## Proposed Water Treatment Works, Cwmystradllyn

Archaeological Assessment



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### **Archaeological Assessment**

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Prepared for: Caulmert

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#### G2231 CWMYSTRADLLYN WATER TREATMENT WORKS, GWYNEDD

#### ARCHAEOLOGICAL ASSESSMENT

#### **SUMMARY**

An archaeological assessment was carried out at the site of the proposed new Cwmystradllyn Water Treatment Works (WTW), Gwynedd and at the adjacent temporary construction compound site. The assessment identified that the study area was located within a rich archaeological landscape and that there are number of known sites of archaeological significance in the vicinity. The site of the proposed Cwmystradllyn Water Treatment Works appears to have undergone some degree of re-instatement works. There is the potential that this work would have truncated any standing archaeological remains and shallow cut archaeological features. The potential for the preservation of buried archaeological remains here is, therefore unknown.

A programme of further archaeological evaluation (geophysical survey) has been recommended in order to ascertain the likely extent of any potential ground disturbance caused by these re-instatement works. Any potential geotechnical investigation carried out by Dwr Cymru/Welsh Water or their contractors may also be archaeologically monitored. Based upon the results of this evaluation, it is possible that further archaeological work will be necessary.

#### 1. INTRODUCTION

Gwynedd Archaeological Trust has been asked by Caulmert Ltd on behalf of Dwr Cymru/Welsh Water to carry out an archaeological assessment on land west to the existing Cwmystradllyn Water Treatment Works (WTW), Gwynedd (centred on OS Grid Ref SH 54718 42864), in advance of the proposed construction of new WTW on the site and the use of an adjacent parcel of land as a temporary construction compound (Fig. 01). Planning permission is being sought for the construction of a new water treatment works.

#### 1.1 Acknowledgements

The staffs at Caernarfon Archives and the National Library of Wales are thanked for their help with providing archive material.

#### 2. DESIGN BRIEF AND SPECIFICATION

A design brief has been prepared for the proposed development which accords with normal requirements requested by Snowdonia National Park Archaeologist. This report conforms to that brief, and to the guidelines specified in *Standard and Guidance for Archaeological Desk-based Assessment* (Institute of Field Archaeologists, 1994, rev. 2001).

A desk-based assessment is defined as 'a programme of assessment of the known or potential archaeological resource within a specified area or site on land, inter-tidal zone or underwater. It consists of a collation of existing written, graphic, photographic and electronic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional, national or international context as appropriate'. (Standard and Guidance for Archaeological Desk-based Assessment, IFA 2001, 2).

The aims of the assessment as given in the specification are:

- to identify and record the cultural heritage within the defined study area;
- to evaluate the importance of what has been identified;
- to recommend ways in which impact upon the cultural heritage can be avoided or minimised;
- Carry out a site visit/walkover survey.

To comply fully with the aims expressed above it can be necessary to undertake a programme of Field Evaluation following the Desktop study and Field Visit. This is because some sites cannot be assessed by desktop or field visit alone, and additional fieldwork is therefore required. This typically takes the form of

geophysical survey or trial excavation, although measured survey is also a possible option. A full programme of assessment and evaluation may therefore consist of:

- Desktop study
- Field walkover
- Initial report
- Field evaluation
- Draft report
- Final report

This phase of the project concerns the first three phases, and recommendations are made concerning further archaeological evaluation or mitigation.

#### 3. METHODS AND TECHNIQUES

#### 3.1 Desk top study

The desktop study comprised the consultation of maps, documents, computer records, written records and reference works, which form part of the Historic Environment Record (HER), located at Gwynedd Archaeological Trust (GAT), Bangor. Information about listed buildings was consulted by means of the CARN (Core Archaeological Index), which is the online index of the Royal Commission on Ancient and Historic Monuments, Wales.

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

#### 3.2 Field Search

The field search was undertaken during February 2012, when the area of the proposed development was examined. Notes were taken, sketches and measurements were taken of sites of potential archaeological interest and a photographic record was made. Weather and ground conditions were poor for a site visit, dense fog prevented long range observations being made or photographs being taken, but within the proposed development area itself visibility was between 20 and 30metres, sufficient to carry out the walkover and observe any potential standing earthworks.

#### 3.3 Report

The available information was synthesised to give a summary of the archaeological and historic background and of the assessment and recommendations, as set out below. The separate features, if any, their evaluation and recommendations are listed separately, and a summary of the overall assessment of the area is given at the end.

The criteria used for assessing the value of features was based upon those used by the Secretary of State for Wales when considering sites for protection as scheduled ancient monuments, as set out in the Welsh Office circular 60/96. The definitions of categories used for impact, field evaluation and mitigation are set out in Appendix 2.

#### 4. ARCHAEOLOGICAL RESULTS

#### 4.1 Topographic description

The study area is located approximately 1.7km south west of the Llyn Cwmstradllyn Reservoir. It lies at a height of approximately 195m OD. The proposed development area consists of an irregular shaped plot of land, west of the existing Dwr Cymru/Welsh Water facility (Fig. 01). The existing road forms the south eastern boundaries while the remaining boundaries are established agricultural field boundaries.

There are three fields within this part of the proposed development area. All are upland pasture of various grades. The large southernmost field (Field 01/Fig. 02) is rough pasture with areas of possible waterlogging downslope (Plate 03). Both the northern fields (Fields 02 & 03 appear to be improved pasture and the uniform nature of the grazing (Plates 01 & 02) suggests both may have undergone recent mechanical cultivation. It is

also possible that the two fields may have been subject to earlier groundworks associated with the existing WTW and have been re-instated (Fig 02).

The boundaries of the proposed development area are stone and earth cloddiau (banks) with stock wire fencing on top, all are in a poor condition, plate 04 shows the boundary between fields 01 and 02 and plate 05 shows the westernmost boundary of field 03. Interestingly the boundary between fields 02 and 03 is dry stone wall and appears to be modern (Plate 01). Again, further evidence, suggesting that this area has undergone recent re-instatement works.

The underlying geology consists of basalt, dolerite & diabase (Geological Survey, England & Wales, Sheets 9 & 10).

#### 4.2 Archaeological and historical background

#### 4.2.1. Prehistoric and Roman sites

The proposed development area is located within a sparsely populated upland environment. The evidence for prehistoric occupation within the vicinity of the proposed development area is slight. No structural evidence of prehistoric settlement has been found to date. The nearest confirmed prehistoric site is the Bronze Age standing stone (PRN 2, 360 SH 5495 4297) at Meini Hirion, approximately 370m south east of the proposed development area. Gwynedd Archaeological Trust Funerary and Ritual Project (GAT 1629/2008) suggests that Meini Hirion is the remnant stone of stone circle, probably Bronze Age in date and dismantled in the 18<sup>th</sup> century. The use of the plural also suggests the possibility of other standing stones or stone circles within the vicinity of Meini Hirion. It is possible; therefore that evidence of prehistoric activity may survive below ground in the vicinity.

There is no evidence of occupation from the Roman period within the vicinity of the proposed development area. The nearest confirmed Romano-British site is a Hut Circle settlement at Cil Drygwr (PRN 166 SH 5359 4301), approximately 1.2km to the west.

The sparseness of the evidence may reflect a lack of investigation rather than a lack of settlement activity relating to these periods.

#### 4.2.2 Medieval

Again the evidence of medieval settlement and activity is sparse; this may again be a reflection of a lack of investigation. There is confirmed medieval occupation in the form of Hut Platforms at Cil Drygwr (PRN 182 SH 5370 4294), approximately 1.2km to the west. More significant evidence of medieval occupation is the deserted settlement of Gesail Gyfarch (PRN 181, SH 5415 4192), approximately 900m south west of the proposed development area.

There are a number of post medieval and modern farmsteads within the vicinity of the proposed development area, it is possible, although not confirmed that these may have originated as medieval farmsteads.

#### 4.2.3 Post-Medieval and Modern

There are a number of known sites dating from the post medieval and modern period recorded within the vicinity of the proposed development area. Only one, however, is within 500m. This is the site of a waterwheel, recorded at Cefn-Coch-Uchaf (NPRN 411, 631, SH 5460 4309), to the north of the proposed development area. The waterwheel is believed to be agricultural in origin. There are a number of other agricultural sites of archaeological significance, but none in the immediate vicinity of the proposed development area.

Extensive evidence of the areas industrial past is also recorded to the north of the proposed development area at the Ynys y Pandy Slate Mill (PRN 220 SH 5500 4330). The site includes extensive standing remains of the mill building and nearby is the abandoned workers settlement and the quarry itself. The alignment of the Gorseddau Railway (PRN 28, 005 SH 5319 4178) passes approximately 185m east of the proposed development area. Part of the Gorseddau Junction and Portmadoc Railway (GJ&PR), the railway was built in 1872 to connect the slate quarries of Cwm Pennant with the wharves at Porthmadog. By 1887 the railway was largely redundant and the slate quarries had failed. The land was sold in 1897 and the railway dismantled.

One of the earliest available maps of Gwynedd is by Samuel Lewis in "A Topographical Dictionary of Wales" published in 1833. The map records the location of Llyn Ystradllyn, the road passing to the south of the proposed development area and the nearby Church at Llanfihagel y Pennant but does not include any detail of the proposed development area itself.

A tithe map of the parish of Penmorfa, which includes the proposed development area was recorded in 1840 (Fig. 03); the proposed development area is clearly identifiable on this map. The tithe map records the proposed development area as is and under pasture. The fields belong to the nearby Cefn Coch Uchaf farm. The remainder of the 19<sup>th</sup> and 20<sup>th</sup> century Ordnance Survey maps (Fig. 04) again record the proposed development area as is with no real change between them and the tithe map, only the First Edition is reproduced for the purpose of this report. Interestingly the field boundaries are all recorded as they currently stand indicating that they all date to the early 19<sup>th</sup> century at least and have remained unaltered, although the walkover survey indicated that the east-west aligned stone wall has been recently rebuilt, but clearly on its original alignment. The only significant alteration is the construction of the WTW in the late 20<sup>th</sup> century to the south east of the proposed development area and not included in this assessment.

#### 4.3 Statutory and non-statutory designations

There are no Scheduled Ancient Monuments, within the vicinity of the proposed development area and no listed buildings within 500m of the study area. An examination of the Register of Landscapes of Outstanding Historic Interest in Wales and the Register of Landscapes of Special Historic Interest in Wales indicates that the proposed development area is not registered within either survey. The nearest entry is Aberglaslyn, approximately 5km to the south east (PRN 18, 214). The proposed development area is not recorded within an Historic Landscape Character Area either.

#### 4.4 The Archaeological Survey

The recommendations reflect the information currently provided by Dwr Cymru/Welsh Water and assume impact only within the defined proposed development area (as outlined on Fig. 01). Any change to the boundary of the proposed development area will require the recommendations below to be changed also.

There is an existing main which crosses the proposed development area, adjacent to its northernmost boundary, the exact alignment of which is currently un-determined. This may result in any potential archaeological deposits having been previously disturbed along the alignment of this main and any potential easement area which may have been stripped during its construction.

#### 5. SUMMARY OF ARCHAEOLOGICAL POTENTIAL

#### **5.1 Location Summary**

The proposed development area lies within a sparsely populated upland environment, on the edge of cultivation. It lies at a height of about 195-198m OD, south west of Llyn Cwmystradllyn.

#### 5.2 Environmental Remains and Soil Morphology

The proposed development area consists of upland pasture and are likely, therefore to be thin topsoil overlaying bedrock. Two of the fields appeared to show signs of possible improvement works, or re-instatement. If so, it is possible that such work may have impacted upon any potential archaeological remains.

#### 5.3 Artefactual Potential

The potential for the survival of medieval or earlier artefacts is unknown, but is thought to be low to medium.

#### 6. SUMMARY OF RECOMMENDATIONS

#### 6.1 General Recommendations

With the exception of the poorly surviving cloddiau, no pre-modern features were observed or recorded by this assessment. The potential for the survival of prehistoric and medieval archaeological remains below ground is

currently un-determined, this walkover survey suggests that at least part of the proposed development area may have undergone some degree of ground improvement or disturbance and it is unclear what, if any impact this would have upon any earthfast archaeological remains. In this case archaeological remains, if any, would survive only as truncated sub-soil features, it is possible, therefore that there is only **low to medium** potential for significant archaeological remains. Further **archaeological evaluation** (geophysical survey) is recommended in order to ascertain the likely extent of any disturbed or un-disturbed archaeological remains. Based upon the results of this evaluation, it is possible that further archaeological work will be necessary. Any potential geotechnical investigation carried out by Dwr Cymru/Welsh Water or their contractors may also be archaeologically monitored to further ascertain the archaeological potential.

#### 7. CONCLUSIONS

The archaeological assessment carried out for the proposed Cwmystradllyn WTW and temporary construction compound identified that the proposed development area was located within a rich archaeological landscape. There are known sites of archaeological significance within the vicinity of the proposed development area including a prehistoric standing stone, possibly part of a lost stone circle and a 19<sup>th</sup> century slate mill. This assessment indicates that the majority of the proposed development area may have undergone some degree of ground disturbance. It is not known whether this disturbance is a result of agricultural improvement or a result of groundworks associated with the existing WTW; the potential for survival of archaeological remains, is therefore unknown. Further archaeological evaluation has been recommended, as well as archaeological attendance during any geotechnical investigation works.

#### 8. ARCHIVE

The archive consists of historic maps, plans and aerial photographs, along with notes and digital images taken on the field visit. The archive is currently held by GAT under project code **G2231**.

One copy of the bound report will be sent to the SNPA archaeologist, and a further copy sent to the HER Archaeologist at the curatorial division of Gwynedd Archaeological Trust, Bangor, for deposition in the Regional HER. A copy of the report will be provided to the National Monument Record at the Royal Commission on the Ancient and Historic Monuments of Wales, Aberystwyth.

#### 9. REFERENCES AND OTHER SOURCES CONSULTED

Boyd, James I.C. 1988. Narrow Gauge Railways in South Caernarvonshire - Volume 1. Oxford.

British Geological Survey 1982 British Geological Survey-Sheets 9 & 10 Solid Edition.

CADW 1998. Register of Landscapes of Outstanding Historic Interest in Wales.

Davies, R. 1999. The Tithe Maps of Wales (National Library of Wales).

CADW 2001. Register of Landscapes of Special Historic Interest in Wales.

Edwards, N (ed). 1997. Landscape and Settlement in Medieval Wales. Oxford.

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

Johnson, P. 2002. An Illustrated History of the Welsh Highland Railway. Oxford.

Lewis, S. 1833. "A Topographical Dictionary of Wales". http://www.genuki.org.uk/big/wal/CAE/index.html#History

Smith, G.A. 2002. *Prehistoric Funerary and Ritual Sites Project: West Conwy and North Gwynedd* (GAT Project G1629 Report No 449).

The Dry Stone Walling Association. 2004 Dry Stone Walling Techniques & Traditions Cumbria.

#### APPENDIX 1

# Sites on the Gwynedd HER database and Scheduled Ancient Monuments (SAM), within 1.5km of the study area

#### Sites on the Gwynedd HER

PRN	Name	Form	Site Type	NGR	Period	Description	Status
2, 360	Meini Hirion Standing Stone	Standing Stone	Site of	SH54954297	Prehistoric	Location	HER
166	Cil Drygwr Hut Circles	Earthwork	Site of	SH53594301	Roman	Location	HER
182	Cil Drygwr Hut Platforms	Earthworks	Site of	SH53704294	Med	Location	HER
181	Gesail Gyfarch	Abandoned Settlement	Site of	SH54154192	Med	Location	HER
411,631	Cefn-Coch-Uchaf Waterwheel		Site of	SH54604309	Post Med	Location	HER
220	Ynys y Pandy Slate Mill	Standing Building	Site of	SH55004330	Post Med	Location	HER
28,005	Gorseddau Railway	Trackbed	Alignment	SH53194178	Post Med	Location	HER

#### **APPENDIX 2**

#### Definitions of terms used within the report

Categories of importance

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

Category A - Sites of National Importance.

Scheduled Ancient Monuments, Listed Buildings of grade II\* and above, as well as those that would meet the requirements for scheduling (ancient monuments) or listing (buildings) or both.

Sites that are scheduled or listed have legal protection, and it is recommended that all Category A sites remain preserved and protected *in situ*.

Category B - Sites of regional or county importance.

Grade II listed buildings and sites which would not fulfil the criteria for scheduling or listing, but which are nevertheless of particular importance within the region.

Preservation *in situ* is the preferred option for Category B sites, but if damage or destruction cannot be avoided, appropriate detailed recording might be an acceptable alternative.

Category C - Sites of district or local importance.

Sites which are not of sufficient importance to justify a recommendation for preservation if threatened.

Category C sites nevertheless merit adequate recording in advance of damage or destruction.

Category D - Minor and damaged sites.

Sites that are of minor importance or are so badly damaged that too little remains to justify their inclusion in a higher category.

For Category D sites, rapid recording, either in advance of or during destruction, should be sufficient.

Category E - Sites needing further investigation.

Sites, the importance of which is as yet undetermined and which will require further work before they can be allocated to categories A - D are temporarily placed in this category, with specific recommendations for further evaluation. By the end of the assessment there should usually be no sites remaining in this category. In this case several areas of unknown potential have been allocated to this category.

#### **Definition of Impact**

The impact of the proposed development on each feature was estimated. The impact is defined as *none*, *slight*, *unlikely*, *significant*, *considerable or unknown* as follows:

#### None:

There is no construction impact on this particular site.

#### Slight:

This has generally been used where the impact is marginal and would not by the nature of the site cause irreversible damage to the remainder of the feature, *e.g.* part of a trackway or field bank.

#### Unlikely:

This category indicates sites that fall within the band of interest but are unlikely to be directly affected. This includes sites such as standing and occupied buildings at the margins of the band of interest.

#### Likely:

Sites towards the edges of the study area, which may not be directly affected, but are likely to be damaged in some way by the construction activity.

#### Significant:

The partial removal of a site affecting its overall integrity. Sites falling into this category may be linear features such as roads or tramways where the removal of part of the feature could make overall interpretation problematic.

#### Considerable:

The total removal of a feature or its partial removal which would effectively destroy the remainder of the site.

#### Unknown:

This is used when the location of the site is unknown, but thought to be in the vicinity of the proposed works.

#### Definition of field evaluation techniques

Field evaluation is necessary to fully understand and assess most class E sites and to allow the evaluation of areas of land where there are no visible features but for which there is potential for sites to exist. Two principal techniques can be used for carrying out the evaluation: geophysical survey and trial trenching. Topographic survey may also be employed where sites are thought to survive as earthworks.

Geophysical survey most often involves the use of a magnetometer, which allows detection of some underground features, depending on their composition and the nature of the subsoil. Other forms of geophysical survey, including resistivity survey and ground penetrating radar might also be of use.

Trial trenching allows a representative sample of the development area to be investigated at depth. Trenches of appropriate size can also be excavated to evaluate category E sites. Trenching is typically carried out with trenches of between 20 to 30m length and 2m width. The topsoil is removed by machine and the resulting surface is cleaned by hand, recording features. Depending on the stratigraphy encountered the machine may be used to remove stratigraphy to deeper levels.

#### **Definition of Mitigatory Recommendations**

Below are the measures that may be recommended to mitigate the impact of the development on the archaeology.

#### None.

No impact so no requirement for mitigatory measures.

#### Detailed recording:

This requires a full photographic record and measured survey prior to commencement of works.

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

#### Basic recording:

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

#### Strip, Map and Sample:

The technique of Strip, Map and Sample involves the examination of machine-stripped surfaces to identify archaeological remains. The stripping is undertaken under the supervision of an archaeologist. Stripping and removal of the overburden is undertaken in such as manner as to ensure damage does not take place to surfaces that have already been stripped, nor to archaeological surfaces that have not yet been revealed.

Stripping is undertaken in as careful a manner as possible, to allow for good identification of archaeological features. A small team of archaeologists will be responsible for subsequently further cleaning defined areas where necessary. Complex sites which cannot be avoided will need to be fully excavated.

#### Watching brief:

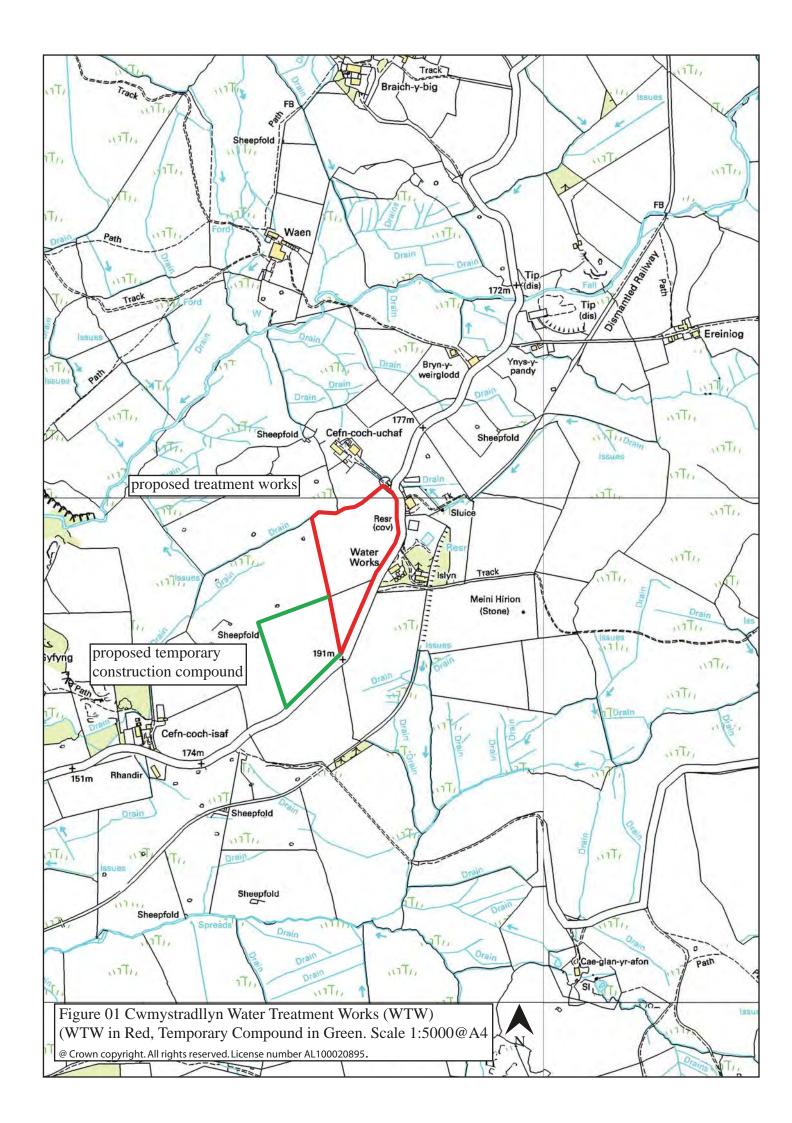
This is a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.

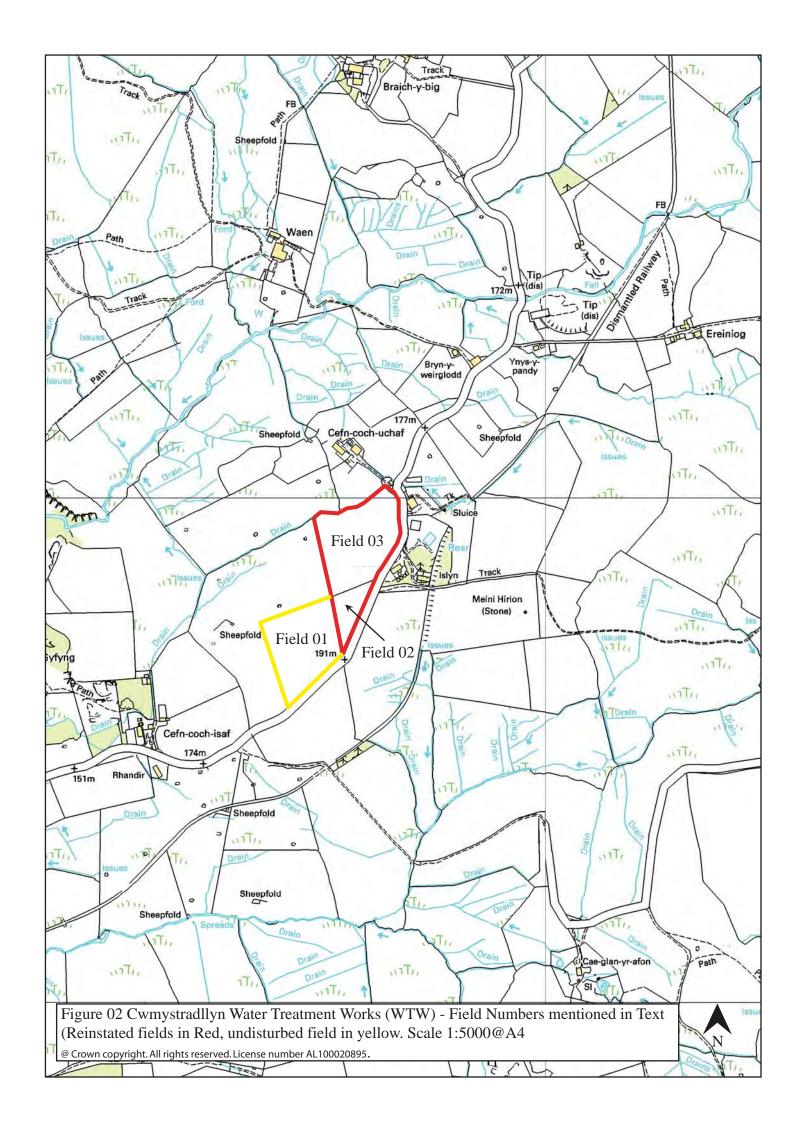
#### Avoidance:

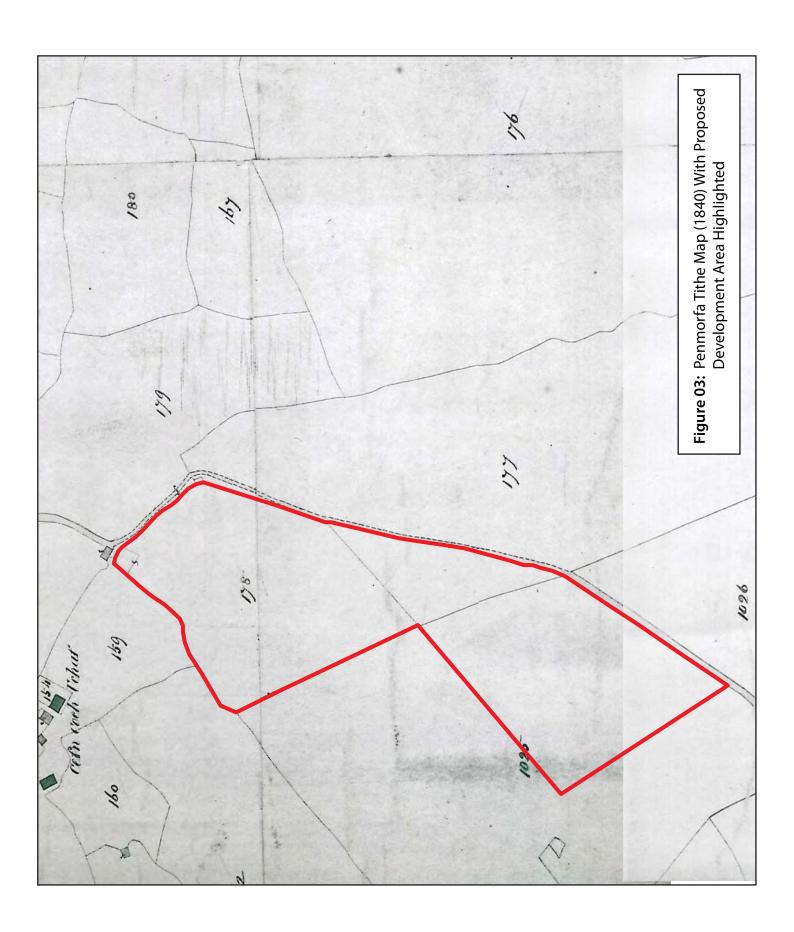
Features, which may be affected directly by the scheme, or during the construction, should be avoided. Occasionally a minor change to the proposed plan is recommended, but more usually it refers to the need for care to be taken during construction to avoid accidental damage to a feature. This is often best achieved by clearly marking features prior to the start of work.

#### Reinstatement:

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







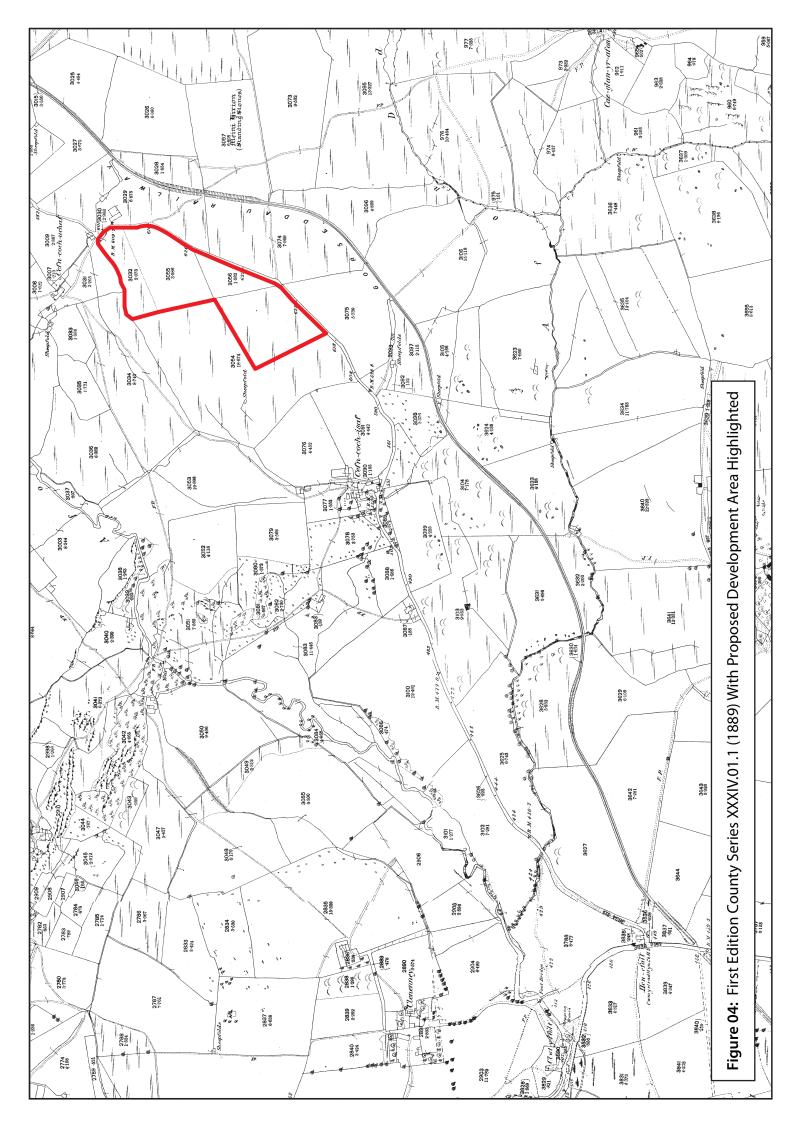




Plate 01: Field 02, showing uniform pasture & newly-built dry stone wall (looking west-south west)



Plate 02: Field 03 showing uniform pasture (looking east-north east)



Plate 03: Field 01 showing un-improved pasture (looking south west)



Plate 04: Original looking Clawdd between fields 01 and 02



Plate 05: Westernmost Clawdd in field 03



