



Bodulgate Farm, Trewalder, Delabole, Cornwall

Archaeological assessment of proposed wind turbine site (revised location)



Historic Environment Projects

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Client	Mark Dyson Surveyors Ltd
Report Number	2012R081
Date	November 2012
Status	Final
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Acknowledgements

This study was commissioned by Mark Dyson Surveyors Ltd and carried out by Historic Environment Projects, Cornwall Council.

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.



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Cover illustration

The project area and proposed location of the wind turbine (black dot), with the National Mapping Programme transcription from air photographs of archaeological features. The feature in the field to the west of the project area strongly resembles a form of enclosed settlement of Iron Age or Romano-British date frequently found in Cornwall and known as a round.

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Abbreviations

ADS	Archaeological Data Service
CCC	Cornwall County Council
EH	English Heritage
HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
NGR	National Grid Reference
NMP	National Mapping Programme
OS	Ordnance Survey

1 Summary

Historic Environment Projects, Cornwall Council, was commissioned by Mark Dyson of Mark Dyson Surveyors Ltd on 8 November 2012 to produce a desk-based archaeological assessment on the revised location of a proposed wind turbine at Bodulgate Farm, Trewalder, Delabole, as part of a proposed planning application. A cost schedule for the new assessment was provided on 8 November. The current assessment is based on that produced in October 2012 for a proposed turbine location approximately 140m to the west, amended appropriately to reflect the revised location.

The proposal is for a 500Kw wind turbine with maximum blade tip height of 77m, to be sited on farmland at Bodulgate Farm, in Camelford civil parish, at NGR SX 08143 81990. The site chosen for the wind turbine lies on a south-facing slope approximately 3 km south west of Camelford town.

This report summarising the results of the assessment and its conclusions was prepared for the client. The primary findings are that the proposed location for the wind turbine lies approximately 160m from a site identified from air photographs as a potential enclosure of the later prehistoric or Roman period, of a type known in Cornwall as a round. The proposed location also falls within a former open field of the medieval farm of Bodulgate, the eastern side of which was the boundary of the medieval deer park of Lanteglos. Several monuments and structures with historic environment designations lie within the wider environs of the proposed site.

Possible means of obtaining additional information and mitigating potential impacts on heritage assets within the project area are discussed briefly.

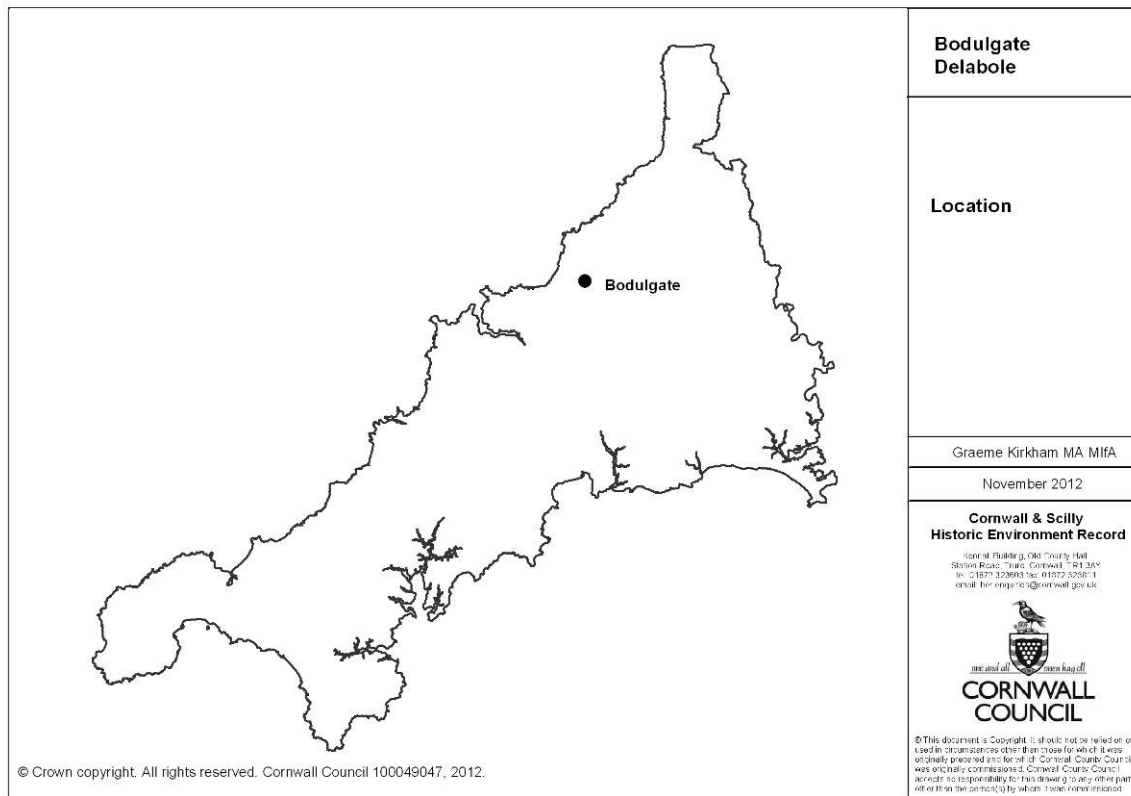


Fig 1 The location of Bodulgate, Delabole.

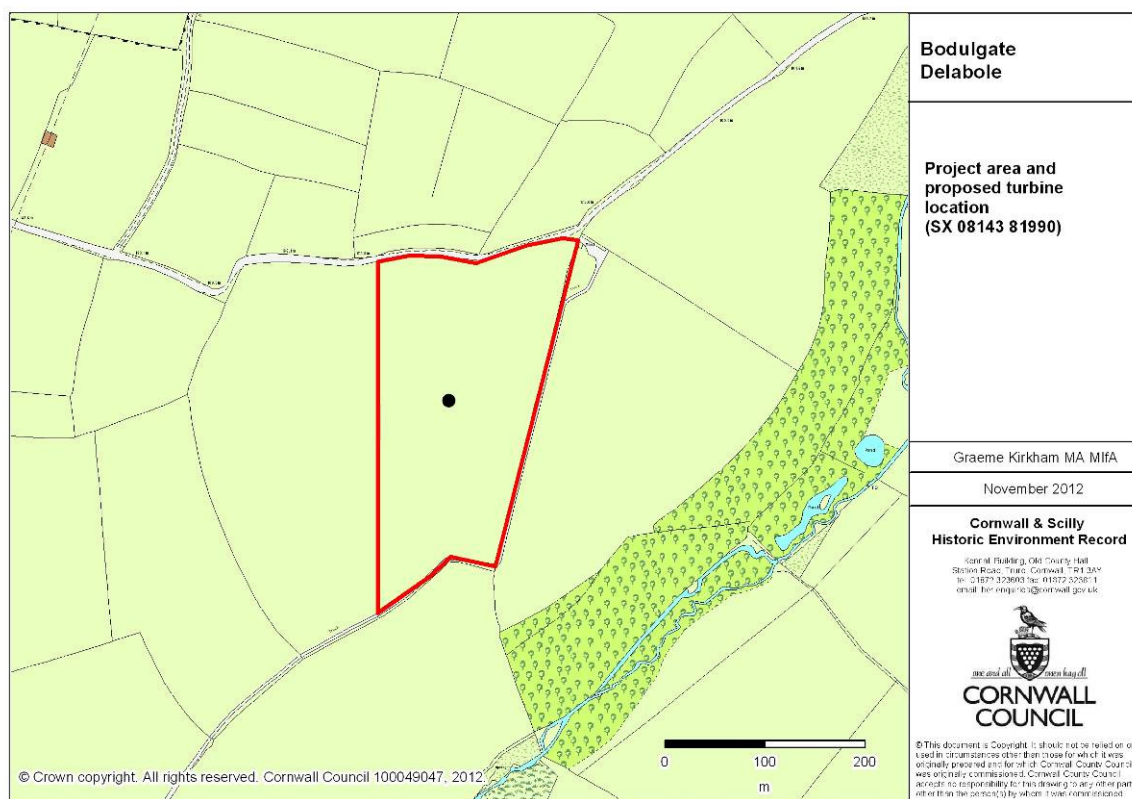


Fig 2 The location of the proposed wind turbine and extent of the project area.

2 Introduction

2.1 Project background

Historic Environment Projects, Cornwall Council, was commissioned by Mark Dyson of Mark Dyson Surveyors Ltd on 8 November 2012 to produce a desk-based archaeological assessment of the site of a proposed wind turbine at Bodulgate Farm, Trewalder, Delabole, as part of a proposed planning application. A cost schedule for this work was provided on 8 November. This assessment is based on one produced in October 2012 for a site approximately 140m to the west (Kirkham 2012), amended appropriately to reflect the revised location.

The proposal is for a 500Kw wind turbine with a maximum blade tip height of 77m, to be sited on farmland at Bodulgate, Delabole, at NGR SX 08143 81990 (Figs 1 and 2).

2.2 Aims

The principal aim of the study is to gain a better understanding of the archaeology and heritage assets which might potentially be affected by construction of a wind turbine on land at Bodulgate Farm, Delabole.

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.
- Produce a report containing the desk based assessment in interpreted form.
- Make recommendations on whether an archaeological evaluation or further archaeological recording of any potential buried remains or other mitigation may be required.

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 in the Cornwall and Scilly HER.
- Historic maps, including
 - Norden's map of Cornwall (c 1600)
 - Joel Gascoyne's map of Cornwall (1699)
 - Thomas Martyn's map of Cornwall (1748)
 - OS 1 inch map (c 1813)
 - Lanteglos-by-Camelford tithe map (c 1840)
 - 1st and 2nd editions of the OS 25-inch maps (c 1880 and c 1907).
- Modern Ordnance Survey mapping.
- National Mapping Programme transcriptions 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 as part of the Cornwall and Scilly HER.

The historic and landscape context of the site was also considered during 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 Archive report and deposition

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. Copies have also been sent to the Historic Environment Planning Advice Archaeologist (HEPAO) for the appropriate area, and to the appropriate English Heritage Inspector of Ancient Monuments. 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 proposed for the wind turbine is at NGR SX 08143 81990, approximately 3km south west of Camelford. It lies at just over 165m OD on a south- and south-east facing slope, close to the southern end of a ridge which projects south from high ground to the north of Delabole (Fig 1). The site lies on the valley side above a stream which rises on high ground north-west of Camelford. This stream combines with another about 1400m south west of the site to form the River Allen.

The field defined as the project area covers 5 ha and lies between approximately 170m and 140m OD. It falls within an area characterised in the Cornwall and Scilly Historic Environment Record (HER) as Farmland: Medieval (Fig 11); that is, land which has been enclosed and cultivated since at least the seventeenth century and potentially from the prehistoric period (Cornwall County Council 1996). Land characterised in this way has been a focus for human activity over a long period and its archaeological potential is therefore regarded as high.

The parent bedrock underlying the application site consist of undifferentiated Middle Devonian mudstones, siltstones and sandstones, with soils characterised as Denbigh 2 loams over slate and slate rubble (British Geological Survey 2008; National Soil Resources Institute Soil Systems Group 2004). The agricultural classification of most of the project area is Grade 3 with approximately the southern third of the field mapped as Grade 4 (GIS dataset held by Cornwall Council).

4 Designations

4.1 Historic environment designations

No historic environment designations apply within the project area. The following designated sites lie within 2.5 km of the project area (Fig 14):

4.1.1 Scheduled Monuments

- Round called Castle Goff (National Heritage List entry no 1004274).
- Round 275m SSE of Little Delinuth (National Heritage List entry no 1004273).

- Round 410m west of Kenningstockmill (National Heritage List entry no 1004419).
- Slight univallate hillfort with outworks containing a medieval chapel and beacon at Helsbury Castle (National Heritage List entry no 1006707).
- Three wayside crosses in St Julitta’s churchyard (National Heritage List entry no 1018208).
- The Castle Goff stone and Valley Truckle cross in St Julitta's churchyard (National Heritage List entry no 1018207)
- Churchyard cross in the cemetery at St Teath, 60m north west of the church (National Heritage List entry no 1016155).
- Wayside cross at Trevia Walls (National Heritage List entry no 1006648)
- Cross south east of Tresinney (National Heritage List entry no 1004418)
- The Trevia cross, at Sportsmans (National Heritage List entry no 1007967)

4.1.2 Listed Buildings

A total of 121 Listed Buildings are located within 2.5 km of the proposed wind turbine location. These are detailed below.

4.1.2.1 Grade I

Church of St Julitta (National Heritage List entry no 1142729)

Church of St Tetha (National Heritage List entry no 1327712)

Church of St Adwen (National Heritage List entry no 1328128)

4.1.2.2 Grade II*

Community centre to north west of church of St Tetha (National Heritage List entry no 1158789)

Trethin [house] (National Heritage List entry 1142720)

4.1.2.3 Grade II

Table I provides totals of Grade II Listed heritage features within 2.5km of the project area.

Wells / wellhouses and associated features	4
Cottages, houses, farmhouses	38
Agricultural buildings	4
Mill	1
Smithy	1
Chapel (medieval)	1
Nonconformist churches / chapels	4
Clock tower	1
Church	1
Arch in wall; churchyard walls; gate piers	3

Schools	2
Cross	1
Clapper bridge	1
Boundstone, milestones	5
Guidepost	1
Headstones, tombchests, etc	48
Total	116

4.1.3 Conservation Areas

The Conservation Area for St Teath lies wholly within the 2.5 km radius of the project area (Fig 14).

The southern edge of the Camelford Conservation Area lies just beyond the 2.5 km radius of the site.

Conservation areas were introduced through the Civic Amenities Act 1967. The primary legislation is the Town and Country Planning Act 1990 and the Planning (Listed Buildings and Conservation Areas) Act 1990. The key reference to government policy on all development affecting Conservation Areas is the National Planning Policy Framework (Department for Communities and Local Government 2012).

4.2 Other designations

4.2.1 Area of Great Landscape Value

The site falls within the Camel and Allen Valleys area of locally important landscape identified as an Area of Great Landscape Value in the North Cornwall Local Plan, section 5.28 (North Cornwall District Council 1999).

4.2.2 Rights of way and access

Available GIS mapping shows no public rights of way or access land on or near the project area, with the exception of the minor public road which bounds the site to the north.

5 Site history

The project area is characterised by Cornwall's Historic Landscape Characterisation (Cornwall County Council 1996) as Farmland: Medieval, also described as Anciently Enclosed Land (Fig 11). This is defined as land enclosed and cultivated since at least the seventeenth century and in many areas from later prehistory, which forms Cornwall's long-established agricultural heartland. Because it has been a focus for human activity over a long period the archaeological potential of such land is regarded as high. Evidence from excavation, geophysics and air photographs has demonstrated that sites within land of this character type frequently reveal complex occupation remains dating from the early prehistoric up to the medieval period and beyond.

5.1 Prehistoric

The Cornwall and Scilly Historic Environment Record (HER) holds a record for a substantial enclosure centred approximately 160m west of the proposed turbine location (Fig 13). This feature is described as follows by the HER record (PRN 57172):

'A rectilinear enclosure, 86m by 60m, with a north-east facing entrance, is visible as cropmarks and very low earthworks on aerial photographs taken in 1995. The enclosure, which is defined by a bank with outer ditch, is situated on the south-west facing slopes of a pronounced ridge to the east of Trewalder. It is of

uncertain date and function, but a prehistoric origin cannot be ruled out. The feature was plotted during the Cornwall NMP.'

This enclosure was not noted by Maclean (1876, II, 284) in his short overview of antiquities in the parish of Lanteglos; he mentions only Castle Goff and Newberry round to the north of the present site and another to the south east at Helstone. It may not, therefore, have been prominent as a standing earthwork by that time. It is notable, however, that the tithe map (Fig 7) shows a survey point – one of a number of intervisible points around the parish from which the map was constructed – at a location on or close to the north-east corner of the cropmark plot of the enclosure. It may be, therefore, that when the map was created in 1841 the earthwork was still at least partly standing and offered a useful vantage point for the surveyors. The air photograph interpretation (HER PRN 57172) suggests that low earthworks survive on the site.

Morphologically the feature plotted from air photographs strongly resembles enclosures of a type known in Cornwall as rounds. These are settlements enclosed by a substantial bank and ditch which were constructed and occupied during the Iron Age and Romano-British period. Some of these survive as standing earthworks but many others are known from air photographs, geophysical survey and excavation. Others have been inferred from place-names. Rounds may be broadly characterised as enclosed farm settlements or estate centres of the Iron Age – Romano-British period, although some have been shown to have had specialist functions including metalworking (Quinnell 2004; Lawson-Jones and Kirkham 2009-10). Geophysics and air photographs have demonstrated that such sites are sometimes associated with adjacent ditched field systems and excavations at Threemilestone, west of Truro, revealed an extensive *unenclosed* settlement in the near vicinity of a round (Gossip, forthcoming). Rounds and comparable enclosures of the Iron Age and Romano-British period are regarded as of national importance (below).

The wider area around Bodulgate offers several other examples of rounds (Fig 14): Castle Goff lies approximately 600m to the north (HER PRN 17839), The Rounds (also known as Newberry or Newberry Round) lies about 900m distant in the same direction (HER PRN 17382) and a further example is known at Helstone (PRN 17851), approximately 1.4 km to the south east. Several more rounds are located within a 5 km radius. Iron Age hillforts are known at Helsbury (PRN 17789), 2.4 km to the south, and Tregeare Rounds (PRN 17894), 5 km to the south west. This was therefore a well-occupied and relatively intensively utilised landscape in the later prehistoric and Roman periods. The distribution of early medieval place-names, particularly those incorporating *tre* and *bod* elements, and the distribution of churches and churchtowns in the wider region – three medieval churches lie within 2.5 km of the proposed turbine site – testify to its continuing importance in the post-Roman, early medieval and medieval periods.

5.2 Early medieval to modern

The name Bodulgate was first documented in 1286 (HER PRN 17881) but is of early medieval origin (that is, pre 1066 AD) and derives from the Cornish elements *bod*, a dwelling (the usual interpretation is a minor settlement or farm holding), and *huel gos*, meaning 'high wood' (Padel 1985, 23-6, 135). Bodulgate was the centre of a significant landholding in the medieval period, owned by a sequence of regionally important Cornish families (Maclean 1876, II, 340-6). From at least the 1470s it was regarded as the chief place of a manor of Bodulgate (*ibid*, 342-5).

The earliest maps available – Norden's surveyed about 1600, Gascoyne's of 1699 and Martyn's of 1748 (Figs 3-5) – provide almost no detail of the landscape around Bodulgate. Beyond showing that the area was all enclosed land – that is, no unenclosed rough ground was depicted in the vicinity – the 1st edition of the Ordnance Survey 1in: 1 mile map of c 1813 offers little more (Fig 6). Both these last two maps do, however, locate and name the farmstead (as *Bedilgate* and *Bodilgate* respectively).

The tithe survey for Lanteglos-by Camelford, mapped in 1841 with an accompanying schedule or apportionment of the lands within the parish, offers the first detailed survey of the project area and its surroundings (Fig 7). It then fell within the 177-acre holding of Bodulgate owned by the Reverend Richard Gerveys Grylls and occupied by Emanuel Wakeham. The proposed turbine site then fell within the eastern part of a larger enclosure named by the tithe apportionment as 'Great Bodulgate' (Figs 7 and 15). The extent of this was listed as 26 acres 3 roods and 28 perches, approximately 11 ha. This is a very large field by comparison with the predominant size of enclosures in the wider area. The evidence from the tithe survey indicates that Great Bodulgate in fact represents an unusual survival of a medieval open field. This would originally have formed a 'cropping unit', cultivated in strips by the farm households of Bodulgate, in combination with other open fields on the farm. Two other former open fields of very similar size can be identified to the west of Great Bodulgate: Higher Middle Field and Lower Middle Field were obviously divisions of a former unit and together totalled 27 acres 2 roods and 13 perches; Outer Beef Park and Home Beef Park, another obvious subdivision, together added up to 28 acres 0 roods and 33 perches. At the time of the tithe survey two further fields lay between these former open fields: Long Field (9 acres 0 roods 21 perches) divided Great Bodulgate from Middle Field; two fields, both recorded as Higher Heaver Close (probably an error for Higher and Lower) and totalling 18 acres 0 roods and 27 perches, lay between Middle Field and Beef Park. Significantly, these two intervening fields together total 27 acres 1 rood 8 perches, suggesting an additional divided cropping unit within the Bodulgate open field system. The curving boundaries typical of fields deriving from former cultivation strips are particularly marked on the western boundaries of Great Bodulgate and Middle Field (Fig 15). All of these fields were recorded as under arable cultivation in 1841.

The eastern edge of the former Great Bodulgate – the eastern boundary of the current project area – was the pale or boundary of the medieval royal deer park of Lanteglos (HER PRN 17850). This was described as 'ancient' in 1337 and was probably established during the twelfth century (Macleay 1876, II, 293). Elsewhere on the deer park boundary circuit it is evident that the creation of the park cut an already established medieval field system (Peter Herring, pers comm). Unfortunately it is unclear from the available mapping and air photographs whether the northern and southern boundaries of Great Bodulgate were cut by (and therefore pre-date) the park pale when it was constructed, or whether they were created to butt against an already existing feature. Both boundaries show marked changes in direction towards their eastern ends (Figs 2, 7-10), perhaps suggesting adaptation of a pre-existing field to the altered context created by construction of the deer park. The fact that Great Bodulgate carried a name indicating the former presence of woodland and is itself the highest and most distant part of the farm may, however, hint that it had itself formerly been an area of woodland, subsequently cleared to form a later addition to an earlier three-field division of the farm's arable. Some evidence for the former wooded character of this area comes from a description of wood in the adjacent deer park in 1549: 'forty-six acres set thinlie w[ith] oke, no timber short and shrubbed, of 100 or 200 yer grow[th]' (*ibid*, II, 294).

The 1st edition Ordnance Survey 25in: 1 mile map sheets, published between 1881 and 1883, show that the field recorded by the tithe survey as Great Bodulgate had by this time been divided by a straight boundary lying north – south (Fig 8). The present project area lies to the east of this boundary. The 2nd edition map, published c 1907, shows that the western field had been divided into two unequal portions by the insertion of a further boundary (Fig 9). (New boundaries had also been created in another field to the west, suggesting a more general process of subdividing fields.) Current Ordnance Survey mapping (Fig 2) and air photographs dated 2000 (CCC air photograph) and 2005 (Fig 10) show that this boundary has subsequently been removed.

The 1st edition Ordnance Survey 25in map of c 1881-3 shows a track leading north east from Bodulgate into the southern, downslope end of the field adjoining the project

area to the west; this track was not shown on the 2nd edition but the route was evidently in use as a farm access track in 2000 (CCC air photograph) and by 2005 had been metalled (Figs 8-10).

Air photographs taken in 1988 showed a large amorphous mound, 40m across, immediately to the south of the Trewalder-Castle Goff road, in the north-east corner of the field immediately to the west of the project area (HER PRN 57171). The feature was plotted during the Cornwall National Mapping Programme and interpreted as a spoil heap of medieval or later date (Figs 12-13). However, nothing is marked at this location on any historic mapping and the mound was apparently located adjacent to a gate into the field from the road to the north. It is conceivable that the feature plotted from air photographs was in fact a modern, temporary deposit of spoil or farmyard manure.

A curving linear feature has been mapped from air photographs in the field adjacent to the eastern side of the project area, within the former deer park (HER PRN 57169) (Figs 12 and 13). This feature is not shown on any of the available historic mapping but it continues the alignment of a track shown running upslope through woodland to the south east on the 1st edition Ordnance Survey 25in map of c 1880 (Fig 8) and may represent a former route from this area to the road to the north. Alternatively it may have been an historic boundary. A small spoil heap (HER PRN 57182) recorded from air photographs approximately 250m east of the north-east corner of the project area (Figs 12 and 13) may represent a small surface quarry opened into the sloping hillside to provide hedging stone for boundaries subdividing the former deer park. Two markedly straight field boundaries, both constructed between the dates of the tithe map of 1841 and the 2nd edition Ordnance Survey 25in map of c 1907, lie close to this feature.

6 Significance

The most significant heritage asset identified by the desk-based assessment within the wider area of the proposed turbine location is the probable round or comparable later prehistoric – Romano-British enclosure indicated by air photographs centred approximately 160m to the west (HER PRN 57172). Substantial numbers of rounds which survive as standing monuments in Cornwall have been designated as Scheduled Monuments. These are accordingly regarded as of national significance. The recent National Planning Policy Framework (NPPF) notes that 'Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets' (Department for Communities and Local Government 2012, 32).

The historic field system, derived from medieval open fields, is significant in that, while much of the landscape of lowland Cornwall similarly reflects its origins in the forms and layout of medieval cultivation strips, the individual cropping units survive here in relatively easily visible and well-preserved form.

The former Lanteglos deer park to the east of the project area is a significant historic feature in the landscape in that the boundary can still be traced over much of its circuit. Medieval deerparks in Cornwall represent a distinctive form of designed landscape, the importance of which has only recently been acknowledged (Herring 2003).

7 Potential further measures

Installation of a wind turbine on the proposed site could potentially impact negatively on buried archaeology and on the setting of heritage assets over a wider area. A range of means to mitigate such potential impacts may be considered by the Historic Environment Planning Advice Officer (HEPAO), who may require one or more of the measures outlined below. A Written Scheme of Investigation (WSI) to meet the brief prepared by the HEPAO would need to be prepared and agreed to establish and direct any programme of further archaeological investigation.

English Heritage regional Inspectors of Ancient Monuments may also request that such measures are carried out to inform the decision-making process.

7.1 Walkover survey

A walkover survey of the site to ascertain whether any earthworks associated with the round survive and to identify any other heritage assets which may be present.

7.2 Geophysical survey

A geophysical survey of the site to identify sub-surface archaeological features.

7.3 Archaeological evaluation

Targeted trenching to characterise buried archaeological features and deposits indicated by the geophysical survey.

7.4 Archaeological recording

In a case where the finalised site design would seem likely to result in unavoidable impacts on below-ground or above ground features, a brief for work to mitigate these impacts would be prepared by the appropriate Cornwall Council Historic Environment Planning Advice Officer, setting out its scope. A Written Scheme of Investigation (WSI) to meet the brief would need to be prepared and agreed to establish and direct a programme of mitigating archaeological work.

Archaeological recording in the form of measured survey of upstanding elements of the site which might be negatively impacted upon by the works, or a watching brief (observation by an archaeologist during mechanical ground reduction activities) can be required:

- where any significant features or areas of ground are to be disturbed (for instance for the foundations for the turbines or during cable trenching);
- in areas where significant features were identified by the site walkover, or where the balance of probability suggests that sub-surface archaeology might survive.

This approach provides for preservation by record of upstanding or buried archaeological features or artefacts.

7.5 Viewshed analysis

An assessment of the potential visual impact of the proposed wind turbine development using the guidelines and methodological approaches set out in English Heritage's recent consultation draft guidance on the setting of heritage assets is likely to be required by English Heritage and the HEPAO. This is derived from 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) is generated using ArcGIS software. The methodology employs a Digital Terrain Model (DTM) which ignores potentially temporary surface features such as buildings, woodland, vegetation, etc, to provide a surface model of potential intervisibility between the proposed wind turbine and key heritage assets within the surrounding landscape.

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 a proposed wind turbine site the viewshed is 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 an additional offset to represent the maximum height of the turbine blades.

Sites identified through GIS-derived intersection of the ZTV modelling with GIS layers containing designated and undesignated heritage assets produce data sub-sets which are further filtered according to their intersection with ZTV zones representing 1 km, 5 km, 10 km and 15 km radii from the site, as required by model HEPAO briefs and English Heritage guidance.

The site types within these data sets are then analysed to determine their likely sensitivity to impacts on settings. Those site types which have no setting (documented sites) were excluded from further analysis, as were those which by their nature have very localised settings (for example, milestones, wayside crosses and fingerposts), except where in very close proximity to the application site. The resultant site lists are further filtered by close examination of the ZTV data and a 2005 vertical aerial photograph GIS layer to remove from the lists those sites where mature vegetation or proximal buildings would almost certainly block intervisibility and where intrusion into key views was unlikely. Designated sites with limited settings (most Grade II Listed Buildings) and those with local settings such as associated urban development which are more than 2 km from the application site tend to be excluded from assessment at this stage unless specific reasons are identified for their retention.

Viewsheds are checked on the ground to assess whether vegetation or other factors substantially block views to and from key sites. Significant heritage assets identified within the theoretical viewshed are visited (where access is possible) and the landscape within which they sit is considered to determine intervisibility with the proposed development site and the nature of their settings, both locally and at a distance. As well as impacts on their settings resulting from intervisibility, the potential inclusion of the proposed wind turbine within views of key heritage assets is also considered. This approach informs the likely scales and types of any visual impacts which might affect their settings, as required by English Heritage (2011).

8 References

8.1 Primary sources

Gascoyne, J, 1991 [1699]. *A map of the county of Cornwall newly surveyed*, Devon and Cornwall Record Society, new series, **34**, Exeter

Martyn, T, 1748. *New and accurate map of the county of Cornwall, from actual survey*, London (paper copy held by HE)

Norden, J, 1972 [c 1600]. *John Norden's manuscript maps of Cornwall and its nine hundreds*, Exeter (University of Exeter)

Tithe map and apportionment, 1839. Parish of Tresmeer (digital copies from Cornwall Record Office)

Cornwall County Council 2005 aerial mapping of Cornwall.

Ordnance Survey, c 1813, 1st edition 1in: 1 mile map (licensed digital copy at HE)

Ordnance Survey, c 1880. 1st edition 25in: 1 mile map (licensed digital copy at HE)

Ordnance Survey, c 1907. 2nd edition 25in: 1 mile map (licensed digital copy at HE)

Ordnance Survey, 2007. Mastermap digital mapping

8.2 Publications

British Geological Survey 2008. Digital Geological Map of Great Britain 1:625,000 scale (DiGMapGB-625). Dataset reference date: 11-2-2008.

Cornwall County Council 1996. *Cornwall: a landscape assessment, 1994*, Truro (Landscape Design Associates and Cornwall Archaeological Unit)

- Department for Communities and Local Government 2012, *National Planning Policy Framework*, London (online at www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf)
- English Heritage 2011, *The setting of heritage assets: English Heritage guidance*, London
- Gossip, J, forthcoming. Life outside the round: Bronze Age and Iron Age settlement at Higher Besore and Truro College, Threemilestone, Truro, *Cornish Archaeology*
- Herring, P, 2003. Cornish medieval deer parks, in *The lie of the land: aspects of the archaeology and history of the designed landscape in the south west of England*, ed R Wilson-North, Exeter, 34-50
- Kirkham, G, 2012. *Bodulgate Farm, Trewalder, Delabole, Cornwall. Archaeological assessment of proposed wind turbine site*, Truro (Historic Environment Projects, Cornwall Council)
- Lawson-Jones, A, and Kirkham, G, 2009-10. Smithing in the round: excavations at Little Quoit Farm, St Columb Major, Cornwall, *Cornish Archaeology*, **48-49**, 173-226
- Maclean, J, 1876. *The parochial and family history of the deanery of Trigg Minor in the county of Cornwall, vol II*, London and Bodmin
- National Soil Resources Institute Soil Systems Group 2004. GIS data held by Cornwall Council. Data copyright © Cranfield University 2004
- North Cornwall District Council 1999. *North Cornwall Local Plan, Pt 1 General policies*, np [Bodmin]
- Padel, O J, 1985. *Cornish place-name elements*, Nottingham
- Quinnell, H, 2004. *Trethurgy. Excavations at Trethurgy round, St Austell: community and status in Roman and post-Roman Cornwall*, Truro (Cornwall County Council)

9 Project archive

The HE project number is **PR146197**

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. English Heritage/ADS OASIS online reference: cornwall2-137408
3. This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites B\Bodulgate, Delabole Wind Turbine Assessment\Revised desktop assessment for altered location\Bodulgate, Delabole, wind turbine assessment (revised location) 146197.doc



Fig 3. The project area and wider surroundings shown on John Norden's early seventeenth century map of Cornwall (first published 1728). Note that north is to the right in this depiction. The approximate location of the project area is circled in red. It is not clear whether the deer park shown close to Lanteglos is that which lies adjacent to the Bodulgate site or a second deer park nearby at Helsbury.

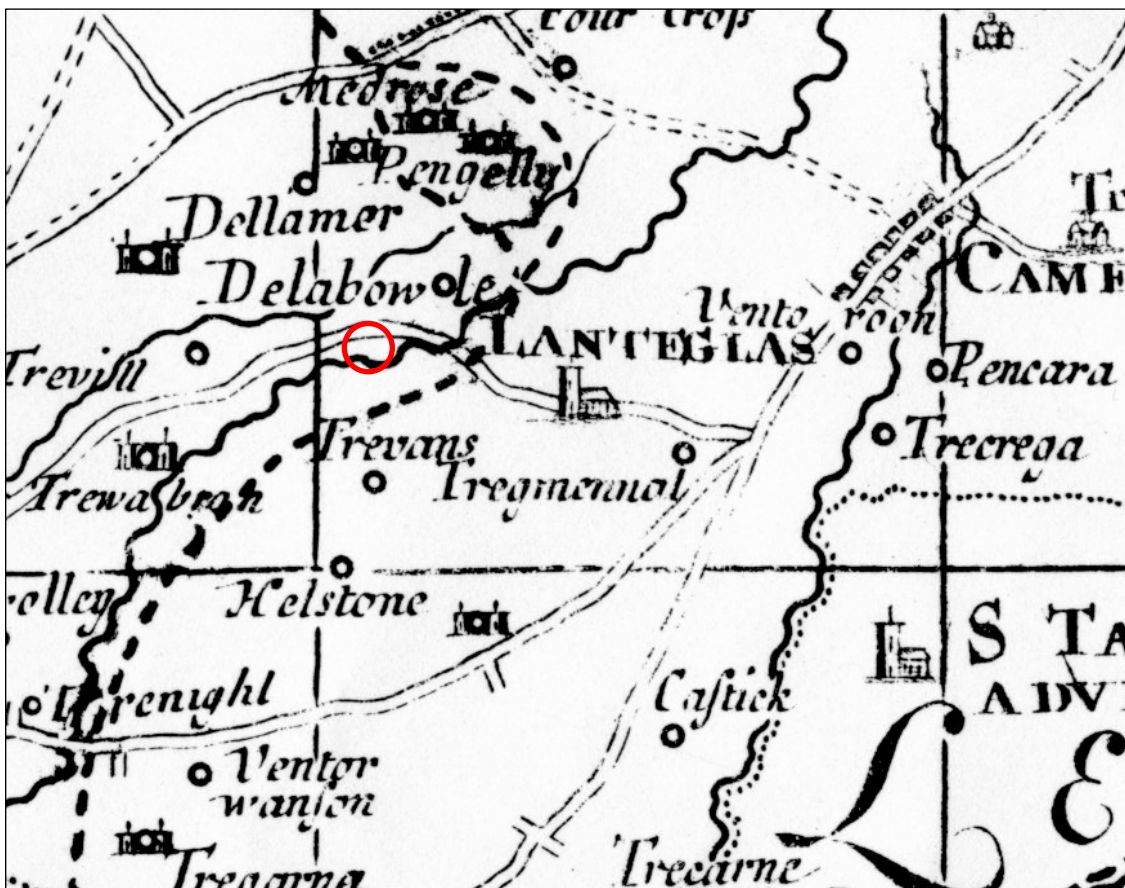


Fig 4. The project area and its wider surroundings shown on Joel Gascoyne's 1699 map of Cornwall. The approximate location of the project area is circled in red.



Fig 5. The project area and its wider surroundings on Thomas Martyn's 1748 map of Cornwall. The approximate location of the project area is circled in red.

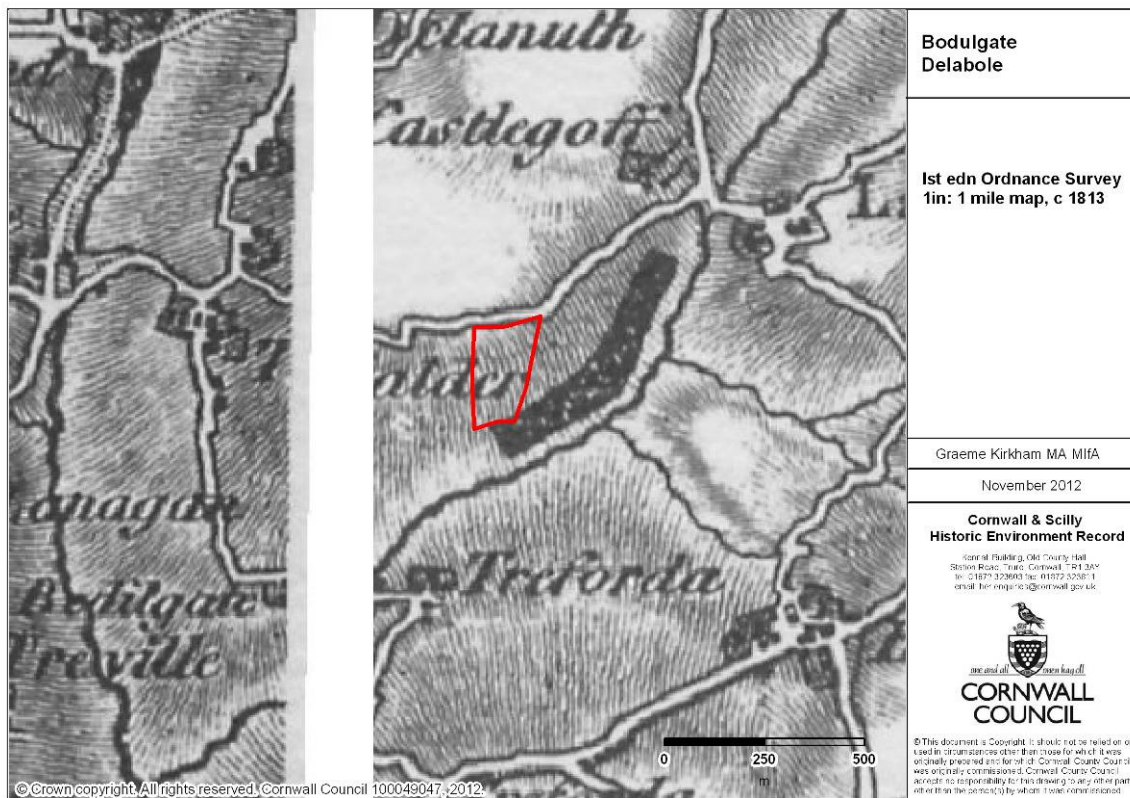


Fig 6. The project area and its surroundings shown on the 1st edition Ordnance Survey 1in map of c 1813. The location of the project area in relation to the historic map is approximate because of the latter's small scale and the different projections used by the nineteenth-century surveyors and modern mapping. (Part of the mapping is missing because it has been scanned from a paper source prior to being incorporated as a GIS layer.)

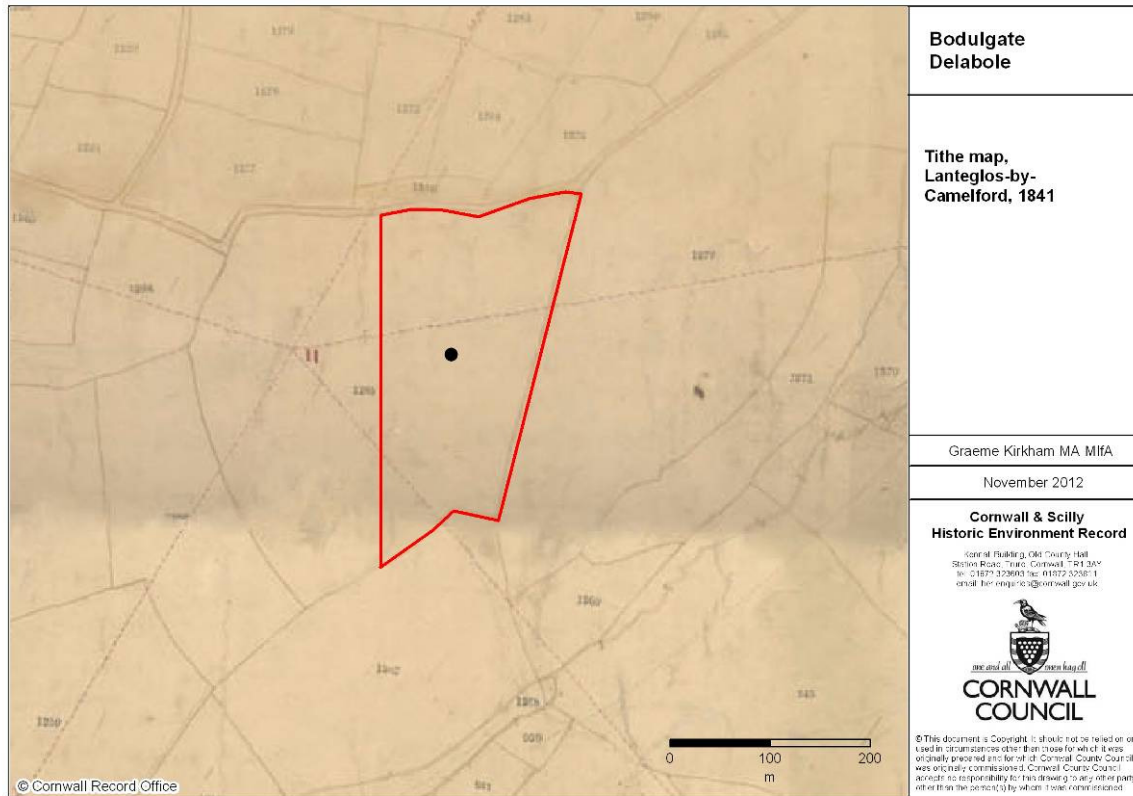


Fig 7. The project area and proposed turbine location shown on the Lanteglos-by-Camelford tithe map of 1841. (Here and on following maps, the location of the proposed turbine is indicated by a black dot.)

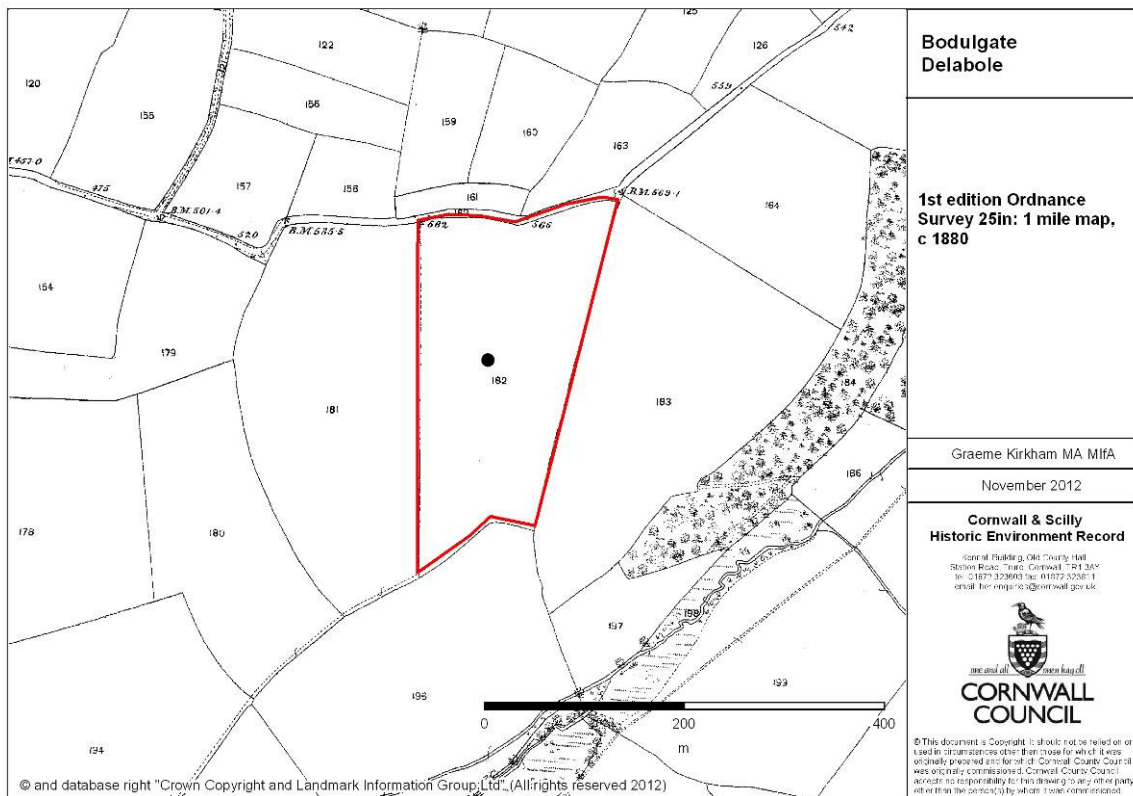


Fig 8. The project area and proposed turbine location shown on the Ordnance Survey 1st ed 25in: 1 mile map of c 1880.

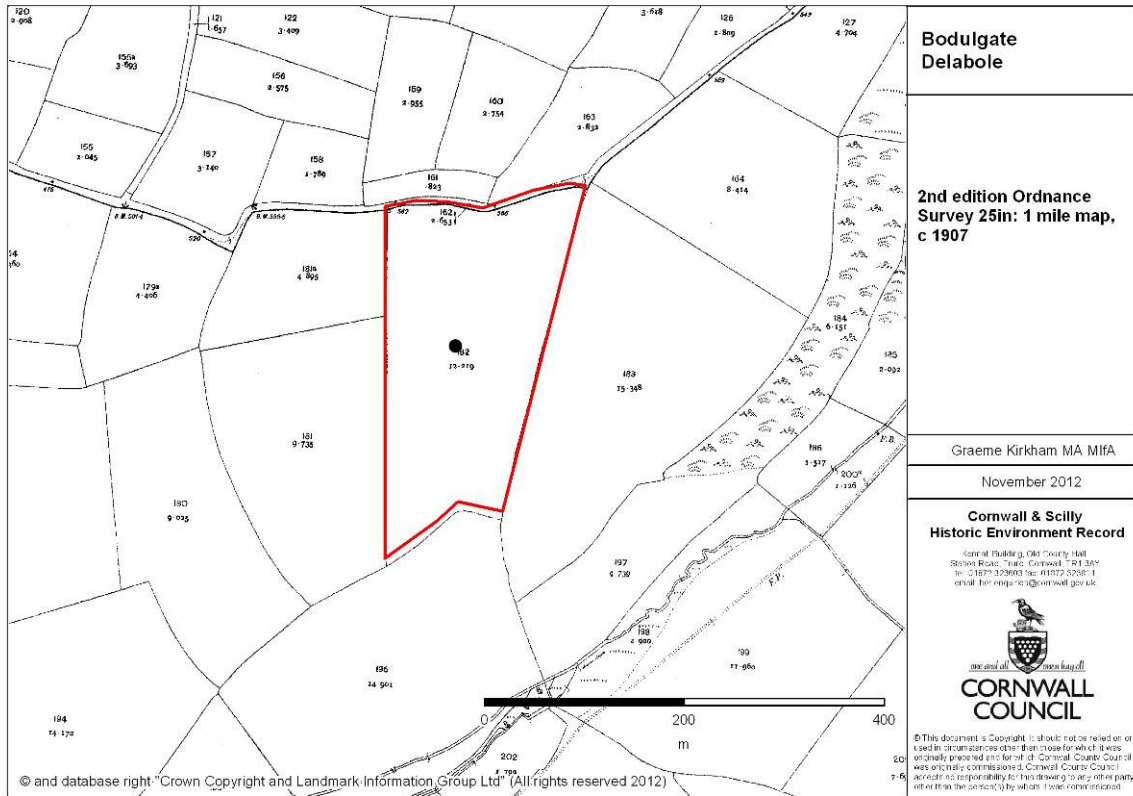


Fig 9. The project area and proposed turbine location shown on the Ordnance Survey 2nd ed 25in: 1 mile map of c 1907.

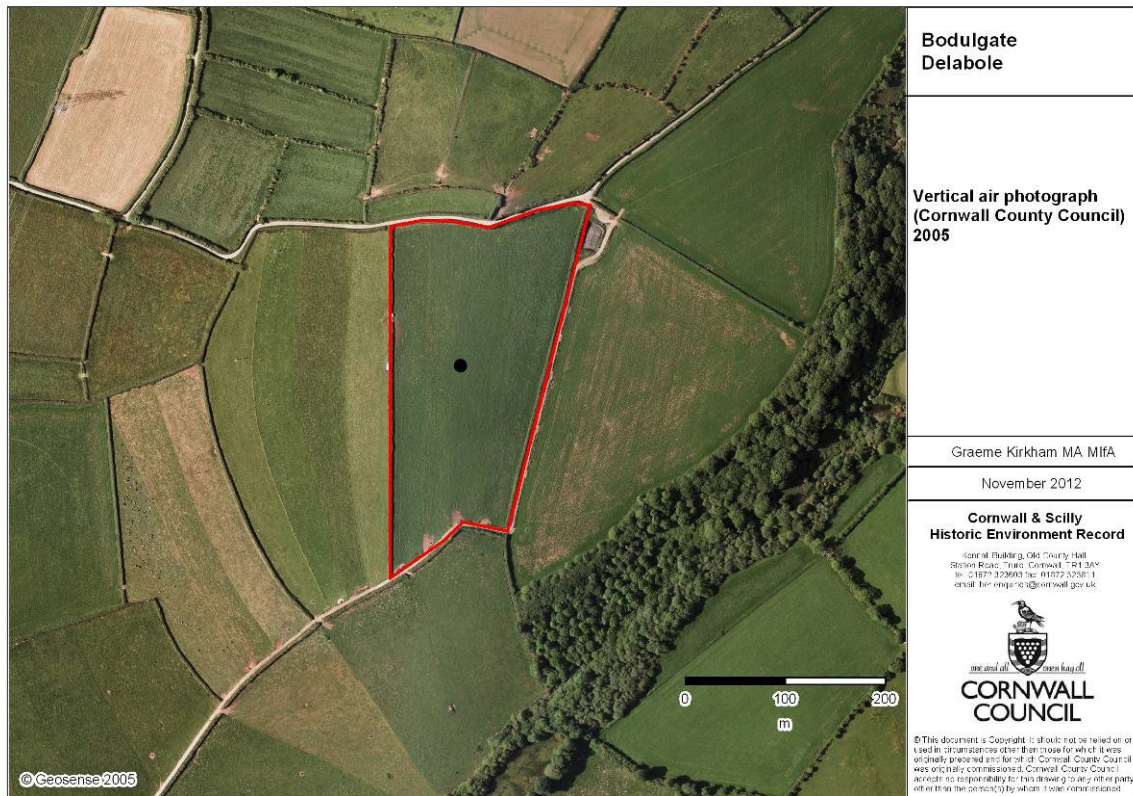


Fig 10. The project area and proposed turbine location shown on a 2005 Cornwall County Council air photograph (© Geosense 2005).

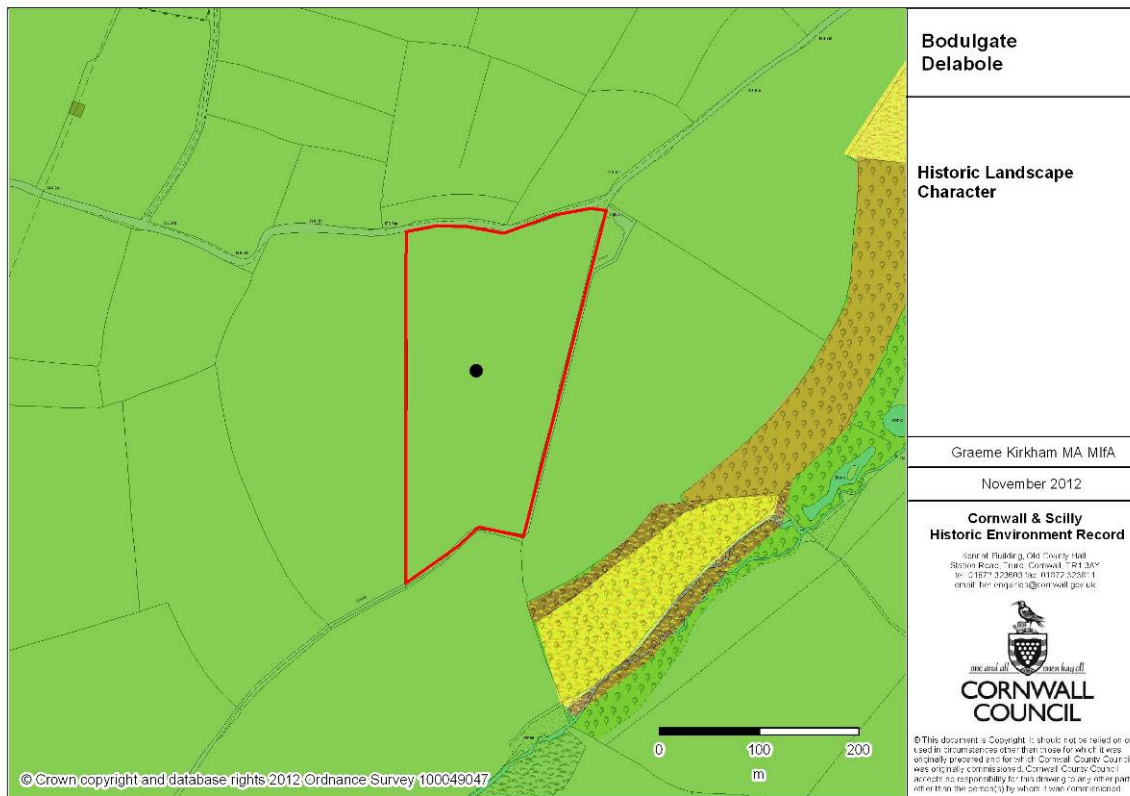


Fig 11. Historic Landscape Character mapping for the area around the proposed wind turbine. The whole is characterised as Farmland: medieval with the exception of a band of woodland and rough ground in the valley bottom to the south east.

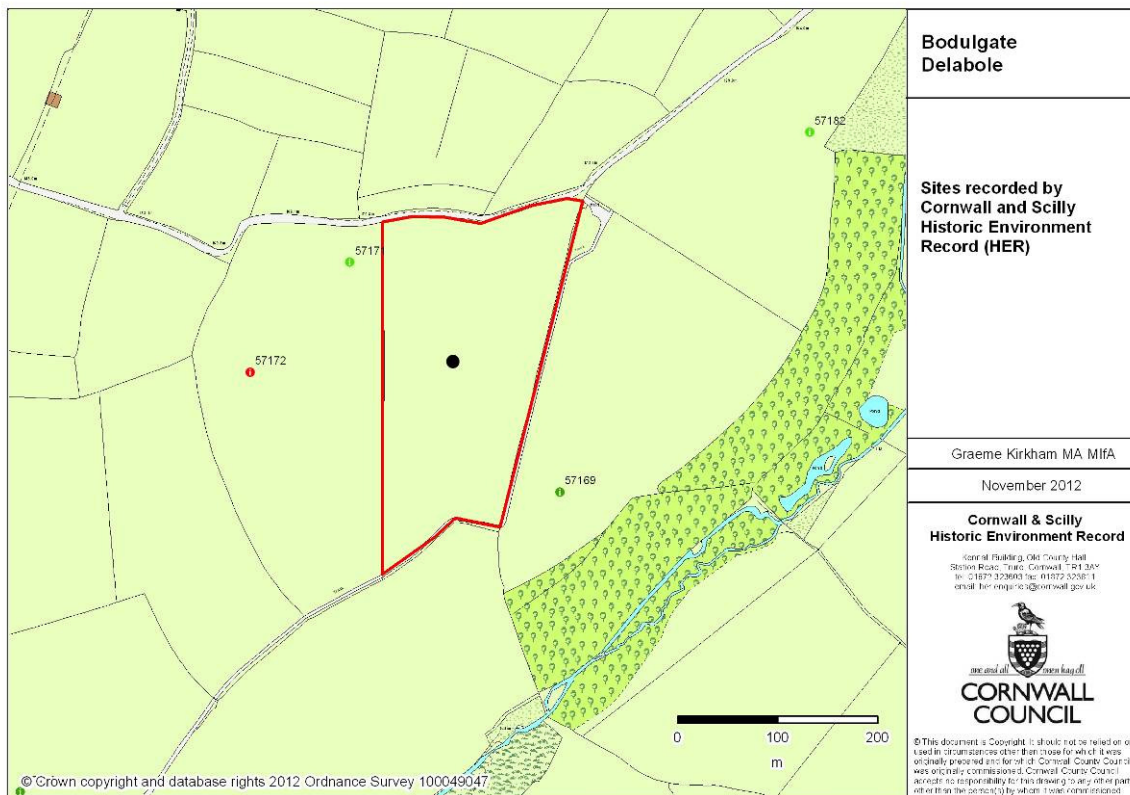


Fig 12. Sites recorded in the Cornwall and Scilly Historic Environment Record in the vicinity of the proposed wind turbine site. Relevant sites are discussed in the text.

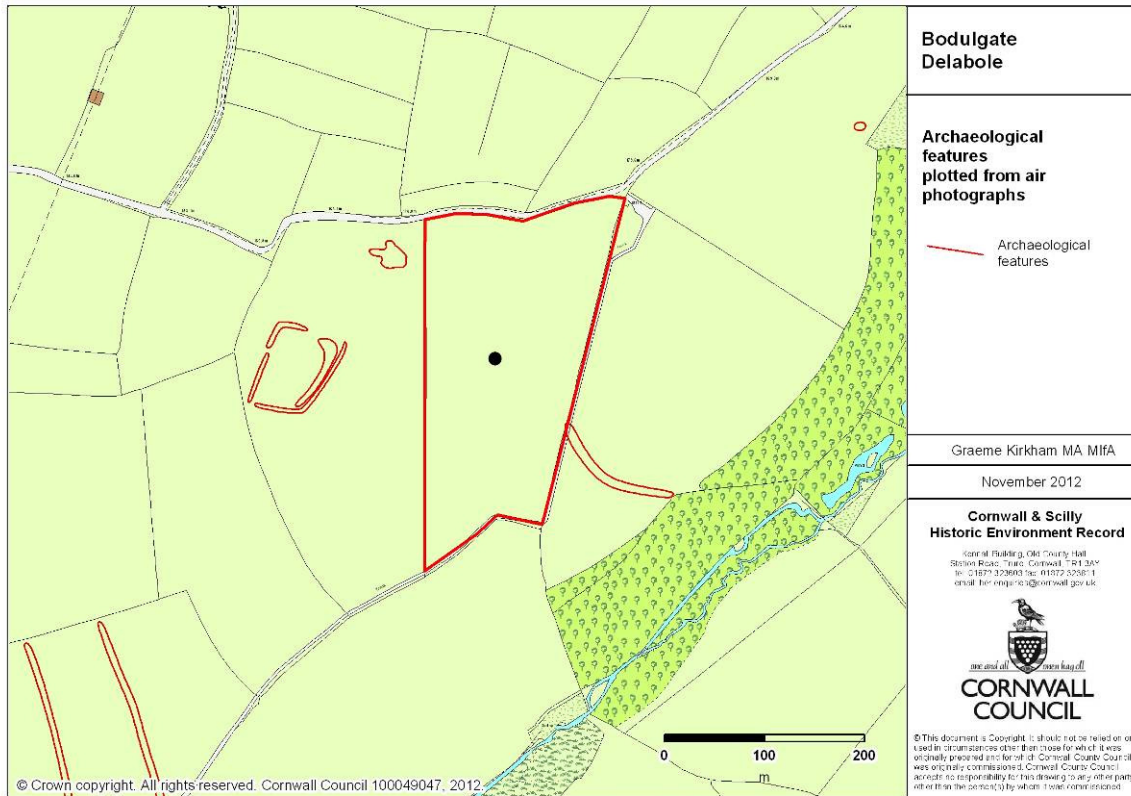


Fig 13. Archaeological features plotted from air photographs by the National Mapping Programme (NMP).

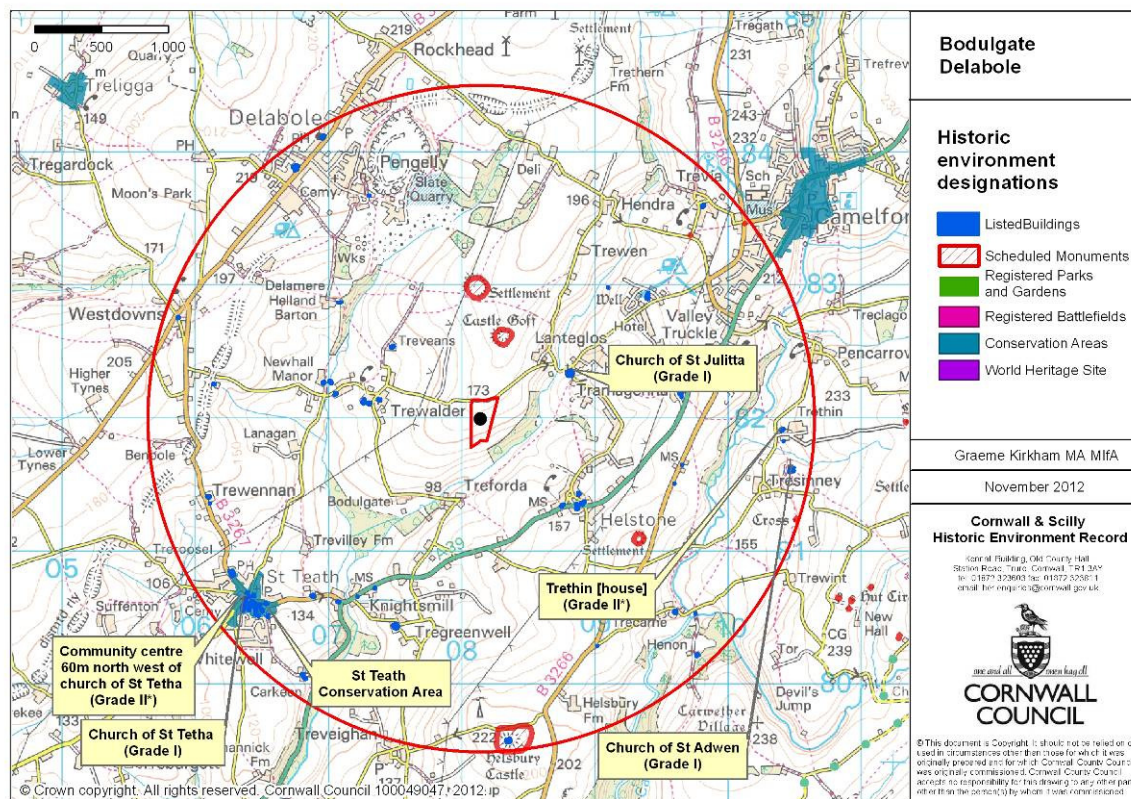


Fig 14. Historic environment designations (Scheduled Monuments, Listed Buildings of Grade I and Grade II*, Conservation Areas) within a 2.5 km radius of the project area. Other Listed Buildings (Grade II) are summarised in Table I.

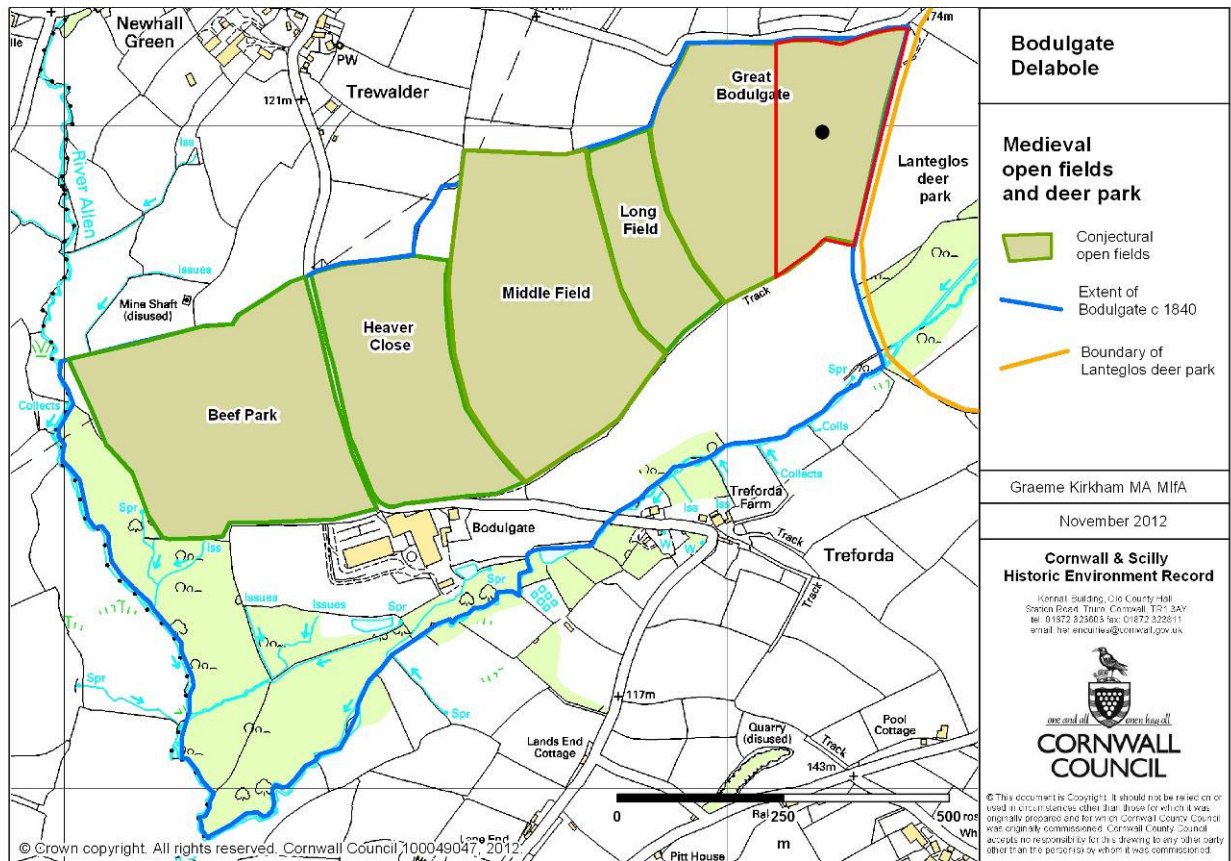


Fig 15. Conjectural reconstruction of the medieval field system at Bodulgate and location of Lanteglos deer park boundary (see text).