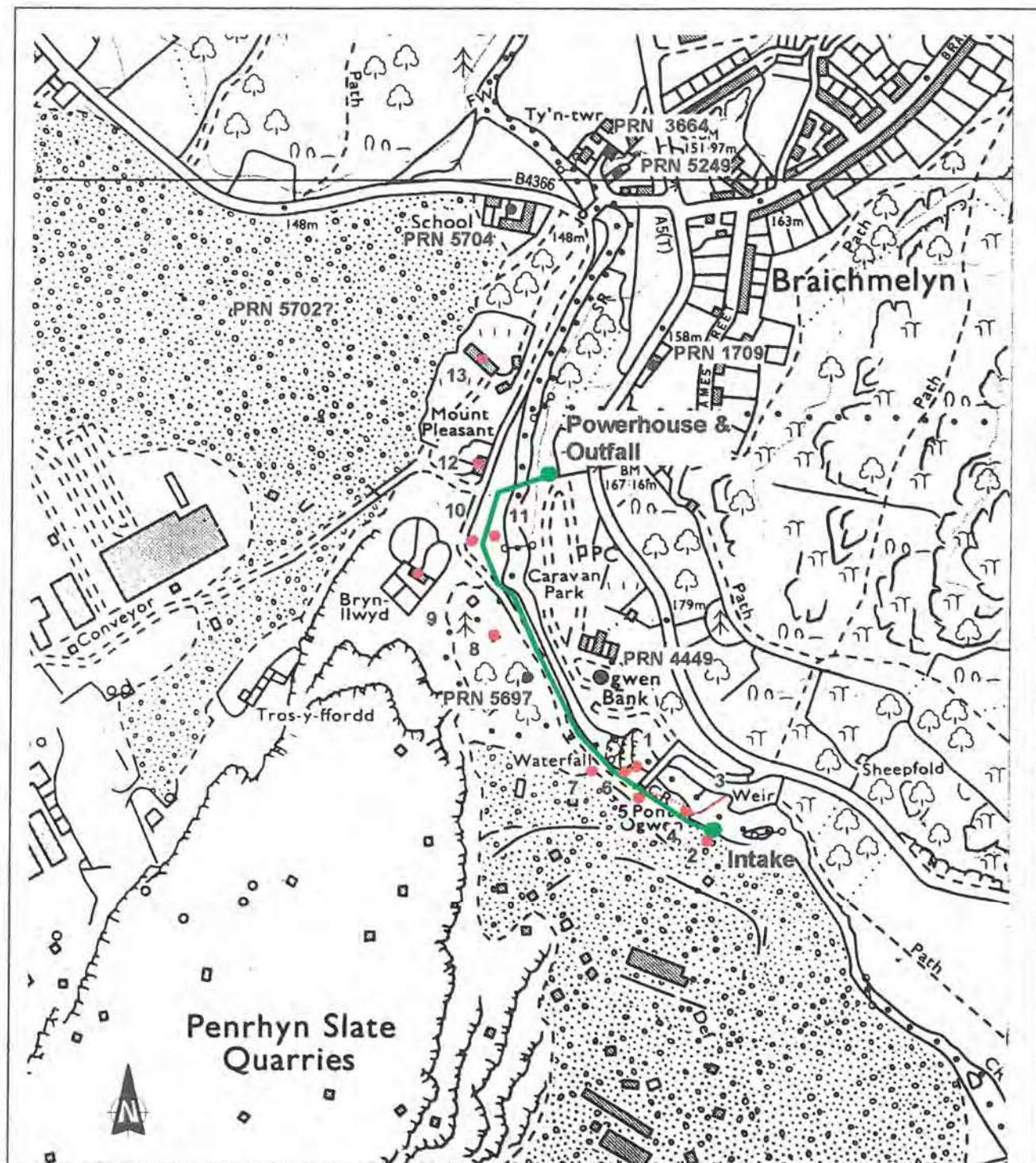
Morgan Rees, D., 1975. *The Industrial Archaeology of Wales*

Richards, A.J., 1991. *A Gazetteer of the North Wales Slate Industry*

7.4 Aerial Photographs
(from CCW)

Colour verticals, 1993 (1:10,000):

Line 12 - 10793, Print 079



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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 Caernarfon (Gwynedd Archives) and Bangor (UCNW Archives) as well as early OS maps and printed literature. The fieldwork involved walking all of the c. 0.45km 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 13 archaeological features were identified within the corridor of the route or immediately near it. The most interesting group of features were located south of Pont Ogwen and consisted of a large, stepped weir; leats and sluice gates leading to a structure containing water tanks. Further to the north a large pipeline leads into the Compressor House, but this along with the remains at Mount Pleasant and the ruins of Penrhyn Quarry Hospital lie outside the main corridor.

The proposed pipeline route runs below the road and quarry track and may damage the leats and sluice gates near Pont Ogwen, it is recommended that these are avoided wherever possible and are recorded in detail and monitored during construction of the pipeline.



Figure 1: Site 4, sluice gate on the weir (site 3 in background) and an iron support for leat (foreground).



Figure 2: Site 9, main building at Bryn-Llwyd

Appendix 1 – Maps Consulted

TENRHYN SLATE QUARRY.



Llandegai Parish Tithe circa 1840's

Slate Quarry

Lae Newydd.

Slate
Quarry

95 D
Bryn y Byrdd

94 B
Caer Drws

113 B
Caer Woiau

112
Gweirglodd
Uchaf

100
Park

113
Gweirglodd
Isaf

94 C

100

97 C

98 C
Gardd
Bryn
Wys

94 D

Buarth
Hir

100
K

116
Llyn Meyrick

97 D 1/2
98 E 1/2
Gurli

94 F
Coed.

111
Bryn Llwyd.

100
Ddol
Uchaf

4 N

AFON OGWEN

99
Ddol
Isaf

110A
Ddol
Isaf

Bryn



Penrhyn Estate (UNNW 2215) Llandegai Parish, circa 1800



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