



aeon archaeology

**Cwm Hesgen Hydro Scheme,
Abergeriw, Dolgellau, LL23 7TE.
May 2016
V 1.0**



Archaeological Assessment
Project Code: A0085.1
Report no. 0090



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Archaeological Assessment

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Project Code: A0085.1

Date: 31/05/2016

Client: North Wales Hydro Power Ltd

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1.0 NON-TECHNICAL SUMMARY

Aeon Archaeology was commissioned by North Wales Hydro Ltd to carry out an archaeological assessment and field visit of a proposed 34kw hydro-electric scheme with turbine house, buried penstock (pipeline), and electrical cable connection. The proposed scheme intake is to be located on the southern bank of the Afon Cwmhesgen, a tributary of the Afon Mawddach and approximately 7.8km northeast of the village of Ganllwyd, Gwynedd and within the Snowdonia National Park Authority (SNPA).

The archaeological assessment identified nine archaeological sites within the 50.0m wide assessment corridor centred on the pipe route, all of which were post-medieval in date. The proposed scheme will directly impact upon four archaeological features, a trackway (feature 2), a field boundary bank and ditch (feature 7), a field boundary ditch (feature 8) and a trackway (feature 9). All of these features are considered to be of *local* importance. The photographs and descriptions provided within this report are considered commensurate with a basic archaeological record level and as such no further recommendations are made for assessment or mitigatory measures for these features.

The assessment has highlighted the increased potential for the location of preserved palaeo-environmental remains within the suspected underlying peat deposits at the northern part of the site. As such it has been recommended that the penstock trench be relocated into the trackway or if this is not possible then an archaeological watching brief will need to be maintained at this location.

Furthermore, there is an unknown potential for preserved buried remains to be encountered once the penstock trench leaves the trackway in the southern part of the scheme. As such recommendations have been made to move the penstock further north to run within the trackway or if this is not possible then an archaeological watching brief will need to be maintained at this location.

2.0 INTRODUCTION, AIMS AND PROJECT DESIGN

Aeon Archaeology was commissioned by North Wales Hydro Ltd to carry out an archaeological assessment and field visit of a proposed 34kw hydro-electric scheme with turbine house, buried penstock (pipeline), and electrical cable connection. The proposed scheme intake is to be located on the southern bank of the Afon Cwmhesgen, a tributary of the Afon Mawddach and approximately 7.8km northeast of the village of Ganllwyd, Gwynedd and within the Snowdonia National Park Authority (SNPA) (figure 1).

The proposed scheme will consist of an intake weir located at **NGR SH 79703 30096** and a c.1.3km long buried penstock running southwest to a new turbine house located at **NGR SH 78523 29410** and which will be installed on the northern bank of the Afon Mawddach. In addition a buried new power cable will run northeast from the turbine house for approximately 196.0m and within the penstock trench, to an existing transformer at the property of Cwm Hesgen. The existing trackway will be used to transport materials to site (intake) and construction access between Cwm Hesgen and the turbine house will be along the penstock route, where a 3.5m wide easement will be required.

The assessment has been carried out as a condition of full planning permission (**ref: NP5/78/500**). A mitigation brief was prepared for this scheme by the SNPA Archaeologist in February 2016 which requested an archaeological assessment to be undertaken, the results of which would inform the requirement, if any, for a further archaeological mitigatory response.

Condition 10

Prior to any work commencing (including any ground disturbance works or site clearance) pursuant to this permission the applicant/developer shall submit to and receive written approval from the Local Planning Authority for an archaeological specification for a programme of works which must meet all relevant archaeological standards. The development shall subsequently be carried out in strict accordance with the approved programme of works unless otherwise agreed to in writing by the Local Planning Authority.

Condition 11

The development hereby approved shall be carried out in strict accordance with the archaeological specification for a programme of works as approved in condition 10 above unless otherwise agreed to in writing by the Local Planning Authority.

Reason

To ensure no matters of archaeological interest are adversely affected as a result of this development and are satisfactorily recorded.

This archaeological assessment is for the proposed development area, which includes the water intake point, the penstock route, the turbine house, the water outflow, the power cable route, and a 50.0m wide assessment corridor centred on the proposed pipeline route.

As part of the archaeological assessment a 1.0km search area centred on the proposed route was utilised for a search of the Gwynedd Historic Environment Record (HER). This provided a background historical narrative of the area and included source material from the Gwynedd Archives and Record Office, Dolgellau. Information on Scheduled Ancient Monuments and Listed Buildings was obtained from Cadw.

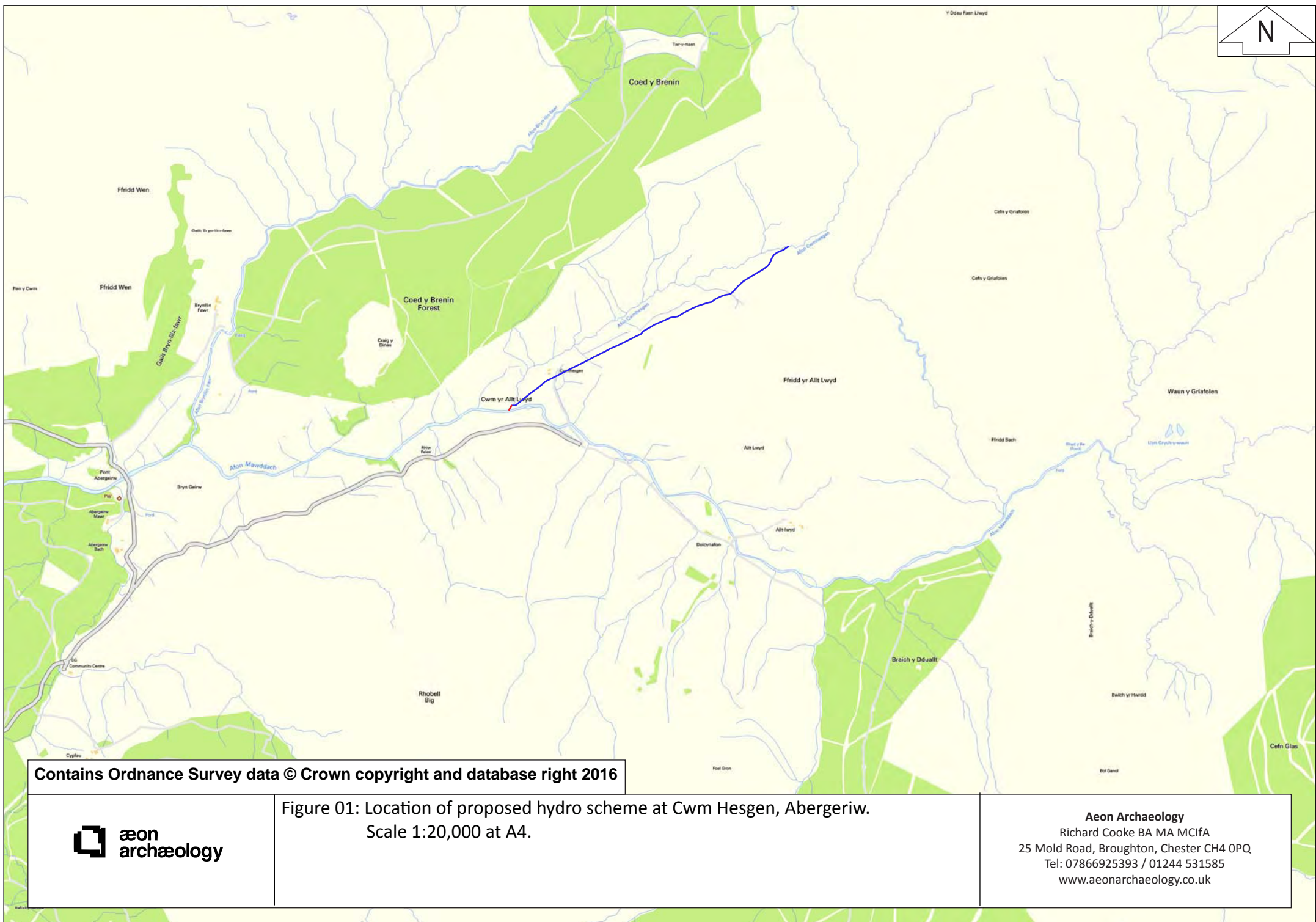
The following report conforms to the guidelines specified in *Standard and Guidance for Archaeological Desk-based Assessment* (Chartered Institute for Archaeologists, 2014).

The archaeological assessment considered the following:

- (i) The history of the site;
- (ii) The significance of any remains in their context both regionally and nationally;
- (iii) The potential impact of the proposed development on known sites of archaeological importance including their setting.

The archaeological assessment was undertaken in four stages:

- (i) Archival research
- (ii) Field visit/site walkover of all accessible areas
- (iii) Written report
- (iv) Project archive



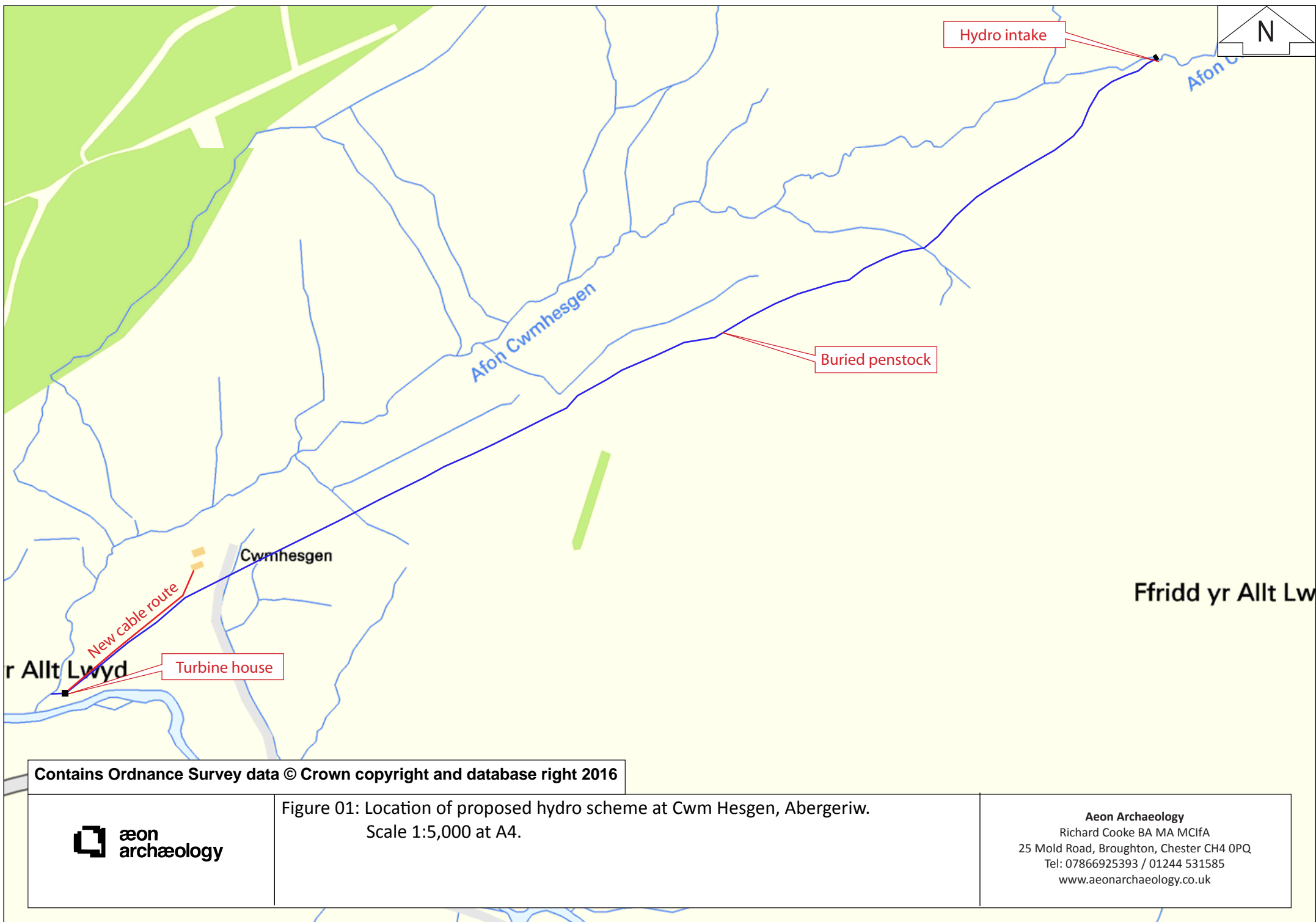




Plate 01: Proposed hydro intake, from the northwest.



Plate 02: Proposed turbine house and outfall location, from the northeast. Scale 1.0m.

3.0 METHODS AND TECHNIQUES

3.1 Archival research

The archaeological assessment involved the study of the following records:

- The regional Historic Environment Record (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, LL57 2RT) was examined for information concerning the study area. This included an examination of the core HER, and secondary information held within the record which included unpublished reports, the 1:2500 County Series Ordnance Survey maps, and the National Archaeological Record index cards and aerial photography.
- The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth, SY23 1NJ) was checked for sites additional to the HER.
- Information about Listed Buildings and Scheduled Ancient Monuments from Cadw were examined in the regional HER. The Register of Outstanding and Special Historic Landscapes and the Register of Parks and Gardens was checked, and also the location of World Heritage Sites.
- Secondary sources were examined, including the Inventories of the Royal Commission on Ancient and Historical Monuments for Wales, and works held within the regional libraries.
- Results from previous archaeological work within the area was also reviewed.

3.2 Site walkover

The site walkover was carried out on 26th May 2015 by Richard Cooke BA MA MCIfA, archaeological contractor and consultant at Aeon Archaeology. The weather conditions were ideal for the field search being both bright and clear. All archaeological sites and view points were photographed using a digital SLR (Canon 600D) set to maximum resolution.

3.3 Assessment report

All features identified from the archival research and site walkover were assessed and allocated to categories of international, national, regional/county, local and none/unknown importance as listed in section 6.0. These are intended to place the archaeological feature within a geographical context of importance and thus help inform the most suitable level of mitigatory response. The criteria used for allocating features to categories of importance are based on existing statutory designations and, for non-designated assets, the Secretary of State's non-statutory criteria for Scheduling Ancient Monuments; these are set out in Planning Policy Wales, National Planning Policy Framework (NPPF), Welsh Office Circular 60/96, and the Heritage Bill (Wales) 2015.

3.4 Project archive

A full archive including plans, photographs and written material was prepared. All plans, photographs and written descriptions were labelled and cross-referenced using Aeon Archaeology pro-formas. A draft copy of the report was sent to the client and upon written approval from them paper and digital copies of the report will be sent to the regional HER

(x1) (Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, LL57 2RT), the Snowdonia National Park Authority (SNPA) Archaeologist (x3), and the Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) (x1). Copies of all notes, plans, and photographs from the assessment are stored at Aeon Archaeology under the project code **A0085.1** with the originals being lodged in a suitable repository to be agreed with the archaeological curator.

Any artefacts arising from future phases of fieldwork will be lodged with the Gwynedd Museum and Art Gallery, Bangor, Gwynedd.

4.0 ARCHAEOLOGICAL AND TOPOGRAPHICAL BACKGROUND

4.1 Topographic Description

The proposed hydro-electric scheme intake is located on the southern bank of the Afon Cwmhesgen, a tributary of the Afon Mawddach and approximately 7.8km northeast of the village of Ganllwyd, Gwynedd and within the Snowdonia National Park Authority.

The proposed scheme will consist of an intake weir located at NGR SH 79703 30096 and a c.1.3km long buried penstock running southwest to a new turbine house located at NGR SH 78523 29410 and which will be installed on the northern bank of the Afon Mawddach. In addition a buried new power cable will run northeast from the turbine house for approximately 196.0m and within the penstock trench, to an existing transformer at the property of Cwm Hesgen. The existing trackway will be used to transport materials to site (intake) and construction access between Cwm Hesgen and the turbine house will be along the penstock route.

The site lies within the parish of Trawsfynydd Community, within the historic county of Meirionnydd and unitary authority of Gwynedd. Mostly given over to rough pasture, the farmland is dominated by acid grassland within which there are cushions of gorse. The site is unenclosed mountain slope in the north, the lower (southern) portion includes enclosed and improved grazing land within four land parcels. The land is primarily given over to hill sheep farming, although some cattle farming also takes place within the localised landscape, generally on the lower slopes.

The assessment area slopes from approximately 408m OD at the proposed hydro intake with the proposed turbine house lying at approximately 278m OD.

The bedrock geology is of the Dolgellau Formation, a mudstone and siltstone sedimentary bedrock that formed approximately 488 to 502 million years ago in the Cambrian Period within an environment previously dominated by open seas with pelagite deposits (British Geological Survey).

4.2 Statutory and non-statutory designations

4.2.1 Non-designated monument points from the Gwynedd Historic Environment Record (figure 3)

The Gwynedd Historic Environment Record (HER) maintains a register of non-designated archaeological sites represented as single point data or as polygons. These are identified through their Primary Reference Number (PRN). These include sites which are of archaeological/historical interest, artefact find spots, documentary evidence, and locations of past events such as archaeological projects.

There are 3 non-designated monuments within 1.0km of the proposed pipeline route (see appendix I) but none lie within the 50.0m assessment zone centred on the pipe or within 100.0m.

4.2.2 Scheduled Ancient Monuments

Scheduled monuments are those considered to be monuments of national importance. The Ancient Monuments and Archaeological Areas Act 1979 supports a formal system of Scheduled Monument Consent (SMC) for any work to a designated monument. Any works within a Scheduled area will require SMC; this includes non-invasive techniques such as geophysics or field-walking.

There are no Scheduled Ancient Monuments within 1.0km of the proposed pipeline route.

4.2.3 National Monuments Record (figure 4)

The Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) maintains the National Monuments Record (NMR) for Wales. This is a register of non-designated archaeological sites represented as single point data or as polygons. These are identified through their National Primary Reference Number (NPRN) and include sites which are of archaeological/historical interest, artefact find spots, documentary evidence, and locations of past events such as archaeological projects that are not statutorily protected.

There are 29 non-designated monument points within 1.0km of the pipeline route (see appendix I) and the following lie within the 50.0m wide assessment corridor centred on the pipe:

- (i) Approximately 21.0m northwest of the post-medieval *Afon Cwmhesgen, sheep fold II* (NPRN: 523885).

No other non-designated monument points lie within 100.0m of the pipeline route.

4.2.4 Listed Buildings (figure 5)

The Secretary of State for Culture, Media and Sport holds a List of Buildings of Special Architectural or Historic Interest, considered to be of national importance. Compiled under the Planning (Listed Buildings and Conservation Areas) Act 1990, the List includes structures from boundary walls and telephone boxes to cathedrals. Listing gives statutory protection and restrictions apply. Consent may be required for works to, or that affect the setting of, a Listed Building and the Local Planning Authority conservation officer should be consulted if in doubt.

There is 1 Listed Building within 1.0km of the pipeline route (see appendix I) but none lie within the 50.0m wide assessment corridor centred on the pipe or within 500.0m.

4.2.5 Historic Landscape Character Areas (HLCAs)

Cadw, National Resource Wales (formerly the Countryside Council for Wales), and the International Council of Monuments and Sites (ICOMOS UK) compiled the two volume Register of Landscapes of Historic Interest in Wales. This includes 58 landscapes of outstanding or special historic interest, which are considered to be the best examples of different types of historic landscapes in Wales. The Register provides information to decision makers and landscape managers, to help ensure that the historic character of the landscape is sustained, and that where change is contemplated, it is well-informed.

Historic Landscape Characterisation takes a closer look at the historic landscape by showing the processes that have shaped the landscape over centuries of human activity, contributing to

its present character. Detailed characterisation studies have been compiled by the four Welsh Archaeological Trusts for all 58 areas on the Register. They are used by local government and developers to help assess the impact of development proposals on the historic landscape.

The proposed development is not included within the Register of Historic Landscapes of Historic Interest in Wales.

4.2.6 Historic Parks and Gardens

Cadw holds a Register of Historic Parks and Gardens of Special Historic Interest. These Registered landscapes are graded I, II* or II, and include private gardens, public parks and other green spaces. They are valued for their design, diversity and historical importance. Inclusion on the Register brings no additional statutory controls, but there is a presumption in favour of conservation of the designated site. Local authorities are required to consult Cadw on applications affecting sites Registered as grade I or II* and the Garden History Society on sites of all grades.

There are no historic parks and gardens within the 40.0m wide assessment corridor centred on the pipe route or within 1.0km of the proposed development area.

4.2.7 Events

The location of the proposed pipeline route was included within an upland survey carried out by the Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) in 2012. The upland survey did not examine the enclosed land and was an extensive survey so is unlikely to have identified discreet features.

An archaeological assessment was undertaken by Aeon Archaeology in May 2016 of a proposed hydro scheme on land approximately 1.5km to the south but no sites relevant to this archaeological assessment were identified.

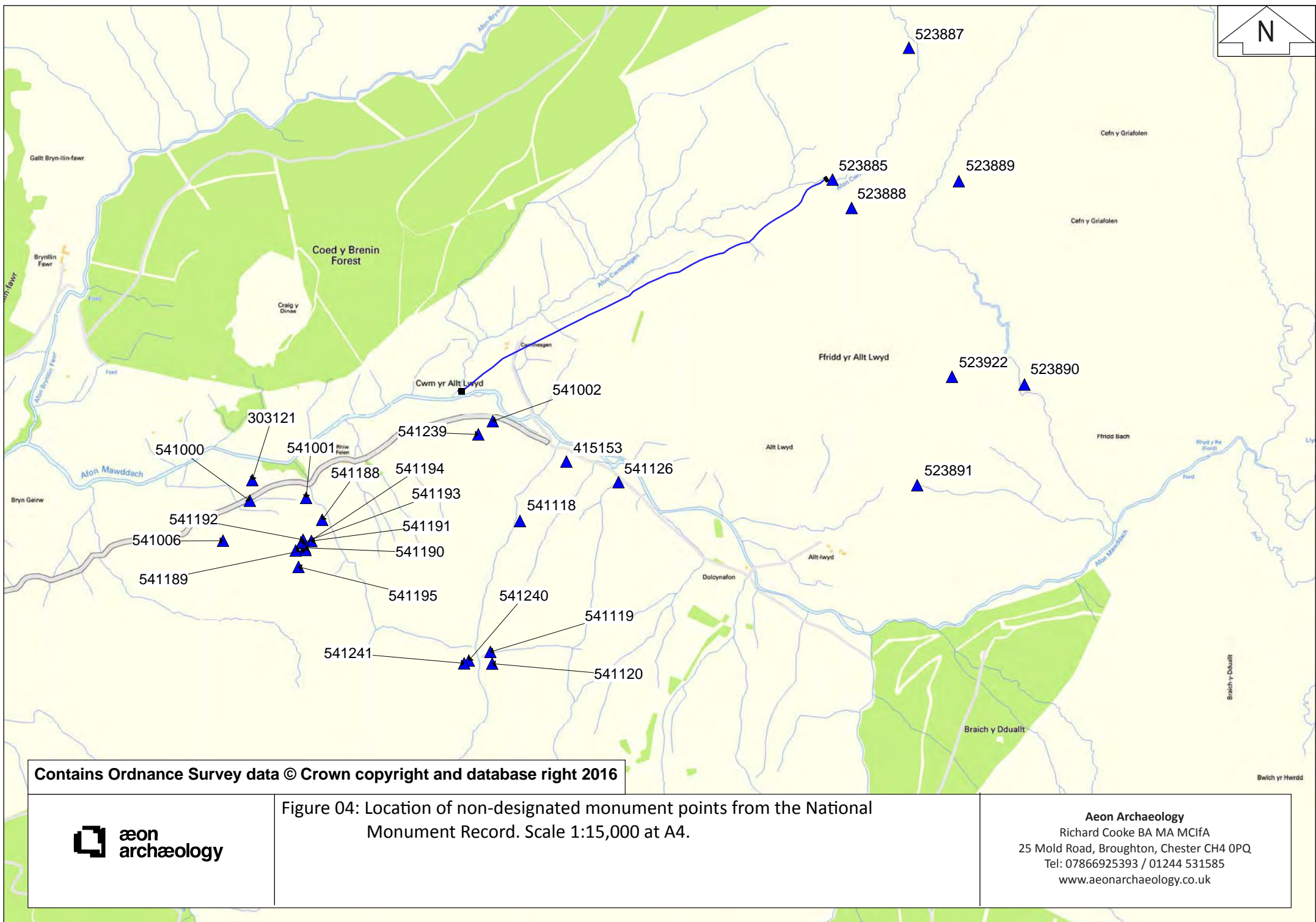


Figure 04: Location of non-designated monument points from the National Monument Record. Scale 1:15,000 at A4.

5.0 THE HISTORICAL CONTEXT

The following sections describe the known archaeological record within the general area of the proposed development. Sites are identified by their Primary Reference Number (PRN) which is the number by which they are identified in the Gwynedd Historic Environment Record (HER), or by their Scheduled Ancient Monument reference, Listed Building reference and/or their National Primary Reference Number (NPRN) if applicable. The intention of this section is to provide a historic and archaeological context to the site. This aids in establishing the relative importance of an archaeological feature within its landscape, as well as assessing the potential for unknown buried archaeological remains on the proposed development site.

The beginning and end of certain periods is a contentious issue. In the Gwynedd Historic Environment Record (HER) the following dates are used. This is a standard convention across all of the Welsh HERs.

Table 1. Historic periods

Palaeolithic (prehistoric)	500,000 BC – 10,001 BC
Mesolithic (prehistoric)	10,000 BC – 4,001 BC
Neolithic (prehistoric)	4,000 BC – 2,351 BC
Bronze Age (prehistoric)	2,350 BC – 801 BC
Iron Age (prehistoric)	800 BC – 47 AD
Romano-British	48 AD – 409 AD
Post-Roman (Early Medieval)	410 AD – 1065 AD
Medieval	1066 AD – 1539 AD
Post-Medieval	1540 AD – 1900 AD
Modern	1901 AD – 2050 AD

5.1 Prehistoric and Roman Period

The prehistoric and Roman periods are poorly represented within the localised landscape and there are no known sites within 1.0km of the proposed hydro scheme.

There is however a hut platform located within 1.0km which is of unknown date but may be of prehistoric or Roman origin. The Historic Environment Record records this site as the *Brithdir and Llanfachreth hut platform* (PRN: 5510) but on the RCAHMW National Monuments Record it is shown as the *Pont Aber-Gerrw hut platform* (NPRN: 303121). The site is located 730.0m to the southwest of the hydro outfall location and on the southern bank of the Afon Mawddach. It is recorded on the Historic Environment Record as a circular enclosure visible on aerial photographs and probably a hut platform or homestead of uncertain date.

The topography of the northern part of the scheme is relatively steep and slopes northward to the Afon Cwmhesgen, which would not have lent itself to early habitation. The lower southern part of the scheme however occupies an area of gently sloping land away from the flood basin of the river and as such may have been conducive to settlement, although no structural remains are evident at this location.

The proximity of the Afon Cwmhesgen to the north and the Afon Mawddach to the south and west would have made the surrounding landscape ideal for the location of prehistoric burnt mounds, although none are known to exist within the localised environment and for the

majority of the proposed scheme the hydro route will be located too far away from the water course for them to have been located.

Therefore the potential for preserved buried remains of the prehistoric and Roman periods is expected to be low throughout the northern part of the scheme, especially where the penstock is to be buried within the existing trackway. Once the penstock route leaves the trackway in the southern part of the scheme and the topography flattens out it is expected that there is an increased but unknown potential for preserved buried remains.

5.2 Early Medieval, Medieval and Post-Medieval Periods

The early medieval and medieval periods are poorly represented within this part of northwest Wales and there are no known sites within 1.0km of the proposed pipeline. Sites from this era are particularly rare in north Wales, although they must have existed, and it is likely that sites were reused and built upon thus accounting for the lack of surviving physical remains.

The upland survey commissioned by the RCAHMW in 2012, although extensive, identified 26 post-medieval sites within 1.0km of the hydro scheme, with an additional 1 site recorded on the regional HER. The landscape, although predominantly upland pasture, has seen a relatively large amount of improvement including the construction of field walls, banks, drainage ditches, clearance cairns, and agricultural buildings. The latter is shown as a sheepfold (NPRN: 523885) located 21.0m to the southeast of the proposed hydro intake.

The northern part of the proposed development site is relatively marshy suggesting that there are underlying peat deposits. It is probable that the land had been utilised for the extraction of peat for burning as fuel since medieval times and areas of peat cutting can be seen 125.0m to the southeast and 425.0m to the east of the hydro intake location respectively (NPRNs: 523888 and 523889). The extraction of peat leaves little trace except for rectangular depressions where the peat was cut from, as well as occasionally peat drying platforms.

The proposed route of the hydro-electric scheme is first depicted on the Trawsfynydd tithe map of 1840 (figure 6) which depicts the site much as it exists today, albeit in very little detail. The area is shown as being bordered to the north by the Afon Cwmhesgen and the assessment area occupies five enclosed fields, as it does today. The trackway leading north to Cwm Hesgen is shown but the trackway running northeast from Cwm Hesgen is not depicted, although this may have been too minor a feature to show.

No further structures or features of note are depicted on the tithe map and the proposed development area is labelled as plots 2533, 2581, 2582, 2592 and 2594. The Llanfachreth tithe apportionment lists the following information for the field plots:

Plot	Landowner	Tenant	Field Name	A/R/P
2533	Sir Robert Williams Vaughan Bart	Gwen Thomas	Cae tan y ffridd	5/2/36
2581	Sir Robert Williams Vaughan Bart	? Griffith	Ffridd Llithwrog	39/2/11
2582	Sir Robert Williams Vaughan Bart	? Griffith	Llithwrog	20/2/30
2592	Sir Robert Williams Vaughan Bart	? Griffith	Cae ly	4/2/26
2594	Sir Robert Williams Vaughan Bart	? Griffith	Cae'r ly	16/0/37

The field names listed in the apportionment relate to the geography of the landscape and its usage. Field plots 2592 and 2594 use an abbreviated version of lyn (flax) showing that this was cultivated in the lower fields by Cwm Hesgen. The use of Llith is somewhat curious and most likely refers to a seam or lode stone, usually of granite (granite stone).

The site is depicted in detail on the first, second and fourth edition 6" county series Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8, and 9). All three maps depict the area much as it exists today, with the Afon Cwmhesgen shown as bordering the site to the north and the Afon Mawddach to the south. The trackway running north to Cwm Hesgen is shown and so is the trackway running northeast from Cwm Hesgen into which the penstock route will be trenched. The sheepfold by the intake is depicted on all three maps as is all of the existing field boundaries.

5.3 LIDAR Data

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. Up to 100,000 measurements per second are made of the ground, allowing highly detailed surface and terrain models to be generated at different spatial resolutions.

As part of the archaeological assessment the LIDAR data for the proposed hydro route was checked in order to identify any archaeological features that may be hidden beneath vegetation growth or too subtle to identify during the site visit. Figure 10 shows a transcription of a series of linear features from the LIDAR data, located towards the southern part of the development area and orientated generally north-northeast to south-southwest. These features could not be clearly identified on the ground but appeared to correspond with an improved wetland area, crossed by field drainage ditches. As such it is believed that these features represent a phase of post-medieval field improvement rather than enclosure boundaries.

Two further linear features located to the west of the Cwm Hesgen and orientated northeast to southwest appear to correspond with a rutted trackway leading from the farm to the Afon Mawddach.



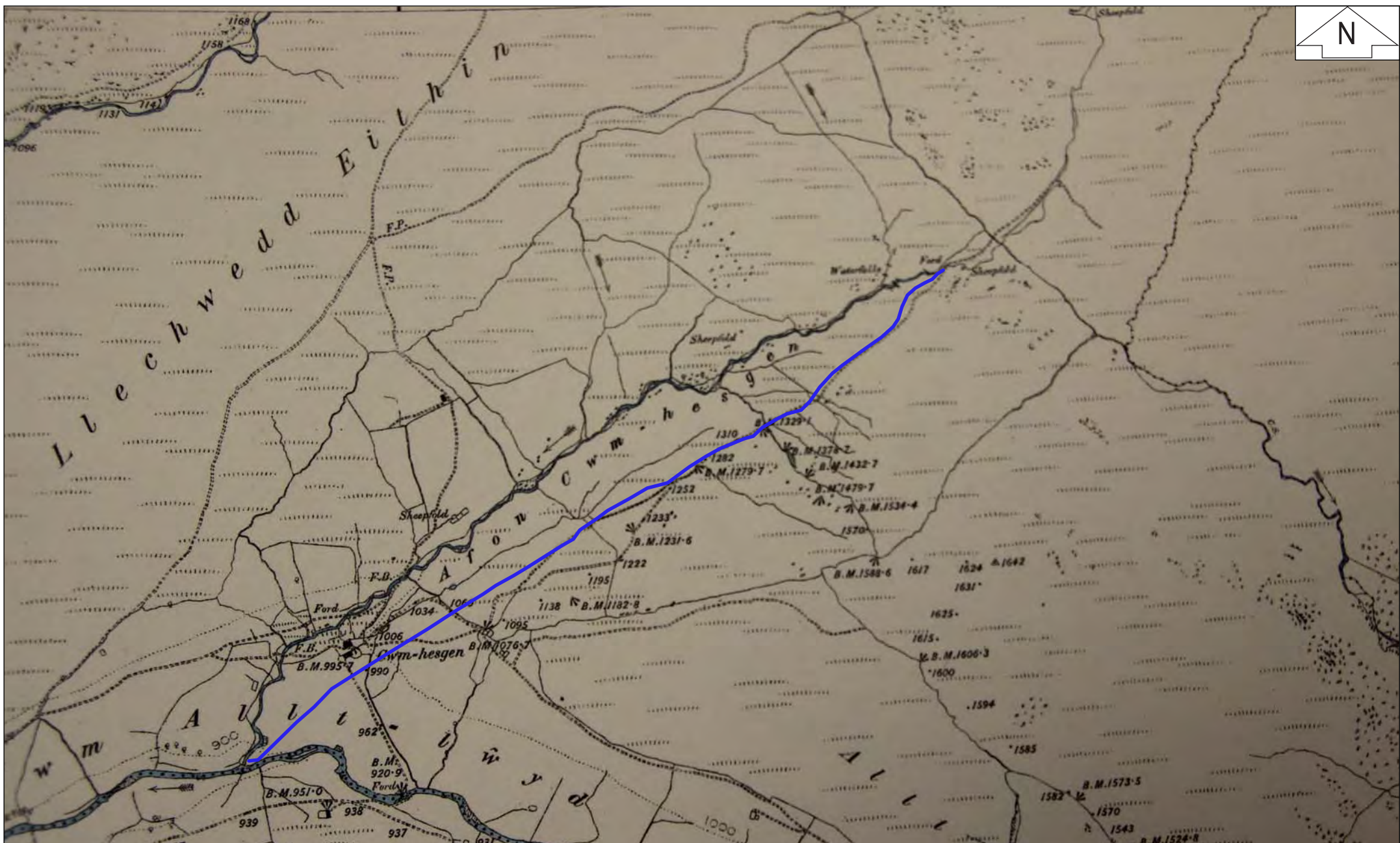


Figure 07: First edition 6 inch county series Ordnance Survey map of 1886.

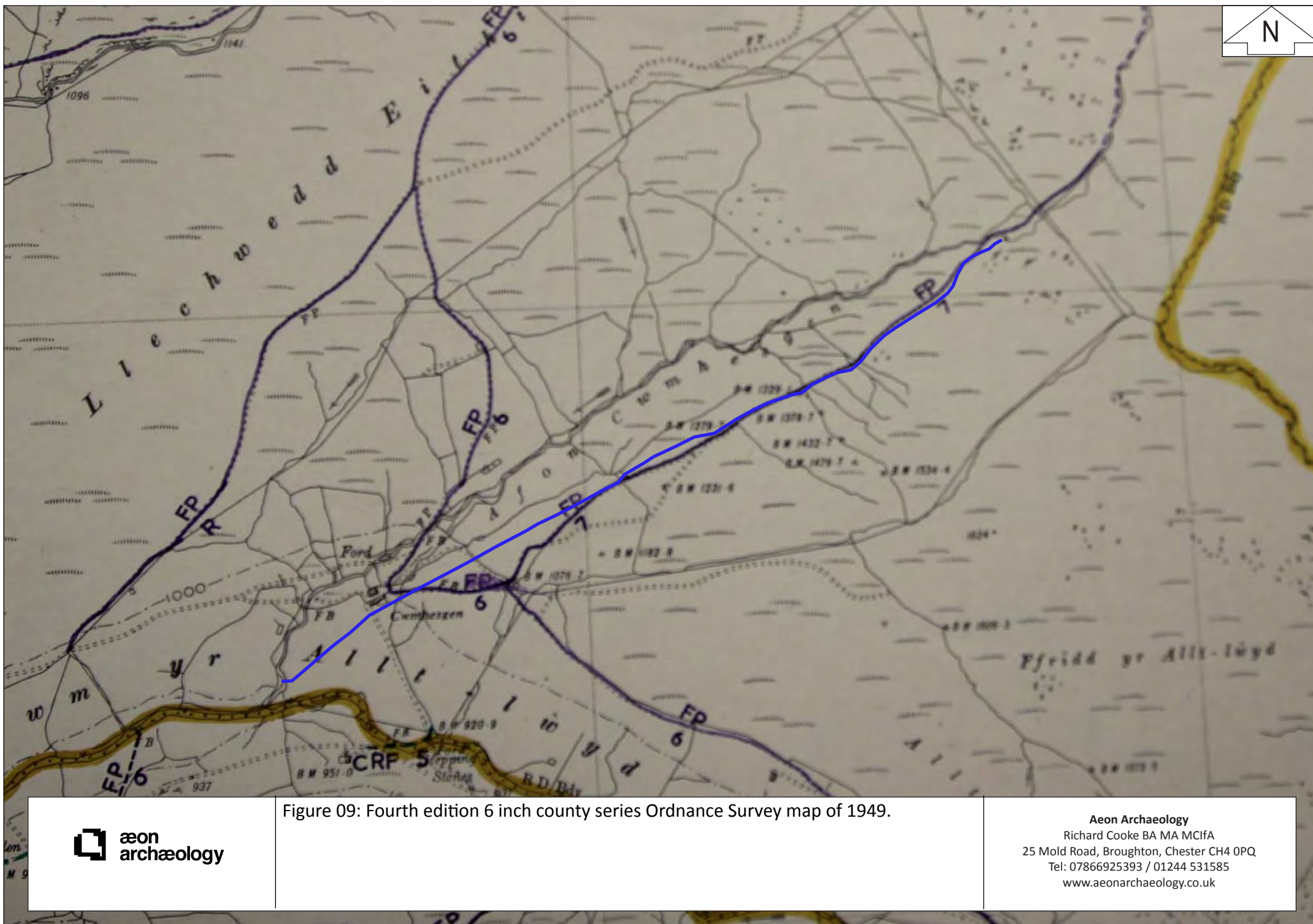


Figure 09: Fourth edition 6 inch county series Ordnance Survey map of 1949.

6.0 ASSESSMENT OF HISTORICAL ASSETS

6.1 Definitions

Definitions of importance, impact, and significance of effect as used in the gazetteer (section 6.2) are listed below. Definitions of assessment and mitigation techniques as used in the gazetteer are listed in appendix II.

1. Definition of Categories of importance

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

Significance	Description
International (Very High)	Archaeological sites or monuments of international importance, including World Heritage Sites. Structures and buildings inscribed as of universal importance as World Heritage Sites. Other buildings or structures of recognised international importance.
National (High)	Ancient monuments scheduled under the Ancient Monuments and Archaeological Areas Act 1979, or archaeological sites and remains of comparable quality, assessed with reference to the Secretary of State's non-statutory criteria. Listed Buildings. Undesignated structures of national importance.
Regional/ County (Medium)	Conservation Areas Archaeological sites and remains which, while not of national importance, score well against most of the Secretary of State's criteria.
Local (Low)	Archaeological sites that score less well against the Secretary of State's criteria. Historic buildings on a 'local list'.
Negligible/None	Areas in which investigative techniques have produced no or only minimal evidence for archaeological remains, or where previous large-scale disturbance or removal of deposits can be demonstrated.
Unknown	Archaeological sites whose importance cannot be determined with the information currently at hand. This can include sites where the extent of buried remains is unknown.

2. Definition of Impact

The direct impact of the proposed development on each site was estimated. The impact is defined as follows:

Magnitude	Direct Impacts	Indirect Impacts
High Adverse	Complete removal of an archaeological site. Complete destruction of a designated building or structure.	Radical transformation of the setting of an archaeological monument. A fundamental change in the setting of a building.
Medium Adverse	Removal of a major part of an archaeological site and loss of research potential. Extensive alteration (but not demolition) of a historic building or feature, resulting in an appreciable adverse change.	Partial transformation of the setting of an archaeological site (e.g. the introduction of significant noise or vibration levels to an archaeological monument leading to changes to amenity use, accessibility or appreciation of an archaeological site). Partial adverse transformation of the setting of a designated building.
Low Adverse	Removal of an archaeological site where a minor part of its total area is removed but the site retains a significant future research potential. Change to a historic building or feature resulting in a small change in the resource and its historical context and setting.	Minor change to the setting of an archaeological monument or historic building.
Negligible/ Neutral	No impact from changes in use, amenity or access. No change in the ability to understand and appreciate the resource and its historical context and setting.	No perceptible change in the setting of a building or feature.
Low Beneficial	Land use change resulting in improved conditions for the protection of archaeological remains or understanding/ appreciation of a historic building or place	Decrease in visual or noise intrusion on the setting of a building, archaeological site or monument. Improvement of the wider landscape setting of a building, archaeological site or monument.
Medium Beneficial	Land use change resulting in improved conditions for the protection of archaeological remains, or understanding/ appreciation of a historic building or place, including through interpretation measures (heritage trails, etc). Removal of harmful alterations to better reveal the significance of a building or structure, with no loss of significant fabric.	Significant reduction or removal of visual or noise intrusion on the setting of a building, archaeological site or monument; and Improvement of the wider landscape setting of a building, archaeological site or monument Improvement of the cultural heritage amenity, access or use of a building, archaeological site or monument.
High Beneficial	Arrest of physical damage or decay to a building or structure;	Exceptional enhancement of a building or archaeological site, its cultural heritage amenity and access or use

3. The significance of effect

The significance of effect is derived from the importance of the resource and the magnitude of the impact upon it.

Very large - A serious impact on a site of international or national importance with little or no scope for mitigation. These effects represent key factors in the decision making process.

Large - Lesser impacts on sites of national importance and serious impacts on sites of regional importance, with some scope for mitigation. These factors should be seen as being very important considerations in the decision making process.

Moderate - Moderate or minor impacts on sites of regional importance and minor to major impacts on sites of local or minor importance. A range of mitigatory measures should be available.

Slight - Negligible impacts on sites of regional, local or minor importance and minor and moderate impacts on minor or damaged sites. A range of basic mitigatory measures should be available.

Neutral - No perceptible effect or change to sites of all categories.

The significance of effect will be determined using the table below, a basic matrix combining archaeological value and magnitude of impact.

Determination of Significance of Effect

Archaeological Value	International	Neutral	Moderate or Large	Large or Very Large	Very Large
	National	Neutral	Moderate or Slight	Moderate or Large	Large or Very Large
	Regional	Neutral	Slight	Moderate	Moderate or Large
	Local	Neutral	Neutral or Slight	Slight	Moderate or Slight
	Negligible	Neutral	Neutral or Slight	Neutral or Slight	Slight
		None	Low	Medium	High
		Magnitude of impact			

7.0 SITE GAZETTEER – PHYSICAL IMPACTS

The field walkover discovered 9 sites of archaeological and historic interest within the 50.0m wide assessment corridor, as listed below.

In accordance with Paragraph 128 of the National Planning Policy Framework, Welsh Office Circular 60/96, Planning Policy Wales, and the Heritage Bill (Wales) 2015 each heritage asset has been assigned a level of importance ranked from International through to National, Regional/County, Local, and None. If it is not possible to assess the importance of the site from the visible remains, then it is ranked Unknown with the suspected importance level placed in brackets if possible. Identified sites were also assigned a level of impact ranked from High through to Medium, and Low. Levels of impact can be considered as both adverse or beneficial, and can be direct (physically impacting upon a site) or indirect (indirectly physically impacting upon a site). The significance of effect is determined from the importance level of the resource and the magnitude of the impact upon it. Where it is expected that a site will be impacted upon by the proposed works then mitigation/assessment recommendations are provided. All archaeological/historical sites identified are depicted on figure 10 and the location and orientation of photographs are shown on figure 11.

1. Sheepfold	PRN: 61642 NPRN: 523885
Figure: 10 and 11	Plate: 3
NGR: SH 79724 30095	Period: Post-medieval
<p>Description</p> <p>The remains of a probable sheepfold measuring 2.5m in length by 2.0m in width is located at this point, on the southern bank of the Afon Cwmhesgen and approximately 21.0m southeast of the proposed hydro intake. The sheepfold is constructed from dry-stone medium and large sized sub-rounded cobbles and has been cut away on its eastern edge by the alteration of the course of the river by approximately 6.0m to the south.</p> <p>The sheepfold does not appear to have utilised an earlier structure although this possibility cannot be dismissed as it is in a poor state of preservation and its original form and dimensions are unclear from the surviving evidence.</p> <p>The sheepfold is depicted on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9) where it is labelled as 'sheepfold'.</p> <p>The proposed hydro intake weir will be located approximately 21.0m away from this structure and as such it is not expected that there will be any adverse impact upon it. It is however recommended that the sheepfold be demarcated prior to the commencement of works so as to ensure that no accidental damage occurs.</p>	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Demarcated prior to commencement of groundworks.	



Plate 03: Sheepfold (feature 1), from the south. Scale 1.0m.

2. Trackway	PRN: 61643
Figure: 10 and 11	Plate: 4
NGR: SH 79720 30100 – SH 79068 29723	Period: Post-medieval
<p>Description</p> <p>A 3.0m wide metallised trackway connects Cwm Hesgen in the southwest with the upland field plots in the northeast. The trackway is well worn and rutted and the natural bedrock and natural substrata is visible along the majority of its length, with the deepest ruts filled with loose stone.</p> <p>The trackway is depicted on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9) but is not shown on the earlier tithe map of 1840 (figure 6). It is however probable that the trackway has earlier origins but was considered too ephemeral to depict on the tithe map.</p> <p>The trackway will require breaching by the proposed penstock route resulting in a low adverse direct physical impact during the construction phase and a neutral or slight significance of effect. As such it is recommended that a basic photographic and descriptive record be taken prior to impact. However, the record presented in this report should be seen as being commensurate with a basic record level and as such no further work is proposed.</p>	
Category of importance: Local	
Level of impact: Low adverse direct physical (limited to construction phase)	
Significance of effect: Neutral or Slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Reinstatement upon completion of works.	



Plate 04: Trackway (feature 2), from the northeast. Scale 1.0m.

3. Field wall	PRN: 61644
Figure: 10 and 11	Plate: 5
NGR: SH 79771 30162 – SH 79413 30011	Period: Post-medieval
<p>Description</p> <p>A dry-stone single-skin field wall measuring 0.6m in height by 0.5m in width runs from northeast to southwest on the northern bank of the Afon Cwmhesgen. The boundary is constructed from medium and large sized sub-angular cobbles.</p> <p>The boundary is depicted on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9) but is not shown on the earlier tithe map of 1840 (figure 6).</p> <p>The proposed penstock route lies approximately 10.0m to the south and on the southern bank of the river, as such there is not expected to be any impact upon this feature.</p>	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 05: Field wall (feature 3), from the south. Scale 1.0m.

4. Field wall	PRN: 61645
Figure: 10 and 11	Plate: 6
NGR: SH 79303 29927 – SH 79515 29666	Period: Post-medieval
<p>Description</p> <p>A dry-stone single-skin field wall measuring 0.5m in height by 1.0m in width runs from northwest to southeast across the assessment corridor. The boundary is constructed from medium and large sized sub-angular cobbles.</p> <p>The boundary is depicted on the tithe map of 1840 (figure 6) as well as on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9).</p> <p>The proposed penstock route lies within the existing trackway (feature 2) and therefore will pass through an existing opening in the field wall. As such there is not expected to be any impact upon the feature.</p>	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 06: Field wall (feature 4), from the north. Scale 1.0m.

5. Trackway wall	PRN: 61646
Figure: 10 and 11	Plate: 7
NGR: SH 79345 29854 – SH 79306 29840	Period: Post-medieval
<p>Description</p> <p>A rough dry-stone wall measuring 0.3m in height by 1.0m in width runs from northeast to southwest along the northern edge of the trackway (feature 2). The wall is constructed from medium and large sized sub-angular cobbles and was almost certainly constructed through the clearance of the trackway route.</p> <p>The boundary is not shown on the tithe map of 1840 (figure 6) or on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9) but was almost certainly too ephemeral to depict.</p> <p>The proposed penstock route lies within the existing trackway (feature 2) and as such will not impact upon the wall.</p>	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 07: Wall north side of trackway (feature 5), from the east. Scale 1.0m.

6. Field wall	PRN: 61647
Figure: 10 and 11	Plate: 8
NGR: SH 79035 29748 – SH 79108 29673	Period: Post-medieval
<p>Description</p> <p>A dry-stone single-skin field wall measuring 0.5m in height by 1.3m in width runs from northwest to southeast across the assessment corridor. The boundary is constructed from medium and large sized sub-angular and angular cobbles.</p> <p>The boundary is depicted on the tithe map of 1840 (figure 6) as well as on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9).</p> <p>The proposed penstock route lies within the existing trackway (feature 2) and therefore will pass through an existing opening in the field wall. As such there is not expected to be any impact upon the feature.</p>	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 08: Field wall (feature 6), from the northwest. Scale 1.0m.

7. Field bank and ditch	PRN: 61648
Figure: 10 and 11	Plate: 9
NGR: SH 78792 29647 – SH 78894 29572	Period: Post-medieval
<p>Description</p> <p>A boundary ditch measuring 2.0m in width by 1.0m in depth with an associated bank on the western side runs from northwest to southeast across the assessment corridor. The boundary is depicted on the tithe map of 1840 (figure 6) as well as on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9) and was most likely excavated in the post-medieval period to help drain the field plot.</p> <p>The field bank and ditch will require breaching by the penstock route resulting in a low adverse direct physical impact during the construction phase and a neutral to slight significance of effect. As such it is recommended that a basic photographic and descriptive record be taken prior to impact. However, the record presented in this report should be seen as being commensurate with a basic record level and as such no further work is proposed.</p>	
Category of importance: Local	
Level of impact: Low adverse direct physical (limited to construction phase)	
Significance of effect: Neutral or Slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None / basic record complete	



Plate 09: Bank and ditch field boundary (feature 7), from the northwest. Scale 1.0m.

8. Field boundary ditch	PRN: 61649
Figure: 10 and 11	Plate: 10
NGR: SH 78736 29581 – SH 78742 29516	Period: Post-medieval
<p>Description</p> <p>A shallow boundary ditch measuring 2.0m in width by 0.5m in depth runs from north to south across the assessment corridor. The boundary is depicted on the tithe map of 1840 (figure 6) as well as on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9) and was most likely excavated in the post-medieval period to help drain the field plot.</p> <p>The boundary ditch will require breaching by the penstock route resulting in a low adverse direct physical impact during the construction phase and a neutral to slight significance of effect. As such it is recommended that a basic photographic and descriptive record be taken prior to impact. However, the record presented in this report should be seen as being commensurate with a basic record level and as such no further work is proposed.</p>	
Category of importance: Local	
Level of impact: Low adverse direct physical (limited to construction phase)	
Significance of effect: Neutral or Slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None / basic record complete	



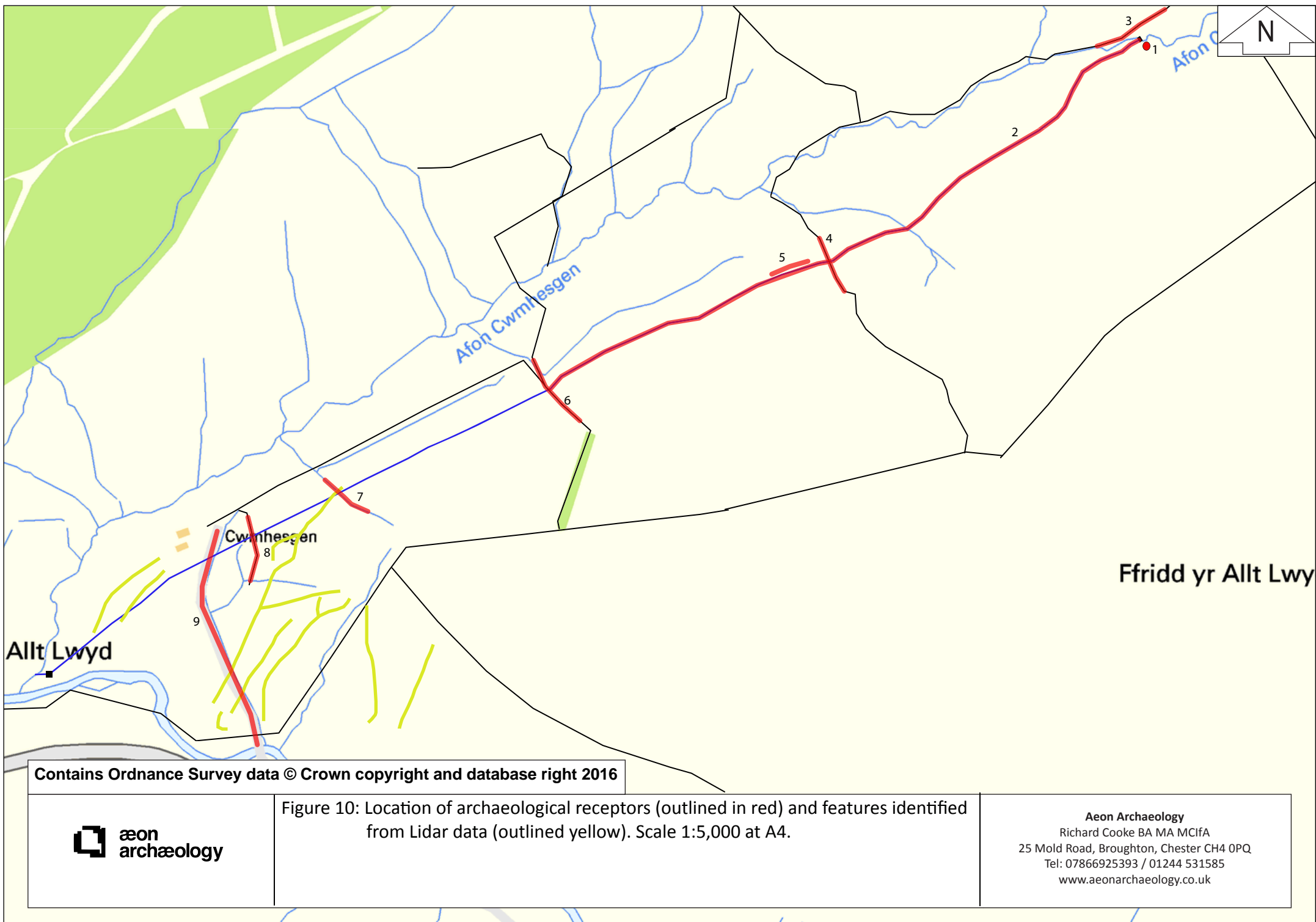
Plate 10: Field boundary ditch (feature 8), from the north. Scale 1.0m.

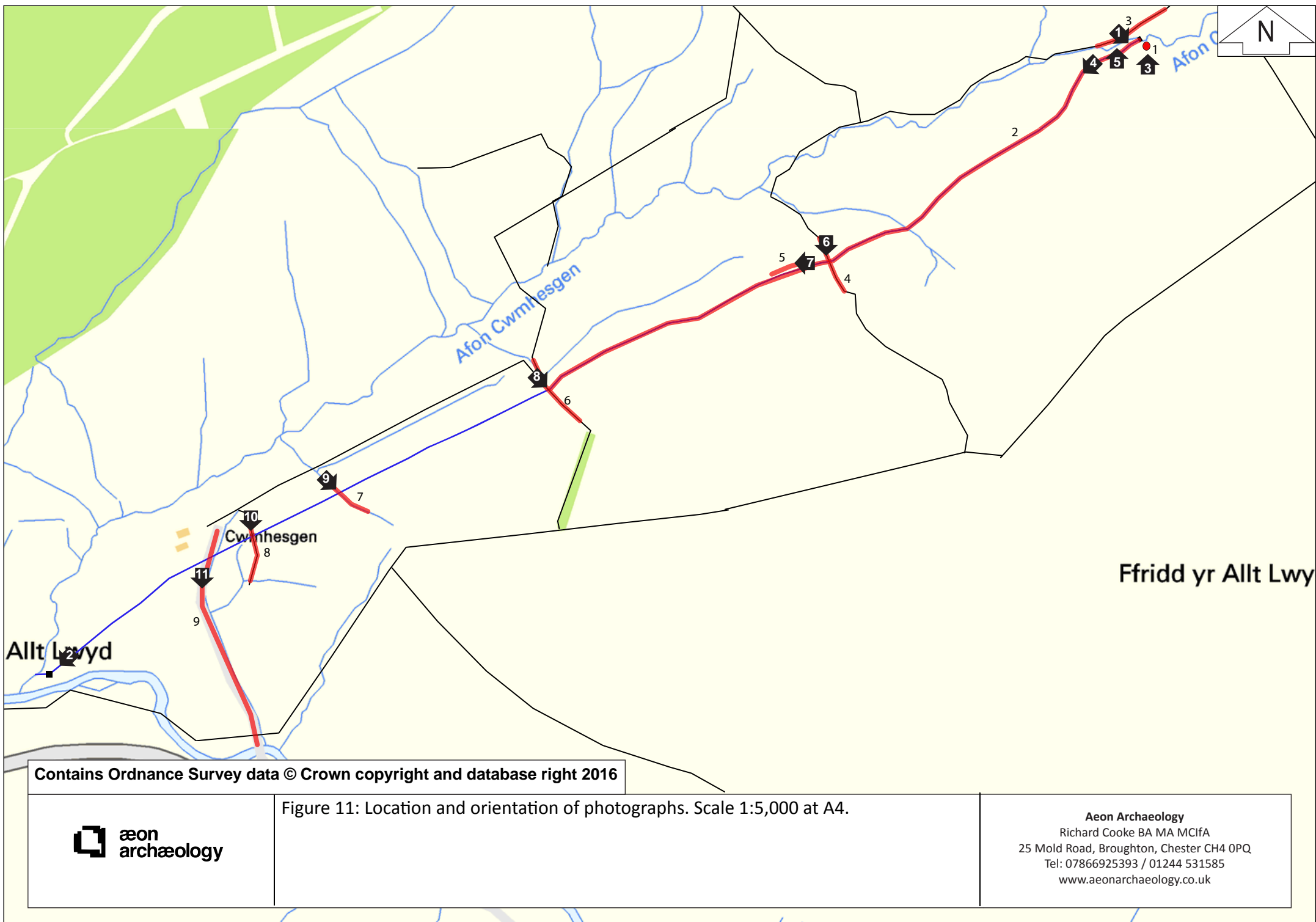
9. Trackway	PRN: 61650
Figure: 10 and 11	Plate: 11
NGR: SH 78703 29564 – SH 78807 29257	Period: Post-medieval
<p>Description A 2.0m wide metalled trackway connects Cwm Hesgen in the north with the access road in the south. The trackway is well established and has been laid with compressed hardcore.</p> <p>The trackway is depicted on the tithe map of 1840 (figure 6) as well as on the first, second and fourth edition 6" Ordnance Survey maps of 1886, 1901 and 1949 respectively (figures 7, 8 and 9).</p> <p>The trackway will require breaching by the proposed penstock route resulting in a low adverse direct physical impact during the construction phase and a neutral or slight significance of effect. As such it is recommended that a basic photographic and descriptive record be taken prior to impact. However, the record presented in this report should be seen as being commensurate with a basic record level and as such no further work is proposed.</p>	
Category of importance: Local	
Level of impact: Low adverse direct physical (limited to construction phase)	
Significance of effect: Neutral or Slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None / basic record complete	

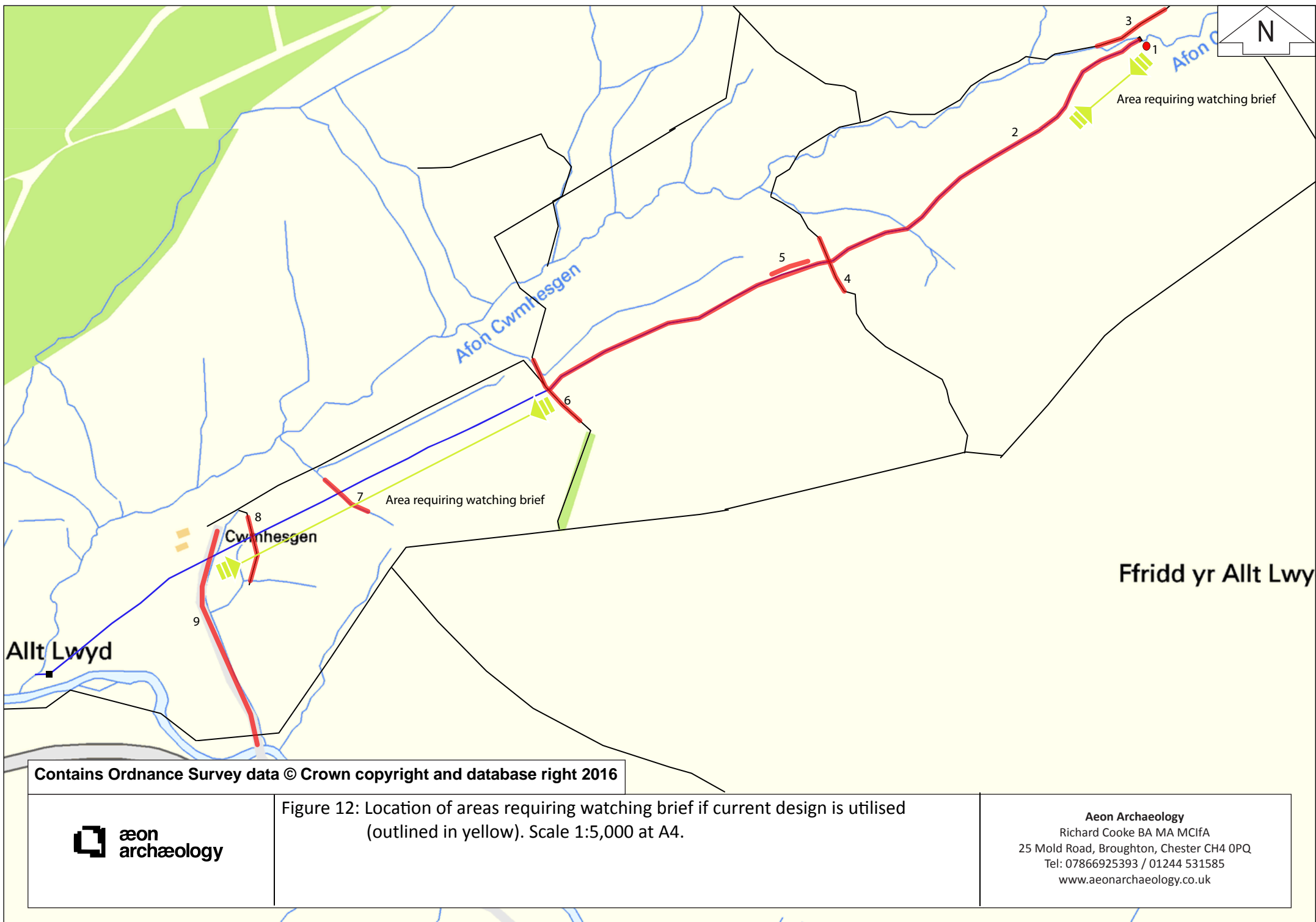


Plate 11: Trackway (feature 9), from the north. Scale 1.0m.

Table 2: Summary of archaeological features. GREEN = no action required; RED= Action required						
Number	Name	Importance	Impact	Significance of effect	Further Assessment	Mitigation Recommendations
PHYSICAL DIRECT AND INDIRECT IMPACTS						
1	Sheepfold	Local	None	Neutral	None	None / avoidance
2	Trackway	Local	Low adverse direct physical (limited to construction phase)	Neutral or Slight adverse (limited to construction phase)	None	None / reinstatement
3	Field wall	Local	None	Neutral	None	None
4	Field wall	Local	None	Neutral	None	None
5	Trackway wall	Local	None	Neutral	None	None
6	Field wall	Local	None	Neutral	None	None
7	Field boundary ditch and bank	Local	Low adverse direct physical (limited to construction phase)	Neutral or Slight adverse (limited to construction phase)	None	None / reinstatement
8	Field boundary ditch	Local	Low adverse direct physical (limited to construction phase)	Neutral or slight adverse (limited to construction phase)	None	None / reinstatement
9	Trackway	Local	Low adverse direct physical (limited to construction phase)	Neutral or Slight adverse (limited to construction phase)	None	None / reinstatement







8.0 IMPACT AND RECOMMENDATIONS

8.1 Direct physical impact

Construction phase

The proposed development scheme is expected to have a *low adverse direct physical* impact upon four sites of archaeological importance (features 2, 7, 8 and 9) during the construction phase. All of these features are post-medieval in date and are considered to be of *local* importance thus resulting in a *neutral or slight adverse* significance of effect.

Completion phase

The proposed development scheme is not expected to have any direct physical impact upon any known sites of archaeological and historical significance upon completion.

8.2 Indirect physical and non-physical (visual) impact

Construction phase

The proposed development scheme is not expected to have any indirect physical or non-physical impacts upon any known sites of archaeological and historical significance during the construction phase.

Completion phase

The proposed development scheme is not expected to have any indirect physical or non-physical impacts upon any known sites of archaeological and historical significance upon completion.

8.3 Site Specific Recommendations

The proposed scheme will directly impact upon only four archaeological features, a trackway (feature 2), a field boundary ditch and bank (feature 7), a boundary ditch (feature 8) and a trackway (feature 9). All of these features are likely to be of post-medieval date and as such are considered to be of *local* importance. The photographs and descriptions provided within this report should be considered commensurate with a basic archaeological record level and as such no further recommendations are made for assessment or mitigatory measures for these features.

8.4 General recommendations

The archaeological assessment did not identify any sites considered to be above local importance within the 50.0m wide assessment corridor or indeed within the localised landscape. Moreover, the majority of the archaeological features recorded on the regional Historic Environment Record and National Monuments Record are agricultural features of post-medieval date.

There are no registered World Heritage Sites, Archaeological Areas, Scheduled Ancient Monuments, Registered Parks and Gardens, Listed Buildings, or Registered Historic Landscapes wholly or partly within the Assessment Site. Therefore, this assessment confirms that the Site does not contain any designated heritage assets for which there would be a presumption in favour of preservation in situ and against development. There are no known undesignated archaeological assets within the Site.

The archaeological potential for buried preserved remains of the Prehistoric and Roman periods has been identified as low in the northern part of the scheme and unknown in the southern part. This is however based upon the available information, rather than an absolute value derived from adequate data. There is also an exception to this in that there is an increased potential for preserved palaeo-environmental remains within the underlying peat deposits which appear to be isolated towards the northern part of the scheme.

The current proposal is that the penstock be trenched to the immediate north of the trackway for the initial 50.0m after the intake weir due to the presence of bedrock within the trackway. If this occurs then a watching brief will need to be maintained along this section of the route due to the suspected presence of underlying peat deposits. It is therefore recommended that the Client assesses the viability of trenching the penstock within the trackway for this initial 50.0m. If a watching brief is required and it becomes apparent that there is little or no underlying peat then provision should be made for the monitoring to be abandoned immediately.

The assessment identified areas of peat cutting in close proximity to the northern part of the penstock route which could be of medieval date, however these do not lie within the proposed penstock route and are unlikely to have any preserved buried associated remains. As such the potential for buried archaeological remains dating to the medieval period is considered to be low.

The potential for unknown sub-surface archaeological remains dating to the post-medieval period is also considered to be low.

On the basis of the evidence presented in this assessment the proposed development on the Site would not be contrary to any local or national policy.

This Assessment enables an informed, sustainable and responsible approach to the development of a new micro hydro scheme at Cwm Hesgen, Abergeriw. The information provided meets the expectations of NPPF and Heritage Bill (Wales) 2015 in that the applicant has described the significance of known archaeological assets that may be affected by proposed development. It is considered that the level of detail provided is proportionate to the assets' importance and provides sufficient information to understand the potential impact of the proposal on the significance of archaeological remains and therefore, there is sufficient information on which to partially discharge the planning condition.

On the balance of evidence, the archaeological interest at the Site is realistically limited to a Low potential for as yet unknown remains of the prehistoric, Roman, medieval and later periods. The exception to this is the unknown potential for preserved organic palaeoenvironmental remains within the peat deposits towards the northern part of the scheme and the unknown potential for preserved buried remains once the penstock route leaves the trackway in the southern part of the scheme and the topography flattens out. In the absence of any data confirming the presence/absence of preserved remains or any other more recent activity which may have compromised archaeological survival, the precautionary principle requires an assumption that some archaeological remains are present at the Site.

Ultimately, therefore, and without prejudice to the findings of any future archaeological, or other investigations at the Site, it is considered that the archaeological interest at the Site could be safeguarded through the alteration of the initial 50.0m of the penstock route to be trenched within the existing trackway, thus avoiding the requirement to monitor excavations through suspected peat deposits. If this alteration is not possible then an archaeological watching brief will be required along this part of the scheme.

Likewise the southern part of the scheme where the penstock route leaves the trackway has an increased potential for preserved remains due to its suitability for early habitation. As such it is recommended that the penstock trench be moved 10.0m-15.0m to the north to continue within the trackway. If this alteration is not possible then an archaeological watching brief will be required from where the penstock trench leaves the trackway until it reaches the property of Cwm Hesgen. Once the penstock route heads southwest from Cwm Hesgen the topography becomes steeper and the potential for preserved buried remains reduces. As such no mitigatory response is recommended for this part of the scheme.

This recommendation is in line with the relevant provisions in NPPF and the Heritage Bill (Wales) 2015.

9.0 SOURCES

OS Maps

1st edition 6 inch Ordnance Survey Map of 1886.

2nd edition 6 inch Ordnance Survey Map of 1901.

4th edition 6 inch Ordnance Survey Map of 1949.

OS 1:10 000 Series sheet SH 73NE, SH 73SE, SH 73SW, and SH 73NW.

Sources

British Geological Survey website. www.bgs.ac.uk.

Chisholm, H. 1911. *Encyclopaedia Britannica*

Dodd, C. R. 1844. *The Peerage, Baronetage, and Knightage of Great Britain and Ireland*

English Heritage, 1991. *Management of Archaeological Projects (MAP2)*

English Heritage, 2006. *Management of Research Projects in the Historic Environment (MORPHE)*

English Heritage, 2011. *The Settings of Heritage Assets*

Gwynedd Historic Environment Record (HER)

NMR Site Record Cards

The Chartered Institute for Archaeologists, 2014. *Standard and Guidance for Archaeological Desk-Based Assessment*

APPENDIX 1: SCHEDULED AND NON-SCHEDULED SITES WITHIN 1.0KM

Undesignated monuments within 1.0km of the proposed development area as listed on the Gwynedd HER (figure 3)

Prn	Name	Type	Broadclass	Period
5509	Craig y dinas - natural rock outcrop	Natural feature	Unassigned	Unknown
5510	Hut platform, brithdir and llanfachreth	Hut circle	Domestic	Unknown
8523	Bryn-llin-bach	House	Domestic	Post-medieval

NMR Monument Points within 1.0km of the proposed development area (figure 4)

NPRN	Name	Broadclass	Type	Period
303121	Hut platform, pont aber-gerrw	Domestic	Homestead	Unknown
415153	Cwm yr alt lwyd, trackway	Agriculture and subsistence	Trackway	Post medieval
523885	Afon cwmhesgen, sheep fold ii	Agriculture and subsistence	Sheep fold	Post medieval
523886	Afon cwmhesgen, marker cairn	Unassigned	Marker cairn	Post medieval
523887	Afon cwmhesgen, sheep fold i	Agriculture and subsistence	Sheep fold	Post medieval
523888	Afon cwmhesgen, peat cutting ii	Industrial	Peat cutting	Post medieval
523889	Afon cwmhesgen, peat cutting i	Industrial	Peat cutting	Post medieval
523890	Ffridd yr allt-lwyd, sheep fold	Agriculture and subsistence	Sheep fold	Post medieval
523891	Ffridd yr allt-lwyd, peat cutting i	Industrial	Peat cutting	Post medieval
523922	Ffridd yr allt-lwyd, peat cutting ii	Industrial	Peat cutting	Post medieval
541000	Cwm allt lwyd, cottage	Domestic	Cottage	Post medieval
541001	Cwm yr allt lwyd, well	Water supply and drainage	Well	Post medieval
541002	Cwm yr allt lwyd, field barn	Agriculture and subsistence	Field barn	Post medieval
541006	Cwm yr allt lwyd, sheep fold	Agriculture and subsistence	Sheep fold	Post medieval
541118	Cwm yr allt lwyd, earthwork bank iii	Monument<by form>	Boundary bank	Post medieval
541119	Cwm yr allt lwyd, earthwork bank iv	Monument<by form>	Boundary bank	Post medieval
541120	Rhobell big, boundary wall	Monument<by form>	Boundary wall	Post medieval
541126	Cwm yr allt lwyd, earthwork	Industrial	Level (possible), spring (possible)	Unknown
541188	Cwm yr allt lwyd, trackway ii	Transport	Trackway	Post medieval
541189	Cwm yr allt lwyd, enclosure ii	Agriculture and subsistence	Sheep fold (possible)	Post medieval
541190	Cwm yr allt lwyd, earthwork bank i	Monument<by form>	Bank (earthwork), wall	Post medieval
541191	Cwm yr allt lwyd, earthwork bank ii	Monument<by form>	Boundary bank	Post medieval
541192	Cwm yr allt lwyd, enclosure i	Monument<by form>	Enclosure	Post medieval
541193	Cwm yr allt lwyd, structure ii	Domestic	Long hut (possible),	Post medieval

			sheep fold (possible)	
541194	Cwm yr allt lwyd, structure i	Unassigned	Structure	Post medieval
541195	Cwm yr allt lwyd, trackway i	Transport	Trackway	Unknown
541239	Cwm yr allt lwyd, clearance cairn	Agriculture and subsistence	Clearance cairn	Post medieval
541240	Rhobell y big, trackway	Transport	Trackway	Post medieval
541241	Rhobell y big, earthwork bank	Monument<by form>	Bank (earthwork)	Post medieval

Listed Buildings within 1.0km of the proposed development area (figure 5)

Number	Name	Grade
82535	Field cowhouse at Rhiw Felen	II

