

Dolbenmaen Water Treatment Works, Dolbenmaen, Gwynedd

Archaeological Assessment



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Dolbenmaen Water Treatment Works Doplbenmaen, Gwynedd

Archaeological Assessment

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Report No. 1092

Prepared for: Caulmert Ltd.

December 2012

Written by: Spencer Smith

Cyhoeddwyd gan Ymddiriedolaeth Archaeolegol Gwynedd
Ymddiriedolaeth Archaeolegol Gwynedd
Craig Beuno, Ffordd y Garth,
Bangor, Gwynedd, LL57 2RT

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Cadeiryddes/Chair - Yr Athro/Professor Nancy Edwards, B.A., PhD, F.S.A.
Prif Archaeolegydd/Chief Archaeologist - Andrew Davidson, B.A., M.I.F.A.

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DOLBENMAEN WATER TREATMENT WORKS

ARCHAEOLOGICAL ASSESSMENT (G2293)

Prepared for Caulmert, December 2012

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SUMMARY

An archaeological assessment has been carried out by the Gwynedd Archaeological Trust on land for a proposed new Water Treatment Works (WTW) at Dolbenmaen, Gwynedd.

The assessment area, located to the west of the village of Dolbenmaen, consists of a series of fields of improved pasture lying to the south east of the steep cliffs of Craig y Llan and the rising ground of Bryniau Ystumcegid to the south. It is bounded to its northern and western sides by roads, to the south by the Afon Dwyfor and fields of improved pasture to the east.

A large rock outcrop was identified to the north of the assessment area, which appears from a combination of place name evidence and historic literature to have been used as an early medieval assembly mound. The remainder of the area was characterised by improved pasture separated by cloddiau (field boundaries) of post-medieval date.

The assessment identified that the study area was located within a rich archaeological landscape and that there are thirty known sites of archaeological significance within a 500m radial zone around the proposed WTW. These include two prehistoric hut circles and two possible Roman road routes.

A number of relict features associated with water management of the surrounding landscape were also identified within the study area, and the programme of continuous improvements to the A487 (T), which forms the northern boundary of the site, has resulted in changes to the character of the field edges along this boundary.

GAT attended a Ground Investigation (GI) stage for Black and Veatch Ltd on the 10th and 11th of December 2012 and monitored the excavation of 12No. trial pits (GAT Report 1098).

In response to the results of the archaeological assessment it is recommended that a programme of archaeological evaluation is completed. Gwynedd Archaeological Trust recommends a series of trial trenches located across the proposed WTW zone to investigate the below ground potential. Based on the results of the evaluation further investigation or mitigation may be required.

In terms of the upstanding archaeological features within the proposed WTW zone (Features 1, 2, 3, 4, 5, 6 and 7), it is recommended these are either avoided or a basic record completed for Features 1, 2, 3, 4 and 5 and a topographic survey/archaeological evaluation is completed for Feature 5.

In terms of known buried archaeological features within the proposed WTW zone (Features 6 and 7), it is recommended that these are recorded if they are exposed during contractor groundworks.

1. INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been asked by *Caulmert* to carry out an archaeological assessment on improved pasture land to the north, east and west of the existing Dolbenmaen Water Treatment Works (WTW), Gwynedd (centred on OS Grid Ref **SH 49800 43006**) in advance of the proposed construction of a new WTW on the site.

The irregular proposed WTW zone measures 39,110m² in size as indicated on *Black and Veatch Ltd* drawing **174357-30-9000** (reproduced as Figure 01). *Black and Veatch Ltd* drawing **174357-30-9000** indicates that there are two areas of proposed land rental, Area 'A' of 6,890m² to the north east of the proposed WTW and Area 'B' of 6,055m² to the west of the proposed WTW. These are assumed to be areas for ancillary works (e.g. compounds). An area of 26,255m² is proposed to be purchased for the proposed WTW.

GAT attended a Ground Investigation (GI) stage for *Black and Veatch Ltd* on the 10th and 11th of December 2012 and monitored the excavation of 12No trial pits (GAT Report 1098).

This is a revised assessment report (original assessment report GAT Report 1092 v2.0). The original assessment report assessed an area of 112,120m² (11.21 hectares) as indicated on *Black and Veatch Ltd* drawing **174357-30-0001**, which included two fields to west and north west of the revised assessment, and did not extend to the eastern boundary of the revised assessment. Any further design alterations to the assessment area or proposed WTW may require additional revisions.

This report conforms to the guidelines specified in *Standard and Guidance for historic environment desk-based assessment* (Institute of Field Archaeologists, 1994, rev. 2001, 2009 and 2011 http://www.archaeologists.net/sites/default/files/node-files/DBA2010working%20draft_0.pdf)

The content of this report must be approved by Gwynedd Archaeological Planning Services.

1.1 Acknowledgements

The staffs at Caernarfon Archives and the National Library of Wales are thanked for their help with providing archive material. Howard Jones is thanked for his assistance in arranging access to the site.

2. METHODS AND TECHNIQUES

2.1 Definition

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 2008, 2).

The aims of the assessment are:

- to identify and record the cultural heritage within the defined study area;
- to evaluate the importance of what has been identified;
- to recommend ways in which impact upon the cultural heritage can be avoided or minimised;

The project will develop an archaeological deposit model, which will take into account:

- The history of the site
- The potential impact of development on archaeological remains
- The potential impact of development on the setting of sites of archaeological importance

The project will be undertaken in four stages:

- Desk-based assessment
- Field visit
- Report compilation
- Project archive

2.2 Desk top study

The desk-top study included the following elements:

- The regional Historic Environment Record (HER, GAT, Craig Beuno, Bangor, Gwynedd 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 includes unpublished reports and the 1:2500 County Series Ordnance Survey maps.
- Information on Listed Buildings and Scheduled Ancient Monuments were examined within the regional HER.
- Information at the archives of the University College of Wales, Bangor (Archives Department, College Road, Bangor, LL57 2DG) was also consulted.
- Information at the Gwynedd archives Caernarfon Record Office, Swyddfa'r Cyngor, Caernarfon, LL55 1SH was also consulted.

- Relevant aerial photographs from the collection at Central Register of Aerial Photography, Welsh Government, Cardiff were also consulted.
- Results from previous archaeological work within the area were also reviewed. This included an archaeological assessment report (GAT report 668 parts 1 and 2), a DMRB assessment report (GAT report 824) and a Conservation Area assessment report (GAT report 917).

2.3 Walkover Survey

This part of the assessment involved a walkover of the study area centred on the proposed WTW as indicated on *Black and Veatch Ltd* drawing **174357-30-9000** (reproduced as Figure 01) and assessing the sites identified during the desk-based study. The walkover survey was completed on 14th of November 2012 and the results are presented below. Notes were taken, sketches and measurements were taken of sites of potential archaeological interest and a photographic record was made. Weather was suitable for a site visit, although ground conditions were poor in certain areas of the site but sufficient to carry out the walkover and observe any potential standing earthworks. The original walkover carried out incorporated the revised land take discussed in this report.

The aim of the walkover survey was to:

- verify the results of the desk based assessment
- identify any further archaeological sites which may exist as above ground features
- assess the potential for the preservation of below-ground archaeology
- assess the impact upon the historic landscape
- photograph and record the present condition of all sites noted.

3. TOPOGRAPHY AND GEOLOGY

3.1 Introduction and Topography

The irregular shaped assessment area is located approximately 800m west of the village of Dolbenmaen. It lies at a height of approximately 90m OD, and the landscape consists of a patchwork of late 18th – 19th century enclosed fields with dispersed settlement and agricultural outbuildings.

3.2 Geology

The underlying geology consists of glacial till over Ordovician extrusive rocks (British Geological Survey Mapping). <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

3.3 Statutory and non-statutory designations

There are no Scheduled Ancient Monuments or listed buildings within a 500m radial zone of the assessment 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 proposed development area is not recorded within a Historic Landscape Character Area either. The assessment area is located about 270m east of the Snowdonia National Park (SNP).

Two Scheduled Ancient Monuments lie within 1km of the assessment area. The prehistoric Craig-y-Tyddyn Camp (CN 046) (**SH 50590 42719**) lies approximately 715m to the south east and the medieval Dolbenmaen Castle Mound (CN063) (**SH50659 43070**) lies approximately 830m to the east.

3.4 Environmental Remains and Soil Morphology

The topsoil within the assessment area is well drained, with some limited areas of waterlogging in Field 01. GAT attended a Ground Investigation (GI) stage for *Black and Veatch Ltd* on the 10th and 11th of December 2012 and monitored the excavation of 12No. trial pits (GAT Report 1098). **TPD 08** and **TPD10** lie outside of the revised assessment area

All 12 trial pits revealed a clay silt topsoil, more humic in character in **TPD02**, **TPD04**, **TPD08**, **TPD11** and **TPD12** and varying in depth between 0.10m (**TPD03** and **TPD06**) and 0.30m (**TPD09**).

TPD02, cut into the southern side of Pen Bryn yr Orsedd revealed that this side of the mound had not been modified and was entirely natural, composed of a grey silt over a very clean orange brown sandy clay.

TPD01, **TPD05**, **TPD07** and **TPD11** revealed river gravel below their respective sub-soils of sandy clay (**TPD01**); orange-brown till derived material (**TPD05**); grey-brown through red-orange clay (**TPD07**) and orange-brown clay-silt (**TPD11**).

TPD03, **TPD04**, **TPD05**, **TPD08**, **TPD09** and **TPD10** came down immediately below the topsoil onto a till or till derived material

Individual unabraded sherds of Post-Medieval pottery were recovered from the topsoil of **TPD06** and **TPD09**.

4. ARCHAEOLOGICAL RESULTS

4.1 Walkover Survey

The archaeological walkover survey was carried out on November 14th 2012. Notes were taken, sketches and measurements were taken of sites of potential archaeological interest and a photographic record was made. Weather was suitable for a site visit, although ground conditions were poor in certain areas of the site but sufficient to carry out the walkover and observe any potential standing earthworks.

The assessment area consists of an irregular shaped plot of land, north, west and east of the existing Dwr Cymru / Welsh Water facilities as indicated on *Black and Veatch Ltd* Drawing **174357-30-900** (reproduced as Figure 01). The A487 (T) road from Caernarfon to Porthmadog forms the northern boundary, with an access road from the A487 (T) to the current WTW partly forms the western boundary, with a 6055m² area to the west of this access road. The southern boundary is broadly defined by the Afon Dwyfor and the eastern boundary is a field boundary between the A487 (T) road and the Afon Dwyfor.

There are three fields within this part of the proposed development area. All are improved upland pasture of various grades and the uniform nature of the grazing, (Plate 01 and Plate 02) suggest they have undergone recent mechanical cultivation. Area 'B' of 6,055m² to the west of the proposed WTW, a proposed area of land rental, partly occupies Field 01, which has some waterlogging in the north and the north western quarter.

An area of 26,255m² is proposed to be purchased for the proposed WTW extends across Field 02 and Field 03. Field 02 is dominated by a geological outcrop and associated earth mound known as Pen Bryn yr Orsedd, although it is of similar character to the other fields on the lower slopes of the mound (Plate 03 and Plate 04).

Area 'A', an area of proposed land rental of 6,890m² lies to the north east of the proposed WTW in Field 03. This field slopes to the east and south east towards the north bank of the Afon Dwyfor (Plate 05 and Plate 06).

The boundaries of the proposed development area vary. Stone and earth cloddiau (banks) with stock wire fencing on top make up the majority of the boundaries. These are in various states of repair. The boundary with the A487 (T) has been rebuilt or replaced (Plate 04) during work to improve this road. The poorest condition boundary is the northern section of the boundary between Field 02 and Field 03.

4.2 Archaeological and Historical Background

4.2.1. Prehistoric and Roman sites

The evidence for prehistoric occupation within the vicinity of the proposed development area is slight. The nearest confirmed prehistoric sites are the hut groups (PRN 145 **SH 4994 4345**) and (PRN 170 **SH 5019 4276**) 450m NE and 450m SE respectively. The Scheduled Ancient Monument of Craig-y-Tyddyn Camp (CN 046; **SH 50594271**) lies approximately 715m to the south east of the assessment area. It is possible; therefore that evidence of prehistoric activity may survive below ground in the vicinity of the proposed development, occupying as it does the lower ground between these two hut groups, the later agricultural improvement of this land may well have truncated or obscured the evidence for earlier occupation of the landscape.

The line of the proposed Roman Road from Segontium - Pen Llystyn - Tomen y Mur may lie under the present A487 (T) although there is no direct evidence of occupation from the Roman period within the vicinity of the proposed development area. The nearest confirmed Roman site is Pen Llystyn fort (PRN 144 **SH 4809 4492**), approximately 2.3 km to the NW.

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

The Scheduled Ancient Monument (CN 063; **SH50654307**) castle earthwork which marks the site of the medieval *llys* of Dolbenmaen is approximately 830m to the west of the proposed development area (PRN 161 **SH 50654037**). The western boundary of the land which made up the *llys* complex comes within 350m of the eastern boundary of the proposed development (Gresham 1973, 370). The geological outcrop and associated earth mound known as Pen Bryn yr Orsedd which is situated in Field 02 may have served as an assembly mound for the retinue of a peripatetic early medieval court. Pen Bryn yr Orsedd translates as 'The Seat on top of the Hill', and assembly mounds which have similar characteristics are known from England, Scotland, Ireland and the Isle of Man (Pantos and Semple (eds.) 2004).

An assembly mound near Llangollen is currently subject to a programme of archaeological work as part of 'Project Eliseg'. In the case of 'Project Eliseg', the mound is topped by the remains of a stone cross, and academic work on the social context for the mound and the cross has recently been published (Edwards 2009, 53-73). The place name 'Dol Pen Maen' is mentioned in the medieval story of 'Math and Mathonwy' as a point where hostages were exchanged between two high – status families (Evans and Evans 2001, 57). Dolbenmaen / Dol Pen Maen translates as 'The Meadow with the Rock at the Head', and the rock in this instance may be Pen Bryn yr Orsedd.

4.2.3 Post-Medieval and Modern

An Exchequer survey dated 1589-90 shows that the boundary of the township of Dolbenmaen was almost exactly the same as the parish as given of the Tithe Map of 1838 (Gresham 1973, 370-371). The assessment area is recorded by the 17th century as being part of a farm known as Tyddyn Rhwng y Ddwryd.

In 1637 the lands were demised to John Griffith of Cefn Amlwch by his father in law Sir Richard Trevor, by which time, or shortly after, the lands were purchased from the Crown. John Griffith's heir and brother sold the township in 1719 to Williams Brynker, son of James Brynker of Brynker. A rental of 1721 includes the farm of Plas Dolbenmaen, which is the earliest found reference of the farm under this name. William ran into financial problems, and the lands with the exception of Dolwgan, were sold to William Owen of Clennau and Brogyntyn in 1736, and so passed by marriage to the Ormesby (later Ormesby-Gore) family (Davidson and Evans 2009, 4).

The table below is an extract from the tithe apportionment of 1839 for the parish of Dolbenmaen, covering the study area (outlined on the maps). The landowners, occupiers and field and property names are given, the numbers corresponding to those shown on the tithe map (Fig. 3). The areas are given in statute measure.

Landowner	Occupier	No. on Plan	Name and Description of land and premeses	State of Cultivation	Quantities in Statute measure A R P
			<i>Rhwnyddwryd</i>		
William Ormsby Gore	John Williams	101	Buarth Llwyn	Arable	1 2 31
		102	Cae mawr Uchaf	Arable	4 2 5
		103	Llaen Bryn Rhosedd	Arable	1 3 27
		104	Caer Mawr Uchaf	Arable	3 3 8
		105	Barn and Yards	-	30
		106	-	Waste	2 10
		111	Cae tan y Beudy mawr	Arable	5 2 9
		112	Tan Rallt Glasnrafon	Pasture	1 32
		113	Cae Glan yr Afon	Meadow	2 1 31
		114	Bryn y Sadle	Pasture	7 - 13
			<i>Bryn Efail Isaf</i>		
	William Jones	152	Bryn Rhosedd	Arable	9 - 23
		153	Cae tan draw	Arable	4 3 18

Between the production of the Tithe Map in 1839 (Figure 03) and the 3rd Edition of the Ordnance Survey Map in 1915 (Figure 06), the field system within the assessment area sees several changes through the planting and grubbing up of field boundaries.

The name Pen Bryn yr Orsedd in reference to the rock outcrop is not recorded on the 1st Edition O.S. map but does appear on the 2nd Edition. Fields 02 and 03 were sold as part of 'Lot 7' by their owner Lord Harlech in 1911 (Caernarfon Archives XSC/720; reproduced as Figure 05).

5 ARCHAEOLOGICAL AND HISTORIC ASSESSMENT

5.1 Aerial Photographs

Aerial photographs dating from May 1946 and March 1973 were examined:

- 106 G/UK/1469 4268 04/06/1946
- 73/020 207 21/03/1973
 - The agricultural building immediately to the east of the proposed WTW retained its roof until post 1973, as it is visible on both the 1946 and 1973 aerial photographs.
 - The construction of the current STW occurred between 1946 and 1973.
 - The field boundary (feature 6) was removed between 1946 and 1973, although there is a faint scar indicating its former presence on the 1973 aerial photograph.
 - The field boundary immediately north of Area 'A' has had its vegetation thinned between 1946 and 1973, suggesting a degree of repair or improvement in the intervening period.
 - Areas of river terracing are visible on both the 1946 and 1973 aerial photographs, being particularly clear on the 1973 photograph as an area of darker exposure. GI test pit **TPD05** cut through one of these areas of river terracing and revealed river gravels in its lower layers.

5.2 Site Gazetteer

Seven features were identified directly within or contiguous with the proposed development area, defined as the outline shown on Figure 01; the features are also located on Figure 01. These are initially described listed below with recommendations for further assessment and mitigatory measures, where appropriate (Note: any change to the boundary of the proposed development area will require the recommendations below to be changed also).

The recommendations also only apply when avoidance of the features is not possible. The use of an 'A' after the grid reference of a site indicate an approximate centre point for a larger feature that may cover a wider area, and a 'C' indicates a point on a linear which extends for some distance, for example a wall.

All archaeological features have been assigned a level of importance of 'A' through to 'E', a definition of each of the levels of importance can be found in appendix II. Details of what is proposed at the site were not available at time of writing, and as such the assessment of the impacts upon the archaeological features are classified as 'unknown' or as 'none' when the feature is located outside of the compensation zone.

1	Cloddiau Field Boundary		
Assessment of Importance	C	Impact: Unknown	Mitigation: Avoidance or basic recording prior to development
Description: A Drystone wall constructed in rough courses. The wall is topped with a post and wire fence and survives in total up to about 1.7 m in height. It is probably 19th century in date.			
NGR	SH 4960942971 C		

2	Cloddiau Field Boundary		
Assessment of Importance	C	Impact: Unknown	Mitigation: Avoidance or basic recording prior to development
Description: A Drystone wall constructed in rough courses and covered in places with an earthen bank. The wall is topped with a post and wire fence and survives in total up to about 1.2 m in height. It is probably 19th century in date.			
NGR	SH 4986443055 C		

3	Cloddiau Field Boundary	PRN 31024	
Assessment of Importance	C	Impact: Unknown	Mitigation: Avoidance or basic recording prior to development
Description: A wall constructed of large angular cobbles cemented in place. It measures 1.10m in height and 0.40m in width and divides the field from a single carriage lane which leads to the modern waterworks building. The wall is approximately 40.0m in length and butts onto an earlier field boundary wall (feature 2) which runs northwest to southeast, and follows the line of the original field boundary as first depicted on the 1 st edition Ordnance Survey map. However, this wall does not follow the original boundary line and it is probably 20 th century in date.			
NGR	SH 49774317 C		

4	Cloddiau Field Boundary		
Assessment of Importance	C	Impact: Unknown	Mitigation: Avoidance or basic recording prior to development
Description: A Drystone wall constructed in rough courses and covered in places with an earthen bank. The wall is intermittently topped with a thorn or briar bushes, particularly along the northern section. The wall survives in total up to about 0.2 m in height. It is probably 19th century in date.			
NGR	SH 4996943036 C		

5	Pen Bryn yr Orsedd Rock Outcrop and Earthen Mound		
Assessment of Importance	E	Impact: Unknown	Mitigation: Avoidance, or await results of topographic survey
<p>Description: A rock outcrop and surrounding earthen mound, measuring 44m by 23m and approximately 10m high. Known as Pen Bryn yr Orsedd. Pen Bryn yr Orsedd translates as 'The Seat on top of the Hill', and the location of the mound close to, but outside of a medieval llys complex suggests that it may have been used as an early medieval assembly mound. Assembly mounds which have similar characteristics are known from England, Scotland, Ireland and the Isle of Man (Pantos and Semple (eds.) 2004).</p> <p>The place name 'Dol Pen Maen' is mentioned in the medieval story of 'Math and Mathonwy' as a point where hostages were exchanged between two high – status families (Evans and Evans 2001, 57). Dolbenmaen / Dol Pen Maen translates as 'The Meadow with the Rock at the Head', and the rock in this instance may be Pen Bryn yr Orsedd.</p>			
NGR	SH 4989343099 A		

6	Former Cloddiau Field Boundary		
Assessment of Importance	C	Impact: Unknown	Mitigation: Avoidance or basic recording prior to development
<p>Description: Former line of a field boundary, removed between the production of the Aerial Photograph of 1946 and the production of the Aerial Photograph of 1973. The southern boundary of Area 'B' will be 12.5m to the north.</p>			
NGR	SH 4970942952 C		

7	Former Cloddiau Field Boundary		
Assessment of Importance	C	Impact: Unknown	Mitigation: Avoidance or basic recording prior to development
<p>Description: Former line of a field boundary, removed between the production of the 2st edition Ordnance Survey Map and the production of the 3rd edition Ordnance Survey Map.</p>			
NGR	SH 4989942955 C		

6 DISCUSSION

6.1 Summary of Detailed Recommendations

Feature	Name	Importance	Impact	Recommendation for further evaluation	Mitigation recommendations
1	Cloddiau Field Boundary	C	Unknown	None	Avoidance or basic recording
2	Cloddiau Field Boundary	C	Unknown	None	Avoidance or basic recording
3	Cloddiau Field Boundary	C	Unknown	None	Avoidance or basic recording
4	Cloddiau Field Boundary	C	Unknown	None	Avoidance or basic recording
5	Pen Bryn yr Orsedd Rock Outcrop and Mound	E	Unknown	Topographic Survey	Avoidance, or await results of topographic survey and archaeological evaluation
6	Cloddiau Field Boundary	C	Unknown	None	Avoidance or basic recording
7	Cloddiau Field Boundary	C	Unknown	None	Avoidance or basic recording

*In terms of the upstanding archaeological features within the proposed WTW zone (Features 1, 2, 3, 4, 5, 6 and 7), it is recommended these are either avoided or a **basic record** completed for Features 1, 2, 3, 4 and 5 and a **topographic survey/archaeological evaluation** is completed for Feature 5.*

In terms of known buried archaeological features within the proposed WTW zone (Features 6 and 7), it is recommended that these are recorded if they are exposed during contractor groundworks.

6.2 General Discussion and Recommendations

The walkover survey suggests that at least part of the proposed development area may have undergone some degree of ground improvement or disturbance which may have impacted on any earthfast archaeological remains (TPD05 in particular revealed the difference in levels between the existing ground surface and the truncated ground surface of the current WTW immediately to the west). In this case archaeological remains, if any, would survive as truncated sub-soil features and it is possible, therefore that there is a **low to medium** potential for significant archaeological remains.

Further **archaeological evaluation** through trial trenching is recommended across the WTW zone as a whole in order to ascertain the likely extent of any disturbed or un-disturbed archaeological remains, particularly in relation to the rock outcrop and associated mound

known as Pen Bryn yr Orsedd (Feature 5), which may represent an early medieval assembly mound. The GI results suggested that the southern end of the site at the location of the proposed WTW comprised river terraces beneath shallow topsoil and this area has the potential to include prehistoric activity areas, e.g., Mesolithic lithic scatter.

At the location of *Black and Veatch Ltd* Area 'A', the GI results suggested that the any topsoil removal will impact on any features immediately below, due to the shallow topsoil immediately above the glacial till derived material .

At the location of *Black and Veatch Ltd* Area 'B', the GI results suggested shallow topsoil leading onto glacial till derived material, which indicated that any topsoil removal could impact on any features immediately below.

It is also recommended that a topographical survey of Feature 5 is completed.

Based upon the results of the evaluation stage across the proposed WTW zone, it is possible that further archaeological work will be necessary.

Basic recording of Features 1 through 4 and 6 through 7 will be required if they cannot be avoided during the contractor groundworks.

7. SOURCES CONSULTED

7.1 Primary, Cartographic and Photographic Sources

Gwynedd Archives, Caernarfon

Dolbenmaen Tithe Map 1839

Ordnance Survey 1:2500 1st Edition Caernarvonshire 1889 Sheet XXXIV.1.

Ordnance Survey 1:2500 3rd Edition Caernarfonshire 1915 Sheets XXXIV.3.

*Sale of Valuable Farms, Small Holdings, Accommodation and Building Lands, Freehold Ground Rents with Reversions and Two fully licenced premises in the parishes of Criccieth, Llanystumdwy, Clynnog, Dolbenmaen and Ynyscynhaiarn, by the direction of Lord Harlech: Particulars and Plans of First Day's Sale at the Public Hall, Criccieth on Tuesday, September 12th at 11 o'clock and 3 o'clock, **XSC/720***

Aerial Photographs located at the Central Register of Aerial Photography, Welsh Government, Cardiff

RAF Aerial Photographs

106 G/UK/1469 4268 04/06/1946

Ordnance Survey Aerial Photographs

73/020 207 21/03/1973

Black and Veatch Ltd **174357-30-0001 Revision 0** Dolbenmaen WTW AMP5 Quality Scheme – Extent of Archaeological Survey

Black and Veatch Ltd **174357-30-9000 Revision A** Dolbenmaen WTW AMP5 Quality Scheme – Land Purchase and Land Rental

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7.3 Unpublished Sources

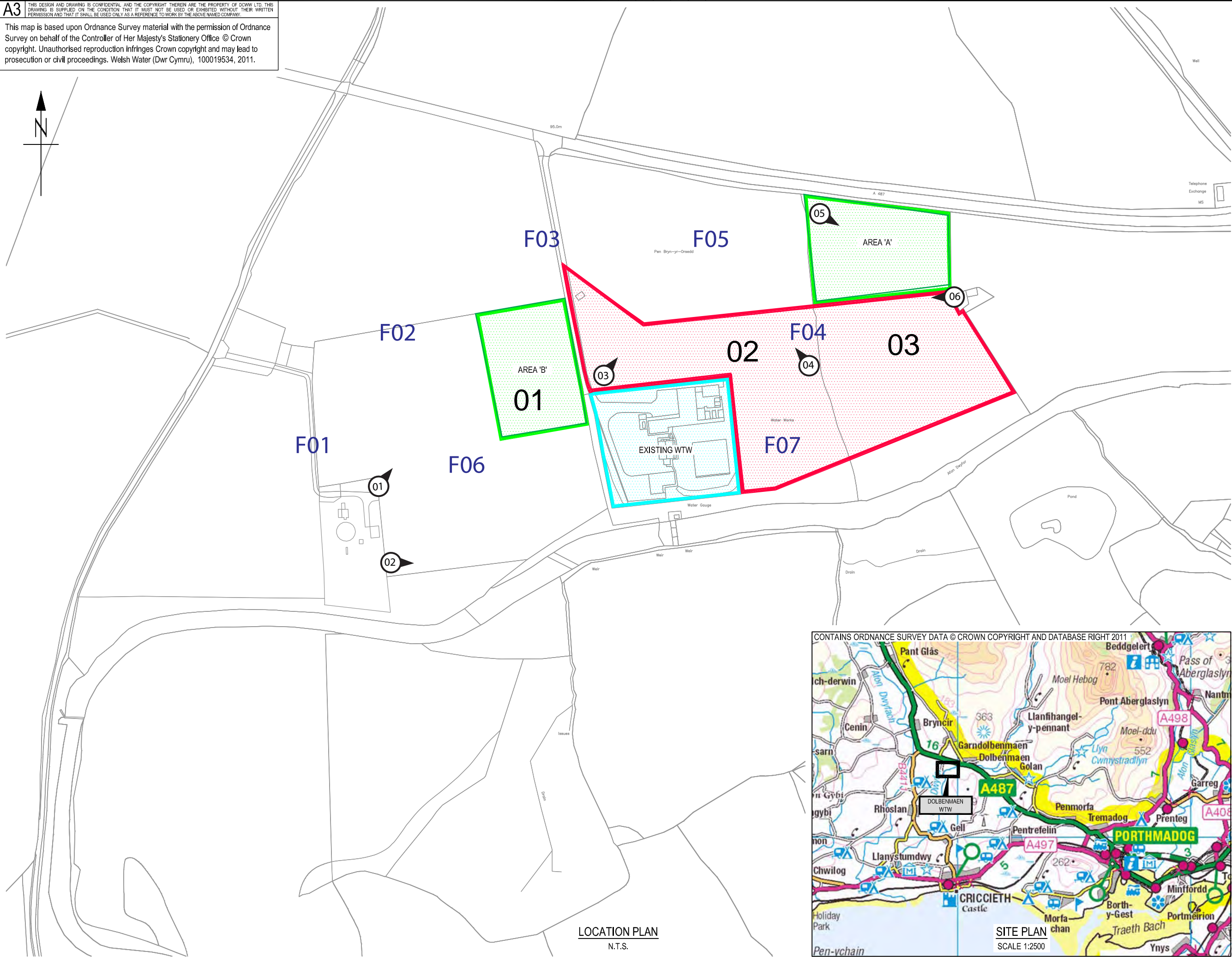
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Historic Environment Record - Gwynedd Archaeological Trust, Craig Beuno, Garth Road, Bangor, Gwynedd LL57 2RT

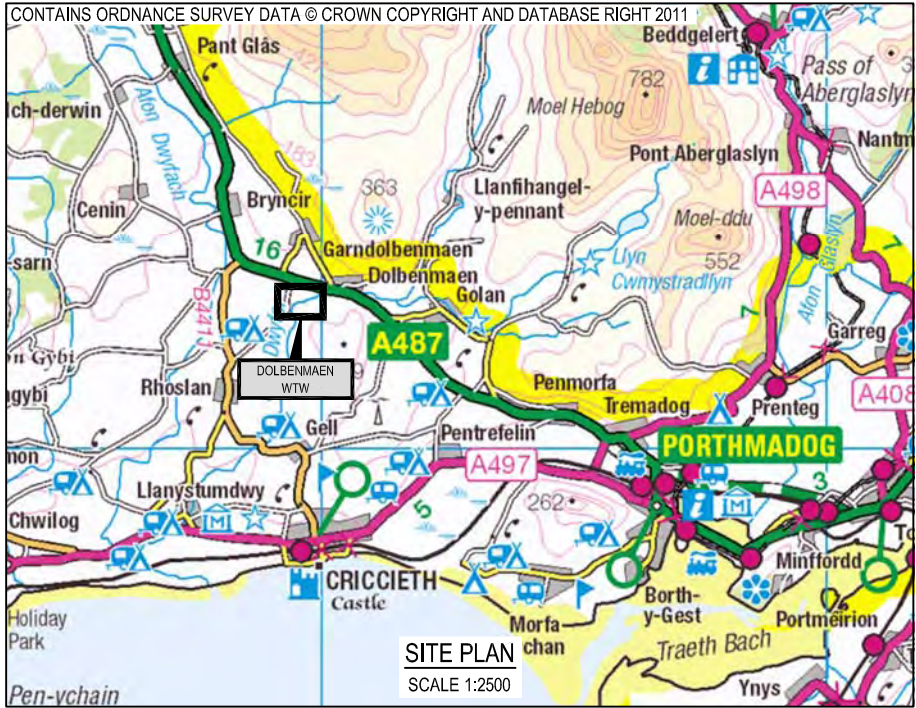
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Hopewell, D. 2007 Roman Roads in North-West Wales (Revision 4), Part 2: Maps. Unpublished GAT Report No. **668**

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LOCATION PLAN
N.T.S.



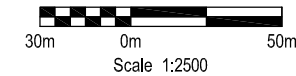
NOTE: THE SCALE RATIOS IN THIS DRAWING APPLY WHEN PRINTED AT A3 ONLY

LEGEND

- EXISTING SITE BOUNDARY
- AREA OF PROPOSED LAND PURCHASE
6.488 ACRE
26255m²
- AREA 'A' PROPOSED LAND RENTAL
1.702 ACRE
6890m²
- AREA 'B' PROPOSED LAND RENTAL
1.496 ACRE
6055m²

- 01 field number
- 01 report plate number
- F01 feature number

Figure 01:
Reproduction of Client
Site Plan
174357-30-9000 with
amendments



Rev	Dim	Chd	Apptd	Date	Description
A	IMN	PJB	RB	30.11.12	FOR INFORMATION

FOR INFORMATION

Date:	30.11.12	Drawn By:	IMN
Drawing Scale:	AS SHOWN	Checked By:	PJB
Original Size:	A3	Approved By:	RB



Scheme Name:
DOLBENMAEN WTW
AMP5 QUALITY SCHEME

Drawing Title:
LAND PURCHASE & LAND RENTAL



Black & Veatch Limited
Grosvener House, 69 London Road, Redhill, Surrey,
RH2 1LQ, United Kingdom
Tel: +44(0)1797 774155 E-mail: bv@bv.com

DCWW Ref:	Status:
Drawing No.	Rev:
174357-30-9000	A

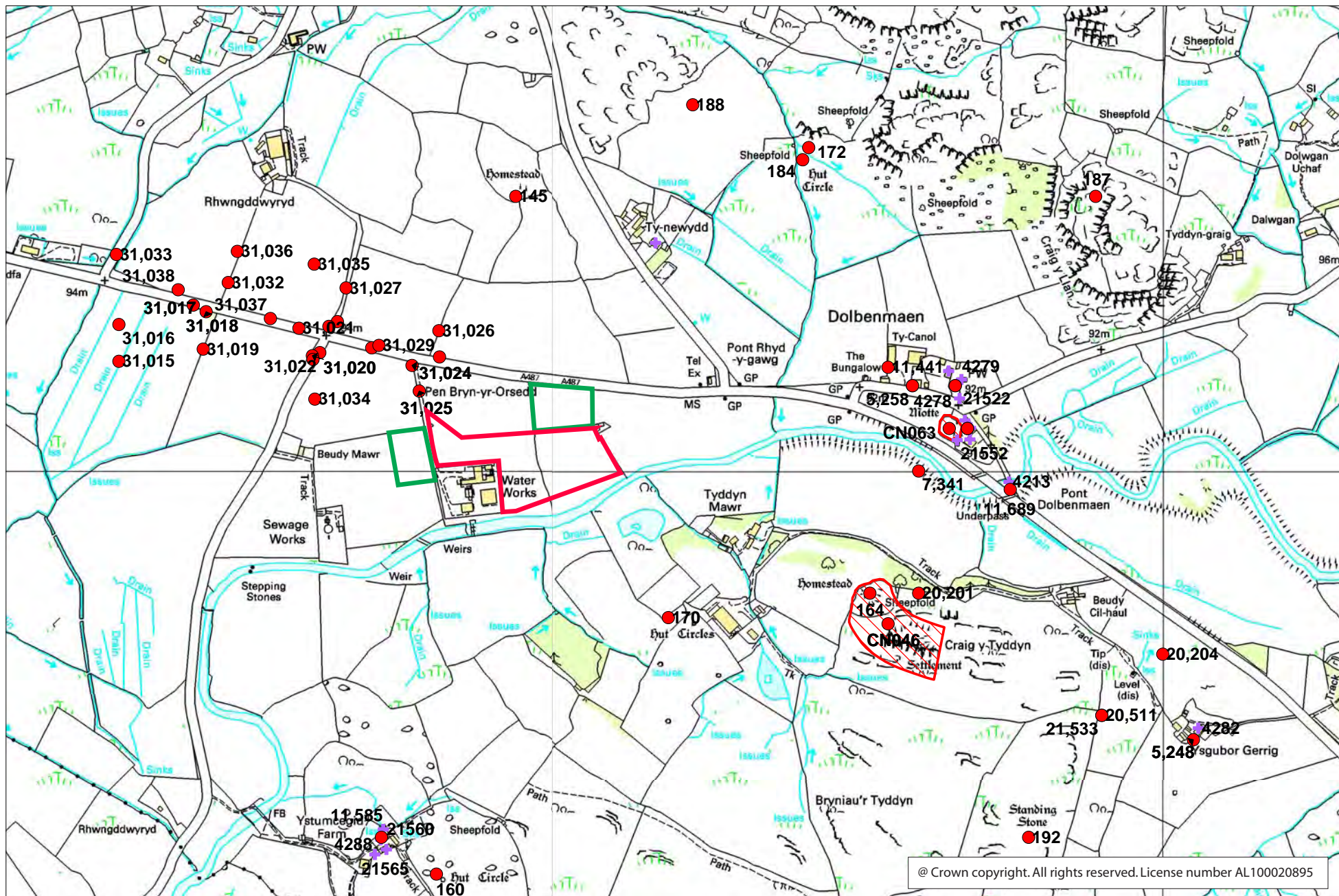


Figure 02: Sites located on the Gwynedd HER (red dots and numbered) and Listed Buildings (purple crosses and numbered), close to the study area are shown. Scheduled Ancient Monuments are shown shaded in red. Study area outlined in green (land rental - ancillary work zones) and red (land purchase - location of proposed water treatment works).

Base map taken from Ordnance Survey 1:10 000 Series sheets SH44 and SH 54. Scale 1:8000 at A4

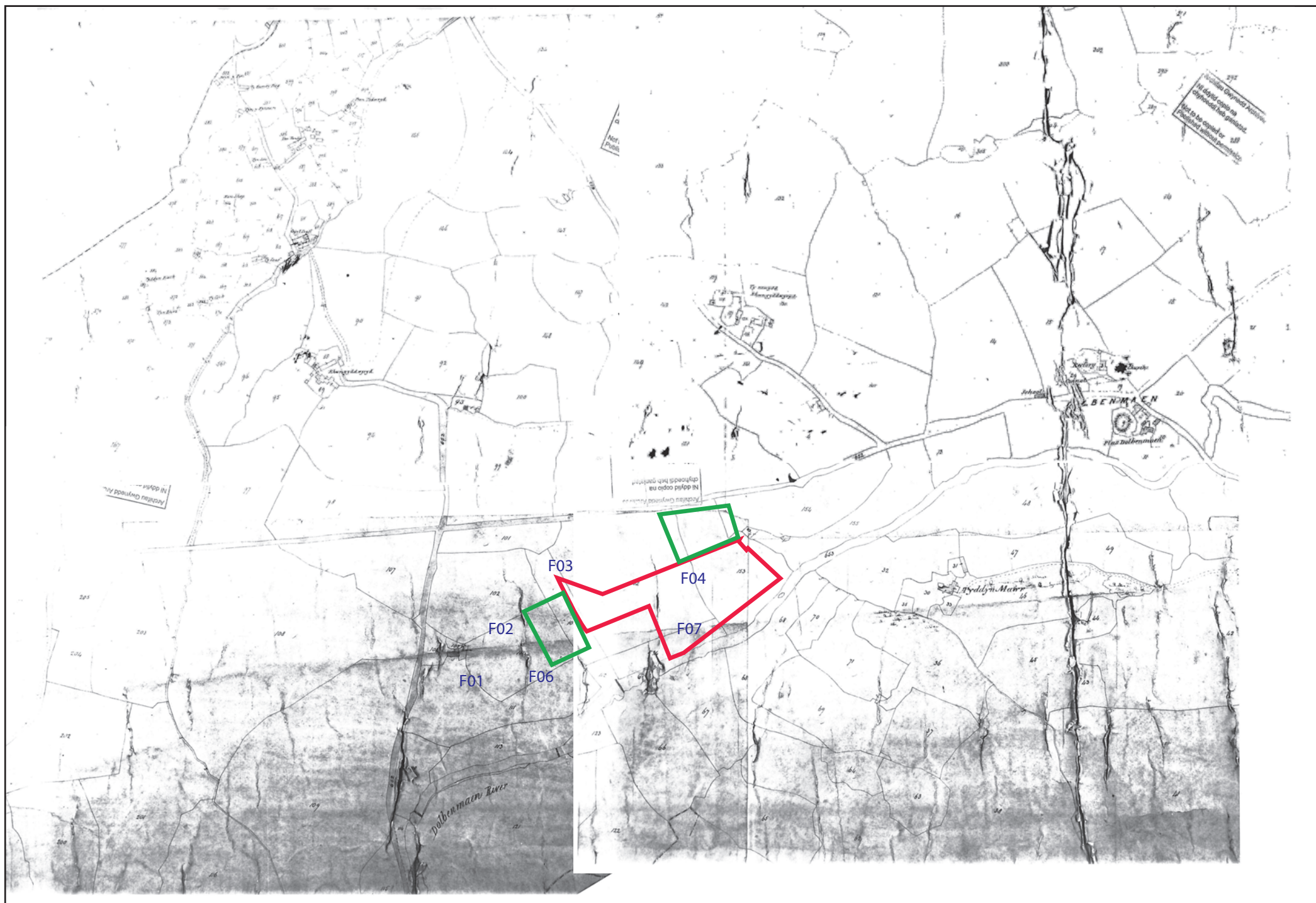


Figure 03: Reproduction of the 1839 Dolbenmaen Parish Tithe Map. The proposed Water Treatment Works Zone assessed is highlighted in GREEN (land rental zones - ancillary works) and RED (land purchase zone - proposed water treatment works). (Scale: not to scale). F02 = Feature Number used in the report

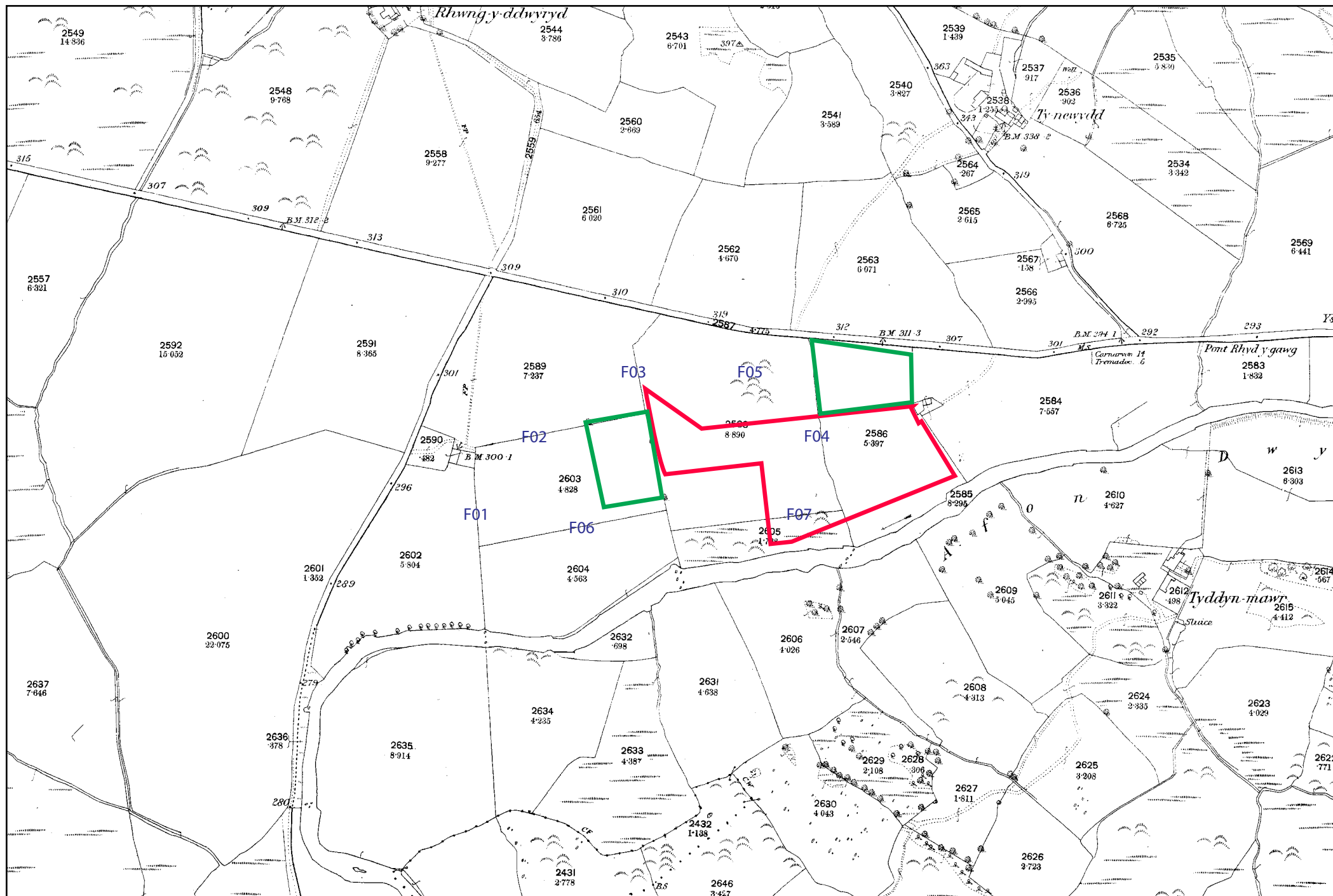


Figure 04: Reproduction of First Edition 25" Ordnance Survey Map 1889 XXXIV.1. The proposed Water Treatment Works Zone assessed is highlighted in GREEN (land rental zones - ancillary works) and RED (land purchase zone - proposed water treatment works) F05 = Feature Number used in the report

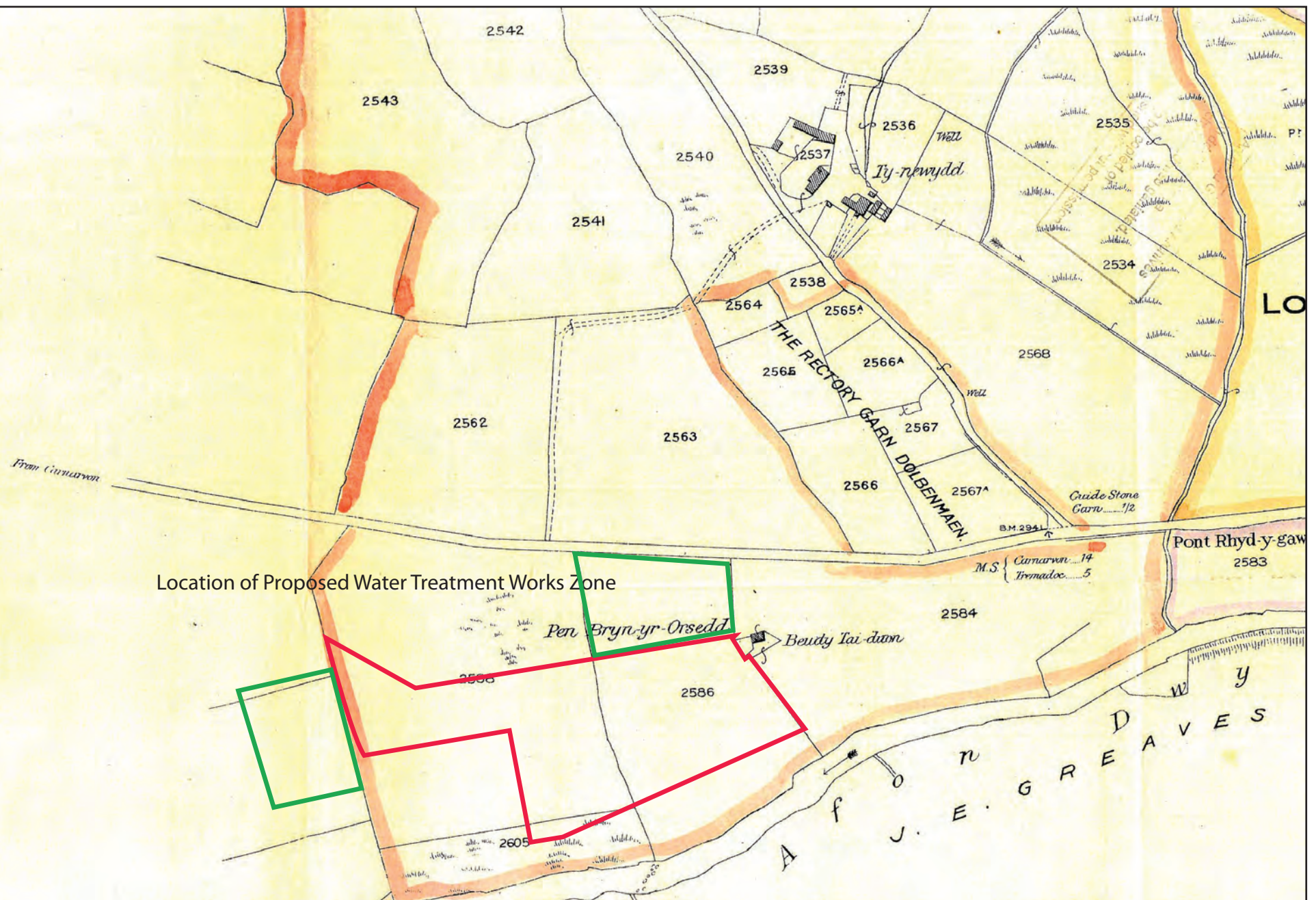


Figure 05: Reproduction of a 1911 sale map entitled "Sale of Valuable Farms, Small Holdings, Accommodation and Building Lands, Freehold Ground Rents with Reversions and Two fully licenced premises in the parishes of Criccieth, Llanystumdwy, Clynnog, Dolbenmaen and Ynyscynhaiarn, by the direction of Lord Harlech" (Gwynedd Archives reference XSC/720). Note the reference to *Pen Bryn yr Orsedd* (GAT Assessment report 1092 Feature 5). The proposed Water Treatment Works Zone assessed is highlighted in GREEN (land rental zones - ancillary works) and RED (land purchase zone - proposed water treatment works)

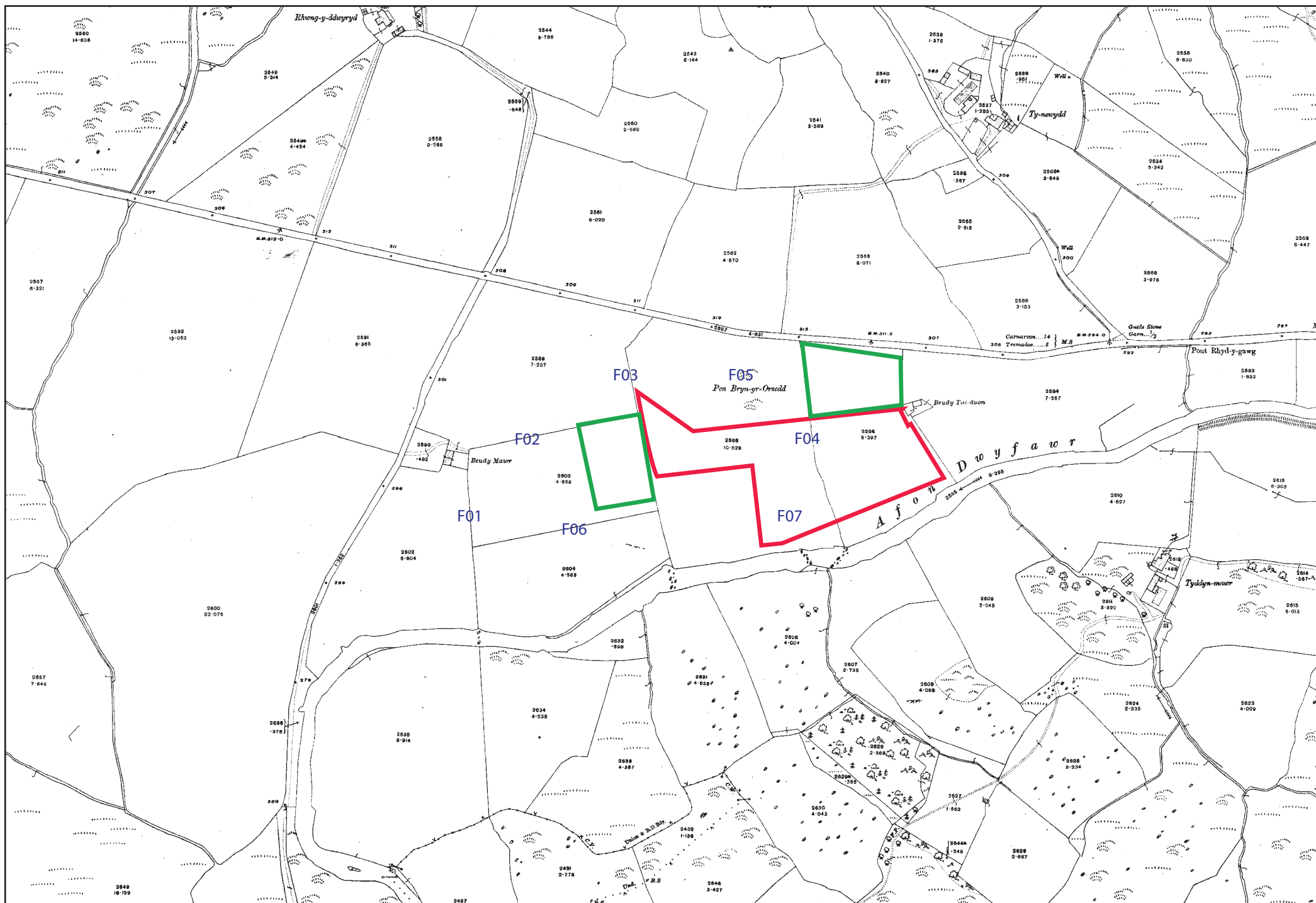


Figure 06: Reproduction of Third Edition 25" Ordnance Survey Map 1915 XXXIV.3. The proposed Water Treatment Works Zone assessed is highlighted in GREEN (land rental zones - ancillary works) and RED (land purchase zone - proposed water treatment works) F05 = Feature Number used in the report



Plate 01 - Field 01: view notheast across View across Field 01 from the north east corner of the existing Sewage Works towards the access road for the Water Treatment Works



Plate 02 - Field 01: view east across Field 01 from the eastern boundary of the Sewage Works towards the Water Treament works showing the break in slope towards the River Dwyfor



Plate 03 - Field 02: View across Field 02 towards the rising ground of 'Pen Bryn yr Orsedd' (GAT Report 1092 Feature 05) from the northwest corner of the Water Treatment Works boundary.



Plate 04 - Field 02: View across Field 02 towards the rising ground of 'Pen Bryn yr Orsedd' (GAT Report 1092 Feature 05)



Plate 05 - Field 03: View across Field 03 towards the River Dwyfor



Plate 06 - Field 03: View across Field 03 towards the rising ground of 'Pen Bryn yr Orsedd' (GAT Report 1092) and the Water Treatment Works

APPENDIX 1

Sites on the Gwynedd HER database and Scheduled Ancient Monuments (SAM), within) \$m of the study area

Sites on the Gwynedd HER

PRN	Name	Form	Site Type	NGR	Period	Description	Status
31034	Trackway, S of Rhwngddwryrd	Trackway	Alignment	SH49614311	Post Med	Location	HER
31028	Road to Ty Cerrig, Dolbenmaen	Road	Site of	SH49604318	Post Med	Location	HER
31022	Wall, S of Rhwngddwryrd	Wall	Site of	SH49613194	Post Med	Location	HER
31024	Wall, S of Rhwngddwryrd	Wall	Site of	SH49774317	Post Med	Location	HER
31025	Road, S of Rhwngddwryrd	Road	Site of	SH49784313	Modern	Location	HER
145	Hut Group (Enclosed), W of Ty Newydd	Ruin	Site of	SH49944345	Prehistoric	Location	HER
170	Hut Circles, SW of Tyddyn Mawr	Ruin	Site of	SH50194276	Prehistoric	Location	HER
31015	Drainage Ditches, S of Rhwngddwryrd	Earthwork	Site of	SH49294318	Post Med	Location	HER
31016	Drainage Channels, S of Rhwngddwryrd	Earthwork	Site of	SH49294324	Post Med	Location	HER
31017	Field Boundary, S of Rhwngddwryrd	Earthwork	Site of	SH49414327	Post Med	Location	HER
31019	Wall, S of Rhwngddwryrd	Wall	Site of	SH49424320	Post Med	Location	HER
31020	Wall, S of Rhwngddwryrd	Wall	Site of	SH49604318	Post Med	Location	HER
31023	Wall, S of Rhwngddwryrd	Wall	Site of	SH49704320	Post Med	Location	HER
31024	Wall, S of Rhwngddwryrd	Wall	Site of	SH49774317	Post Med	Location	HER
31026	Wall, SE of Rhwngddwryrd	Wall	Site of	SH49814323	Post Med	Location	HER
31029	Wall, SE of Rhwngddwryrd	Wall	Site of	SH49714320	Post Med	Location	HER
31030	Wall, SE of Rhwngddwryrd	Wall	Site of	SH49644324	Post Med	Location	HER
31031	Wall, SE of Rhwngddwryrd	Wall	Site of	SH49634323	Post Med	Location	HER
31032	Wall, S of Rhwngddwryrd	Wall	Site of	SH49464330	Post Med	Location	HER
31037	Wall, S of Rhwngddwryrd	Wall	Site of	SH49534325	Post Med	Location	HER
31018	Plantation, S of Rhwngddwryrd	Conifer Plantation	Site of	SH49434326	Post Med	Location	HER
31021	Road, Line of Current A487,	Earthwork	Site of	SH49584323	Post Med	Location	HER

PRN	Name	Form	Site Type	NGR	Period	Description	Status
	Dolbenmaen						
31027	Road to Rhwngddwryd, Dolbenmaen	Road	Site of	SH49664330	Post Med	Location	HER
31033	Road to Garndolbenmaen	Road	Site of	SH49284335	Post Med	Location	HER
31035	Trackway, S of Rhwngddwryd	Trackway	Site of	SH49614333	Post Med	Location	HER
31036	Trackway, S of Rhwngddwryd	Trackway	Site of	SH49384329	Post Med	Location	HER
31038	Clearance Cairn, S of Rhwngddwryd	Cairn	Site of	SH49384329	Post Med	Location	HER
31039	Hedgerow, SE of Rhwngddwryd	Hedgerow	Site of	SH49814318	Post Med	Location	HER
17557	Roman Road Syr 8	Road	Alignment	SH49584323	Roman	Location	HER
17820	Roman Road Syr 8	Road	Alignment	SH49804300	Roman	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, likely, significant, considerable or unknown* as follows:

None:

There is no construction impact on this particular site.

Slight:

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

Unlikely:

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

Likely:

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

Significant:

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

Considerable:

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

Unknown:

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

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 a manner as to

ensure damage does not take place to surfaces that have already been stripped, nor to archaeological surfaces that have not yet been revealed.

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

Watching brief:

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

Avoidance:

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

Reinstatement:

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



Gwynedd Archaeological Trust
Ymddiriedolaeth Archaeolegol Gwynedd

Craig Beuno, Ffordd y Garth, Bangor, Gwynedd. LL57 2RT
Ffon: 01248 352535. Ffacs: 01248 370925. email: gat@heneb.co.uk

