
BETHEL TO FELINHELI RISING MAIN ARCHAEOLOGICAL ASSESSMENT

GAT Project No. G1840

Report No. 533



Trackway, blocked gateway and pedestrian gate close to the Bethel WwTW

Prepared for Galliford Try

By George Smith

21st June 2004



Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

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SUMMARY

An archaeological assessment was carried out in advance of excavation for a new waste water pipeline between Bethel and Felinheli, Gwynedd. The assessment involved the consultation of existing documentary records, maps, aerial photographs and a field search. Sixteen features were recorded of which none were existing Heritage Environment Records.

1 INTRODUCTION

Gwynedd Archaeological Trust was asked by Symonds Group Ltd to carry out an archaeological assessment in advance of the proposed rising main between the existing waste water treatment works at Bethel NGR SH 51606520 and the pumping station at Felinheli, NGR SH 52406755 (Fig. 1) as shown on Black and Veatch Drawing Nos 2469-0000-8003-PO and 2469-0000-8004-PO.

2 SPECIFICATION AND PROJECT DESIGN

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

Gwynedd Archaeological Trust's proposals for filling these requirements were as follows:

- 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 the impact on the cultural heritage can be avoided or minimised.

The archaeological assessment consists of

- Desktop study of records and historical documents
- Field walkover
- Initial report

This report covers these three stages.

This might be followed by a field evaluation if it is considered that there might be features that cannot be assessed just by a field walkover. The field evaluation might take the form of geophysical survey or trial excavation. Such an evaluation would then be followed by a further report stage.

3 METHODS AND TECHNIQUES

3.1 Desk top study

This comprised the consultation of maps, documents, computer records, written records and reference works, which form part of the Gwynedd Sites and Monuments Record (SMR), located at GAT, Bangor. The records held at the Gwynedd Archives, Caernarfon were also consulted as well as aerial photographs held by the Countryside Council for Wales, Bangor. Further information, particularly concerning standing buildings was consulted by means of the CARN (Core Archaeological Index) which is the online index of the National Monuments Record of Wales maintained by the Royal Commission on Ancient and Historic Monuments, Wales.

Sites, buildings and find spots listed in the GAT SMR and RCAHMW records were identified within 1km of the survey area (Fig. 1 and Appendix 2). Most of these give the general background to the potential for relict historic landscapes, which might not be visible in above ground features. Those on or close to the route give a more direct indication of the possible presence of features.

3.2 Field search

The area was visited on several occasions because of difficulty in locating farmers to obtain permission for access. The fields belonging to Bodandreg were not walked over because of lack of permission for access but these were narrow fields and so could be observed closely from the boundary of the adjoining farm of Tyddyn Perthi. Features were noted, described and photographed. Conditions were good for visibility, all the main part of the route being open grassland. All records are archived in Gwynedd Archaeological Trust under the project number G1840.

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, 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 features were then assigned to one of five categories of importance, A-E, A: National Importance, B: Regional or County Importance, C: District or local importance, D: Minor or damaged sites, E: Sites needing further investigation. The definitions of these categories and those used for Impact, Field evaluation and Mitigation are set out in Appendix 1.

4 ARCHAEOLOGICAL RESULTS

4.1 Topographic description

The area is lowland plateau at a height of between 50 to 150m OD. Its soils are brown earths developed over morainic clays and boulder clay over impervious igneous rocks. Most of the soils are classed as Grade 3: Good to Moderate quality with some restrictions as to types of crops. Today the area consists largely of semi-permanent improved pasture with occasional waterlogged hollows of poorer marshy land. Where drained it is of reasonable agricultural quality and this is reflected in the well-settled character of the landscape with fairly numerous and well-scattered small farms (Gwyn and Thompson 2000, 57).

4.2 Archaeological and historical background (Fig. 1)

The agricultural potential of the area means it was well settled in prehistoric times, at least from the first millennium BC. There is some possible evidence for even earlier settlement in the form of a possible ruined Neolithic chambered tomb at Bryn, just north of the route. However, this feature is now thought most likely to be a natural group of erratic boulders. The area was certainly occupied during the second millennium BC because of Bronze Age burial remains found in the 19th century in the gardens of Crug Farm just to the west. These included at least two cremation urns and two bronze pins. One of the latter, now lost was of a rare type, probably imported from the Wessex area and suggests a burial of some status. This again suggests that there was some quite affluent settlement close by. Evidence of activity in the same general period is also probably represented by a standing stone, (PRN 631) at Fodol, just north of Felinheli and a 'burnt mound' (PRN 3470) found on the edge of a marshy area just east of Bodandreg Farm. These features are fairly common, found close to water courses and when excavated generally date to the second millennium BC and are thought to be communal cooking areas associated with hunting or cattle herding.

The main occupation of the area that is recognisable in the archaeological record is during the first millennium BC. The evidence suggests that during this period the area was fairly fully settled by farms forming a community controlled or centred on a major hillfort at Dinas Dinorwic, Llanddeiniolen, 2km to the south-east. This lies on a prominent small hill that gives it a dominant view over this part of the plateau. There are also a few smaller defensive settlements, none of which have yet been excavated, that may represent an earlier period of more localised control. These are at Dinas (Felinheli), Caer (Llanddeiniolen) and Ty'n y Caeau (Llandygai) to which may have belonged some outlying scattered settlement. The main settlement during the later first millennium BC and into the Roman period consisted of a number of individual enclosed or nucleated

settlements such as those at Cae Metta, just south of Bethel. The same pattern probably continued and flourished during the period of Roman control and there are several extensive but fragmentary remnants of field systems and roundhouses, such as those at Prysgol, Llanrug, which have gradually been removed by continuous land improvement. The same is the case in the area along the line of the proposed pipeline, where there are hints of early settlement and agriculture. The best evidence is that of the remains of two roundhouses found and excavated by GAT at Bush Farm prior to the construction of the Port Dinorwic by-pass in 1992 (Johnstone in Longley *et al* 1998). Other traces of possible field boundaries that might belong with this period were also found during the previous assessment work along the line of the by-pass (GAT 1991). There are also the remains of roundhouses and associated fields along the shallow valley of the Afon Cadnant just south of Bethel (PRNs 3698 and 3699). There are other chance finds of objects from the immediate area that indicate the presence of other settlement close by. The nearest to the route of the proposed pipeline is that of finds of Roman coins at Carreg Goch Farm 100m to the west of the route. The exact findspot is not known but the farmer believes from the oral description that it was from just west of the farmhouse. This is a local prominence that has been quarried and it seems likely that the finds were made during quarrying. The topographic position would be suitable for a Romano-British period settlement. Further away, there is a find of a small Roman brooch from Crug Farm 600m to the west of Bethel and quernstones from Cerrig yr Afon at the foot of the plateau 600m to west of the pipeline route.

The area had no major settlement before the development of the slate industry but probably continued to be farmed after the Roman period. There is a sub-rectangular enclosure at Caerlan Tibot close to Crug Farm, which may be of Romano-British or Earl Medieval date. There was also a medieval township close by, the name of which is retained in that of Bodandreg Farm. The first reference to this is in the Edwardian Extent of 1296, which listed nine tenants (GAT 1991, 4). It may well be that Bodandreg itself lies on the site of the house of one of these tenants but no actual medieval settlement or fields have yet been identified. The medieval fields would have been in aggregations of long curving strips. Traces of these sometimes survive in the modern field pattern or in earlier maps but those here seems to have been quite fully reorganised into regular sub-rectangular patterns during their ownership by the Vaynol Estate. However, the field pattern has not been subject to detailed analysis. There are some major curvilinear boundary lines that continue across several properties and these might be remnants of major land divisions from an earlier landscape. One possible example is crossed by the proposed pipeline to the south of Carreg Goch (Feature 7). There are also some fields which retain bi-curved edges, most obviously those around Bodandreg, particularly that crossed by the pipeline route to the west of the farm (Features 9 and 11). These could be relicts of a former open field of strips, the bi-curved shape typical of strip fields ploughed by an ox team, but could also be a rectilinear pattern that was distorted by the topography.

There are a considerable number of features in the survey area belonging to the 19th century when Felinheli developed as a small town based on the slate industry. There were once over 50 shops, now reduced to three. The features include the harbour, slate works, dry dock and tramway as well as the main-line railway and station. The only feature affected by the pipeline construction is the trackbed and embankment of the main-line railway.

The field names are listed on the Tithe Apportionment Survey for Llanfairisgaer and the names for the fields on the route were identified. All are simple names relating to the shape or use of the fields and give no hint at any earlier features except for the one relating to the vanished cottage Tyddyn Conglog (Feature 6).

4.3 The Archaeological Survey

27 archaeological or historic features were identified within the overall survey area by the RCAHMW and 52 by the Gwynedd SMR (Fig. 1), defined as the scheme area shown on the maps supplied (Black and Veatch Drawing Nos 2469-0000-8003-PO and 2469-0000-8004-PO. 16 features were identified on or immediately adjacent to the pipeline route, by desktop study or field survey and these are described below with recommendations for further assessment and mitigatory measures, where appropriate (Fig. 2).

Feature 1 Trackway (Fig. 3)

SH 5158 6530

Period: 18th-19th

Category: C. Impact: Significant

A deliberately constructed trackway providing a route between Crug Farm/Bryn Farm and the crossing of the Afon Cadnant at Penrhos Farm, Bethel. In the rough land around the Bethel Waste Water Treatment Works it is a raised open stony track. North of this field it becomes a double walled wide track so was clearly designed for wheeled vehicles not just a footpath. This was a more direct route than that taken by the present road and is preserved as a public right of way, footpath. It may have originated as part of 18th-19th century estate improvements but could continue the line of an earlier route between Llanfairisgaer Church and the original village community around Penrhos, before the development of Bethel based around the chapels.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

Feature 2 Blocked gateway (Fig. 3)

SH 5158 6530

Period: 18th-19th century

Category: C. Impact: Possible

A gateway for track 1, now blocked by stone walling.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoid

Feature 3 Pedestrian gate (Fig. 3)

SH 5158 6531

Period: 19th century

Category: C. Impact: Possible

A sheet iron 'kissing gate' replacing the wide farm gate 2. One of a type of gate which were common on the footpaths used by quarry workers and their families for access to work and chapels in the 19th century.

Recommendations for further assessment: None

Recommendations for mitigatory measures: Avoid

Feature 4 Possible early land boundary

SH 5193 6567

Period: Pre-19th century

Category: C. Impact: Unlikely

A curvilinear boundary within the existing field pattern that continues across several fields and more than one property boundary as well as crossing the line of the Afon Cadnant. Possibly a Medieval boundary around the hamlet around Penrhos at the Cadnant crossing, predating the development of Bethel. Unaffected by construction as the pipeline trench will run through an existing gateway.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

Feature 5 Track/Path

SH 5199 6578

Period: Pre-19th century

Category: D. Impact: Significant

An old community route formerly connecting the house of Carreg Goch and a former cottage of Tyddyn Conglog (Feature 5). Now preserved as a public Right of Way, Footpath.

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

Feature 6 Site of former cottage Tyddyn Conglog

SH 5200 6569
Period: Pre-19th century
Category: C. Impact: Unlikely

This cottage lay on the edge of the field a few metres east of the pipeline route. It still existed at the time of the 1849 Tithe Apportionment survey and the large low-lying marshy field crossed track/path feature 4 was called Weirglodd Ty Conglog. The land of Tyddyn Conglog is now part of Carreg Goch Farm.

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

Feature 7 Possible early land boundary

SH 5212 6589
Period: Pre-19th century
Category: C. Impact: Unlikely

A curvilinear boundary within the existing field pattern that continues across several fields and more than one property boundary and seems to predate the 18th-19th century rectilinear field pattern. This may be just a result of the field following the topography but could be a Medieval boundary associated with the Township of Bodandreg. Unaffected by construction as the pipeline trench will run through an existing gateway.

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

Feature 8 Possible early land boundary/enclosure

SH 5222 6628
Period: Pre-19th century
Category: C. Impact: Unlikely

An irregular boundary with a sharp curvilinear deviation at about the point where the pipeline will cut it. This may be remnant of a complex pattern of small irregular fields predating the 18th-19th century rectilinear field reorganisation, even a remnant of a Romano-British field pattern. The sharp curvilinear deviation here is not the result of the topography and could be because the earlier field pattern was built on and continued the outline of a curvilinear enclosure, which might have been a Romano-British settlement. The field boundary itself seems to be of normal clawdd construction not a remnant of, or built on an earlier large bank, but this would become clearer when observed during cutting through the boundary line.

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

Feature 9 Possible Medieval land boundary

SH 5240 6671
Period: Pre-19th century
Category: C. Impact: Likely

One of two bi-curved field boundaries, with Feature 11, within the farm of Bodandreg enclosing a curving field that may be a remnant of a medieval open field of strips associated with the Medieval township of Bodandreg.

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

Feature 10 Terrace/lynchet (Fig. 4)

SH 5240 6671
Period: Pre-19th century/Natural?
Category: C/Nil. Impact: Considerable

A shallow terrace runs north-south along the length of this field, approximately following the contours. It is also visible on recent aerial photographs (CCW 2000). This could be the remnant of an earlier plough lynchet, which has survived because the fields of Bodandreg have not been subject to the same degree of ploughing and improvement as other fields in the area and retain many slight undulations in their surface. However, the terrace also runs parallel to the general trend of the underlying bedrock of the ridge and so seems more likely to be of natural geological origin.

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

Feature 11 Possible Medieval land boundary

SH 5247 6675
Period: Pre-19th century
Category: B. Impact: Significant

This is the north side of the possible Medieval field, defined at the south by boundary Feature 9.

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

Feature 12 Crop-mark features – possible roundhouses (Fig. 5)

SH 5255 6718
Period: 1st-4th century AD?
Category: B?. Impact: None

These features lie in a field that is generally quite sloping and hummocky, probably because of underlying rocky outcrops as well as remnants of small quarries associated with the construction or repair of the road at the west. The field has not therefore been ploughed and improved to the extent of other, more level fields on the plateau to the south and east. The field therefore has more permanent pasture than the lush ploughed and resided fields nearby. The recent aerial photographs show considerable mottling in the grass of the field in which there are two possible circular features at the south edge of the field on the line of the proposed pipe trench. These features are marked by darker and lighter vegetation patterns no different from the other areas of mottling over most of the field. They seem most likely to be natural patterns of vegetation growth. However, there is a possibility that they are the sites of Romano-British or Late Iron Age roundhouses similar to the two discovered further to the north at Bush Farm prior to the construction of the by-pass (Johnstone in Longley *et al* 1998).

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

Feature 13 Trackway (Fig. 6)

SH 5264 6751
Period: 18th-19th century

Category: D. Impact: Slight

A trackway runs around the hillside below the curving field boundary at the top of the slope at the west side of Pen-yr-Allt. It connects from Pen-yr-Allt to a few small fields at the foot of the slope just above the old railway line. The track has been built up on the fairly steep slope by the terracing and dumping of a considerable amount of stone. The track is not marked on the 1891 Ordnance Survey map, perhaps because it was just an internal farm track but perhaps was created more recently. The fields themselves down slope are small and surrounded by irregular walls of clearance stone and appear to be at least 19th century if not earlier.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None.

Feature 14 Boundary bank

SH 5263 6751

Period: 18th-19th century

Category: D. Impact: Slight

A low, narrow bank runs across the slope, just down slope of the field boundary at the west side of Pen-yr-Allt. This continues the line of a footpath that runs diagonally up the slope from the west and is likely to be associated with it or may have marked the boundary between the woodland on the slope and the land of Pen-yr-Allt.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

Feature 15 Railway trackbed

SH 5255 6752

Period: 19th century

Category: B. Impact: Considerable

The main railway line from Bangor to Felinheli opened in 1852. The station was closed in 1960 but the line to Caernarfon stayed open until 1970. It was then reopened temporarily in 1972 as a freight shipping terminal instead of Holyhead during the reconstruction of Britannia Bridge (Baughan 1980). The railway trackbed is now re-surfaced as a footpath and cycleway. It is presumed that the line of the track is still a preserved route in case of any future reconstruction of the railway and so the pipe trench will run alongside the track.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

Feature 16 Railway embankment

SH 5250 6750

Period: 19th century

Category: B. Impact: Considerable

The embankment is part of the original railway construction of 1852.

Recommendations for further assessment: None

Recommendations for mitigatory measures: None

5 SUMMARY OF RECOMMENDATIONS FOR MITIGATORY MEASURES

The assessment and mitigatory measures are summarised in Table 1.

Table 1 Summary of assessment and recommended mitigation

Feature No.	Type	Category	Impact	Further assessment	Proposed mitigation
1	Trackway	C	Significant	Nil	Nil
2	Blocked gateway	C	Possible	Nil	
3	Pedestrian gate	C	Possible	Nil	
4	Possible early land boundary	C	Unlikely	Nil	Nil
5	Track/Path	D	Significant	Nil	Nil
6	Site of former cottage Tyddyn Conglog	C	Unlikely	Nil	Nil
7	Possible early land boundary	C	Unlikely	Nil	Nil
8	Possible early land boundary/enclosure	C	Unlikely	Nil	Detailed watching brief
9	Possible Medieval land boundary	C	Likely	Nil	Watching brief
10	Terrace/lynchet	C/Nil	Considerable	Nil	Watching brief
11	Possible Medieval land boundary	B	Significant	Nil	Watching brief
12	Crop-mark features – possible roundhouses	B?	None	Nil	None
13	Trackway	D	Slight	Nil	Nil
14	Boundary bank	D	Slight	Nil	Nil
15	Railway trackbed	B	Considerable	Nil	Nil
16	Railway embankment	B	Considerable	Nil	Nil

There are relatively few known archaeological features in this area because most of it has been intensively improved for agriculture over the centuries. However, there is good evidence that the area was well used in the Romano-British and Medieval periods and so there may be archaeological features that have not been identifiable by documentary and aerial photographic research, or by surface observation. This can be mitigated by a general watching brief during the topsoil stripping and pipe trenching. Most of the features recorded are of low overall value or are linear features for which a single cut will not significantly affect their overall value. The most potentially valuable of these features need to be covered by a watching brief when they are cut for the pipeline and the resulting sections may need to have a detailed (drawn) record made. Potentially the most valuable feature identified is that of the crop marks of possible prehistoric or Romano-British settlement at Bush Farm, Feature 12. These crop marks features are unclear and it is possible that they are natural vegetation marks. However, these are sufficiently far from the proposed route to be unaffected by construction.(Fig 5).

6 DOCUMENTARY SOURCES

6.1 Published sources

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Cadw 1997. *Buildings of Special Architectural or Historic Interest: Y Felinheli*.

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Longley, D.M.T., N.M. Johnstone and J. Evans 1998. Excavations on two farms of the Romano-British period at Bryn Eryr and Bush Farm, Gwynedd, *Britannia* 29, 185-246.

MAFF 1977. *Land Capability Maps*, Ministry of Agriculture, Fisheries and Foods.

RCAHM 1960. *Inventory of Ancient Monuments in Caernarvonshire, Vol. 2, Central*. Royal Commission on Ancient and Historical Monuments, HMSO.

6.2 Non-published sources

GAT 1991. *Port Dinorwic Bypass: Archaeological Assessment*, GAT Report No. 30.

Gwyn, D. and Thompson, D. 2000. *Historic Landscape Characterisation - Ardal Arfon*, Report for Cadw, GAT Report No. 351.

6.3 Cartographic sources

Ordnance Survey 1st ed. 1 inch to 1 mile, 1837, printed with additions 1864.

John Evans Map of North Wales 1795, Half inch to a mile.

Ordnance Survey 1st ed. 6 inches to 1 mile, 1891.

Ordnance Survey 2nd ed. 1:2500, 1901, Sheet XLVIII.1.

Saxton, Map of Caernarfonshire and Anglesey 1578.

Tithe map for the parish of Llanfairisgaer, c. 1841.

6.4 Aerial Photographic sources

Countryside Council for Wales 2000. National cover colour verticals.

Countryside Council for Wales 1940. Anglesey and Menai Straits, Luftwaffe collection.

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APPENDIX 1

DEFINITIONS OF CATEGORIES OF ARCHAEOLOGICAL IMPORTANCE, IMPACT, FIELD EVALUATION AND MITIGATION

1. Categories of importance

The following categories were used to define the value 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 be no sites remaining in this category.

2. Definition of Impact

The impact of the road development on each site 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 road.

3. Definition of field evaluation techniques

Field evaluation is necessary to fully understand and assess 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.

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. Geophysical survey is not thought to be suitable for the feature and subsoil types expected at Fairbourne/Arthog.

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.

4. Definition of Mitigatory Recommendations

None:

No impact and therefore no requirement for mitigation measures.

Avoidance

Where possible, features that may be affected should be avoided. Sometimes this could mean a change in layout, design or route. More usually it refers to the need for care during construction to avoid accidental damage to a feature. This may be achieved by marking features or areas, for example with warning tape, before work starts, or in sensitive cases carrying out a watching brief.

Detailed recording:

Detailed recording requires a photographic record, surveying and the production of a measured drawing prior to the commencement of the works on site.

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

Basic Recording:

A photographic record and full description, and limited measured survey where applicable.

Watching brief:

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

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APPENDIX 2

A: LIST OF ARCHAEOLOGICAL AND HISTORIC FEATURES WITHIN 1 KM OF THE PIPELINE ROUTE RECORDED IN THE NATIONAL MONUMENTS RECORD OF WALES

NPRN	NAME	NGR	SITE_STAT	TYPE	PERIOD
6704	BETHANIA CHAPEL (WELSH CALVINISTIC METHODIST; FELINHELI, Y), PORT DINORWIC (FELINHELI,	SH53246805		CHAPEL	Post Medieval
6931	BETHEL INDEPENDENT CHAPEL, BETHEL	SH52386536		CHAPEL	Post Medieval
6950	SARON METHODIST CHAPEL (WESLEYAN), BETHEL	SH52926547		CHAPEL	Post Medieval
6968	PORT DINORWIC INDEPENDENT CHAPEL (MORIAH), FELINHELI/PORT DINORWIC	SH52476748		CHAPEL	Post Medieval
6969	SALEM BAPTIST CHAPEL, FELINHELI/PORT DINORWIC	SH52286724		CHAPEL	Post Medieval
6970	BRYNMENAI WELSH INDEPENDENT CHAPEL (BRYN-MENAI), FELINHELI/PORT DINORWIC,	SH52096698		CHAPEL	Post Medieval
6971	ELIM METHODIST CHAPEL (WESLEYAN) AND BETHANIA CHAPEL (CALVINISTIC METHODIST), PORT DINORWIC	SH52526762		CHAPEL	Post Medieval
15751	MOEL-Y-DON; THE OLD CUTTER INN	SH51786789	LB2	HOUSE	Post Medieval
26039	BODARBORTH NOS 1,2	SH526678	LB2	DWELLING	Post Medieval?
26060	BODORGAN	SH5368		DWELLING	Post Medieval?
32210	FFYNNON GARMON	SH52566765		HOLY WELL	Medieval?
32585	FELINHELI TELEPHONE CALL BOX	SH531680	LB2	TELEPHONE BOX	Post Medieval
33592	VAYNOL ESTATE GAS WORKS CHIMNEY	SH52396761	LB2	GAS WORKS	Post Medieval
41442	PORTDINORWIC STATION	SH52696768		RAILWAY STATION	Post Medieval
43784	ST MARYS CHURCH (NEW CHURCH)	SH51856684		CHURCH	Post Medieval
54412	CEFN GWYN BURNT MOUND	SH52966675		BURNT MOUND	Prehistoric
56583	BURIAL CHAMBER (POSS), N.E. OF BRYN, FELINHELI	SH51546604		CHAMBERED TOMB	Prehistoric
95308	DINAS CAMP	SH519671	SAM	PROMONTORY FORT	Prehistoric
96228	Y FELINHELI HARBOUR; PORT DINORWIC HARBOUR	SH5267		HARBOUR	Post Medieval
271466	WILL	SH52006700		WRECK	Post Medieval
302076	Y FELINHELI HARBOUR: DOCK SYSTEM; PORT DINORWIC HARBOUR	SH527678	LB2	DOCK	Post Medieval

302077	Y FELINHELI HARBOUR: FORMER DOCK OFFICES; PORT DINORWIC HARBOUR	SH527678	LB2	OFFICE	Post Medieval
302078	Y FELINHELI HARBOUR: SOUTH DOCK AND QUAY WALLS; PORT DINORWIC	SH524677	LB2	DOCK	Post Medieval
302502	CAERLAN TIBOT	SH50716482		DEFENDED ENCLOSURE	Unknown
302513	BRYN GEFEILIAU, BLOOMERY	SH51566432		FURNACE	Medieval
302527	HUT CIRCLE	SH51736455		HUT CIRCLE	Unknown
302528	HUT CIRCLE	SH51436436		HUT	Unknown

B: LIST OF ARCHAEOLOGICAL AND HISTORIC FEATURES WITHIN 1 KM OF THE PIPELINE ROUTE RECORDED ON THE GWYNEDD SITES AND MONUMENTS RECORD

PRN	SITENAME	NGR	STATUS_NO	SITETYPE	PERIOD
35	ROMAN COIN HOARD - FINDSPOT, CARREG GOCH	SH52006610A		FINDSPOT	Roman
36	URN BURIAL, BRYN CRUG, NEAR BETHEL	SH50946524		CREMATION	Prehistoric
56	QUERNSTONES - FINDSPOT, CERRIG YR AFON, FELINHELI	SH51876671		FINDSPOT	Unknown
627	BURIAL CHAMBER (POSS), N.E. OF BRYN, FELINHELI	SH51546604		BURIAL CHAMBER	Prehistoric
793	ROMAN COIN HOARD, QUERN & SPURS - FINDSPOT, VAYNOL	SH52636836		FINDSPOT	Roman
1961	GREUOR, HOUSE, FELINHELI	SH51876548		HOUSE	Post-Medieval
3238	BODANDREG MEDIEVAL SETTLEMENT	SH52706670		SETTLEMENT	Medieval
3424	ENCLOSURE, MOEL Y DON, MENAI	SH51656779		ENCLOSURE	Medieval
3463	HUT CIRCLE, BUSH FARM, FELINHELI	SH52896750		HUT CIRCLE, ENCLOSURE	Roman
3468	ICE HOUSE - POSSIBLE, CRUG FARM, GRIFFITHS CROSSNG	SH50916518		ICE HOUSE	Post-Medieval
3470	BURNT MOUND, BODANDREG, FELINHELI	SH52946675		BURNT MOUND	Prehistoric
3682	DINAS PROMONTORY FORT, Y FELINHELI	SH51906710	C047	FORT - PROMONTORY	Unknown
3683	DINAS - MEDIEVAL BUILDINGS - Y FELINHELI	SH51906710	C047	BUILDING	Early-Medieval
3693	CAERLAN TIBOT, ENCLOSURE, NE. OF CAERNARFON	SH50706480		ENCLOSURE	Unknown
3698	HUT CIRCLES & FIELD SYSTEM, W. OF ADEN, CADNANT	SH51746456C		HUT CIRCLE SETTLEMENT	Prehistoric
3699	HUT CIRCLE, S. OF RHYD Y GALEN	SH51436436	C229	HUT CIRCLE	Prehistoric
4436	CRUG FARM GARDEN, GRIFFITHS CROSSING	SH50906522		GARDEN	Post-Medieval
5428	QUERN STONE - FINDSPOT, "THE BEEHIVE", FELINHELI	SH51696640		FINDSPOT	Prehistoric
6463	OLD CUTTER INN, MOEL Y DON	SH51786789	GII	INN	Unknown

6816	ABERPWLL MEDIEVAL TOWNSHIP	SH53306820		TOWNSHIP	Medieval
7042	SMALL FIBULA - FINDSPOT, CRUG FARM	SH50926489		FINDSPOT	Roman
7226	'THE OLD CUTTER', MOEL Y DON	SH51766790		BUILDING	Post-Medieval
11934	BODARBORTH NOS 1,2	SH52606780	GII	BUILDING	Post-Medieval
12668	FELINHELI TELEPHONE CALL BOX	SH53106800	GII	TELEPHONE BOX	Modern
12705	VAYNOL ESTATE GASWORKS CHIMNEY	SH52396761	GII	GASWORKS	Post-Medieval
15826	BETHEL AND SARON - LANDSCAPE	SH52606540		LANDSCAPE	Multi-period
15853	Y FELINHELI (PORT DINORWIC) - LANDSCAPE	SH52506740		LANDSCAPE	Multi-period
15854	LLANFAIR ISGAER - LANDSCAPE	SH51006590		LANDSCAPE	Multi-period
15879	TIDAL MILL, Y FELINHELI	SH52576786A		CORN MILL?	Medieval; Post-Medieval
15880	OUTER TIDAL QUAY, FELINHELI	SH52496781		QUAY	Post-Medieval
15881	LOCK GATE CONTROL MECHANISM, FELINHELI	SH52566784		LOCK	Post-Medieval
15882	LAMP POST, FELINHELI	SH52556784		LAMP POST	Post-Medieval
15883	OUTER LOCK GATE, FELINHELI	SH52566785		LOCK GATE	Post-Medieval
15884	OUTER LOCK, FELINHELI	SH52596785		LOCK	Post-Medieval
15885	INNER LOCK GATE, FELINHELI	SH52616785		LOCK GATE	Post-Medieval
15886	LOCK GATE CONTROL MECHANISM, FELINHELI	SH52616784		LOCK	Post-Medieval
15887	INNER LOCK, FELINHELI	SH52786792		LOCK	Post-Medieval
15888	SWING BRIDGE, FELINHELI	SH52706787		BRIDGE	Post-Medieval
15889	DRY DOCK, FELINHELI	SH52976798		DRY DOCK	Post-Medieval
15890	SAIL MAKERS' WORKSHOP, FELINHELI	SH52996796		WORKSHOP	Post-Medieval
15891	DOCK SIDE CRANE, FELINHELI	SH52996787		DOCK SIDE CRANE	Post-Medieval
15892	DRY DOCK GATE MECHANISM HUT, FELINHELI	SH52946796		DOCK HUT	Post-Medieval
15893	ELECTRICITY SUPPLY HOUSE, SITE OF, FELINHELI	SH52936794		SWITCH HOUSE	Post-Medieval
15894	DREDGING BUCKET, FELINHELI	SH52726786		Dredging bucket (decorative feature)	Post-Medieval
15895	BRICK EDGING LINE, FELINHELI	SH52786788		RAILWAY?	Post-Medieval
17009	LIMEKILN COVERT, VAYNOL	SH52686842C		PARK; LIMEKILN	Post-Medieval
17020	FREE-STANDING STONE WALLS, VAYNOL	SH52726854		WALL	Post-Medieval
17021	HEDGEROWS, VAYNOL	SH52716853		FIELD BOUNDARY	Unknown

20740	PORT DINORWIC PORT	SH52506780C		PORT	Post-Medieval
20741	INCLINE, PENSCOINS	SH53006780C		INCLINE	Post-Medieval
20744	BANGOR-CAERNARVON RAILWAY, PORT DINORWIC BRANCH	SH53006800C		RAILWAY	Post-Medieval
20745	INCLINE DRUMHOUSE, PENSCOINS	SH53136785		DRUMHOUSE	Post-Medieval

BETHEL TO FELINHELI RISING MAIN

APPENDIX 3

DESIGN BRIEF BY GWYNEDD ARCHAEOLOGICAL PLANNING SERVICE

DESIGN BRIEF FOR AN ARCHAEOLOGICAL ASSESSMENT

Gwynedd Archaeological Planning Service

Site: Bethel to Y Felinheli proposed new pipeline route

Client: Dŵr Cymru

Contractor: GallifordTry Construction North

Date: 18 March 2004

National Grid Reference: 252230 366220

This design brief is only valid for six months after the above date. After this period Gwynedd Archaeological Planning Service should be contacted.

It is recommended that the contractor appointed to carry out the archaeological assessment visits the site of the proposed development and consults the Regional Sites and Monuments Record (SMR) for north-west Wales before completing their specification. Gwynedd Archaeological Planning Service cannot guarantee the inclusion of all relevant information in the design brief.

Key elements specific to this design brief have been highlighted.

1.0 Site Location and Description

- 1.1 For the purposes of this brief the site comprises the route of new underground pipeline, approximately 2.6km long, between Bethel and Y Felinheli.
- 1.2 The proposed route cuts across agricultural land, partly following the alignment of the Port Dinorwic (Y Felinheli) by-pass, before cutting down across a network of small fields to the south-western outskirts of Bethel.
- 1.3 Bethel and Y Felinheli are two settlements situated between Caernarfon and Bangor, on the north-west Wales coast.

2.0 Archaeological Background

- 2.1 A number of archaeological sites are known to exist in the vicinity of the proposed pipeline, including a round house settlement and burnt mound, of prehistoric date.

2.2 Documentation

The following references must be read in conjunction with this brief:

- Anon. 1991. A487 Port Dinorwic Archaeological Assessment. Gwynedd Archaeological Trust report 30. Unpublished report held by the Sites and Monuments Record, Gwynedd Archaeological Trust.
- Fasham, P. 1991. *Archaeology in Wales*. 31, p. 14.
- Gwyn, D. & Thompson, D. 2000. Historic landscape characterisation – Ardal Arfon. Gwynedd Archaeological Trust report 351. Unpublished report held by the Sites and Monuments Record, Gwynedd Archaeological Trust.

3.0 The nature of the development and archaeological requirements

- 3.1 The proposed development comprises plans to lay a new underground pipeline.
- 3.2 This is a design brief for an **archaeological assessment**, to comprise a **desk-based study** and field visit.
- 3.3 The object of this programme of archaeological works is to make full and effective use of existing information in establishing the archaeological significance of the site to assess the impact of the development proposals on surviving monuments or remains
- 3.4 Following desk-based assessments field evaluation work may also be required in order to further assess the presence or absence of remains, their extent, nature, quality and character before determining the appropriate mitigation strategy, whether it be preservation *in situ*, archaeological excavation or a combination of the two.

4.0 Desk-based assessment detail

- 4.1 This *brief* should be used by archaeological contractors as the basis for the preparation of a detailed archaeological *specification* (also known as a project design). The specification must be submitted to the archaeological curator for approval before the work commences.
- 4.2 The assessment must consider the following:
 - a) The nature, extent and degree of survival of archaeological sites, structures, deposits and landscapes within the study area through the development of an **archaeological deposit model**. This deposit model should reflect accurately the state of current knowledge and provide a research framework for further work if necessary. [See 4.3 below for further details]
 - b) The **history of the site**. [See section 4.4 below for further details]
 - c) The potential impact of any proposed development on the **setting of known sites of archaeological importance**. [See section 4.5 below for further details]
 - d) A **methodology for non-intrusive survey and intrusive evaluation** to determine the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be threatened by the proposed development. [See section 4.6-4.8 below for further details]
- 4.3 The **archaeological deposit model** will involve the following areas of research:
 - a) Collation and assessment of all relevant information held in the SMR, including listed building records.
 - b) Assessment of all available excavation report and archives including unpublished and unprocessed material effecting the site and its setting.
 - c) Assessment of all available excavation report and archives including unpublished and unprocessed material relating to Port Dinorwic Bypass excavations at Bush Farm (PRN 3463, Gwynedd Archaeological Trust project G1046).
 - d) Assessment of all extant aerial photographic (AP) evidence and, where relevant, a re-plotting of archaeological and topographic information by a

suitably qualified specialist at an appropriate scale. Many of the main archaeological aerial photographic records can be consulted at the Royal Commission on Ancient and Historical Monuments in Wales (RCAHMW), Aberystwyth. However, the Countryside Council for Wales (CCW), Bangor, also holds AP collections including 1940s Luftwaffe photographs, and these may be equally suited to the requirements of the desk-based study.

- e) Assessment of records held at the RCAHMW and University College Bangor, if appropriate.
- f) Assessment of the environmental potential of the archaeological deposits through existing data or by inference.
- g) Assessment of the faunal potential of the archaeological deposits through existing data or by inference.
- h) Assessment of the artefactual potential of the archaeological deposits through existing data or by inference.
- i) Assessment of all available geotechnical information for the area including the results of test pits and boreholes.
- j) Assessment of the present topography and landuse of the area through maps and site visits.

4.4 **Historical research** will involve the following:

- a) An analysis of relevant maps and plans. Cartographic evidence is held at the County Record Offices, including Tithe Maps, Enclosure Act Plans, Estate Maps and all editions of the Ordnance Survey. Place and field-name evidence from these sources should be considered.
- b) An analysis of the historical documents (e.g. county histories, local and national journals and antiquarian sources) held in museums, libraries or other archives, in particular local history and archives library.

4.5 When considering the **issue of setting** for scheduled ancient monuments, listed buildings and other sites of national and/or regional significance, the SMR should be consulted to determine if the development falls within any designated landscape areas, such as World Heritage Sites and landscape character areas. Of particular importance are the *Register of Landscapes of Outstanding Historic Interest in Wales*, the *Register of Landscapes of Special Historic Interest in Wales*, published by Cadw: Welsh Historic Monuments in 1998 and 2001 respectively.

4.6 The **evaluation methodology** must consider the use of the following techniques:

- a) Ground survey within the core area.
- b) The use of geophysical survey.
- c) A programme of trenching and/or test pits to investigate the deposit model in more detail.

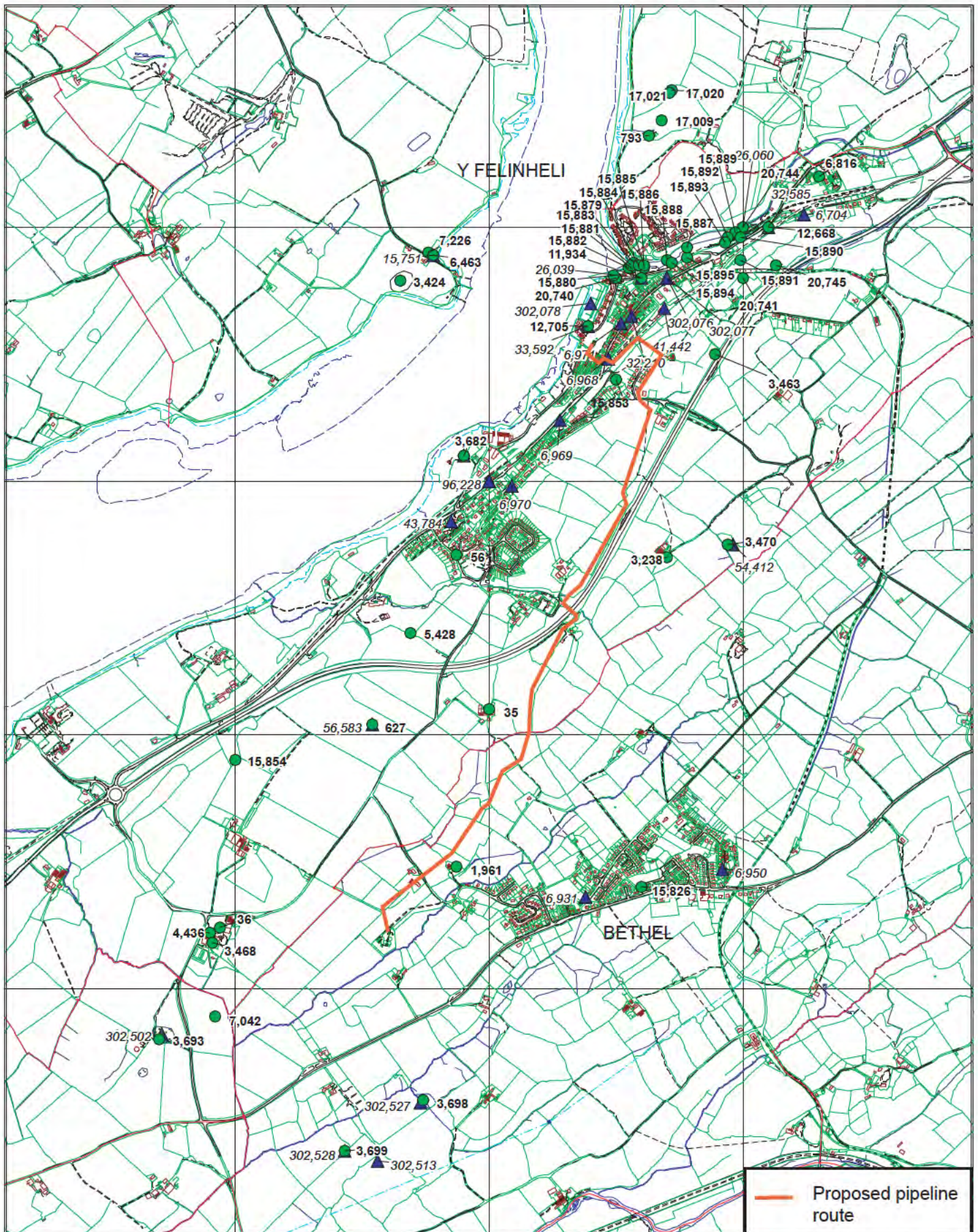
4.7 The evaluation should aim to determine the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be threatened by the proposed development. An adequate representative sample of all areas where archaeological remains are potentially threatened should be studied.

- 4.8 The evaluation should carefully consider any artefactual and environmental information and provide an assessment of the viability (for further study) of such information. It will be particularly important to provide an indication of the relative importance of such material for any subsequent decision making regarding mitigation strategies.
- 5.0 Results
- 5.1 The results must be presented in a report and should be detailed and laid out in such a way that data and supporting text are readily cross-referenced. **The SMR Officer should be contacted to ensure that any sites or monuments not previously recorded in the SMR are given a Primary Recognition Number (PRN) and that data structure is compatible with the SMR.** The historical development of the site must be presented in phased maps and plans comprising clearly, the outline of the site.
- 5.2 The deposit model should be presented graphically in plan and, where appropriate, in profile and at a scale that is commensurate with subsequent use as a working document.
- 5.3 Within the report an attempt should be made to indicate areas of greater or lesser archaeological significance and the sites should be ranked in level of overall archaeological importance (locally, regionally and nationally).
- 5.4 All relevant aerial photographs, re-plots and historic maps must be included and be fully referenced.
- 5.5 The report should specifically include the following:
- a) a copy of the design brief
 - b) a location plan
 - c) all located sites plotted on an appropriately scaled plan of the development
 - d) a gazetteer of all located sites, including full dimensional and descriptive detail
- 6.0 General requirements
- 6.1 The archaeological assessment must be undertaken by an appropriately qualified individual or organisation, fully experienced in work of this character. Details, including the name, qualifications and experience of the project director and all other key project personnel (including specialist staff) should be communicated to the development control archaeologist and all written work attributed to an author (s).
- 6.2 Contractors and subcontractors are expected to conform to standard professional guidelines, including the following:-
- English Heritage's 1991 Management of Archaeological Projects (MAP2).
 - The Institute of Field Archaeologists 1985 (revised 1997) Code of Conduct.
 - The Institute of Field Archaeologists 1990 (revised 1997) Code of Approved Practice for the Regulation of Contractual Arrangements in Field Archaeology.

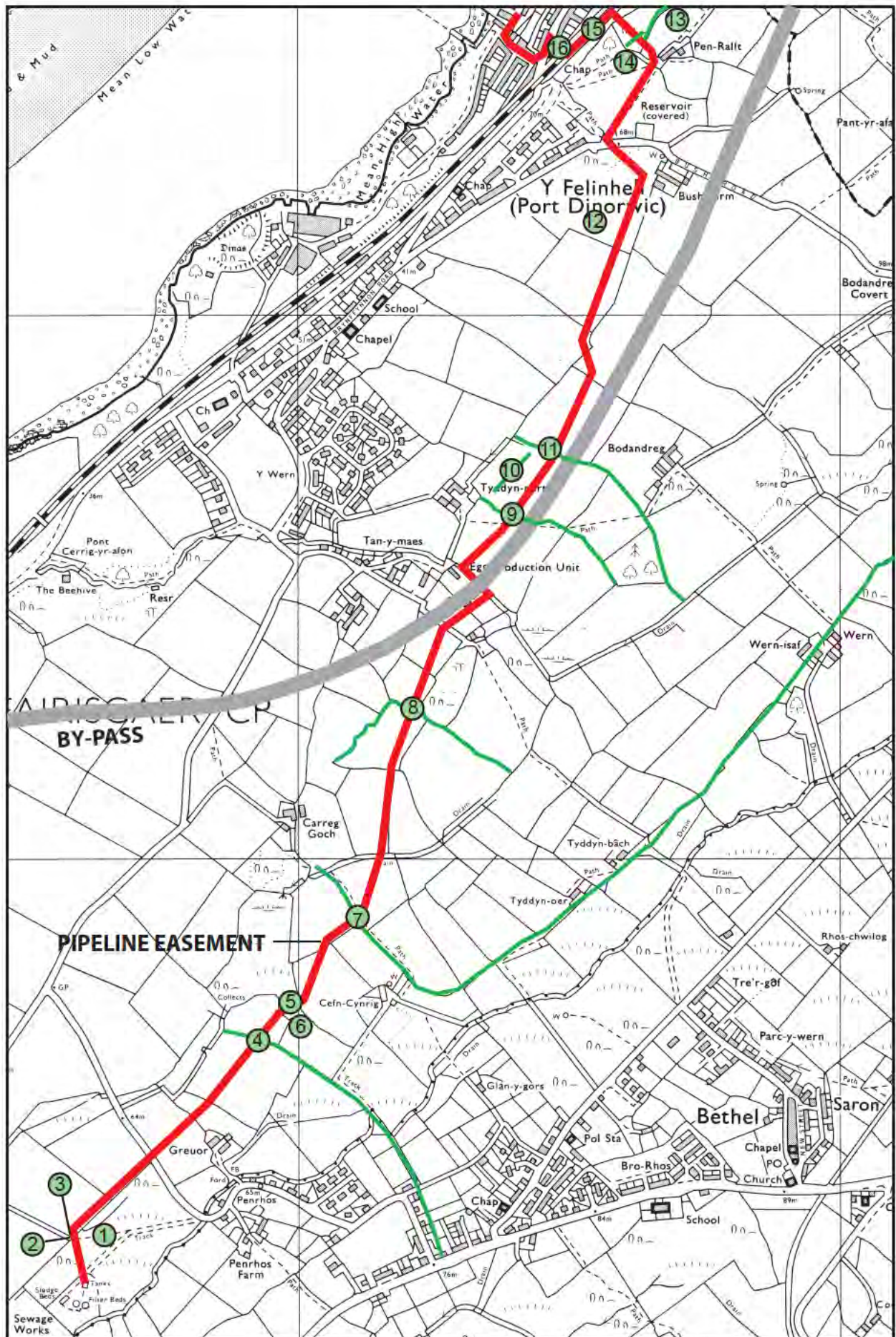
- The Institute of Field Archaeologists 1994 (revised 1999) Standard and Guidance for Archaeological Desk-Based Assessment.
 - The Institute of Field Archaeologists 1994 (revised 1999) Standard and Guidance for Archaeological Watching Briefs.
 - The Institute of Field Archaeologists 1994 (revised 1999) Standard and Guidance for Archaeological Field Evaluation.
 - The Institute of Field Archaeologists 1995 (revised 1999) Standard and Guidance for Archaeological Excavation.
 - The Institute of Field Archaeologists 1996 (revised 1999) Standard and Guidance for the Archaeological Investigation and Recording of Standing Buildings or Structures.
 - The Institute of Field Archaeologists 1999 Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials.
 - Museum and Galleries Commission 1994 Standards in the Museum Care of Archaeological Collections.
 - United Kingdom Institute for Conservation 1990 Guidelines for the Preparation of Excavation Archives for long-term storage.
- 6.3 Many people in North Wales speak Welsh as their first language, and many of the archive and documentary references are in Welsh. Contractors should therefore give due consideration to their ability to understand and converse in Welsh.
- 6.4 Where relevant, specialist studies of environmental, economic and historical data must include a *statement of potential*. All specialist reports used in the preparation of this study must be reproduced in full in the desk-based study.
- 6.5 A full archive including plans, photographs, written material and any other material resulting from the project should be prepared. All plans, photographs and descriptions should be labelled, cross-referenced and lodged in an appropriate place (to be agreed with the archaeological curator) within six months of the completion of the project.
- 6.6 Two copies of the bound report must be sent to the address below, one copy marked for the attention of the Development Control Archaeologist, the other for attention of the SMR Officer, who will deposit the copy in the SMR.
- 6.7 The involvement of Gwynedd Archaeological Planning Service should be acknowledged in any report or publication generated by this project.
- 7.0 Glossary of terms**
- 7.1 *Archaeological Contractor*
A professionally qualified individual or an organisation containing professionally qualified archaeological staff, able to offer an appropriate and satisfactory treatment of the archaeological resource, retained by the developer to carry out archaeological work either prior to the submission of a planning application or as a requirement of the planning process.
- 7.2 *Archaeological Curator*
A person, or organisation, responsible for the conservation and management of archaeological evidence by virtue of official or statutory duties. In north-west Wales the archaeological advisor to the Local Planning Authorities is the

- development control archaeologist, who works to the Welsh Archaeological Trust's Curators' Code of Practice.
- 7.3 *Archive*
An ordered collection of all documents and artefacts from an archaeological project, which at the conclusion of the work should be deposited at a public repository, such as the local museum.
- 7.4 *Assessment*
A desk-based archaeological assessment (also known as a *desk-top assessment*) is a detailed consideration of the known or potential archaeological resource within a specified area or site (land-based, intertidal or underwater), consisting of a collation of existing written and graphic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resource in a local, regional or national context as appropriate.
- 7.5 *Brief*
The Association of County Archaeological Officers (1993) defines a *brief* as an outline framework of the planning and archaeological situation which has to be addressed, together with an indication of the scope of works that will be required.
- 7.6 *Evaluation*
A limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site; and, if present, defines their character and extent, and relative quality. It enables an assessment of their worth in a local, regional, national or international context, as appropriate. The programme of work will result in the preparation of a report and archive.
- 7.7 *Sites and Monuments Record (SMR)*
A documentary record of known sites in a given area. In north-west Wales the SMR is curated by the curatorial division of the Gwynedd Archaeological Trust.
- 7.8 *Specification*
The Association of County Archaeological Officers (1993) defines a *specification* as a schedule of works outlined in sufficient detail to be quantifiable, implemented and monitored.
- 8.0 **Further information**
- 8.1 This document outlines best practice expected of an archaeological assessment but cannot fully anticipate the conditions that will be encountered as work progresses. If requirements of the brief cannot be met they should only be excluded or altered after gaining written approval of the Gwynedd Archaeological Planning Service.
- 8.2 Further details or clarification of any aspects of the brief may be obtained from the Development Control Archaeologist at the address below.

Emily La Trobe-Bateman
Development Control Archaeologist
Gwynedd Archaeological Planning Service
Craig Beuno, Ffordd Y Garth, Bangor, Gwynedd L57 2RT
Ffon/Tel: 01248 370926 Ffacs/Fax: 01248 370925 emily@heneb.co.uk



Bethel-Felinheli Rising Main Fig. 1 Location of archaeological features in the vicinity of the pipeline easement



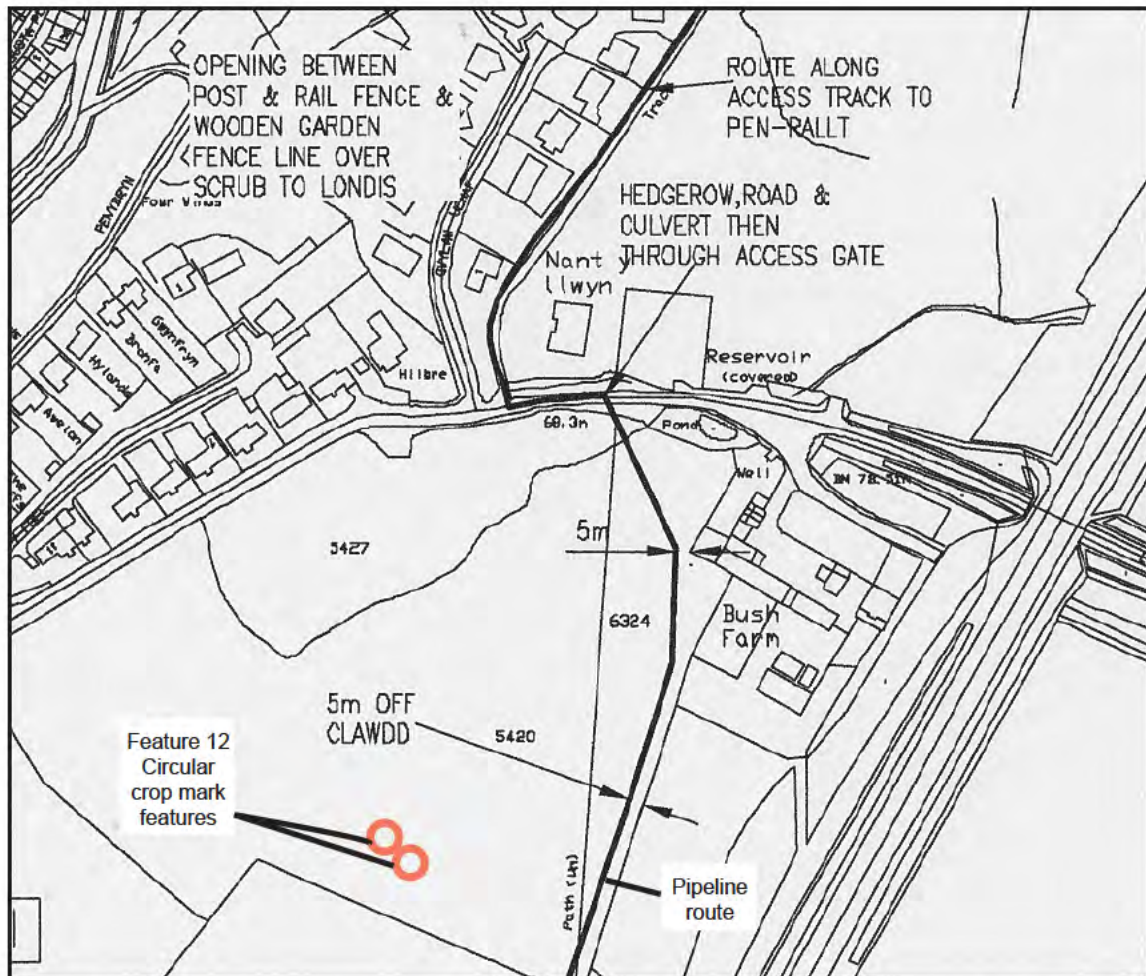
Bethel-Felinheli Rising Main Fig. 2 Location of features identified during the desk-top study and field survey. Scale 1:10,000. Based on OS 1:10,000 scale maps. © Crown copyright. All rights reserved. Licence number AL 100020895.



Bethel-Felinheli Rising Main Fig. 3 Trackway Feature 1, Blocked gateway Feature 2 and Pedestrian gate Feature 3, from the north-west. 1m scale



Bethel-Felinheli Rising Main Fig. 4 Terrace/Lynchet Feature 10, Bodandreg, from the north-west.



Bethel-Felinheli Rising Main Fig. 5 Sketch plot of Feature 12 - Crop marks west of Bush Farm, from CCW air cover 2000. Plotted onto extract from Black and Veatch Drawing No. 2469-0000-8004-PO. Reproduced from the Ordnance Survey with the permission of the Controller of Her Majesty's Stationary Office, © Crown copyright. Licence No. GD03177G. Scale 1:2500.



Bethel-Felinheli Rising Main Fig. 6 Former terraced trackway, Feature 13, west of Pen-yr-Allt. 1m scale.



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