

Penans, Grampound, Cornwall
Report on an archaeological magnetometer survey

Cornwall Archaeological Unit

Report No: 2016R074

Penans, Grampound: results of an archaeological magnetometer survey

Penans, Grampound, Cornwall

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The views and recommendations expressed in this report are those of Cornwall Archaeological Unit and are presented in good faith on the basis of professional judgement and on information currently available.

Freedom of Information Act

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Cover illustration

The interpreted 2016 geophysical survey at Penans

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Abbreviations

CAU	Cornwall Archaeological Unit
CIfA	Chartered Institute for Archaeologists
HER	Cornwall and the Isles of Scilly Historic Environment Record
MCO	Monument number in Cornwall HER
OS	Ordnance Survey

1 Summary

As part of preliminary archaeological investigations in advance of the development of a proposed anaerobic digester plant and gas injection unit at Penans Farm, Grampound, Cornwall, Qila Energy asked Cornwall Archaeological Unit to commission an archaeological geophysical survey of the agricultural enclosure in which the development was proposed. The survey was carried out by TigerGeo Ltd.

Elements of ploughed out field system boundaries were revealed together with indications of ridge and furrow cultivation. Strong anomalies appeared to represent a stone-lined pond and an associated culvert, parts of a probably early 18th century water management system, some of whose components are documented on archive maps. The survey also revealed indications of the site of a probable Bronze Age barrow and a probable late prehistoric or Romano-British a field system, parts of which appear to respect the position of the barrow.

Evaluation of anomalies revealed by the geophysical survey has been recommended by the Historic Environment Planning Advice Officer prior to any groundworks taking place on site in order to truth test the results of the geophysical survey and to determine whether further archaeological recording is required.

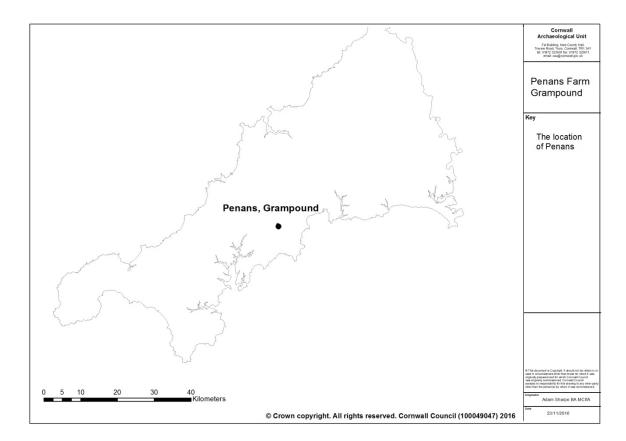


Fig 1. The location of Penans Farm, Grampound, Cornwall.

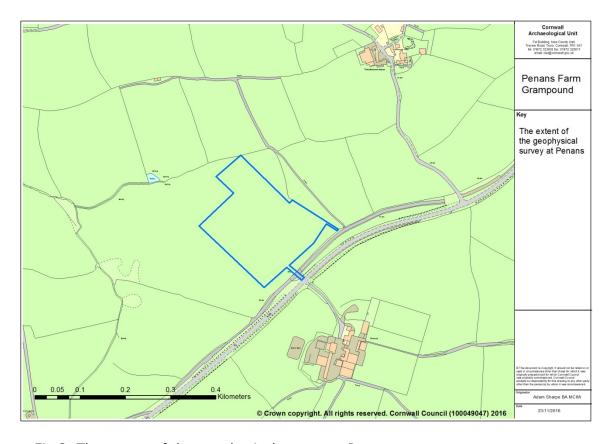


Fig 2. The extent of the geophysical survey at Penans.

2 Introduction

2.1 Project background

As part of preliminary archaeological investigations in advance of the development of a proposed anaerobic digester plant and gas injection unit at Penans Farm, Grampound, Cornwall, Qila Energy asked Cornwall Archaeological Unit to commission an archaeological geophysical survey of the agricultural enclosure in which the development was proposed (Figs 1 and 2). The survey and data management were undertaken by TigerGeo Ltd. in two tranches. The first was undertaken in early August 2016, but only part of the field could be surveyed at the time, owing to a misunderstanding over the extent of the area require to be cleared of its crop. The remainder of the survey was undertaken in mid-October once the remainder of the barley crop had been harvested.

2.2 Aims

The principal aim of the survey was to provide initial data on the sub-surface archaeology of the field at Penans in order to inform an archaeological mitigation strategy during the development stage of the proposal. The objectives were to produce a report on the findings of the survey including recommendations for archaeological recording to mitigate any significant negative effects of the proposals on the sub-surface archaeology of the site which would result from the development, and to produce an entry to the Historic England OASIS online database of archaeological projects.

2.3 Methods

2.3.1 Desk-based assessment

A desk-based assessment of the site was undertaken by Wardell Armstrong in July 2016 (Howell 2016).

2.3.2 Magnetometer survey

Geometrics MagMapper G858 caesium vapour magnetometers were used for the survey, using a high performance sledge mounted acquisition system. The four sensors were sited approximately 0.4m above the ground surface to maximise sensitivity while decreasing the strengths of anomalies from surface, whilst a line separation of 1.0m was used. The along line interval was approximately 0.25m following Historic England guidance. As the ground conditions were suitable the instruments were deployed as an array mounted on a specially constructed nonmagnetic high performance sledge towed by a quad bike at speeds under 10 mph, offering rapid site coverage, limited contact with the ground and a stable measurement platform. The sled-based approach avoids the need for extensive grid set out because real time tracking is provided by a GNSS receiver mounted on the sledge. Coverage is guided by real time track plotting visible to the driver who also monitors instrument data, positioning quality and survey resolution through continuous display on a ruggedized laptop mounted on the quad.

2.3.3 Post-fieldwork

The geophysical field data was subjected to normal potential field processing techniques including reduction of the background regional field and splitting of the resultant residual field into different depth models through analysis in the frequency domain, yielding a shallow data set modelling anomalies likely to originate within the upper 3m of ground and also a pseudo-gradient data set which models the response of a 1m vertical gradiometer.

The data was presented as a series of greyscale images overlaid onto map data georeferenced to the Ordnance Survey grid. A separate catalogue map graphically highlights the most significant anomalies regardless of their origin and also provides a numerical key to a detailed anomaly catalogue included within the TigerGeo report (see Fig 5 in this report). The TigerGeo report highlights significant aspects of the results,

and includes a detailed methodological description, and justification and analysis of the geophysical environment and its impact upon or presence within the data.

3 Location and setting

The survey area at Penans Farm is centred at SW 95263 49210 and extends to 4ha. The postcode for Penans is TR2 4RQ. The site is in the ecclesiastical parish of Grampound with Creed (Fig 1).

The local soils are the well-drained fine loams of the Denbigh 2 Association, these overlying mudstones and sandstones of the Middle Devonian Gramscatho Formation. The agricultural land classification for the site is a mixture of Grade 3 and Grade 2 land.

The Historic Landscape Character of the proposed development area is recorded as Recently Enclosed Land, though since it is in close proximity to the 17th century remodelled Penans Farm and given that the National Mapping Programme has plotted a significant number of enclosed Romano-British farmsteads (rounds) in the surrounding area it should be reclassified as Anciently Enclosed Land (AEL: farmland medieval), that is land which has been in continuous agricultural use since at least the medieval period. The proposed development area is bounded to its south-east by a short section of the former Truro to St. Austell road, and beyond this the line of the modern A390.

4 Designations

No national, regional or local designations apply to the area under investigation.

5 Site history

The archaeological desk-based assessment of the proposed development area indicates that there has been only limited archaeological investigation of the surrounding area and none specifically within the development site until 2016.

The survey area lies within an area which archaeological evidence shows has been at least partly cultivated since late prehistory. The arrangement of field boundaries locally indicates that this area was farmed during the Medieval period, and from at least 1326 this area was part of the farmland of Penans Farm, whose place name is Cornish, from pen (top or head) and nans (valley), describing the settlement's topographical location.

Penans (alternatively spelt Pennans, Pennant and Pennance) was depicted on Gascoyne's and Martyn's maps dating to 1699 and 1740. In some cases Martyn includes the name of the owner next to the farms or settlements. At Penans Martyn recorded the name of Hawkins, this likely to be a member of the family occupying Trewithen House, Probus.

Prehistoric remains in this area tend to consist of a series of relatively large hilltop enclosures rather than scatters of findspots or clusters of smaller monuments. There are some barrows in elevated locations near the site as well as Romano-British enclosures recorded from aerial photographs by the National Mapping Programme in the landscape surrounding the development site. These include Tybesta Round on the hilltop overlooking Grampound, and the cropmark field system and additional enclosures recorded to its south. A particularly well-articulated cropmark complex at Trenithan Bennett to the west Grampound comprises at least eight Romano-British rounds (enclosed settlements) and their associated field systems; there is another example at Carwinnick just to the south of Penans.

The closest recorded Domesday Manor was Tybesta, whose site was located just to the south of the A390 to the west of Penans. This was held by the Count of Mortain following 1066, having been appropriated from Ralph the Constable. Tybesta and Grampound were important early medieval centres within Cornwall. Strip fields or fields derived from agricultural enclosures dating to the medieval period are characteristic of

this part of the Cornish landscape, whilst surviving medieval burgage plots are associated with properties of medieval origin in Grampound. Many local place-names have early medieval or medieval origins.

The place name Penans was first recorded in 1326, when it was spelt *Pennant*. Most of the other farms in the locality, including Nantellan, Trewinnow, Pengelly and Tregensa were first recorded around this date.

The farmhouse at Penans Farm dates back to c1680 though it was remodelled and wings were added to create a 'U' shaped plan circa 1700-1720. An ornamental tree-lined avenue was constructed from the western frontage of the house out in the direction of Tybesta Round. Pennans Farmhouse was, at the time, a high status building, its owners significantly influencing activity in the surrounding landscape. However, by the early 1800s it was recorded that the house and avenue had fallen into decay, probably as a result of the rise of local large post medieval estates including Trewithen and Trewarthenick and the resultant diminution in the importance of Penans.

In 1840, the apportionment for the Creed with Grampound Tithe Map (the earliest detailed mapping available for this site) named the development field *Moor Park*, and described its use as *arable* – the term meaning that it had been cultivated within the past seven years. However, the name of the field suggests that when first named it had been relatively marginal land, and it is notable that it was far larger in extent than the surrounding fields. The field was owned by William Carlyon of Pennance and occupied by Nicholas Donnithorne and by Richard Couch, who also occupied the house at Tybesta. At the time Penans Farm comprised the house, its large walled garden and avenue, a mowhay, orchards, meadows, a plantation and enclosed fields.

Both the Creed Tithe Map and the 19th and early 20th century OS 25" to a mile mapping suggest that water management had become established as an important element of the surrounding landscape by the mid-19th century, probably long before. The larger of the local streams were captured near their sources, fed to a series of ponds and conveyed by a leat to the western side of Grampound, where the settlement's 'Town Mills' (established in 1607) was sited.

The 1878 and 1907 OS maps show few changes to the landscape although they both mark the extent of Tybesta Round and more clearly depict the tree-lined avenue extending westwards from Penans Farmhouse. The avenue probably dates to the early 18th century and was probably deliberately aligned with Tybesta Round as part of an ornamental landscape established within the vistas available from the western frontage of the house. The western section of this feature beyond the A390 ran just to the south-west of the development site; there was initially a brick bridge carrying the drive over the St. Austell road; this was demolished a short while after its construction as it constricted traffic on this route.

During recent years the A390 road has been upgraded into a major route between Truro and St Austell with associated modern infrastructure, whilst the surrounding landscape is increasingly being used for renewable energy installations. A small number of the avenue's original trees survive at its western end.

6 Survey results

See Section 9 for the TigerGeo anomaly interpretations and Figure 6 for locations.

Note: the interpretations of anomalies described differ in some cases to those made by the geophysical survey contractor and reproduced in Section 9 of this report.

The magnetometer survey has revealed evidence for hedgelines associated with two now-removed field systems which clearly predates 1840. There is also evidence for probably medieval ridge and furrow cultivation (features [6] and [13]) which predate at least one of these field systems, the eastern area being crossed by feature [7], a single ditched boundary which runs parallel to the north-eastern boundary of the modern

field. Feature [1] consists of cultivation evidence of unknown date, but which is on alignments other to those used today during ploughing.

The apparently more modern boundaries (though predating 1840) consist of a mixture of double-ditched and single-ditched boundaries. Feature [4], a single ditched boundary, is on an alignment parallel to a hedgeline immediately to the south of the former avenue. Feature [3], a ploughed out gently-curving Cornish hedge with twin flanking ditches on a similar alignment to the ridge and furrow cultivation, appears to butt feature [4] at its southern end, suggesting that they are elements of the same field system. At its northern end it appears to cross feature [2], a single ditched boundary whose western end appears to incorporate a former field corner, suggesting that these two features may not be contemporary. Feature [3] appears to be continued northwards by feature [24]. Feature [7] runs parallel to the eastern boundary of the modern field and is also likely to be part of a post-medieval field system. Feature [17] may also be part of this field system, though is on a slightly different alignment to the elements described above.

A further group of single ditched boundaries appear from their morphology to be likely to represent elements of a late prehistoric or Romano-British field system. This includes features [5] and [12] in the south of the survey area, features [16], [21], [20], [15] and [19] in the central part of the survey area and feature [28] near the northern hedge. Although the north-south aligned sections of [15] and [21] appear as parallel ditches, they may well represent boundaries either side of a trackway between two enclosures. Feature [19] is fragmentary and hence rather difficult to interpret, but may represent further related boundaries. Feature [11] may also represent an element of an early field system.

It was anticipated that, given the proximity of the survey area to a farm which had been in existence since at least the late 17th century (and probably much longer) that the survey would reveal traces of medieval or post-medieval farming activity, and this evidence confirms that there have been several field systems in this area of the landscape on differing alignments from those currently in use.

In the south of the survey area, a strong circular anomaly [18] enclosing an apparently circular feature is considered most likely to represent a Bronze Age barrow. This feature is respected by linear boundary [5] which curves around it to the north. A small subcircular feature [22] immediately to the south of boundary [21] may represent evidence for a small prehistoric roundhouse, though this interpretation would need to be tested. Rectangular feature [26] in the north-eastern part of the survey area is crossed by Cornish hedge [24] and may represent a late prehistoric or Romano-British settlement enclosure. This appears to contain [27] a narrow band of strongly magnetic ground which could represent the remains of a structure.

The data also includes a number of individual small-scale anomalies which represent highly magnetic material. These may be discarded ferrous objects, magnetised rock brought up by ploughing or soil which has been magnetised by heat action.

On the basis of available information the group of unusually strong anomalies adjacent to the north-eastern boundary of the site (8], [9] and [10]) are considered very likely to represent water management features, whilst [23] appears likely to represent spreads of magnetic soil or rock produced during their creation.

In 1840 this field contained three reservoirs or ponds – a square feature in the central part of the northern section of the field (MCO21719 in the Cornwall HER), a sub-rectangular pond at the north-western end of the avenue (which was depicted by a dashed line), and a large triangular reservoir in the north-western corner of the field. This pond was shown as being fed by spring-fed streams from its east and south (running adjacent to the hedgelines bordering the field, the southern springs being to the south of Tybesta to the west of Penans and close to Penbetha (*Pendenbethwy* on the Tithe Map). The water in this pond was carried in a leat around the north of Grampound and then to its west, where it appears to have returned to the River Fal

without serving any mills. This seems unlikely, and the features it served may have disappeared without record. It is, however, possible (as suggested on the Creed Tithe Map) that an extension of this leat can be traced to the south of Grampound where it served the now-demolished medieval Nanclasen Mill at SW 93248 47700 near Creed Wood, this being 3.5km from the triangular pond along the course of the leat. At SW 93281 47548 to the south of Nanclasen Mill this leat appears to re-join the River Fal, though the 1878 OS mapping suggests that it branched just before this point, possibly feeding a large rectangular pond immediately to the west of Creed church, from which a further south-heading channel returned the water to the River Fal just below a nearby weir.

The Tithe Award mapping also showed a further leat exiting the triangular pond, also heading north-west and terminating at Nantellan Farm. The Tithe Award mapping also suggests that the leat formerly branched to the north of Trevithick where it appears at the time to have fed water into the Grampound Town Mill leat.

In 1878, some realignment of the south-western field boundary had taken place, resulting in it becoming straighter than had previously been the case. At this date the first pond (MCO21719) was not mapped, whilst the second was represented solely by an area of marshy ground, the avenue being defined by a double line of trees (Fig 3). The water system feeding and fed from the third pond was still active. A small quarry was shown in the centre of the field. In 1907, the quarry was again depicted but no longer named, the first of the ponds was not mapped, the second pond appeared to be water-filled rather than marshy, and the water system linked to the third pond was in active use, as it remains to this day.

The strong anomalies occupy the eastern edge of the central part of the survey area. Their existence was not predicted from the desk-based assessment, as they seem to be wholly undocumented and were not recorded as cropmarks by the National Mapping Programme. However feature [8] is visible in two CAU aerial photographs dating to August 2009; guided by the geophysical survey results feature [9] is also just visible in these images (Fig 4). Feature [8] is recorded as MCO55627 in the Cornwall HER (where it is currently interpreted as a medieval field boundary). The anomalies consist of an approximately square feature [9] approximately 18m to a side sited next to the northeastern boundary and an apparently associated linear feature immediately to its north [8] which heads off to its west-south-west, but which curves gently downslope at its western end. Both of these features ([9] and [8] and the fill of [9] - [10]) are strongly magnetic. On available evidence feature [9] has been interpreted as being constructed of either stone or un-reinforced concrete. Its fills [10] are also strongly magnetic. Feature [8] has also been interpreted as having a stone or peat fill, though might be a voided feature. Areas of strongly magnetic soil or rock to the south of [8] in the western part of the project area seem likely from their proximity to [8] to represent spoil dumps.

On the available evidence, only a hypothetical interpretation of these features can be attempted. The margins of this field historically sited a number of artificial water management features, and there are a number of documented springs on its northern periphery. At least some of these springs fed the leat taking water to the west of Grampound; this is likely to be an important medieval or post-medieval feature, the water having been used to power the town mill near the settlement. The pond at the north-western end of the former avenue may well have originated as the headstock for the medieval fulling mill 100m to its east, but was might also have been adapted as an ornamental feature during the early 18th century, as it formed the western end of the avenue. It might also have had a practical use as a fowling pool. Most of the landscape embellishments at Penans dating to this period have been lost to agricultural improvement, and only traces of the pond now survive.

It seems almost certain that feature [9] represents a further pond and feature [8] a leat or culvert. Whether these were constructed for practical purposes as part of the system feeding water from local springs into the Grampound leat, ornamental features

(this seem unlikely given its spatial relationship with the house) or part of a domestic or agricultural water storage and supply system cannot be determined given that only the eastern section of feature [8] has been mapped. However, CAU aerial photographs F94-129 (Fig 4) and F94-130 show that feature [8] links feature [9] with the documented pond to its west (shown on both Figs 3 and 4). In turn this pond may well have supplied that at the end of the avenue, and may also have been used to supplement the flows in the Grampound leat.

Dating these features is impossible on currently-available evidence, though it would seem most likely that they date to the period between 1680 and the 1720s when Penans was being upgraded. Some elements of the water management system in the landscape to the north and north-west of Penans Farm may, however, be medieval in origin.

7 Significance

The geophysical survey carried out in 2016 on part of Penans Farm, Grampound has revealed elements of a complex multi-period farming landscape. Its earliest elements appear likely to be likely to be prehistoric in date, though the survey area also includes evidence for medieval ridge and furrow cultivation and several phases of reorganisation of field boundaries during the post medieval period prior to 1840. The site also includes evidence for a probable Bronze Age barrow which is likely to pre-date the earliest field systems on the site, as well as for one rectangular enclosure and a possible prehistoric round house. The elements of an apparently late prehistoric field system, the enclosures and the barrow are potentially of national significance.

If, as seems to be the case, features [8] and [9] represent the sub-surface remains of parts of an early 18th century water management system, quite probably elements of a designed ornamental landscape associated with Penans, these features are relatively rare and of also of some interest and significance. Their investigation would add considerably to our understanding of the way in which the landscape to the north-west of Penans was remodelled during the period from 1680 to 1720 when the farm was being developed into a local high status site.

8 Recommendations

The Historic Environment Planning Advice Officer has recommended that features revealed by the geophysical survey should be investigated by archaeological evaluation trenching. A proposal to address this requirement has been drawn up by CAU. Of particular interest are the probable barrow [18], the rectangular enclosure [26], the possible roundhouse [22] and the probable elements of late prehistoric field systems [[28], [20], [21], [15], [16], [5] and 12]. The probable post-medieval reservoir [9] and culvert [8] are also potentially of significance. Whilst some parts of the survey area appear 'blank' it should be noted that a soil strip and watching brief carried out in the south-eastern part of this field during the initial development phase of works for a gas injection unit revealed a feature of possibly Neolithic or Early Bronze Age date (Britton 2016). There is the potential for some of the other point anomalies scattered throughout the survey area to represent similar features.

9 Inventory of geophysical anomalies

See Figure 6 in this report.

Label	Anomaly type	Feature type	Description
1	Texture	Natural (geological) and cultivation	A weak banding from the sandstone is crossed at right angles by relict (though perhaps modern) cultivation furrows.
2	Linear enhanced	Fill – Ditch – Former boundary?	Probable field boundary, perhaps part of a system with [3] and [4]. But if so it is peculiar that [3] seems to cross it.
3	Linear enhanced (group)	Fills – Ditches – Former boundary	Cornish hedge, fits with [4] but not well (except in terms of angle) with [2].
4	Linear enhanced	Fill – Ditch – Former boundary?	Seems to fit with Cornish hedge [3] and would be an example of a field system defined by an arbitrary-looking mixture of single and double-ditched boundaries.
5	Linear enhanced	Fill - Ditch	Perhaps an earlier edition of former boundary [4] or part of an enclosure that a later field system incorporated within itself?
6	Texture	Cultivation	This appears to be ridge and furrow type cultivation, perhaps respecting or respected by former boundary [3] and perhaps also by the extant NE hedge. It appears to cut structure [9]. The curving anomalies and their separation seem more typical of cultivation than drains.
7	Linear enhanced	Fill – Ditch?	Possible former boundary, parallel to the extant NE hedge.
8	Linear reduced	Fill - structure	A curving reduced field anomaly typical of a stone or peat fill or a void sweeps across the field and exits through or at the NE field boundary. It changes form slightly as it passes adjacent to structure [9] which has a similar form and anomaly strength. It seems likely that the two are related, indeed connected, in some way. Given the history of water management in the area (Sharpe, pers comm) a large stone culvert seems possible.
9	Strong linear reduced (group)	Structure	A roughly square shape about 18m on a side enclosed by a strongly reduced magnetic field anomaly typical of stone or un-reinforced concrete. It encloses strongly magnetic area [10]. A stone-lined pool is possible, probably connected with possible culvert [8].
10	Strong enhanced area	Fill - structure	Interpretation of this depends to some extent upon the nature of [9], but this anomaly marks a strongly magnetic material, perhaps ferrous metal or an accumulation of process debris or heated soil. It is enclosed by [9] so must be part of

			this.
11	Linear enhanced (group)	Fills - Ditches?	Possible enclosure ditch fills, uncertain as somewhat masked by other variation.
12	Linear enhanced	Fill - Ditch	Uncertain extent and function, potentially a former field boundary or might relate to [5].
13	Texture	Cultivation	Probable furrows, maybe modern rather than the ridge and furrow of [6], however, if former boundary [4] marked a medieval division then this could also be ridge and furrow.
14	Texture	Natural	Patches of both enhanced and reduced magnetic field strength probably reflects variations in soil depth caused by prolonged arable activity smoothing out irregularities in the natural topography.
15	Weak linear enhanced (group)	Fills – Ditches - Field boundary	Former Cornish hedge.
16	Linear enhanced	Fill – Ditch – Field boundary	Probable former filed boundary, contemporary with [3] and [15], or perhaps inserted between these.
17	Weak linear enhanced	Fill?	Possible fill, perhaps against a former bank rather than within a ditch? Uncertain anomaly.
18	Strong linear enhanced	Fill – Ring ditch	A strongly magnetic, potentially rock-cut, circular ditch fill approximately 20m in diameter. Within the ring there are signs of further annular or circular features. The diameter and nature of the complex strongly suggests a Bronze Age burial mound may have been present and the apparent deflection of ditch fill [5] around it would be typical.
19	Linear enhanced (group)	Fills – Ditches / Cultivation	Uncertain, contained within enclosure defined by [20] and maybe linked with weak signs of cultivation perhaps crossing [2], [8] and [23].
20	Linear enhanced	Fill - Ditch	Apparently fairly deeply buried (relative to other features) is this ditch fill from an enclosure extending uphill to the south. It is one of a series with [21] and most likely also [24].
21	Linear enhanced (group)	Fills – Ditches – Field boundaries	See [20] – this example appears to be double and hence probably a Cornish hedge and therefore contextually linked with [3] and [24].
22	Weak linear enhanced	Fill?	Uncertain, possibly a small feature and possibly also natural.
23	Strong variable dipolar	Debris / Structures – Fills	Quarry pits? Ferrous debris? Both?

	(group)		
24	Linear enhanced (group)	Fills – Ditches – Field boundaries	The southern end of this Cornish hedge is, like [21] and [20] only weakly magnetic and with the anomaly suggesting a greater depth of burial. It again appears to define the edge of a former field system.
25	Linear enhanced (group)	Fills - Ditches	Possibly narrow ditch fills, maybe related to [7] based upon its alignment.
26	Linear enhanced (group)	Fills – Ditches - Enclosures	A small rectangular enclosure a little over 20m square and defined by ditches abuts the eastern side of Cornish hedge [24]. The southern limb appears to cross the line of the hedge for a short distance, as if the enclosure continued to exist after disuse of the hedge, unless there is a narrow entrance through the latter at this point. The fills are mostly significantly more magnetic than those of the Cornish hedge which implies different volume or chemistry and perhaps also focussed activity.
27	Area enhanced	Fill / Spread?	Within enclosure [26] there is a narrow band of strongly magnetic ground that appears associated with the southern edge of the enclosure. This could be the remains of a small structure or an area of modified soil.
28	Strong linear enhanced	Fill - Ditch	Possible former field boundary, again, like the fills of [26], more strongly magnetic than those of the adjoining Cornish hedge.
29	Texture	Natural	A large area of the lower lying part of the survey is associated with uniform magnetic field typical of alluvial fill. It lacks convincing signs of former enclosures or other activity and may always have been damp marginal ground.

10 References

10.1 Primary sources

Ordnance Survey, c1880. 25 Inch Map First Edition (licensed digital copy at CAU)

Ordnance Survey, c1907. 25 Inch Map Second Edition (licensed digital copy at CAU)

Ordnance Survey, MasterMap Topography

Tithe Map and Apportionment, c1840. Parish of Creed (licensed digital copy at CRO)

10.2 Publications

Britton, G. 2016, *Penans Farm, Grampound, Cornwall: archaeological watching brief, Phase 1*, CAU report No 2016R055 for Qila Energy

Howell, A. 2016, *Penans Farm, Grampound, Cornwall: cultural heritage*, Wardell Armstrong report number PE10701 for Qila Energy

Roseveare, M. 2016. Penans Farm, Grampound, Cornwall: geophysical survey report, project code PGC161

10.3 Websites

http://www.heritagegateway.org.uk/gateway/ Online database of Sites and Monuments Records, and Listed Buildings

11 Project archive

The CAU project number is 146645

The project's documentary, digital, photographic and drawn archive is maintained by Cornwall Archaeological Unit

Electronic data is stored on the CAU system in the following locations:

Project admin: \\Sites\Sites P\Penans Grampound GEU and AD development

Historic England/ADS OASIS online reference: cornwall2-296412

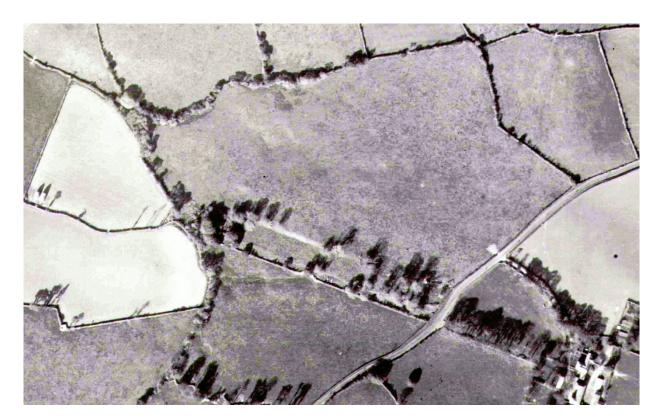


Fig 3. An extract from a 1946 RAF aerial photograph of Penans, showing a rectangular reservoir to the left of the north centre of the field, and the remains of the avenue along the south-western edge of the field.



Fig 4. An extract from CC HER aerial photograph F94/129 covering the northern part of the field, showing (green) the western reservoir and running through the crop towards it from feature [9], hints of culvert [8].



Fig 5. Total magnetic intensity plot results for Penans.



Fig 6. Interpreted geophysical survey results from Penans.

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