Report No: 2012R008

Higher Tregawne, Withiel, Cornwall

Archaeological assessment of proposed wind turbine

Historic Environment Projects

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Client	**Bowler Energy**
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Acknowledgements

This study was commissioned by Suzanne Love of Bowler Energy and carried out by Historic Environment Projects, Cornwall Council.

The viewshed mapping was carried out by Francis Shepherd, whilst the geophysical survey was carried out by GSB Prospection.

The views and recommendations expressed in this report are those of Historic Environment Projects and are presented in good faith on the basis of professional judgement and on information currently available.

Freedom of Information Act

As Cornwall Council is a public authority it is subject to the terms of the Freedom of Information Act 2000, which came into effect from 1st January 2005.

Historic Environment, Cornwall Council is a Registered Organisation with the Institute for Archaeologists

Cover illustration

Looking south east from St. Breock Downs towards Hustyn Downs. The arrow indicates the location of the proposed wind turbine, but is not intended to convey an impression of the height of the turbine mast.

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Abbreviations

EH	English Heritage
HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
NGR	National Grid Reference
OS	Ordnance Survey

1 Summary

Planning application PA11/07746 was submitted on the 13th September 2011 for the installation of a single 50kw wind turbine mounted on a 36m high monopole mast. A brief for site investigation was prepared by the Historic Environment Planning Advice Officer (East), Cornwall Council, and HE Projects were commissioned to carry out an assessment of the potential impacts of this proposal on 24 January 2012. Geophysical survey of the area surrounding the location proposed for the wind turbine and along the route for its cables was separately commissioned from GSB Prospecting by Bowler Energy.

The site chosen for the wind turbine lies on Hustyn Downs: a former area of elevated enclosed downland which formed the eastern part of the very extensive St. Breock Downs. During the Bronze Age, this downland became the site for a large number of highly visible barrows, many of these being intervisible with one another, some being clustered into discrete groups.

From the mid 18th century, the downs were increasingly subjected to a process of enclosure for agriculture, a process which continued through the 19th century and into the early years of the 20th century, and these barrow groups became incorporated into the newly-created fieldscape on the former downs. Many have been scheduled.

Although still a prominent and lightly-settled upland area, modern developments have not been absent within this landscape, as there is a large and very prominent wind farm on St. Breock Downs 2Km to the west of the proposed turbine site. The St. Breock Downs wind farm, constructed in 1993, currently consists of eleven 53m high turbines.

Although the wind turbine proposed for Higher Tregawne will be the first visually prominent 'modern' feature on Hustyn Downs and will have impacts on the settings of designated and undesignated heritage assets within the surrounding landscape, the existence of the St. Breock Downs wind farm will inevitably reduce the scale of the impacts resulting from its construction.

No archaeological features were found during the walkover survey, whilst a 1Ha magnetometer survey centred on the site proposed for the wind turbine and the 20m wide corridor following the route proposed for cabling also revealed no significant archaeological features.

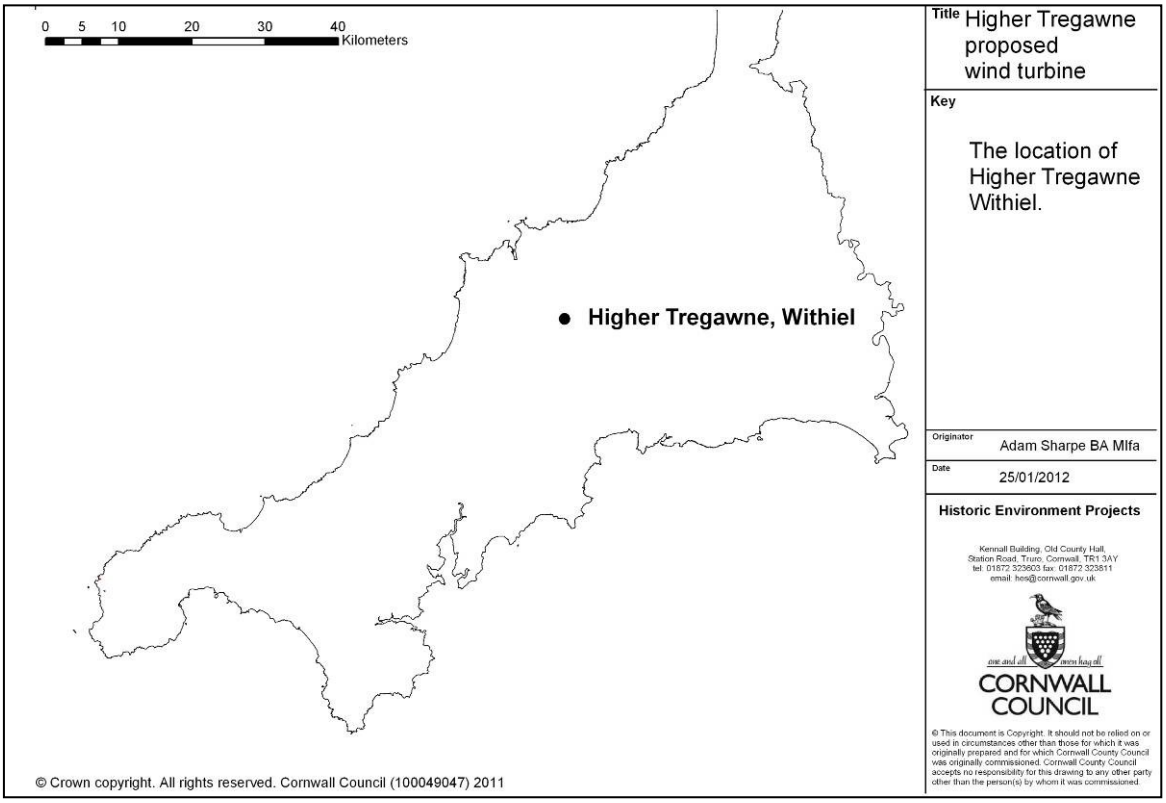

Fig 1. The location of Higher Tregawne, Withiel.

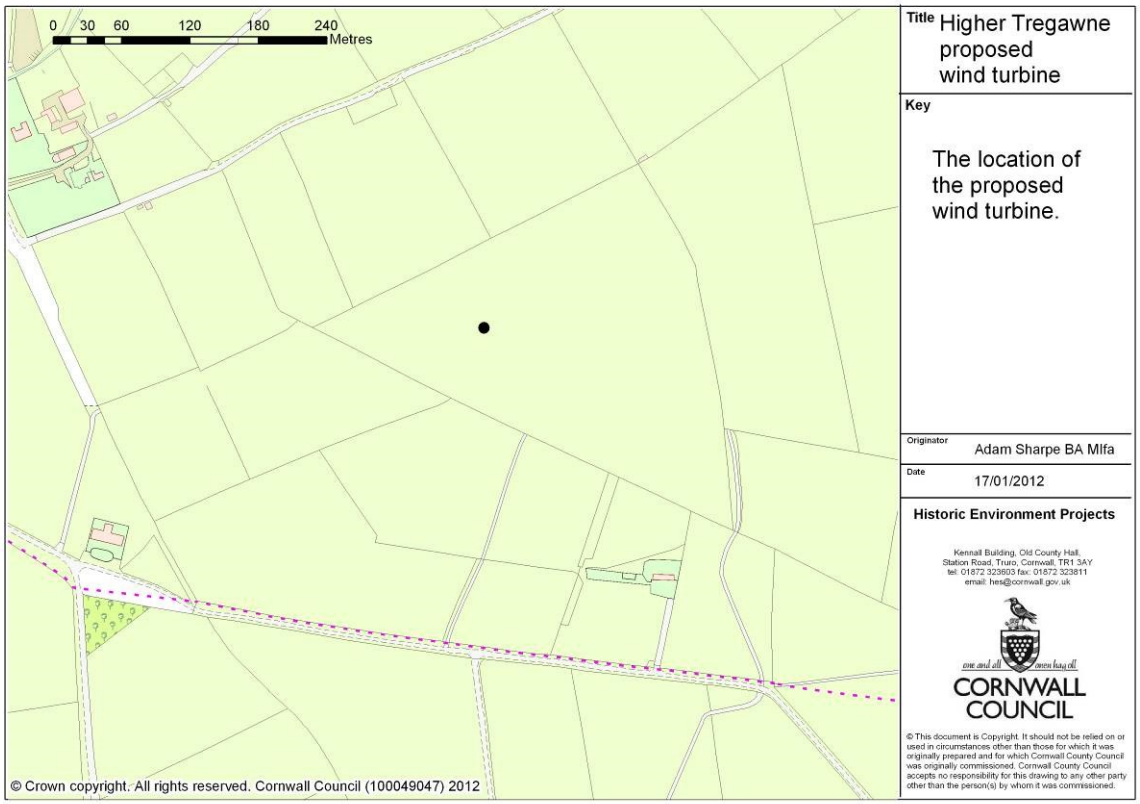

Fig 2. The location proposed for the Higher Tregawne wind turbine on former downland which had been part of Hustyn Downs.

2 Introduction

2.1 Project background

Planning application PA11/07746 was submitted on the 13th September 2011 and was for the installation of a single 50kw Endurance wind turbine mounted on a free standing 36m high monopole mast at SW 99118 67753. The turbine would be sited on a 6m x 6m concrete base and would have a blade radius of 9.6m. This application is currently pending consideration.

A brief for site investigation dated 10 January 2012 was prepared by the Historic Environment Planning Advice Officer (East), Cornwall Council, Mr. Phil Copleston. The Planning officer is Mr. Mark Evans. Requests for a WSI and cost schedule for the work were received by Historic Environment Projects from Bowler Energy on 11 January 2012. HE Projects Cornwall Council was commissioned to undertake an archaeological assessment on 24 January 2012. Geophysical survey of the area proposed for the turbine and the route proposed for its cabling was separately commissioned from GSB Prospecting by Bowler Energy.

2.2 Aims and objectives

The principal aim of the study is to gain a better understanding of the impacts which would result from the construction of a wind turbine on land in the southern part of the parish of St. Breock, Cornwall, which is farmed from Higher Tregawne in the neighbouring parish of Withiel to the south.

The overall project aims are to:

- Draw together historical and archaeological information about the development site and its surroundings, including relevant information held within the Cornwall Historic Environment Record.
- Review and analyse historic map evidence for the site.
- Follow the approach outlined in Section 3 of the English Heritage guidance on setting.
- Identify the construction, use and 'end of life' impacts of the current proposals on the significance of the setting of these assets and the proposal site.

The site specific project aims are to:

- Draw together the historical and archaeological information about the site
- Undertake an archaeological magnetometer survey
- Produce a report containing the geophysical data and the data in interpreted form
- Inform whether an archaeological evaluation or further archaeological recording of any potential buried remains is recommended, or that the turbine be repositioned to avoid any sensitive buried features

The objective of the project is to produce a report setting out the likely range of impacts (both direct and on settings) of the development on heritage assets within the site or the surrounding locality, as defined above.

2.3 Methods

2.3.1 Desk–based assessment

As part of the desk-based assessment (DBA), historical databases and archives were consulted in order to obtain information about the history of the site and its surroundings, and the structures and features recorded within the site boundaries. The main sources consulted were as follows:

- Published sources available at the Cornwall and Scilly HER
- Historic maps including
    - Joel Gascoyne's map of Cornwall (1699)
    - Norden's Map of Cornwall (1728)
    - Thomas Martyn's map of Cornwall (1748),
    - OS 1 inch survey (*circa* 1810)
    - St. Breock Tithe Map (*circa* 1840),
    - 1st and 2nd Editions of the OS 25 inch maps (*circa* 1880 and *circa* 1907)
- Modern maps
- National Mapping Programme transcripts from aerial photographs
- Other aerial photographs in the Cornwall and Scilly HER
- Historic Landscape Characterisation mapping
- Cornwall and Scilly Historic Buildings, Sites and Monuments Record (HBSMR)
- Information held as GIS themes on the Cornwall and Scilly HER

The historical and landscape context of the site was also considered during this stage of the assessment in order to establish the nature of the heritage assets which are located within the area surrounding the proposed wind turbine.

2.3.2 Viewshed analysis

An assessment of the impacts of the proposals was made from the surrounding area using the guidelines and methodological approaches set out in English Heritage's recent consultation draft guidance on the setting of heritage assets. This was based on GIS-based viewshed mapping produced using a model of theoretical inter-visibility between the wind turbine proposed for the site and significant heritage assets within the surrounding landscape; the viewshed (ZTV or Zone of Theoretical Visibility) was generated using ArcGIS software. The methodology employs a Digital Surface Model (DSM), which takes account of surface features such as buildings, woodland, vegetation, roads etc, and provides a more accurate representation when compared to a 'bare earth' or DTM elevation model. A viewshed was generated for an 'observer point' based on the location of the proposed wind turbine.

When performing a viewshed analysis, several variables are used to limit or adjust the calculation including offset values, limitations on horizontal and vertical viewing angles (azimuth) and distance parameters (radius) for each observer point. For the proposed wind turbine at Higher Tregawne, the viewshed was based on an 'overall observer elevation value' made up of the 'elevation value' or height above sea level of the ground at the observer viewpoint, with added to this an additional offset of 36m to represent the height of the turbine mast. This viewshed was checked on the ground, given that vegetation and other factors may block views to key sites, whilst significant heritage assets within the theoretical viewshed were visited (where access was possible) to determine intervisibility with the proposed development site, and hence the scale and type of any visual impacts which may affect their settings, as required by English Heritage (2011). A viewshed radius of 2.5Km was used to determine potential impacts on designated heritage assets and a radius of 1Km for undesignated heritage assets (see Figs 17 to 19).

2.3.3 Fieldwork

In order to check the validity of the Zone of Theoretical Visibility (ZTV) indicated by the viewshed analysis, and thus the potential impacts on key heritage assets within the ZTV, site visits were made to both the site proposed for the wind turbine, and to key

locations within the surrounding landscape. A visual check and photographic record were made of intervisibility (or the lack of it) between the proposed development area and heritage assets indicated by the ZTV mapping as being likely to be within the viewshed. A walkover survey of the site proposed for the wind turbine and for its cabling was also undertaken to examine the site for upstanding archaeology and to record the nature of the boundary types which might be impacted upon during the development.

2.3.4 Fieldwork – geophysical survey

A geophysical survey of a one hectare area of the field proposed for the proposed wind turbine (centred on its proposed location) and a 20m wide strip following the route proposed for its cabling was commissioned by the client from GSB Prospecting. The fieldwork was undertaken on 19 January 2012.

A hand-held Bartington Grad 601-2 twin fluxgate gradiometer was used for the magnetometer survey. This employs a pair of vertically-mounted fluxgate gradiometers set 1.0m apart, the lower gradiometer being between 0.1m to 0.3m from the ground surface, allowing detection of archaeological features up to 1.0m below the ground surface. The traverse distance was 1.0m and the sample interval was 0.25m. The instruments were operated at 0.1 nanoTesla sensitivity.

All survey grid positioning was carried out using Trimble R8 Real Time Kinematic (RTK) VRS Now dGPS equipment. The geophysical survey areas were subsequently georeferenced relative to the Ordnance Survey National Grid by tying in to local detail and corrected to the OS Mastermap provided by the client.

Following the data gathering stage, data processing was performed as appropriate using both in-house and commercial software packages (Geoplot) including Zero Mean Traverse to set the background mean of each traverse within each grid to zero, removing striping effects and edge discontinuities over the whole of the data set, Step Correction (De-stagger) to correct any effects of walking speeds in forward and reverse traverses, and Y-axis Interpolation to calculate and insert additional values between existing data points to produce a smoother greyscale image.

The geophysics report has been made available to Historic Environment Projects, Cornwall Council, and its findings have been incorporated into this assessment report to help to inform recommendations for any further investigative work or other archaeological mitigation which might be required for this site.

2.3.5 Post-fieldwork

On completion of the project and following review with the HE Project Manager the results of the study were collated as an archive in accordance with: *Management of Research Projects in the Historic Environment (MoRPHE) English Heritage 2006*. The site archive will initially be stored at ReStore, with the eventual aim of deposition at Cornwall Record Office.

An archive report (this report) has been produced and supplied to the Client. This report will be lodged with the Cornwall and Scilly Historic Environment Record (HER) and made available for public consultation once a planning application for the site has been made. A copy of the report will be supplied to the National Monuments Record (NMR) in Swindon, to the Courtney Library of the Royal Cornwall Museum and to the Cornish Studies Library. All digital records will be filed on the Cornwall Council network.

An English Heritage/ADS online access to the index of archaeological investigations (OASIS) record has been made covering this assessment project.

3 Location and setting

The site of the proposed wind turbine is at SW 99118 67753 on land 540m to the north of Higher Tregawne Farm, at 165m OD on a southwest-facing slope on Hustyn Downs, which formerly marked the eastern end of the larger St. Breock Downs.

The development area is characterised in the Cornwall and Scilly Historic Environment Record (HER) as 'Recently Enclosed Land (land enclosed during the 20th century), part of the former St. Breock Downs. This part of the Downs is surrounded by land characterised as 'Anciently Enclosed Land' (farmland medieval) to the south and east.

The field selected for the construction of the wind turbine contains no known archaeological sites, though the imprecisely-located site of a documented probable barrow (MCO21634) lies nearby. The surrounding area sites a large group of prehistoric and medieval monuments, and within a 1.5km radius of the proposed turbine are the sites of approximately forty Bronze Age barrows, of which nine are Scheduled Monuments, the site of five cairns, four enclosures, and eight extensive field systems of probably medieval date, some of which are well-preserved.

The closest listed buildings to the site proposed for the wind turbine are Hustyn Farmhouse, located 1.6Km to the north west and Bosneives, 1.7Km to the south. The Grade I Listed church of St. Clement at Withiel is 2.5Km to the south of the proposed site of the wind turbine, and is fully intervisible with the site proposed for the wind turbine on Hustyn Downs.

The parent bedrock underlying the application site is recorded as sandstones, siltstones and mudstones of the Staddon Formation, part of the Early Devonian Meadfoot Group (BGS data). The soils in the western part of the field proposed for the development are recorded as Denbigh 2 well drained fine loams over shale, whilst within the eastern part of this field and on the higher parts of Hustyn Downs the soils are recorded as poor quality Hegren Association loamy permeable upland soils over rock, these typically having a wet peaty surface horizon and a bleached subsurface horizon, a thin iron pan often being present. During the walkover survey, abundant quartz was noted within field soils and incorporated into the field boundaries.

4 Project extent

The archaeological assessment was focussed on those heritage assets (whether designated or not) which might be physically impacted upon through activities associated with the erection of the wind turbine, including cable trenching, siting of temporary compounds, cranes or other equipment and with any associated semi-permanent infrastructure.

The assessment takes into account and quantifies impacts on the settings of heritage assets (both designated and undesignated) within the viewshed of the proposed turbine site in line with Policy HE6 in PPS5, sections 16(2) and 66(1) of the Planning (Listed Buildings and Conservations Areas) Act 1990 Chapter 9, and English Heritage guidance relating to the setting of historic assets (2011) and on wind energy and the historic environment (2005), namely:

- Non-designated heritage assets – I Km radius
- Scheduled Monuments, Listed Buildings – 2.5Km radius
- Conservation Areas – 2.5Km radius
- Registered Parks and Gardens – 5Km radius
- Historic Battlefields – 5Km radius.

5 Designations

5.1 National

No national designations apply to the fields proposed for the development. Many of the barrows within the landscape surrounding the application site are scheduled monuments, whilst a number of structures within the 2.5Km viewshed of the site are listed buildings.

5.2 Regional/county

No regional or county designations apply to the fields proposed for development.

5.3 Local

No local designations apply to the fields proposed for the development.

5.4 Rights of Way

No rights of way traverse the site proposed for the wind turbine, nor the fields through which the cabling will be undergrounded. These areas are not registered as open access land under the CROW Act 2005.

6 Results of desk-based assessment

St Breock Downs was formerly a large area of open upland stretching from St. Columb in the west to the valley of the River Camel in the east, the churchtowns and enclosed land of Withel and St. Wenn lying to its south. Hustyn Downs formed its eastern end adjacent to the valley of the River Camel.

During prehistory this archaeological evidence suggests that this formerly very extensive area of downland was not permanently settled, and would have been used as upland grazing by the farmers whose settlements lay on the fringes of this area, probably predominantly during the summer. In common with other upland areas in Cornwall, the Downs were also the focus for important ceremonial activity, as is demonstrated by the very extensive bronze age barrow cemeteries which top the high ground, and by the presence of three standing stones, one of Cornwall's small number of stone rows (the Nine Maidens) dating to same period, and the Neolithic Pawton Quoit (labelled on Martyn's map as '*An Altar of Ye Druids*'). St. Breock Downs were, therefore, of far more than marginal importance to those who lived around them, and the often prominent barrows sited on them (like the earlier Pawton Quoit) were as much territorial markers and shrines associated with local kin groups as places of burial. Whilst may of these barrows survive to this day, it is likely that the locations of others have been lost to agriculture. Unless deep or repeated ploughing has taken place, however, significant archaeological evidence for these lost barrows may survive. One likely example (MCO21634) is documented in the general location of the proposed wind turbine, the Cornwall and Scilly Historic Environment Record (HER) suggesting a location for this feature just to the north of the project area.

St. Breock Downs remained as open land into the historic period, the rough grassland which they supported continuing to provide an important agricultural resource for farming families living in the surrounding landscape, providing summer grazing, as well as a place where '*furze*' (gorse) could be gathered for fuel, as well as '*ferns'* (bracken) or rushes for animal bedding. Settlements were established off the high ground during the pre-Conquest period, these having names incorporating elements in Cornish such as '*Tre', 'Pol' or* 'Pen', though a few farms were created on the fringes of the Downs – these being characterised by names beginning with the prefix '*Ros',* meaning heath or downs.

The analysis of historic aerial photographs undertaken as part of the English Heritage National Mapping Programme (Fig 14) shows that, during the medieval period, the Downs were also occasionally cultivated during times of high land pressure in the lowlands, most probably during the period preceding the Black Death. At several locations such as on Rosenannon Downs to the west of the Higher Tregawne site, near Higher Tregolls to its south-west and on the northern and south-eastern parts of Hustyn Downs there is often extensive evidence for medieval outfields. These strip fields would have been used for only short periods, perhaps once a generation, exploiting what little natural fertility had built up in the shallow soils of the downs in the interim.

The first survey including St. Breock Downs dates to the 17th century, when Joel Gascoyne produced his map of Cornwall. Gascoyne labelled this area '*St. Breigh Downs*' (Fig 3), showing the area as being characterised by a series of elevated hills, traversed by the roadway from Bodmin to Padstow (the route now known as '*The Saints' Way*') which crosses the River Camel at '*Rothrwn* Bridge' (Ruthernbridge). No settlements were depicted on St. Breock Downs at this date, and it would have been a large area of open upland grazing land, much as it had been through prehistory and the medieval period – a significant resource for local farmers.

Norden's map dating to 1728 (Fig 4) also depicted St. Breock Downs as a chain of rugged hills siting '*The 9 Stones*' and bereft of settlements or farms, whilst Martyn's map of 1748 (Fig 5) again showed the Downs ('*St. Breock Beacon*') as lacking any farms, though traversed by a plethora of routeways linking settlements to their north and south.

The 1st Edition of the Ordnance Survey 1" to a mile mapping (Fig 6), dating to the first decade of the 19th century, continued to show Hustyn Downs at the eastern end of St. Breock Downs as largely unenclosed, and siting a number of prehistoric monuments including '*Tregawne Barrow*' and '*Hustyn Barrow*'. There are, however, indications on this mapping that the process of downland enclosure had begun by this date, blocks of enclosed land being shown on the north eastern end of Hustyn Downs, on the former Rosenannon Downs, on the southern part of Nine Maidens Downs to the west and around Pawton and Pengelly to the north. This may reflect the increased demand for food created by the growth of Cornwall's towns and the development of a rapidly increasing industrial workforce, but it may also to a degree reflect the effects of naval blockades during the Napoleonic wars.

The *circa* 1840 St. Breock Tithe Map (Fig 7) shows this process in progress with the development of new farms set within blocks of often large (by Cornish standards) straight-sided fields, often within grid-like layouts. Many of these have names incorporating wholly English names, often incorporating terms such as '*Downs*' or '*Moor*', whilst the fields have names such as '*Higher Stone Park*' or '*Outer Down Park*' (the two fields to be traversed by the cabling from the turbine) and '*Three Corner Down*' (the field proposed for the wind turbine), and were described within the Tithe Assessment as '*Coarse Pasture/Arable*' indicating that the process of improvement was at a relatively early stage. The first two fields were tenanted by William Julian and the third by John Hocking. All were owned by Charles Prideaux Brune, Esq. of Padstow.

By the late 19th century (Fig 8) it can be seen from the 1st Edition Ordnance Survey 25" to a mile mapping that this process of downland enclosure had taken place on a massive scale, almost all of the former uplands having been parcelled up. Nevertheless, some of the enclosures were still depicted as being croft, rough grassland or even heathland, and it is evident from this mapping that the improvement process was, at the time, still ongoing. As an example, the higher ground immediately to the east of the application area was, in 1877, still clearly wholly unimproved land (Fig 8), though the tree planting around some of the paddocks making up Hustyn Gate to the north suggest a degree of maturity. Small scale iron mining had been tried at Hustyn Mine, just to the north of Hustyn Downs.

This process of gradual improvement continued during the following decades, and by 1908 (Fig 9) the area to the east of the application site was no longer depicted by the Ordnance Survey as heathland. However a large block to the west of Hustyn Gate was still clearly unimproved, as were almost the whole of the eastern, higher parts of Hustyn Downs. This probably reflects variations in the quality, stoniness and depth of soils, local topography and exposure together with the resources available to tenant farmers and the degree of encouragement to improve imposed on tenants by their landlords. Some land might have remained very marginal, and simply not worth improvement to arable use, and would have remained as rough grazing, despite having been enclosed, as on the higher parts of Hustyn Downs, which are level, poorly drained and (at the time of the walkover survey in January 2012) were waterlogged and supported occasional ponds and rushy vegetation.

Today, as can be seen on Cornwall Council aerial photographs dating to 2005 (Fig 10) or on more recent Google Earth mapping, Hustyn Downs has effectively disappeared completely, though some of its highest, most exposed parts to the north-east of the application area appear on these sources not to have been worth improving beyond rough grazing.

The processes underlying the landscape history of Hustyn Downs are reflected in its Historic Landscape Characterisation (Fig 11) as Recently Enclosed Land (REL), both post-medieval and 20th century in date.

7 Results of site walkover

A site walkover and inspection was made on 26 January 2012. The weather was generally fine though with occasional heavy wintry showers, but visibility was good. The three fields examined were in short grazed pasture, one of which had been recently muck-spread. Much of the ground was severely waterlogged, with standing water in hollows and wheel ruts. Although some undulations in the fields surfaces were noted, these were felt to be the results of the underlying geology rather than being archaeological features, with the exception of a vaguely linear shallow hollow running north north west to south south east in the northern central part of the field proposed for siting the wind turbine. This was felt likely to reflect the location of a documented boundary depicted on the *circa* 1877 and 1908 Ordnance Survey 25" mapping, but since removed.

The boundaries of the three enclosures examined were relatively low Cornish hedges (stone faced earth walls) whose faces incorporated considerable amounts of lump quartz. The hedges were between 1.5m and 1.2m high and 2.25 and 1.5m wide. Some vegetation topping was present, this including low thorns and coppiced ash trees (a few of these reaching 5.0m high). Several field boundaries further upslope to the north east were stone faced stone walls, these being distinctive and very visible features within the local landscape, being made up entirely of lumps of quartz, presumably derived from field clearance on the upper parts of Hustyn Downs. These walls averaged 1.6m high and 2.0m wide, and were all very neatly constructed. The upper parts of Hustyn Downs were also visited, and these were found to be level, waterlogged, and affording very extensive views over mid and east Cornwall.

Despite the presence of the 19th and early 20th century enclosure boundaries, the open character of Hustyn Down is largely intact given the relatively low heights of the boundary hedges and the large sizes of the fields. Almost all views were therefore open and extensive. With the exception of some modern galvanised steel field gates, one or two 20th century dwellings on the fringes of the Downs and a couple of large water storage tanks sited on the upper parts of the Downs, the local landscape contains only a small number of 'modern' features, these not being visually obtrusive from a distance.

The surrounding landscape is also notably open in character, being divided up into large enclosures, these generally becoming more extensive on the higher parts of the Downs. Not far to the north are two large areas of coniferous plantation – Belingick Wood and Vile's Park Wood, to the north west is Hustyns Hotel and country club, behind which the St. Breock Downs wind farm appears on the skyline when viewed from the south east.

Views from the site proposed for the wind turbine are far reaching. Although the skyline is formed by the woods to the north and the ridge siting the St. Breock wind farm to the north west, to the south Hensbarrow is clearly visible, the views extend across the small settlement of Withiel to the line of the A30 at Innis Downs just to the east of south, to the south east the views extend to Taphouse Ridge, whilst to the east views are blocked by the rising ground of Hustyn Down, from the top of which views extend east to Bodmin Moor and to the outskirts of Bodmin.

8 Summary results of geophysical survey

See Figs 15 & 16

A one hectare area surrounding the proposed turbine site and the corridor for the cabling were surveyed by GSB Prospecting on 19 January 2012, preliminary results being supplied to HE Projects on 25 January 2012.

The results revealed no significant archaeology within either the 1 Hectare area centred on the site proposed for the wind turbine or the 20m wide corridor following the route proposed for the cable trench. The local soils were considered amenable to the detection of archaeological sites, and their absence from the geophysical data was considered likely to reflect the situation within the survey area.

Within both the area surrounding the proposed turbine site and in the 20m wide corridor for the cabling route the data plots show some variation due to the underlying bedrock and soil depths and magnetic quality. The data shows no clear evidence for the effects of deep or repeated ploughing, confirming the general impression that this part of the former Hustyn Downs has not proved readily cultivable, something which may be confirmed by the waterlogging noted during the site visit.

9 Results of viewshed analysis

See Figs 17 - 19.

Given the elevated location of the site and the height of the turbine mast, the viewshed analysis suggests that the Zone of Theoretical Visibility (ZTV) will be far-reaching. In line with the requirements of the brief, the ZTV has been mapped to a distance of 3Km from the site, though will inevitably extend a considerable distance beyond this. However, the visibility of the turbine will diminish with distance, and may be locally blocked by intervening buildings within settlements, or by the plantations to the east and north east of the site.

The ZTV mapping (Figs 17-19) shows that the wind turbine will be almost ubiquitously visible within a 1km radius of the site. Within the zone from 1Km radius to 2.5Km radius out from the site, the wind turbine will be visible from about 30% of the local landscape due to its topography, being visible from about 2.5Km distance in an arc running from west through south to east. To the north the site will be visible within this zone, though in a more fragmentary fashion. The viewshed will extend out to the south to include the Grade I Listed church of St. Clement at Withiel, together with other listed buildings in its vicinity, these being 2.5Km away from the site. The viewshed mapping suggests intervisibility with listed buildings at Burlawn and Bosneives to the north and south east respectively (though in practice this is not the case). The wind turbine will also be readily visible in whole or in part from all of the scheduled monuments within both the 1Km radius ZTV and the 2.5Km ZTV.

The proposed wind turbine will also be visible well beyond the 2.5m viewshed in an arc from the east through the south to the west, with the potential to be visible to some degree from Hensbarrow, Innis Downs, Taphouse Ridge, the western parts of Bodmin and from the western parts of Bodmin Moor. However it is felt that any potential for impact on the settings of heritage assets would be negligible at distances greater than 2.5Km, especially given that any views from the south, south east and east would also include the nearby St. Breock wind farm.

Field verification of ZTV

The viewshed mapping and potential impacts were ground checked from a number of locations, including Withiel and Bosneives to the south, Hustyn Gate and St. Breock Downs to the west, from the road to the north of Higher Tregolls to the south west, from Burlawn to the north, and from the upper parts of Hustyn Downs to the east north east.

On the whole, the ZTV mapping was found to be an accurate representation of the likely intervisibility between the proposed wind turbine and the surrounding landscape out to 2.5Km together with the heritage assets it includes, with the exception of the area containing the coniferous plantations to the north, whose trees would block or significantly attenuate any views of the turbine from this direction, including those from the listed buildings sited in Burlawn to their north. Some local blocking of intervisibility elsewhere within the viewshed would also be produced by hedges, tree screens and other buildings where they occur within groups and clusters.

Intervisibility with the proposed wind turbine was confirmed for the church and other listed buildings in Withiel, for all scheduled monuments within the 2.5Km radius ZTV and for the large majority of undesignated heritage sites within the 1Km radius ZTV.

10 Synthesis

The walkover survey and the geophysical survey suggest that, on the basis of available information, there are unlikely to be any direct impacts on archaeology within the site selected for the wind turbine on Hustyn Downs and along the route for its cable connection to the National Grid which crosses the two fields to its south. However, the distribution of known barrows within this area suggests that there is a high potential for further so far unrecorded barrows or associated prehistoric ceremonial sites on the ridge on which the turbine is proposed to be sited, this potential probably diminishing towards the western part of Hustyn Downs given the reduced skyline visibility of this area from the south (most known barrows in this area are sited on the higher parts of the Downs).

Impacts on both designated and undesignated heritage assets within the local landscape resulting from the construction of a wind turbine on Hustyn Downs will vary with their distance from the turbine site, their state of preservation, their nature, their proximity to the St. Breock Downs wind farm or the dominance of this feature within views of them, and the effects of reduced or blocked intervisibility due to local topography, vegetation (including coniferous plantations) or the presence of other buildings. In some cases, the topography will limit views of the wind turbine from archaeological sites to the upper section of the turbine mast or to the upper parts of its blades.

The presence of the existing, large scale and highly visible St. Breock Downs wind farm 2Km to the north west of Hustyn Downs inevitably reduces the impacts on the setting of heritage assets within this area which would result from the construction of the proposed wind turbine. However, this development would introduce the first highly visible modern feature on Hustyn Downs, only a few hundred metres from a group of scheduled barrows whose current settings are characteristically relatively open and which have been only partially impacted upon by the 19th and early 20th century enclosure of this area of former downland.

11 Policies and guidance

The following section brings together policies and guidance (or extracts from these) used in the development of the assessment and its methodology.

11.1 Planning Policy Statement 5 (PPS5), 'Planning for the Historic Environment'

11.1.1 Policy HE9.6

HE9.6 '*There are many heritage assets with archaeological interest that are not currently designated as scheduled monuments, but which are demonstrably of equivalent significance….The absence of designation for such heritage assets does not indicate lower significance and they should be considered subject to the policies in HE9.1 to HE9.4 and HE10.*'

11.1.2 Extracts from Policies HE9.1 to HE9.4 and HE10

Policies HE9.1 to HE9.4 and HE10, referred to in Policy HE9, include the following;

- HE9.1 '*There should be a presumption in favour of the conservation of designated heritage assets and the more significant the designated heritage asset, the greater the presumption in favour of its conservation should be. Once lost, heritage assets cannot be replaced and their loss has a cultural, environmental, economic and social impact. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting.*'

- HE9.2 '*Where the application will lead to substantial harm to or total loss of significance local planning authorities should refuse consent unless it can be demonstrated that: (i) the substantial harm to or loss of significance is necessary in order to deliver substantial public benefits that outweigh that harm or loss….*'

- HE10.1; '*When considering applications for development that affect the setting of a heritage asset, local planning authorities should treat favourably applications that preserve those elements of the setting that make a positive contribution to or better reveal the significance of the asset. When considering applications that do not do this, local planning authorities should weigh any such harm against the wider benefits of the application….*'

11.2 PPS5 English Heritage guidance

The English Heritage and DCMS (Department for Culture, Media and Sport) document 'PPS5 Planning for the Historic Environment: Historic Environment Planning Practice Guide' provides guidance on PPS5 and its application.

This refers to the need, for decision-making in response to an application for change that affects the historic environment, of providing and assessing, at a level appropriate to the relative importance of the asset affected, information on the asset and its extent, on its setting, and on the significance of both of these aspects. Section 5, 54 states that '*Heritage assets may be affected by direct physical change or by change in their setting. Being able to properly assess the nature, extent and importance of the significance of a heritage asset and the contribution of its setting is very important….*'

Section 5 on Policies HE6 to HE 12, 58, notes among appropriate actions (in point 5) '*Seek[ing] advice on the best means of assessing the nature and extent of any archaeological interest e.g. geophysical survey, physical appraisal of visible structures and/or trial trenching for buried remains*.'

The section on Policy HE10 defines setting as follows:

'*113. Setting is the surroundings in which an asset is experienced. All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance, or may be neutral.*'

'*114. The extent and importance of setting is often expressed by reference to visual considerations. Although views of or from an asset will play an important part, the way in which we experience an asset in its setting is also influenced by other environmental factors such as noise, dust and vibration; by spatial associations; and, by our understanding of the historic relationship between places. For example, buildings that are in close proximity but not visible from each other may have a historic or aesthetic connection that amplifies the experience of the significance of each. They would be considered to be within one another's setting*.'

11.3 Former Cornwall Structure Plan

The following policies in the Cornwall Structure Plan relate to the historic environment are currently used to guide responses to applications.

11.3.1 Policy 1

'*Development should be compatible with:*

The conservation and enhancement of Cornwall's character and distinctiveness;

The prudent use of resources and the conservation of natural and historic assets;

A reduction in the need to travel, whilst optimising the choice of modes, particularly opportunities for walking, cycling and the use of public transport;

Through developing the principles of Policy 1 it is intended to integrate environmental values with land use and transport policies, achieving patterns of development that reflect strong environmental protection and stewardship of resources.'

11.3.2 Policy 2

'*Throughout Cornwall, development must respect local character and:*

- *Retain important elements of the local landscape, including natural and semi-natural habitats, hedges, trees, and other natural and historic features that add to its distinctiveness;*
- *Contribute to the regeneration, restoration, enhancement or conservation of the area;*
- *Positively relate to townscape and landscape character through siting, design, use of local materials and landscaping.*
- *The conservation and enhancement of sites, areas, or interests, of recognised international or national importance for their landscape, nature conservation, archaeological or historic importance, including the proposed World Heritage Site, should be given priority in the consideration of development proposals*.'

11.4 Former North Cornwall Local Plan

Although now part of Cornwall Council, North Cornwall District Council's policies listed in its local plan continue to be relevant. Relevant policies concerning the historic environment are listed below.

The North Cornwall Local Plan contains policies designed to protect the archaeological resource, using the following elements of policy framework:

POLICY ENV12:

4. *Development proposals for the erection of a new building or other structure, or the use of land, will not be permitted where this would adversely affect the character or appearance of a listed building or its setting.*

POLICY ENV14:

1. Development proposals affecting nationally important remains, whether scheduled or not, and their settings, will not be permitted unless:

(a) there will be no significant damage to, or adverse effect on, a site or its setting; and

(b) the development can be controlled through the use of conditions or planning obligations to ensure the remains to ensure the remains are preserved in-situ.

2. Development proposals which adversely affect locally important archaeological sites or remains identified as a result of a prior archaeological investigation will only be permitted where:

(a) physical preservation in-situ is not feasible in conjunction with the proposed development and the importance of the development clearly outweighs the case for preservation of the remains; and

(b) satisfactory arrangements are made for the investigation and recording of the remains before or during development.

3. In areas of great historic value, historic settlements and all other locations where there is evidence to suggest that significant remains may exist on the site of a proposed development the extent and importance of which are unknown, applicants will be requested to carry out an archaeological evaluation of the proposal before the planning application is determined. The areas of great historic value and historic settlements are defined on the proposals map.

POLICY ENV15:

Development proposals will not be permitted where they would adversely affect the character, appearance or setting of areas of great historic value, historic parks and gardens and historic battlefields.

North Cornwall District Council Policy ENV15 3. states: In areas of Great Historic Value, Historic Settlements and all other locations where there is evidence to suggest that significant remains may exist on the site of a proposed development the extent and importance of which are unknown, applicants will be requested to carry out an archaeological evaluation of the proposal before the planning application is determined. The Areas of Great Historic Value and Historic Settlements are defined on the Proposals Map.

11.5 Hedgerow Regulations

Under the current, 1997 Hedgerow Regulations, owners wishing to remove all or part of a hedgerow considered to be historically important must notify the Local Planning Authority (LPA). Criteria determining importance include whether the hedge marks a pre-1850 boundary, and whether it incorporates an archaeological feature. The LPA may issue a hedgerow retention notice prohibiting removal.

12 Likely impacts of the proposed development

12.1 Types and scale of impact

Two general types of archaeological impact associated with wind turbine developments have been identified as follows.

12.1.1 Types of impact, construction phase

Construction of the wind turbine could have direct, physical impacts on the buried archaeology of the site through the construction of the turbine foundations, through the undergrounding of cables, and through the provision of any works compound, together with any permanent or temporary vehicle access ways into and within the site. Such impacts would be **permanent** and **irreversible**.

12.1.2 Types of impact, operational phase

A wind turbine might be expected to have a visual impact on the settings of some key heritage assets within its viewshed during the operational phase, given the height of its mast (36 metres). Such factors also make it likely that the development would have an impact on Historic Landscape Character. These impacts would be **temporary** and **reversible**.

12.1.3 Scale and duration of impact

The impacts of a wind turbine on the historic environment may include positive as well as adverse effects. For the purposes of assessment these are evaluated on a seven-point scale:

positive/substantial

positive/moderate

positive/minor

neutral

negative/minor

negative/moderate

negative/ substantial

Negative/unknown is used where an adverse impact is predicted but where, at the present state of knowledge, its degree cannot be evaluated satisfactorily.

The assessment also distinguishes where possible between **permanent** and **temporary** effects, or between those that are **reversible** or **irreversible**, as appropriate, in the application of the scale of impacts.

12.1.4 Potential and residual impacts

Potential adverse impacts may be capable of mitigation through archaeological recording or other interventions. In the assessments forming Section 12.2, where appropriate, both 'potential' and 'residual' impacts are given; that is, expected impacts 'before' and 'after' such work, principally in relation to the development phase. A proposed mitigation strategy is outlined below in Section 13.

12.2 Assessment of impact

Overall, the impacts of the proposed wind turbine on the archaeological resource are assessed as having a potential scored as **negative/moderate** to **negative/minor**, principally dependant on proximity to the site and intervisibility with it, but also taking into account the proximity of some of its components with the St. Breock wind farm. Impacts on potential sub-surface archaeology within the development site may be higher, but could be limited to **negative/minor** provided that any recommended mitigation is undertaken.

The assessments supporting this general statement are outlined in the following sub-sections. To comply with current policies and guidance (Section 11) these provide assessments of impact in terms of different aspects of the archaeological resource - its individual sites, the settings of sites, Historic Landscape Character, and field

boundaries. There are inevitably areas of overlap between these categories of impact; the assessment is adjusted accordingly to avoid 'double counting' of impacts.

12.2.1 Impacts on archaeological sites within the development area

Ground disturbance associated with the installation of supports for the wind turbine, cabling or ancillary works during the construction phase could result in permanent, irreversible loss of below ground remains of archaeological sites within the development area, or of elements of these. The works, if deeper than current topsoil levels, might affect buried cut features.

Scales of impact will vary with the degree of significance of individual site, and with the proportion of the whole site which would be affected. Notably, buried features could be disturbed, truncated or removed. In the absence of detailed information regarding the survival of sub-surface archaeology within the development area and the full extent of groundworks or other potentially intrusive activity associated with the development, this impact is considered to be **negative/unknown**, with a residual impact of **negative/minor** provided that appropriate mitigating work is carried out. These impacts would be **permanent** and **irreversible**.

The only site recorded in the immediate vicinity of the location of the proposed wind turbine consists of a documented enclosure or barrow (MCO21634). Although the location for this feature given in the Cornwall and Scilly Historic Environment Record places it 135m to the north-west of the proposed turbine site, it should be noted that this location is approximate and based on a documentary reference. It is possible, therefore that the barrow site may lie within the field proposed for the wind turbine.

Identifier	Site	NGR	Impact/recommendations
MCO21634	Documented enclosure or barrow	SW 99081 67907 (approximate location)	Damage to sub-surface archaeology through the creation of the turbine foundation and associated cable trenching.
None	Buried archaeological sites, possibly including funerary, ceremonial or settlement sites.	Fields proposed for the development and for its associated cabling.	Potential archaeological watching brief during groundworks.

12.2.2 Impacts on the settings of surrounding key heritage assets

The proposed wind turbine is considered likely to have an impact on the setting of key surrounding heritage assets, this being summarised as **negative/moderate** and **temporary/reversible** overall:

- There are sixteen scheduled monuments within the 2.5Km radius of the site of the proposed wind turbine, some of which are within 1Km of the proposed wind turbine and most of which consist of bronze age barrows. The barrows exist either singly, or in groups at distances of 700m (Hustyn Downs to the north east), 1Km (Tregawne to the south east), 1.75Km (St. Breock Downs to the north west) and 1.2Km (Higher Tregolls to the south west). When constructed, these monuments were intended to be the most prominent features within the local landscape, in particular when viewed from the lower lying land to the north and south of the downs. The construction of a 36m high wind turbine mast at this location will introduce a highly visible feature into this former ceremonial landscape (see Figs 17 & 20).

- However as a result of the 19th and early 20th century enclosure process on Hustyn Downs and St. Breock Downs, the character and appearance of the landscape within which these monuments now sit has changed from that within which the monuments were originally designed to be seen and understood. Although as a result they are now less prominent within the modern landscape, and are no longer fully intervisible with each other, the large scales of the enclosure fields, their low boundaries and the general absence of developed hedge toppings helps considerably to retain much of the former open downland character of the area, lessening the overall impact of these 19th and early 20th century landscape changes.
- In addition, there is already a large-scale and very visible wind farm on St. Breock Downs centred 2Km to the north west of the site on Hustyn Downs proposed for the wind turbine. As a result the impact on the broader setting of local scheduled monuments through the construction of the Higher Tregawne wind turbine will be considerably less than were it the first feature of this type to be constructed within the local landscape. However, whilst additional wind turbines can be seen at some distance at several points in the wider landscape surrounding this site, the Higher Tregawne wind turbine would be the first on Hustyn Downs and by far the closest to the five scheduled barrows (DCO1630) on its summit, these being sited between 500m and 750m from the proposed turbine site.
- The settings of scheduled monuments on St. Breock Downs are considered to have already been significantly impacted upon by the proximity of the existing St. Breock Downs wind farm. As a result, the impacts on their setting which would occur as a result of the construction of a wind turbine at Higher Tregawne are considerably lessened.
- During the operational phase the wind turbine is unlikely to impact to a significant degree on the setting of the listed buildings within its viewshed, given the relatively large distances between the wind turbine and these designated structures (see Fig 18). Whilst intervisibility between the Hustyn Downs wind turbine and the listed buildings in Bosneives and Burlawn is unlikely, the church and the nearby listed buildings at Withiel will be fully intervisible with the turbine, though at a distance of 2.5Km.
- There are no Conservation Areas within the 2.5Km radius viewshed of the proposed wind turbine.
- There are no Registered Parks and Gardens within the 5Km radius viewshed of the proposed wind turbine.
- There are no Registered Battlefields within the 5Km radius viewshed of the proposed wind turbine.
- During its operational phase the proposed wind turbine is felt likely to have some degree of impact on the settings of undesignated heritage assets within the 1Km viewshed, many of which consist of the earthwork remains of bronze age barrows and medieval outfield systems. However, these impacts will decrease with distance from the site on Hustyn Downs proposed for the wind turbine and with increasing proximity to the St. Breock Downs wind farm.

  There are no earthwork sites within the immediate vicinity of the proposed wind turbine, the closest being 500m away (scheduled barrow on Hustyn Downs MCO2912, DCO1630), a low, denuded earthwork adjacent to a boundary wall, 650m away (barrow at Hustyn Gate MCO2916, a fairly well preserved earthwork close to a boundary to the east) and another barrow 800m to the north east (scheduled barrow on Hustyn Downs MCO2909, DCO1630) which is again rather denuded and is now set adjacent to a boundary. As a result, whilst the construction of the wind turbine would introduce a highly visible, modern feature

within the landscape occupied by these and other prehistoric sites, it is not considered that it would be close enough to them have a substantial negative impact on their settings. The potential impacts on these particular sites are therefore assessed as **negative/moderate** or **negative/minor**. The potential impacts on those at a greater distance from the site have been assessed as **neutral**.

- Any impacts on heritage assets within the landscape surrounding the proposed wind turbine would be **temporary** and **reversible** should the wind turbine be dismantled in the future.

Designated heritage assets within the 2.5Km radius viewshed

Scheduled Monuments (SM) – see Fig 17

Identifier	Site	NGR	Impact
DCO1373	Three barrows on St. Breock Downs	SW 97105 68395	Neutral
DCO1373	Three barrows on St. Breock Downs	SW 97247 68375	Neutral
DCO1373	Three barrows on St. Breock Downs	SW 97369 68476	Neutral
DCO1286	Barrow on St. Breock Downs	SW 97602 68233	Negative/minor
DCO186	Monolith and cairn on St. Breock Downs	SW 96771 68324	Neutral
DCO1281	Burial chamber	SW 96781 68234	Neutral
DCO1287	Standing stone	SW 97318 68284	Neutral
DCO1628	Two barrows	SW 98230 66764	Negative/minor
DCO1628	Two barrows	SW 98331 66896	Negative/minor
DCO1629	Tregawne Barrow	SW 99952 67149	Negative/minor
DCO1630	Round barrows on Hustyn Downs	SW 99526 68273	Negative/minor
DCO1630	Round barrows on Hustyn Downs	SX 00013 67970	Neutral
DCO1630	Round barrows on Hustyn Downs	SX 00084 68000	Neutral
DCO1630	Round barrows on Hustyn Downs	SW 99749 68000	Negative/moderate
DCO1630	Round barrows on Hustyn Downs	SW 99607 68020	Negative/moderate
DCO1630	Round barrows on Hustyn Downs	SW 99537 67807	Negative/moderate

Listed Buildings (LBs) with grades (see Fig 18)

Identifier	Site	NGR	Impact
DCO9322	Bosneives Farmhouse (II)	SW 99888 66226	Neutral
DCO9480	Garden wall and gate at Bosneives farmhouse (II)	SW 99885 66202	Neutral
DC010691	Group of farm buildings at Bosneives (II)	SW 99867 66236 SW 99854 66247 SW 99840 66237	Neutral
DCO10946	Withiel House and outbuildings (II)	SW 99360 65298	Negative/minor
DCO10126	Withiel old rectory (II)	SW 99388 65356	Negative/minor
DCO8851	Withiel old rectory gate piers, gate and garden walls (II)	SW 99419 69365	Neutral
DCO8023	Church of St. Clement, Withiel (I)	SW 99434 65387	Negative/minor
DCO8163	Churchyard walls, gateways	SW 99392 65381	Neutral

Identifier	Site	NGR	Impact
	and attached privy (II)		
DCO8852	Buscomb Monument, Withiel churchyard (II)	SW 99447 65381	Neutral
DCO3783	Lavender Cottage and Withiel Post Office (II)	SW 99474 65408	Negative/minor
DCO10281	Menaghty (II)	SW 99527 65411	Negative/minor
DCO9321	South View (II)	SW 99543 65399	Neutral
DCO8014	N^{o}s 1 & 2 Meadowside, Burlawn (II)	SW 99668 70016	Neutral
DCO8858	Burlawn Eglos Farmhouse (II)	SW 99759 70127	Neutral

Undesignated heritage assets within the 1Km radius viewshed

See Fig 19.

Identifier	Site	NGR	Impact
MCO3002	Lantuel Barrow	SW 98220 67302	Neutral
MCO3644	Tregolls Barrow	SW 98505 67037	Neutral
MCO21065	Higher Tregustick medieval field system	SW 98651 66899	Neutral
MCO21066	Higher Tregustick medieval field system	SW 98859 66797	Neutral
MCO2842	Higher Bosneives Barrow	SW 99115 66736	Neutral
MCO3505	Barrow on St. Breock Downs	SW 98431 67864	Neutral
MCO21817	Bronze Age enclosure on St. Breock Downs	SW 98419 68027	Neutral
MCO2917	Hustyn Gate Barrow	SW 98537 67978	Negative/minor
MCO3508	Barrow on St. Breock Downs	SW 98497 68112	Neutral
MCO21084	Hustyn Moor medieval field system	SW 98403 68185	Neutral
MCO3506	Barrow on St. Breock Downs	SW 98598 68027	Neutral
MCO3508	Barrow on St. Breock Downs	SW 98488 68108	Neutral
MCO291	Documented barrow at Hustyn Gate	SW 98615 67961	Neutral
MCO21634	Documented barrow or enclosure	SW 99001 67907	Neutral
MCO3759	Barrow	SW 98916 68759	Neutral
MCO3760	Barrow	SW 99022 68743	Neutral
MCO3762	Barrow	SW 99172 68763	Neutral
MCO3761	Barrow	SW 99058 68372	Neutral
MCO20560	Belingick medieval field system	SW 99787 68393	Neutral
MCO2913	Barrow on Hustyn Downs	SW 99531 68218	Negative/moderate
MCO2914	Barrow on Hustyn Downs	SW 99795 68088	Negative/minor

12.2.3 Impacts on Historic Landscape Character

A wind turbine installation at Higher Tregawne can be predicted to have an impact on the historic character of the landscape to some degree. The expected effect on HLC has been assessed as **negative/moderate** to **negative/minor**. Factors contributing to this assessment are as follows;

- The land-take for the proposed development is small in comparison with the area of the HLC Unit of Recently Enclosed Land within the surrounding landscape.

- There would be no impacts in terms of physical loss during the construction phase of the upstanding boundaries which form the visible components of HLC.
- Some visual impact throughout the operational phase would occur, affecting the integrity of this area as recently-created farmland, formerly open unenclosed downland, in particular through the introduction of a highly visible modern feature onto Hustyn Downs.
- The neighbouring landscape includes the extensive and visually very dominant St. Breock Downs wind farm to the north-west. The effects of cumulative impact are real, and should be taken into consideration, but this is not a landscape lacking visually intrusive modern features.
- Recently Enclosed Land is a traditionally dynamic landscape type. However in the case of Hustyn Downs this is not currently the case, there having been no significant changes to this area since its enclosure during the 19th and early 20th centuries.
- Any impacts on the legibility of HLC would be **temporary** and **reversible** should the wind turbine be dismantled in the future.

12.2.4 Other archaeological impacts

Any ground disturbing works on this site could encounter significant buried prehistoric or medieval remains, resulting in permanent, irreversible loss of these, or elements of them. This potential impact is assessed as **negative/unknown** as specific evidence for the nature and extent of any such remains is limited to that provided by documentary records, aerial photography and geophysical survey. Features or artefacts may not survive in forms recordable by these methods and the absence of evidence should not be taken as inferring evidence for absence. It is likely that any such impacts could be mitigated satisfactorily though archaeological recording, reducing the residual impact to **neutral** or **negative/minor**. These impacts would be **permanent** and **irreversible**.

13 Mitigation Strategy

A range of means to mitigate the potential impacts identified in this assessment may be considered by the Historic Environment Planning Advice Officer, who may choose to recommend one or more of the following.

13.1 Site re-design

Based on the results of available evidence, the HEPAO might ask the site developer to either move the turbine location to a less archaeologically sensitive location. Such an approach would limit any impacts on known significant below ground archaeology and would reduce the direct impacts on the below ground archaeology of the site to **neutral**. In this instance, neither the desk based assessment, nor the site walkover, nor the geophysical survey suggest any reason to adopt this approach.

In a case where the finalised site design would seem likely to result in unavoidable impacts on below-ground features, a Written Scheme of Investigation (WSI) would need to be prepared and agreed to establish and direct a programme of mitigating archaeological work. This would follow a brief set by Cornwall Council's Historic Environment Advice Officer, and would set out the scope of any further work required.

13.2 Controlled soil stripping and watching brief

An archaeological watching brief (observation by an archaeologist during mechanical topsoil and subsoil stripping) might be required either where any significant areas of ground are to be disturbed (for instance for the foundations for the turbine mast or during cable trenching), in areas where significant results had been identified through aerial photographs or geophysical survey and which remain proposed for ground

disturbance in the final scheme design, or where the balance of probability suggests that sub-surface archaeology might survive. This approach would provide for preservation by record of buried archaeological features or artefacts and reduce any impacts on the below ground archaeology of the site to **negative/minor**. The resultant impacts would be **permanent** and **irreversible**.

13.3 Analysis and presentation of findings

The results of any required mitigating archaeological recording outlined above would need to be compiled and analysed; significant findings would be presented as required, with publication to professional standards where appropriate.

14 References

14.1 Primary sources

Joel Gascoyne's 1699 Map of Cornwall

John Norden's 1724 Map of Cornwall

Martyn's 1748 Map of Cornwall

Ordnance Survey, 1809, *1 inch mapping* First Edition (licensed digital copy at HE)

Ordnance Survey, *c*1880. *25 Inch Map* First Edition (licensed digital copy at HE)

Ordnance Survey, *c*1907. *25 Inch Map* Second Edition (licensed digital copy at HE)

Ordnance Survey, 2007. *Mastermap Digital Mapping*

Tithe Map and Apportionment, *c*1840. *Parish of St. Breock* (digital copy available from CRO)

14.2 Publications

English Heritage 2005, *Wind energy and the Historic Environment*

English Heritage 2011, *The setting of Heritage assets: English Heritage guidance*

Herring, P. 1998, *Cornwall's historic landscape: presenting a method of historic landscape character assessment,* Cornwall Archaeological Unit

14.3 Websites

http://www.heritagegateway.org.uk/gateway/ English Heritage's online database of Sites and Monuments Records, and Listed Buildings

15 Project archive

The HE project number is **2012007**

The project's documentary, photographic and drawn archive is housed at the offices of Historic Environment, Cornwall Council, Kennall Building, Old County Hall, Station Road, Truro, TR1 3AY. The contents of this archive are as listed below:

1. A project file containing site records and notes, project correspondence and administration.
2. Digital photographs stored in the directory R:\Historic Environment (Images)\SITES.E-H\Higher Tregawne wind turbine assessment 2012007
3. English Heritage/ADS OASIS online reference: cornwall2-118324
4. This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites H \Higher Tregawne wind turbine assessment 2012007\Higher Tregawne wind turbine assessment.doc

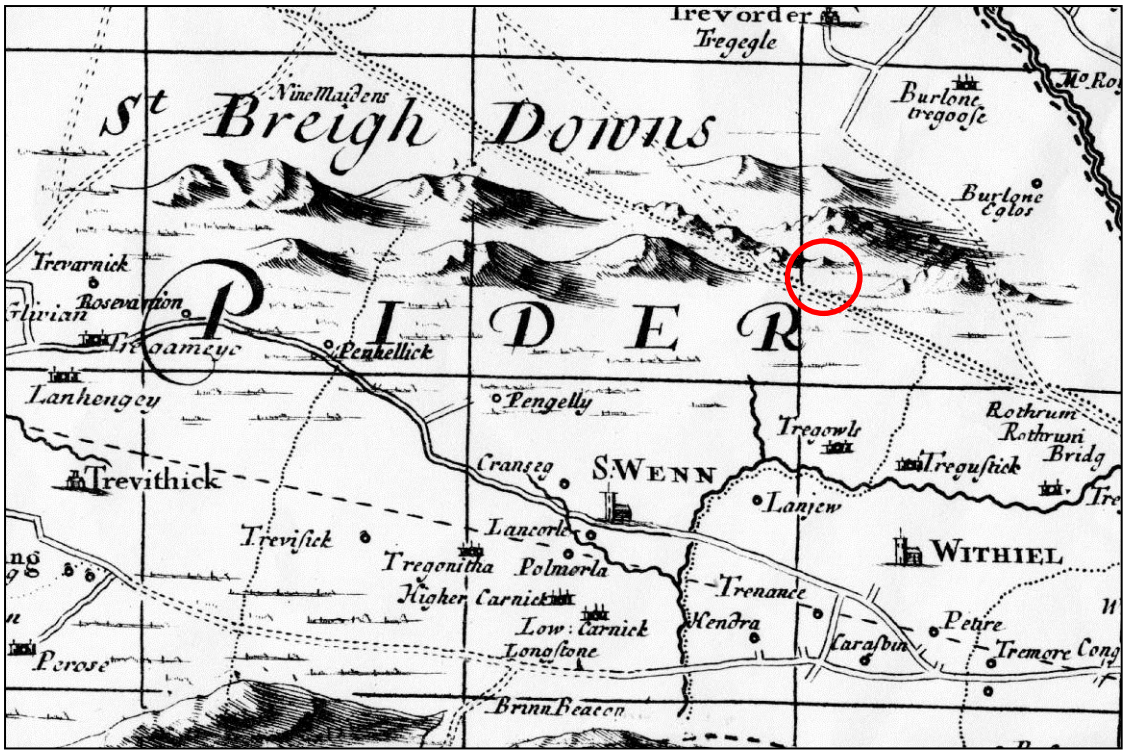

Fig 3. The project area and its surroundings as shown on Joel Gascoyne's 1699 Map of Cornwall. The project area is circled in red.

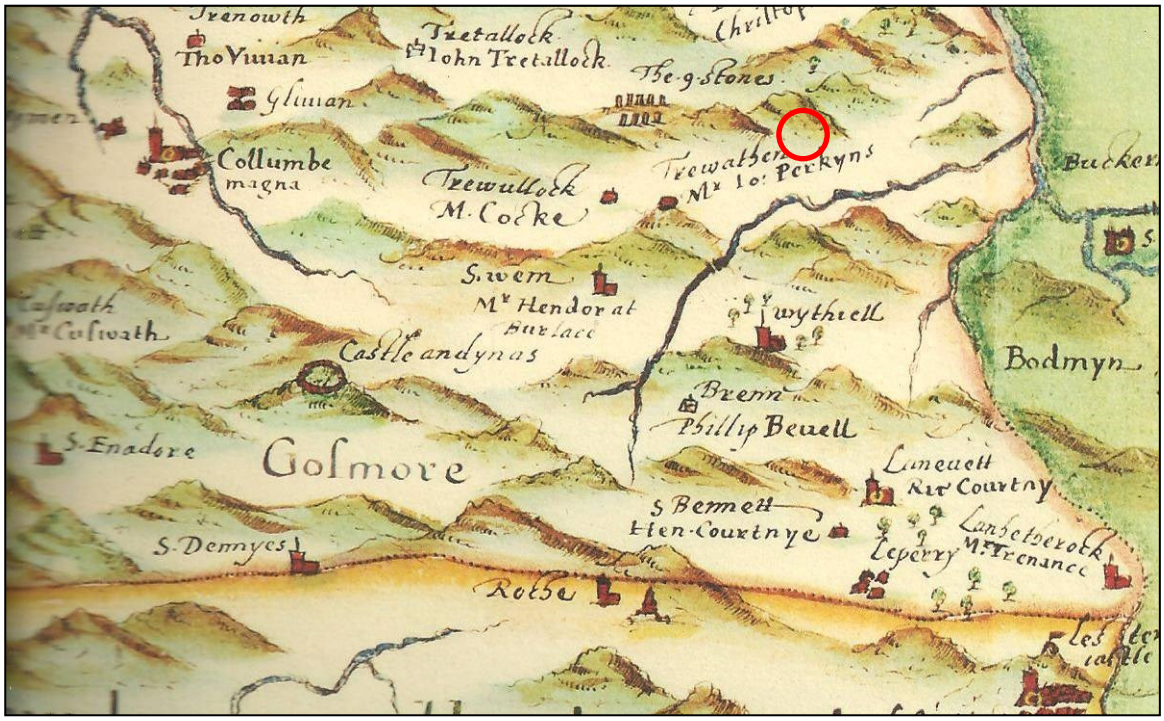

Fig 4. The proposed turbine site and its surroundings as shown on John Norden's 1724 Map of Cornwall. The project area is circled in red.

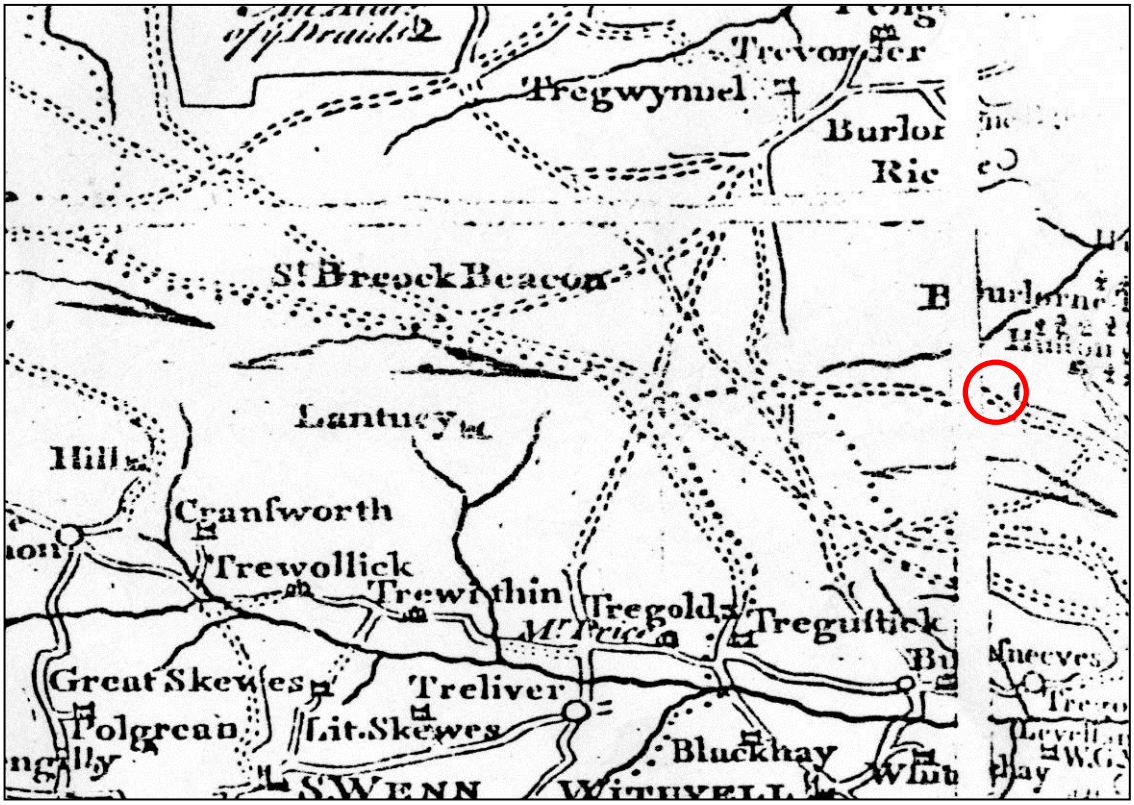

Fig 5. The proposed turbine site and its surroundings as shown on Martyn's 1748 Map of Cornwall. The project area is circled in red.

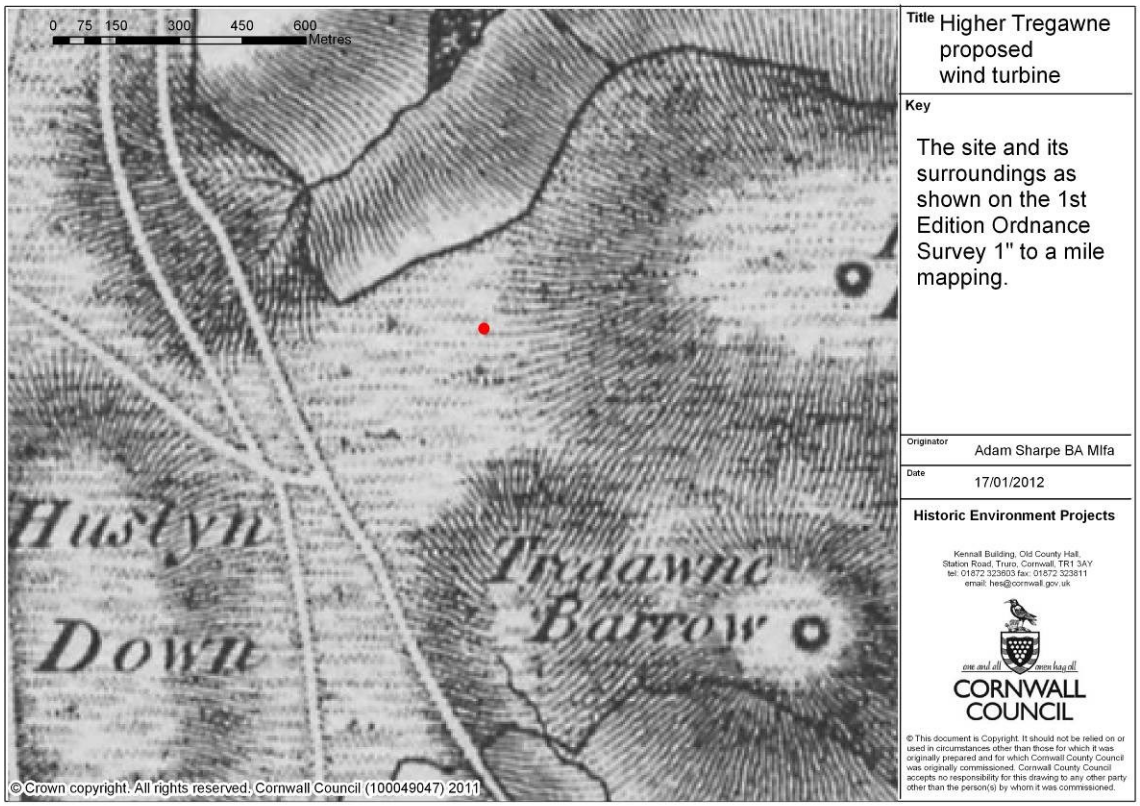

Fig 6. The project area and its surroundings as shown on the circa 1809 1st Edition OS mapping. The landscape at the time was largely open downland.

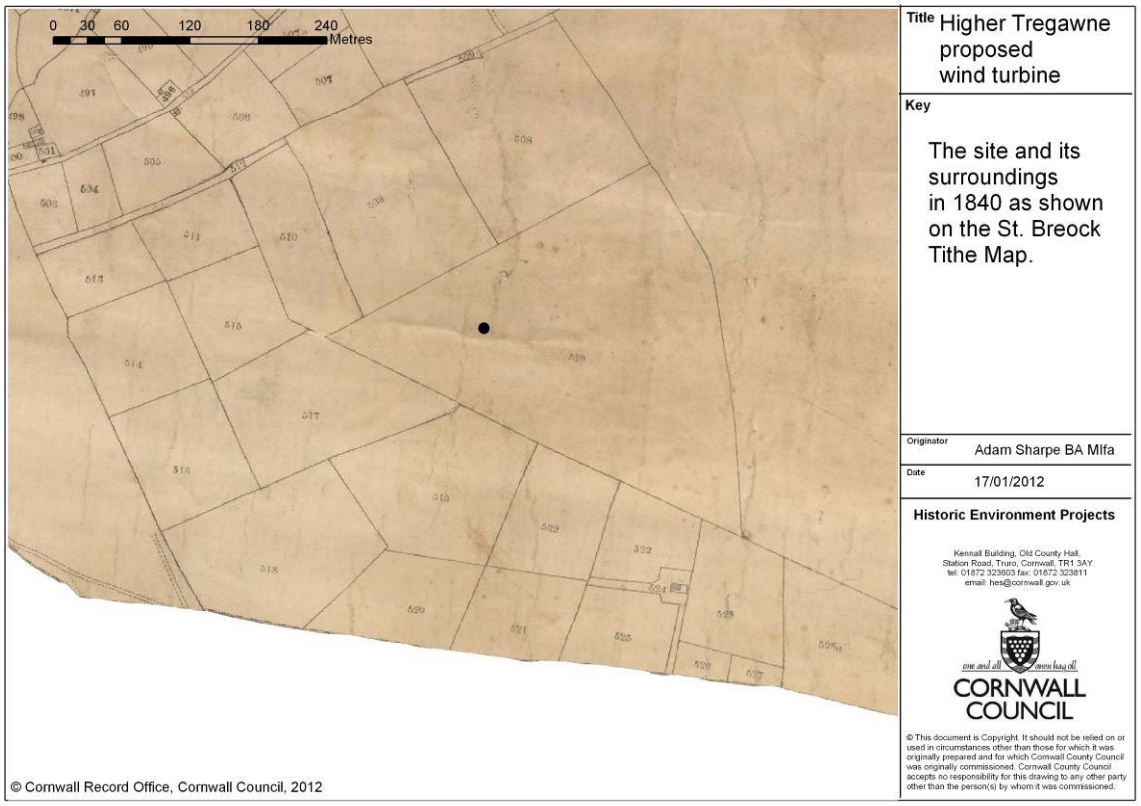

Fig 7. The project area as shown on the circa 1840 St. Breock Tithe Map. The process of enclosure of the downland was well under way by this date.

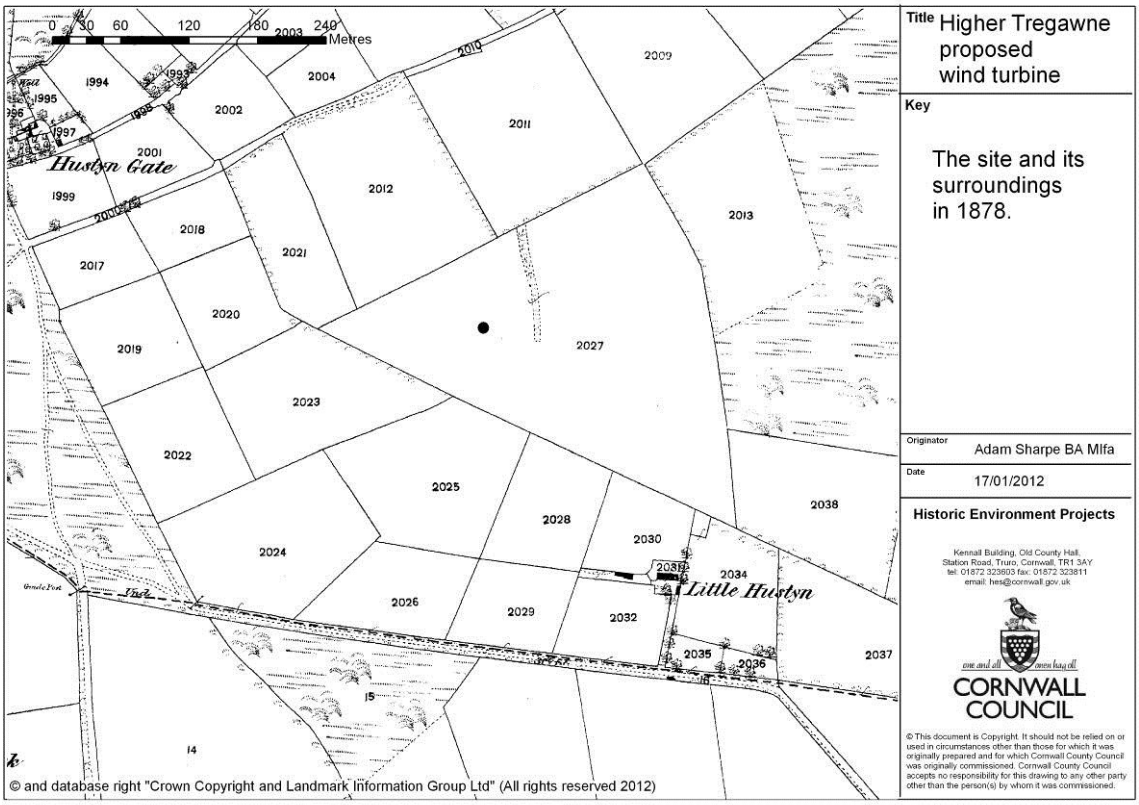

Fig 8. The project area as shown on the circa 1877 1st Edition OS 25" to the mile mapping. The enclosure of the surrounding downland had progressed somewhat since 1840. Note the boundary shown to the east of the proposed turbine site.

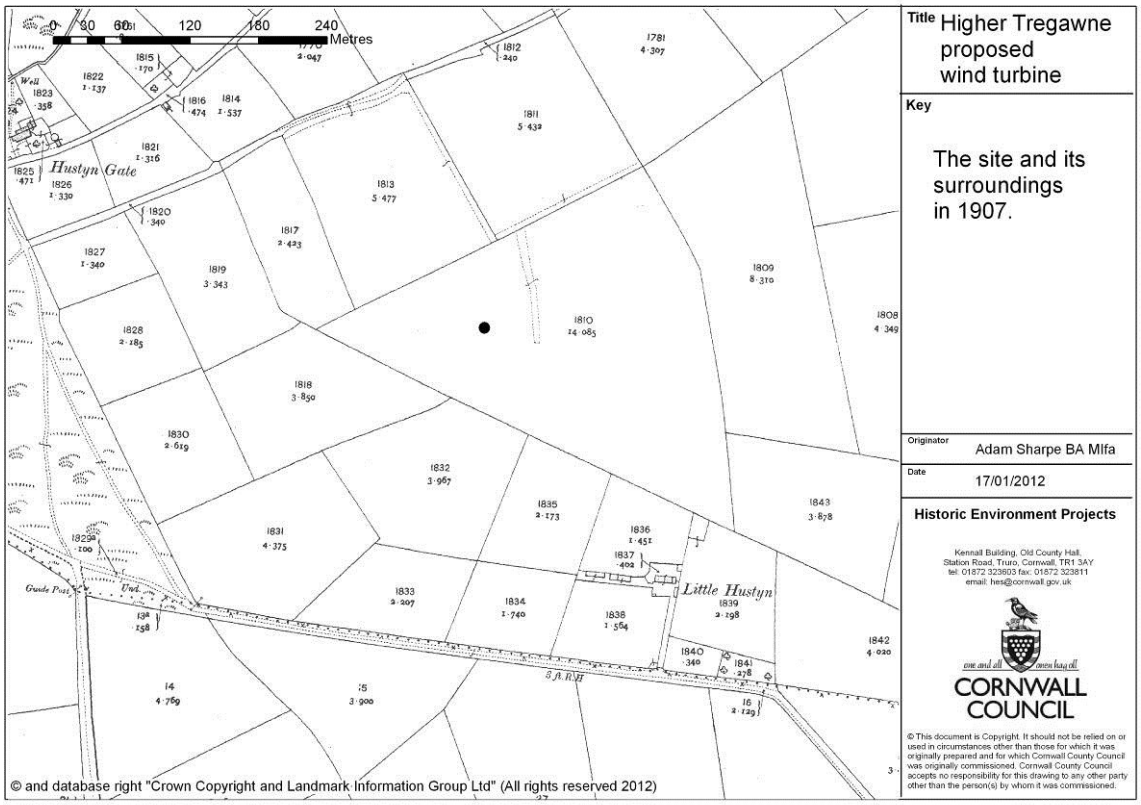

Fig 9. The project area as shown on the circa 1908 OS 25" mapping showing further downland enclosure which had taken place to the east of the project area since 1877.

Fig 10. The project area as shown on a 2005 CCC aerial photographs, showing how the former downland character of this area has been completely removed through the process of enclosure.

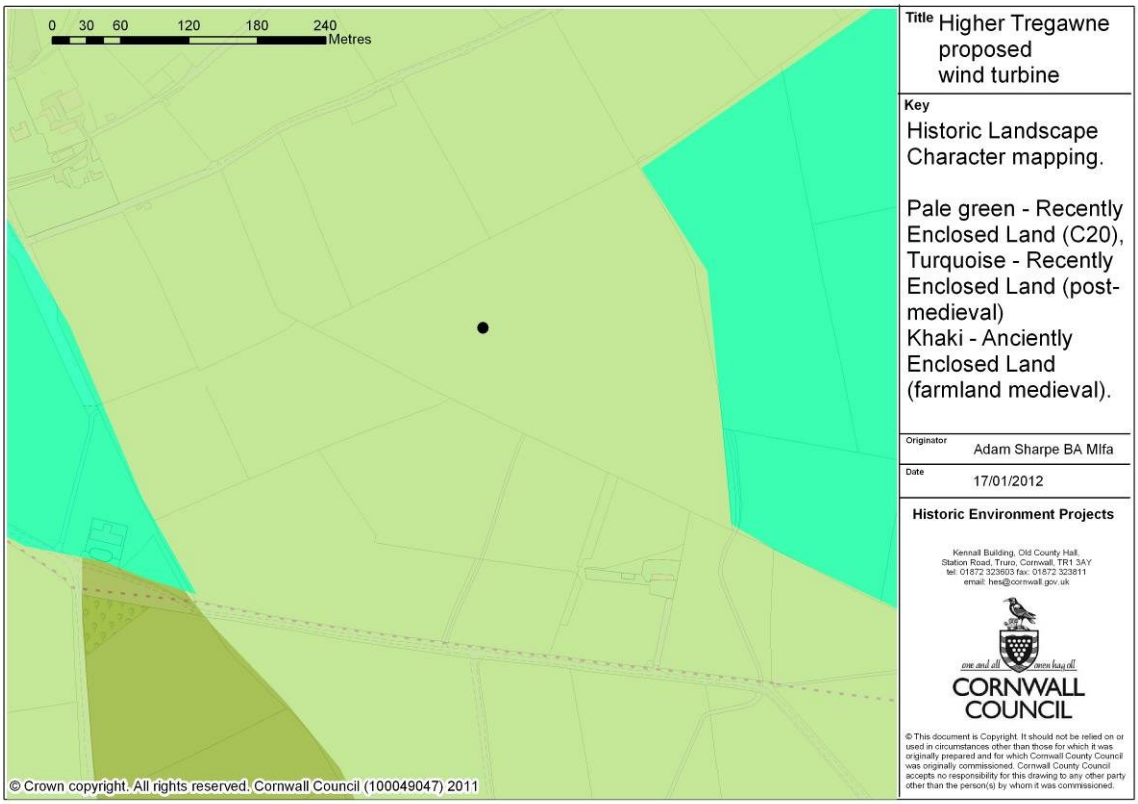

Fig 11. Historic Landscape Character mapping summarises the changes shown on the previous map extracts, showing progressive enclosure from downland over a period of some years.

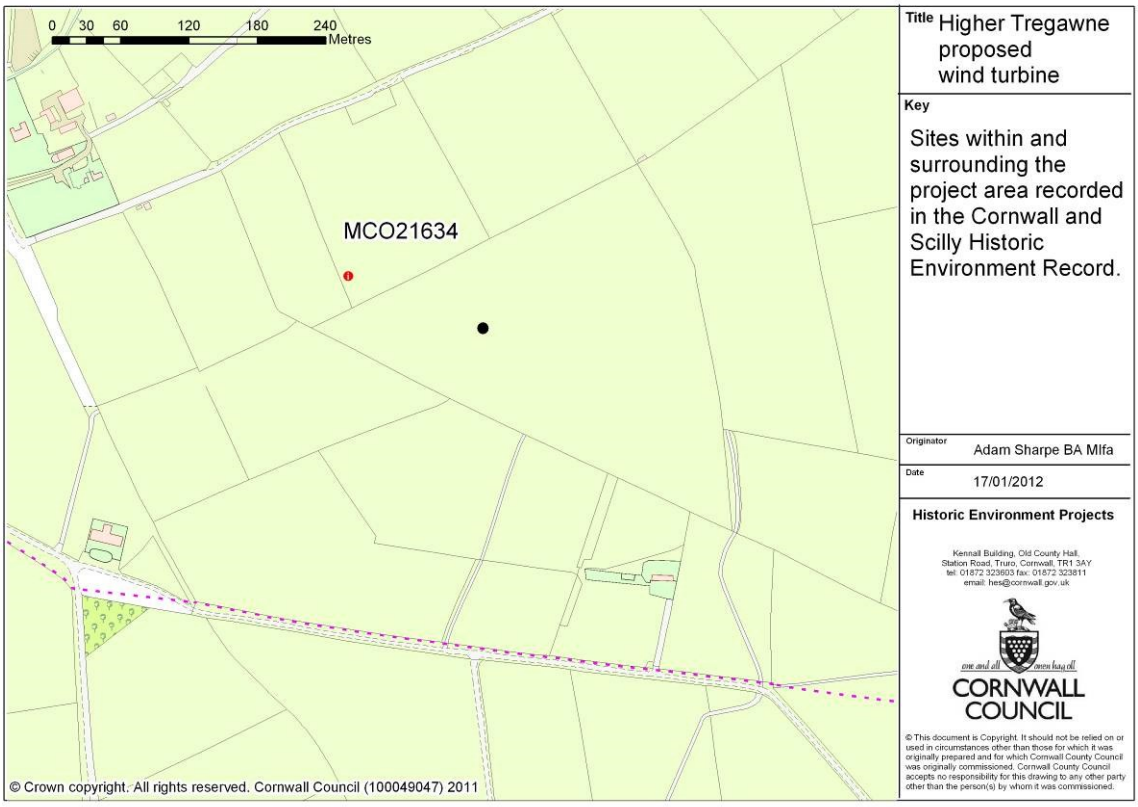

Fig 12. The only site recorded near the site of the proposed turbine is a now-lost feature whose description strongly suggests it was a bronze age barrow. The precise location of this feature is uncertain.

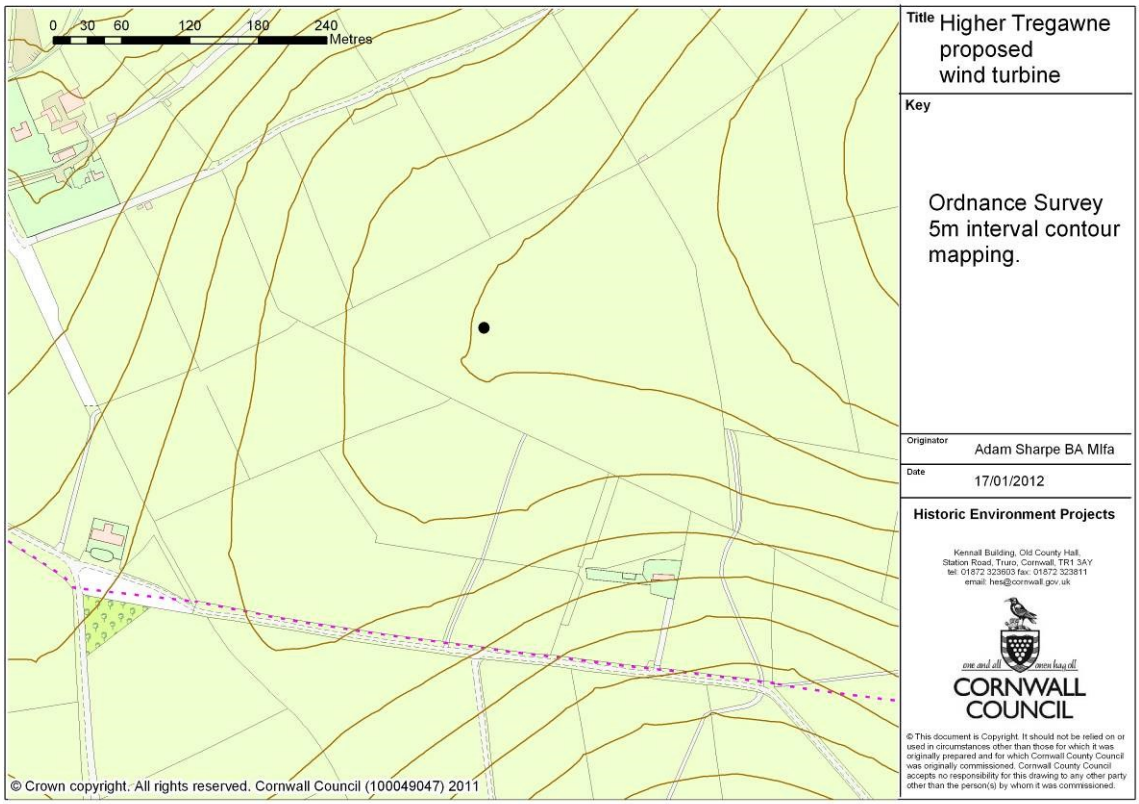

Fig 13. OS contour data for the area immediately surrounding the proposed wind turbine shows the site located on a spur falling to the north, west and south.

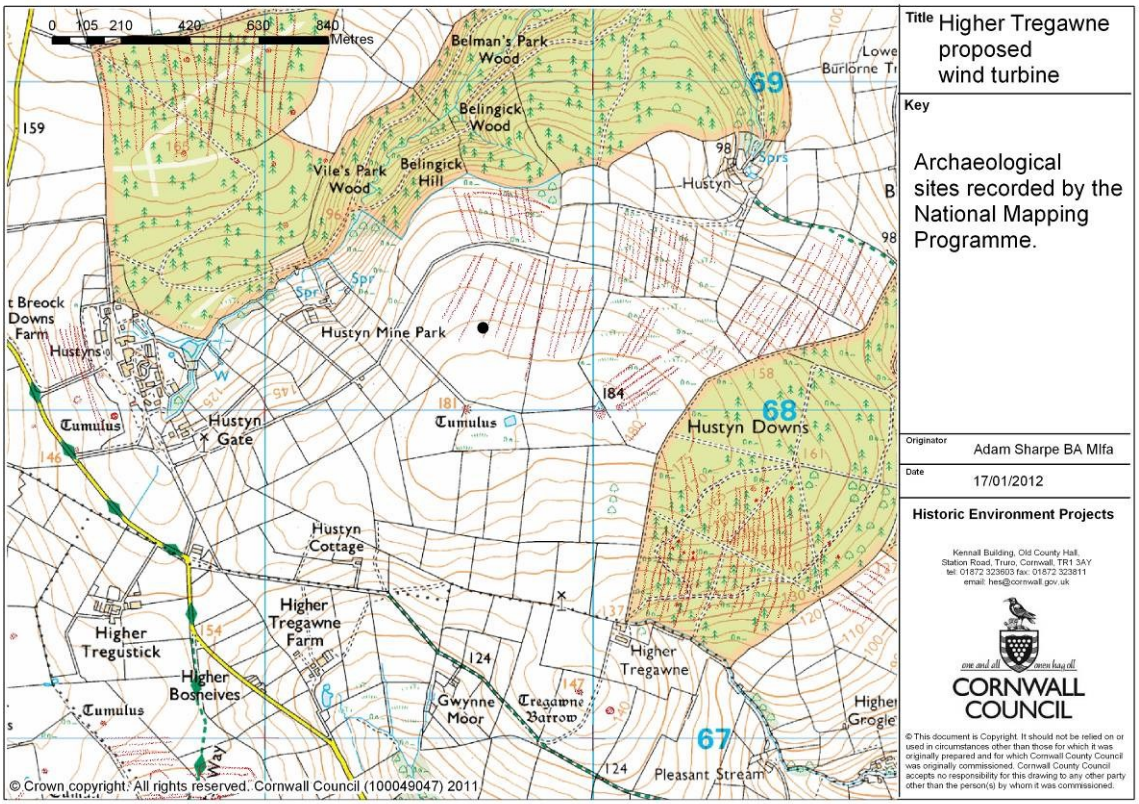

Fig 14. NMP mapping from aerial photographs covering Hustyn Downs, showing the very extensive areas of medieval outfield recorded over much of this area.

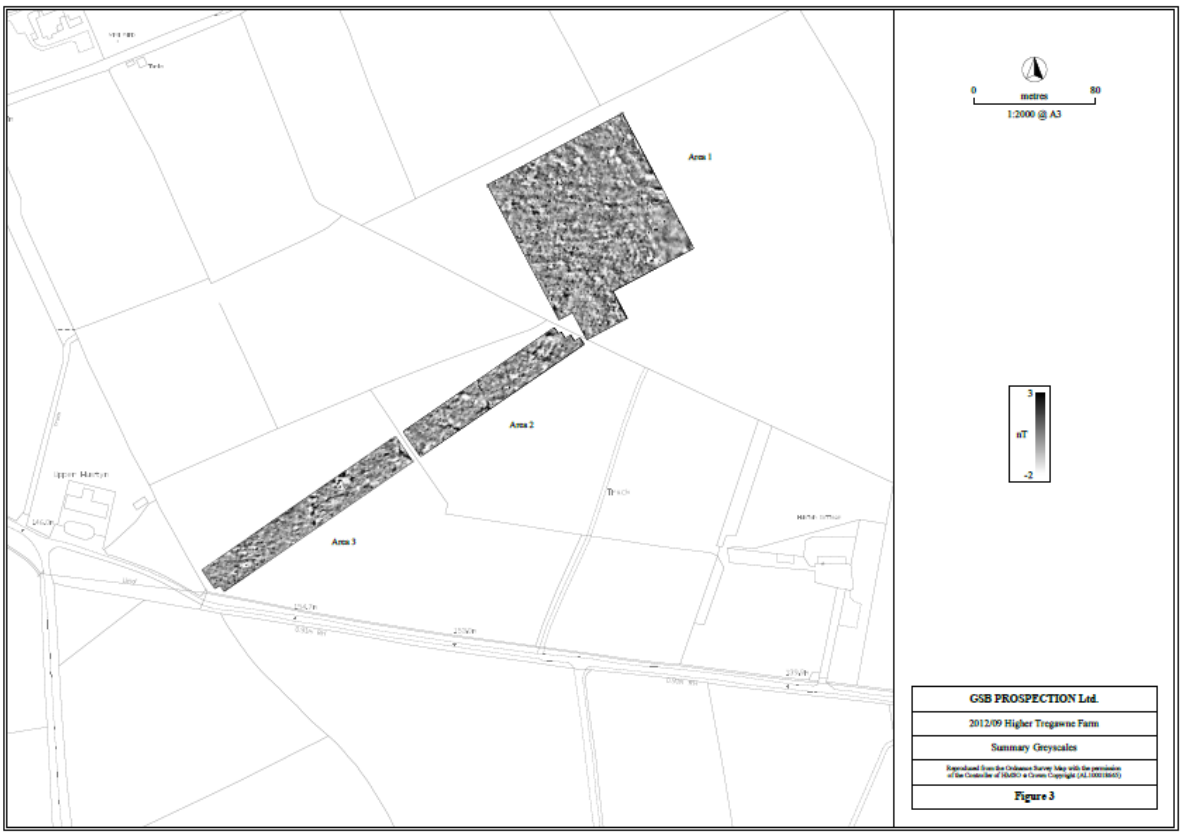

Fig 15. The GSB geophysics data plot for the area surrounding the proposed Higher Tregawne wind turbine and its cable route.

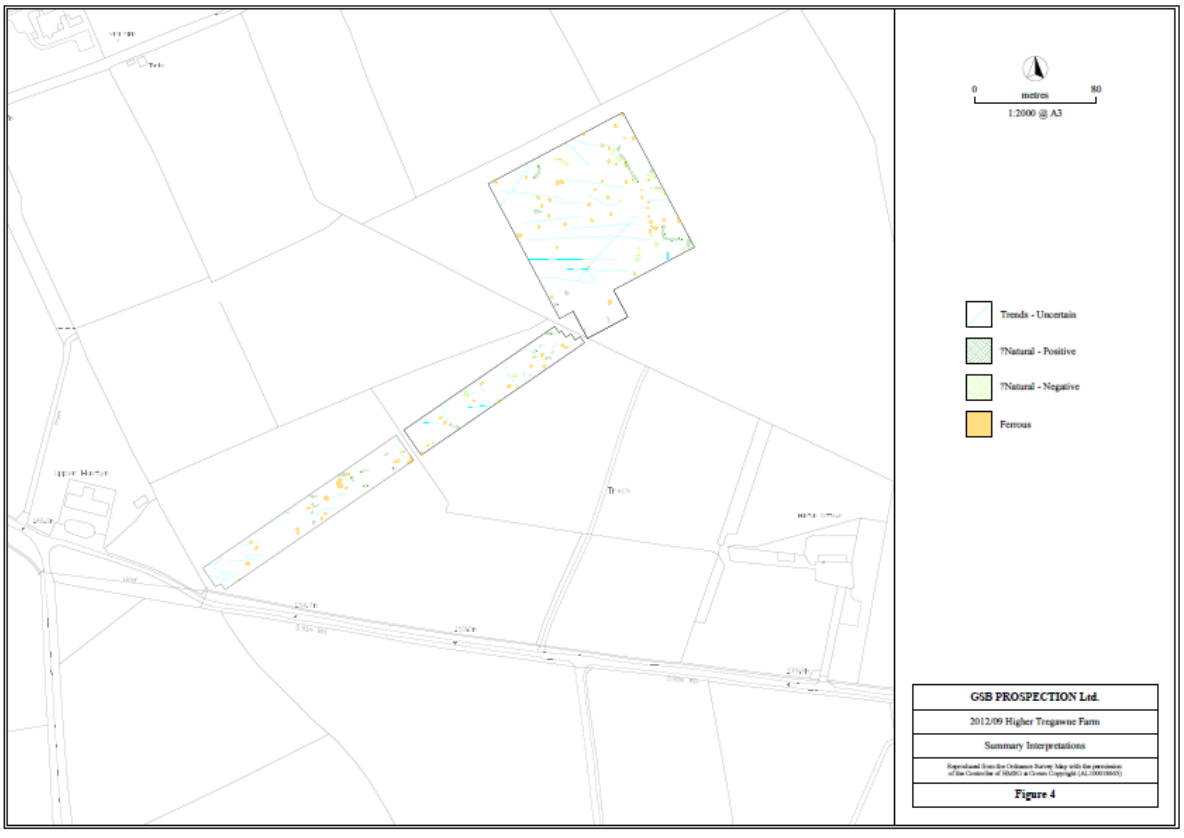

Fig 16. The interpreted geophysics data for the proposed Higher Tregawne wind turbine and cable route.

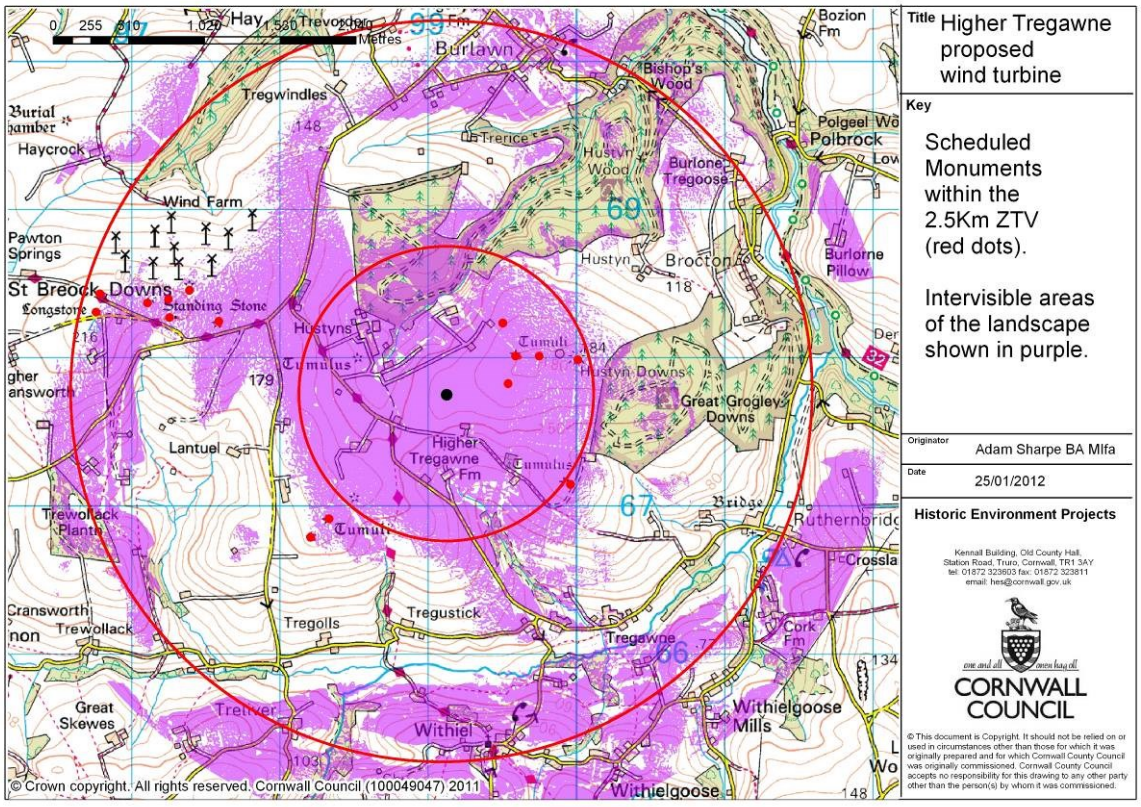

Fig 17. Mapping showing the ZTV within a 2Km radius of the site proposed for the wind turbine, showing potentially intervisible scheduled monuments.

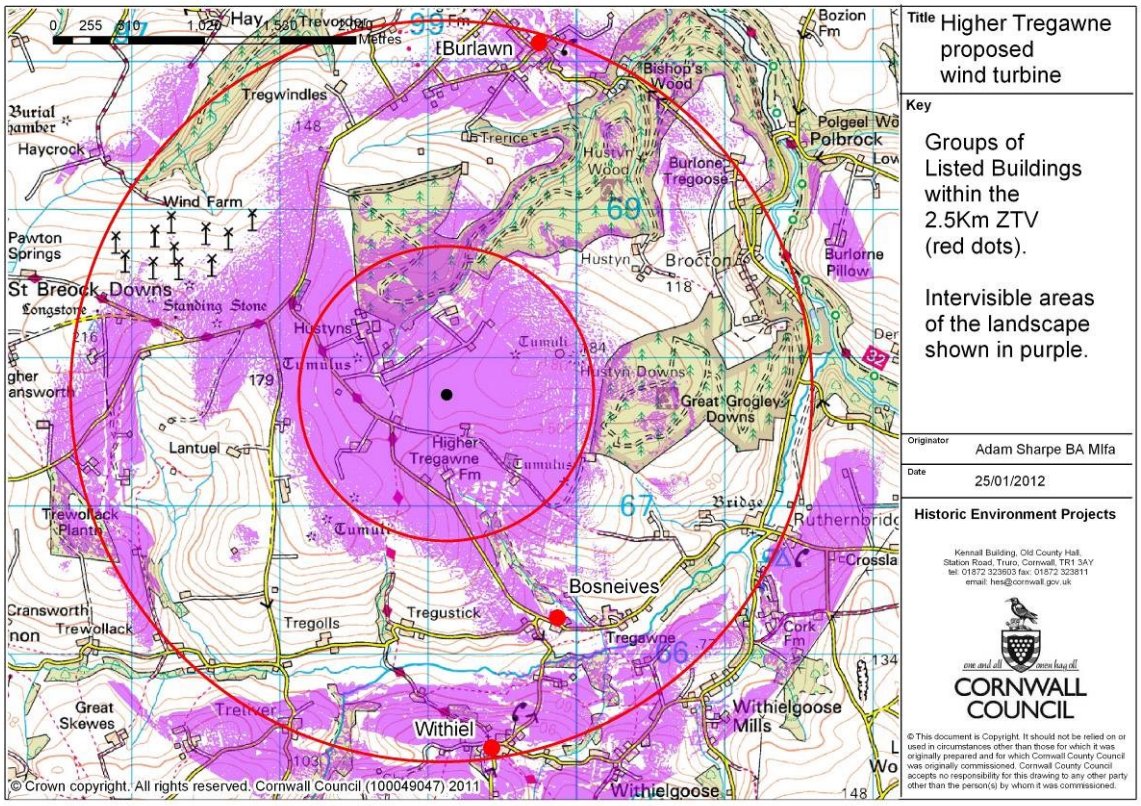

Fig 18. Mapping showing the ZTV within a 2.5Km radius of the site proposed for the wind turbine, showing potentially intervisible listed buildings.

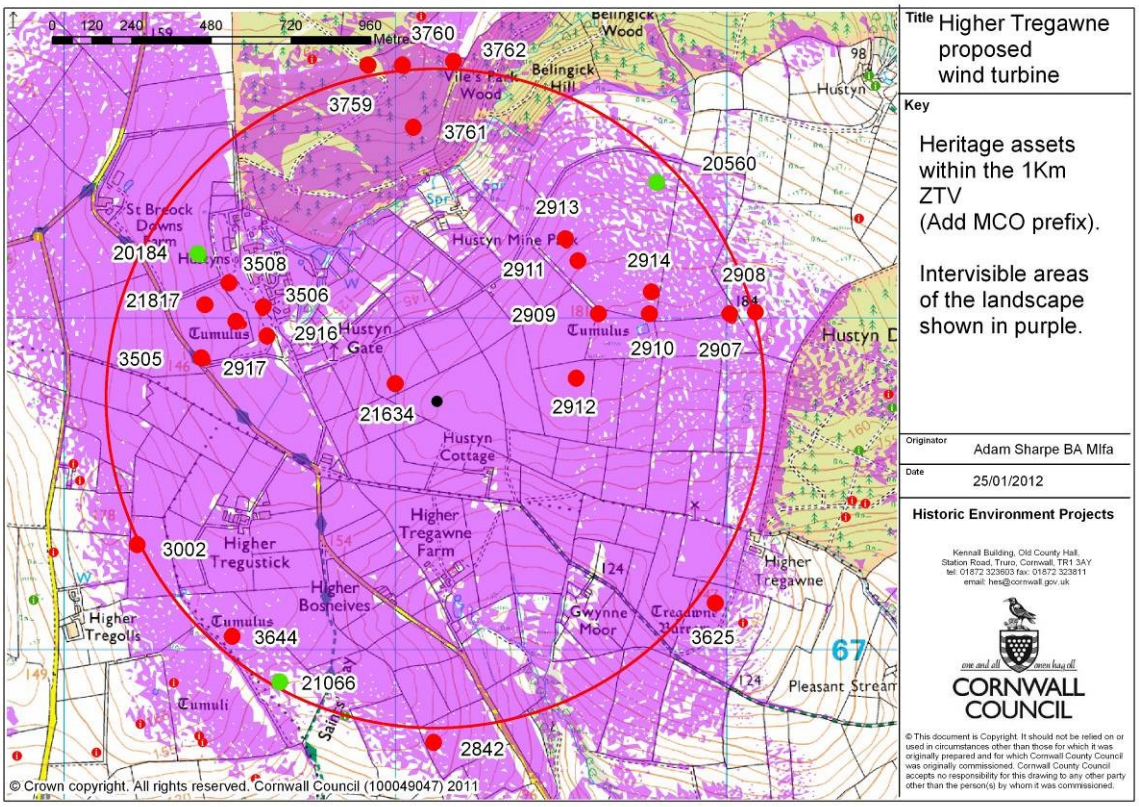

Fig 19. Mapping showing the ZTV within a 1Km radius of the site proposed for the wind turbine, showing potentially intervisible heritage assets.

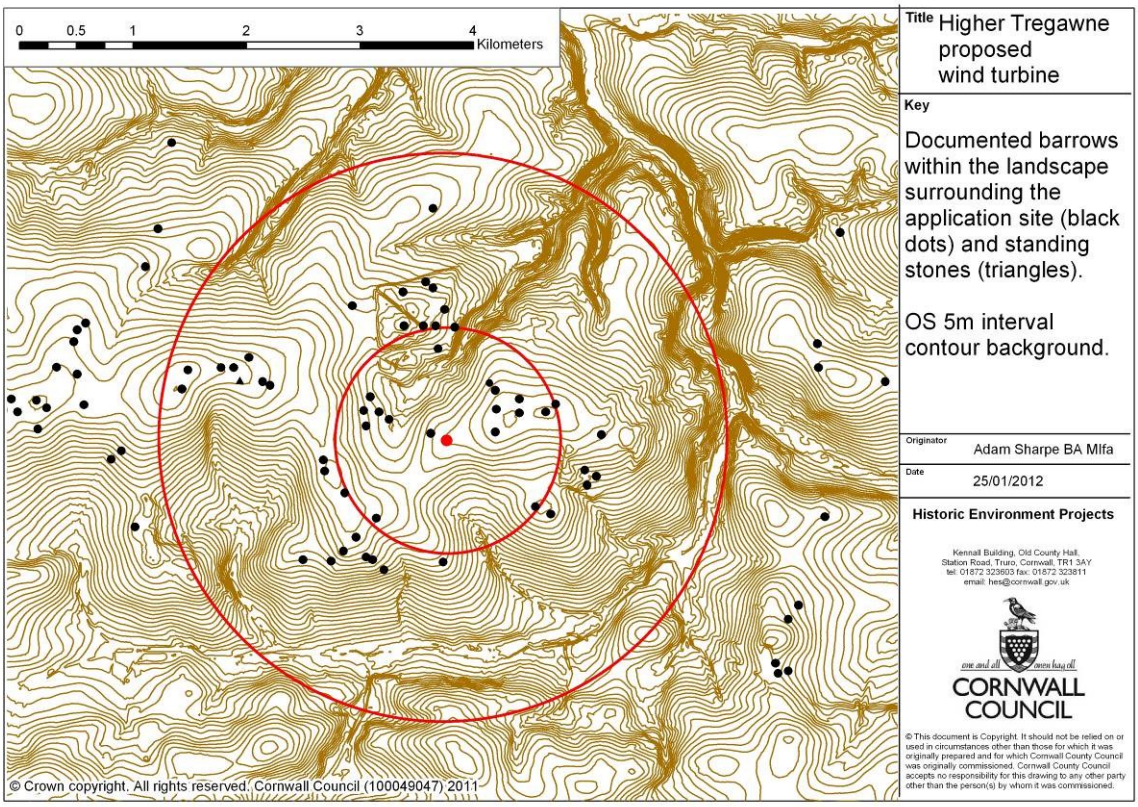

Fig 20. Mapping showing the topographical setting of the proposed wind turbine showing documented barrows on a 5m interval contour base.

Fig 21. Looking towards Hustyn Downs from the top of the hill adjacent to Withiel House. The proposed wind turbine would be sited on the skyline to the left.

Fig 22. The view from Withiel churchyard looking north to Hustyn Downs on the skyline.

Fig 23. Lavender Cottage and Withiel post office, with Hustyn Downs in the background.

Fig 24. Barrow MCO2917 near Hustyn Park (left centre) with Hustyn Downs forming the skyline.

Fig 25. Hustyn Downs from the road 1.1Km to its west. The Higher Tregawne wind turbine would be sited in the skylining field near the centre of this view.

Fig 26. Looking east towards Hustyn Downs 1.75Km away from St. Breock Downs with one of the scheduled barrows (left) and a scheduled standing stone (right) in the middle distance.

Fig 27. Part of the St. Breock wind farm, showing the proximity of these turbines to the scheduled barrows, one of which can be seen right centre.

Fig 28. One of the scheduled barrows on St. Breock Downs, showing the already-existing impacts on its setting arising from the proximity of the wind farm.

Fig 29. An area of medieval ridge and furrow (MCO20184) to the north west of Hustyn Gate. The conifer plantation hides a number of barrows, and would block intervisibility between the proposed wind turbine and the settlement of Burlawn to its north.

Fig 30. Looking north east from the site of the proposed wind turbine towards St. Breock Downs, its wind farm and the scheduled barrow group on the skyline.

Fig 31. Looking north east towards the summit of Hustyn Downs from the site of the proposed wind turbine. From ground level, the barrow group on the summit cannot be seen, though its components would be intervisible with the upper parts of the turbine mast.

Fig 32. Looking from the proposed wind turbine site towards Withiel 2.5Km away to the south, with Hensbarrow Downs in the distance.

Fig 33. Scheduled barrow MCO2909 (DCO1630) showing as a 0.6m high raised area adjacent to a low field boundary. The proposed wind turbine would be just over 500m away just to the left of centre of this view.

Fig 34.Looking east across the summit of Hustyn Downs towards scrub-grown scheduled barrow MCO2907 (DCO1630) which would be just intervisible with the proposed wind turbine. The impacts on the setting of the barrow resulting from the proximity of the water tank just to its north are clearly evident.