

LAND AT WHEAL VOR ROAD

CARLEEN

BREAGE

CORNWALL

Results of an Archaeological Assessment:
Including a Geophysical Survey and Heritage Impact Assessment



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Land at Wheal Vor Road, Carleen, Breage, Cornwall

Results of an Archaeological Assessment: Including a Geophysical Survey

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Work undertaken by SWARCH for a Private Client.

SUMMARY

South West Archaeology Ltd. was commissioned to undertake an archaeological assessment, including a geophysical survey and Heritage Impact Assessment on land at Wheal Vor Road, Carleen, Cornwall. The site is located at the north-eastern edge of the settlement of Carleen, c.1.6km north of Breage and c.4.75km north-west of Helston at a height of c.95mAOD.

The site comprises a single field surrounded by the post-medieval and modern development of the medieval settlement of Carleen. The site falls within land designated on the Historic Landscape Characterization as 'Modern Enclosed Land', incorporating Anciently Enclosed Land and Post Medieval Enclosed Land, whose field systems have been substantially altered by large scale hedge removal in the 20th century. There is clear evidence of prehistoric funerary and ritual activity within the surrounding landscape; though much of the evidence reflects historic medieval and post-medieval field-systems, and more immediately post-medieval mining.

The Tregonning and Gwinear mining area has a rich mining history and forms part of the Cornwall and West Devon World Heritage Site, assessment of the historic and cartographic sources indicating that the site forms part of the former Wheal Vor mine and is likely to have previously been common land open as grazing. Whilst Carleen has medieval origins, much of the village grew during the post-medieval period as a result of the significant mining in the area. Wheal Vor was one of the biggest and richest tin mines in the 19th century, and it is notable as being an innovative sett, having been the first mine in Cornwall to use steam power for de-watering the mine, with a Savery pump in the late 17th century and Newcommen pump added in the early 18th century. It was also the first to erect a Brunton calciner in 1835

The geophysical survey identified four groups of anomalies. The anomalies identified include: known (Group 1) and possible (Group 2) shafts or mine workings; disturbed ground as a result of mine workings (Group 3); and a modern drain (Group 4).

Any development of the site is likely to encounter and destroy the buried archaeological resource, and whilst there is a high potential suggested by the surrounding prehistoric and post-medieval mining landscape, the results of the geophysical survey would suggest that the archaeological potential for the site is moderate, many of the identified anomalies likely reflecting post-medieval mining. Whilst further archaeological mitigation in the form of a conditioned watching brief or targeted evaluation trenching may be required to validate and clarify the results of the geophysical survey, previous mining survey trenching has already identified the scale and nature of the mining features present on the site.

*In terms of indirect impacts, most of the designated heritage assets in the wider area are located at such a distance as to minimize the impact of the proposed development, or else the contribution of setting to overall significance is less important than other factors. The landscape context of many of these buildings and monuments is such that they would be partly or wholly insulated from the effects of the proposed development by a combination of local blocking from trees, topography, buildings or embankments, or that other modern intrusions have already impinged upon their setting. The only sites where there might be the potential for an appreciable impact are the Tregonning and Gwinear Mining Area World Heritage Site; and the Multi-period Landscape and Round Cairn on Tregonning Hill (all **negative/minor**). In the instance of the WHS, it is the location of the proposed development within the WHS which means that an impact (**negative/moderate**) is unavoidable, though is restricted to the site and immediately surrounding roads. The proposal site is not clearly visible from Tregonning Hill, largely being screened by woodland blocking, and whilst its location would make it visible within wider landscape views which were important to the setting of the monument, it would not be discernible from the existing settlement with which it would form a part.*

*With this in mind, the overall impact of the proposed development can be assessed as **negligible to negative/minor**. The impact of the development on any buried archaeological resource may be **permanent and irreversible** but can be mitigated through an appropriate programme of archaeological investigation and recording.*



September 2021

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1.0 INTRODUCTION

LOCATION: LAND AT WHEAL VOR ROAD
PARISH: BREAGE
COUNTY: CORNWALL
NGR: SW 61886 30192
SWARCH REF: BWV21
OASIS REF: southwes1-505613

1.1 PROJECT BACKGROUND

South West Archaeology Ltd. (SWARCH) was commissioned by a private client (the Client) to undertake an archaeological assessment including a geophysical survey and a Heritage Impact Assessment on land at Wheal Vor Road, Carleen, Breage, Cornwall to inform the proposed development of the site. This work was carried out in accordance with ClfA guidelines.

1.2 TOPOGRAPHICAL AND GEOLOGICAL BACKGROUND

The site lies to the east of Carleen, with Carleen Community Church located to its east and a private residential property, Gannilly, located to its west. It is accessed from Wheal Vor Road. The site is on gently sloping ground c.4.7km north west of Helston at a height of c.90-95m AOD.

The soils of this area are the well-drained fine loamy or fine silty soils of the Manod Association (SSEW 1983) overlying slate and siltstone of the Mylor Slate Formation (BGS 2021).

1.3 HISTORICAL BACKGROUND

The site lies to the north west of Helston in the parish of Breage in the deanery and west division of the hundred of Kirrier. A number of settlements of medieval and early medieval date are located in this area including Carleen, which contains the element 'ker (fort/round)' suggesting a possible prehistoric origin. Godolphin, seat of the Godolphin family who were lords of the manor, lies to the north-west of Carleen. The Tithe apportionment indicates that the land around the proposed site lies within the manor of Treworlis and therefore it is likely that the site also fell within this manor. Treworlis appears to have been a post Domesday manor. At Domesday it is probable the site lay within the larger manor of Crawles, which was partially documented as waste and likely included much of the land in this area. The manor of Crawles was recorded as having a number of Lords. Its tenant in chief in 1086 was King William; the overlord in 1066 having been Earl Harold.

Lysons (1814) notes that the manor of Treworlis was the property of Charles Trelawney Esq. Charles Trelawney Esq appears to have resided at Coldrenick, Menheniot and inherited the manor of Treworlis from his father Edward Stephens, who took the name Trelawney on inheriting the Coldrenick Estates from his cousin, who had inherited from his cousin, who in turn had inherited the estate from Charles Trelawney Esq (Burke 1847). He had inherited the estates from his brother Darrell Trelawney with the stipulation that they must pass down their mother's line (the Darrells) rather than to the Trelawneys of Trelawne as this family had treated him with such disrespect (History of Parliament Online 2021).

Wheal Vor has a very complex history, but is summarised in its Cornwall HER entry (no. 40228) as: *"an ancient working, worked for at least two periods in the eighteenth century and is reputed to have been one of the greatest tin mines ever worked in Cornwall. It is very possible that mining in this vicinity dates from Roman times, while mining proper began in the fifteenth century. It*

included Carleen mine (also known as West Wheal Vor or Wheal Emma), and at one time included Great Wheal Vor. The mine produced tin and copper and is shown as Wheal Vreah on Hamilton Jenkin's map (b4, b6). It is reputed to have been one if not the first Cornish mine to embrace steam power and was the first to have a beam engine in the early eighteenth century. In 1835 it was the first to erect a Brunton calciner.

The greatest period of working was between 1810 to 1848, when it was reopened by John Gundry and associates. In 1814 a 48" pumping engine was drawing water from 108 fathoms below adit, and a 45" engine on Wheal Vreah from 26 fathoms. Returning 726 tons of black tin (550 tons metal) in 1815-16, it was equipped with one of the first set of fire-stamps in the county, followed by the erection of two others. Ore was hoisted through 20 shafts by means of four steam and 16 horse whims (b5).

The development of a huge concern such as this proved too great for the Gundry brothers who were the majority shareholders and in 1819 they were declared bankrupt. The Helston solicitors who were the assignees in bankruptcy were subsequently sued by the Gundry brothers beginning the serious litigation that ruined the mine in spite of its great resources.

In 1820 the property was taken over by a company with leases covering Wheal Vor, Wheal Vreah, Wheal Sozen and Carleen, with Penhale, Polrose, Polladras Downs and Poldown (Wheal Metal) later added to the group. The underground workings were extended to upwards of a mile in length and reached a maximum of 300 fathoms below adit. The mine boasted an underground forge, cut from the rock 1,470 feet from surface to avoid the necessity of sending to grass for the sharpening of drills, so hard was the rock in places (b5). This idea might have been brought back by the Reed brothers who had worked in the mines of the Bere Peninsula in Ireland. The mine also had its own furnaces for the smelting of tin, production of which reached on occasions 220 tons (black tin) a month. The mine was a huge employer, anywhere between 1,200-1,400 people working there and with its 16 steam engines, extensive dressing floors and numerous buildings, resembled a small town.

However, the corrosive effects of the ongoing lawsuit took their course, finally wrecking the mine which was abandoned in a very dilapidated state in 1847. It did however re-open again in 1852 to much pomp and circumstance. Work concentrated on unwatering the old mine to the bottom and two new Harvey-built engines were erected - an enormous 100" on Crease's Shaft and another of 85" on Trelawney's, the former being the largest beam engine erected on a Cornish mine to that date. The sett of Wheal Metal was also added, and calciners, a dry, changing house, railroad and new reservoirs were constructed. As well as tin dressing operations, copper dressing facilities were also laid out on the strength of the copper ore it was hoped would be raised from the north part of the sett close to the old Godolphin Bridge Mine that had been renowned for copper (b7). By mid 1855 Wheal Vor had been drained to the 70 and mining was in progress to this depth, yet by the following year it was evident that the mine was in financial difficulties and new shares were issued but not taken up, a shock for adventurers who had to pay heavy calls. The only returns were coming from the Wheal Metal section and the cost of draining the old mine was prohibitive, compounded by a fall in the price of tin. Operations ceased soon after following a series of blunders and mistakes that included the breaking of the rod of Crease's engine and suggestions of financial and managerial inpropriety from which the mine never recovered, resulting in a loss of over £200,000, which severely tarnished the reputation of Cornish mining (b5,7). The company abandoned the Wheal Vor sett in 1860 and after trying to sell some of its nine engines, decided to re-deploy some of them at the neighbouring Wheal Metal mine. The company continued to use the name Great Wheal Vor United although it was working a different sett. In 1906 an attempt was made to unwater the main engine shaft of Wheal Vor with an electric pump supplied by a power plant at the surface. Sadly this enterprise was a spectacular failure which ended in 1911. Nothing more was done at Wheal Vor until it attracted the attention of

Camborne Tin Ltd. in 1963, when some prospecting was undertaken which also came to nothing. The mine is shown as a tin producer on the 1880 OS map. Shafts, spoil heaps and buildings associated with this mine are visible on vertical aerial photographs (p1-2) and were plotted during the Cornwall NMP. The foundations of the early twentieth century power plant are still visible.”

1.4 ARCHAEOLOGICAL BACKGROUND

The site lies within land recorded on the Cornwall and Scilly Historic Landscape Characterisation (HLC) as ‘Modern Enclosed Land’. This includes Anciently Enclosed Land and Post Medieval Enclosed Land, whose field systems have been substantially altered by large scale hedge removal in the 20th century. The Cornwall and Scilly Historic Environment Record (HER) records several heritage assets within 1km of the proposed development site. A complete list of these with location maps can be seen in Section 3. These generally depict a relatively intensively utilised prehistoric landscape, medieval settlement, and post-medieval buildings, structures and mining activity. The site is located within the Tregonning and Gwinear Mining District area of the Cornwall and West Devon Mining Landscape World Heritage Site. No Listed Buildings or Scheduled Monuments are located immediately adjacent to or within the proposed site however several designated heritage assets are located within the wider landscape.

1.5 METHODOLOGY

This work was undertaken in accordance with best practice and ClfA guidelines.

The historic impact assessment follows the guidance outlined in: *Conservation Principles: policies and guidance for the sustainable management of the historic environment* (English Heritage 2008b), *The Setting of Heritage Assets* (Historic England 2015), *Seeing History in the View* (English Heritage 2011), *Managing Change in the Historic Environment: Setting* (Historic Scotland 2010), and with reference to *Visual Assessment of Wind farms: Best Practice* (University of Newcastle 2002) and *Guidelines for Landscape and Visual Impact Assessment 3rd edition* (Landscape Institute 2013). Any desk-based assessment aspect of this report follows the guidance as outlined in: *Standard and Guidance for Archaeological Desk-Based Assessment* (ClfA 2014a) and *Understanding Place: historic area assessments in a planning and development context* (English Heritage 2012).

The gradiometer survey follows the guidance outlined in *Geophysical Survey in Archaeological Field Evaluation* (English Heritage 2008a); *Standard and Guidance for Archaeological Geophysical Survey* (ClfA 2014b); *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and *Standard and Guidance for Archaeological Geophysical Survey* (ClfA 2014b).

‘Archaeological geophysical survey uses non-intrusive and non-destructive techniques to determine the presence or absence of anomalies likely to be caused by archaeological features, structures or deposits, as far as reasonably possible, within a specified area or site on land, in the inter-tidal zone or underwater. Geophysical survey determines the presence of anomalies of archaeological potential through measurement of one or more physical properties of the subsurface.’ (Standard and Guidance for Archaeological Geophysical Survey 2014).

The results of the survey will as far as possible inform on the presence or absence, character, extent and in some cases, apparent relative phasing of buried archaeology to inform a strategy to mitigate any threat to the archaeological resource.

LAND AT WHEEL VOR ROAD, CARLEEN, BREAGE, CORNWALL

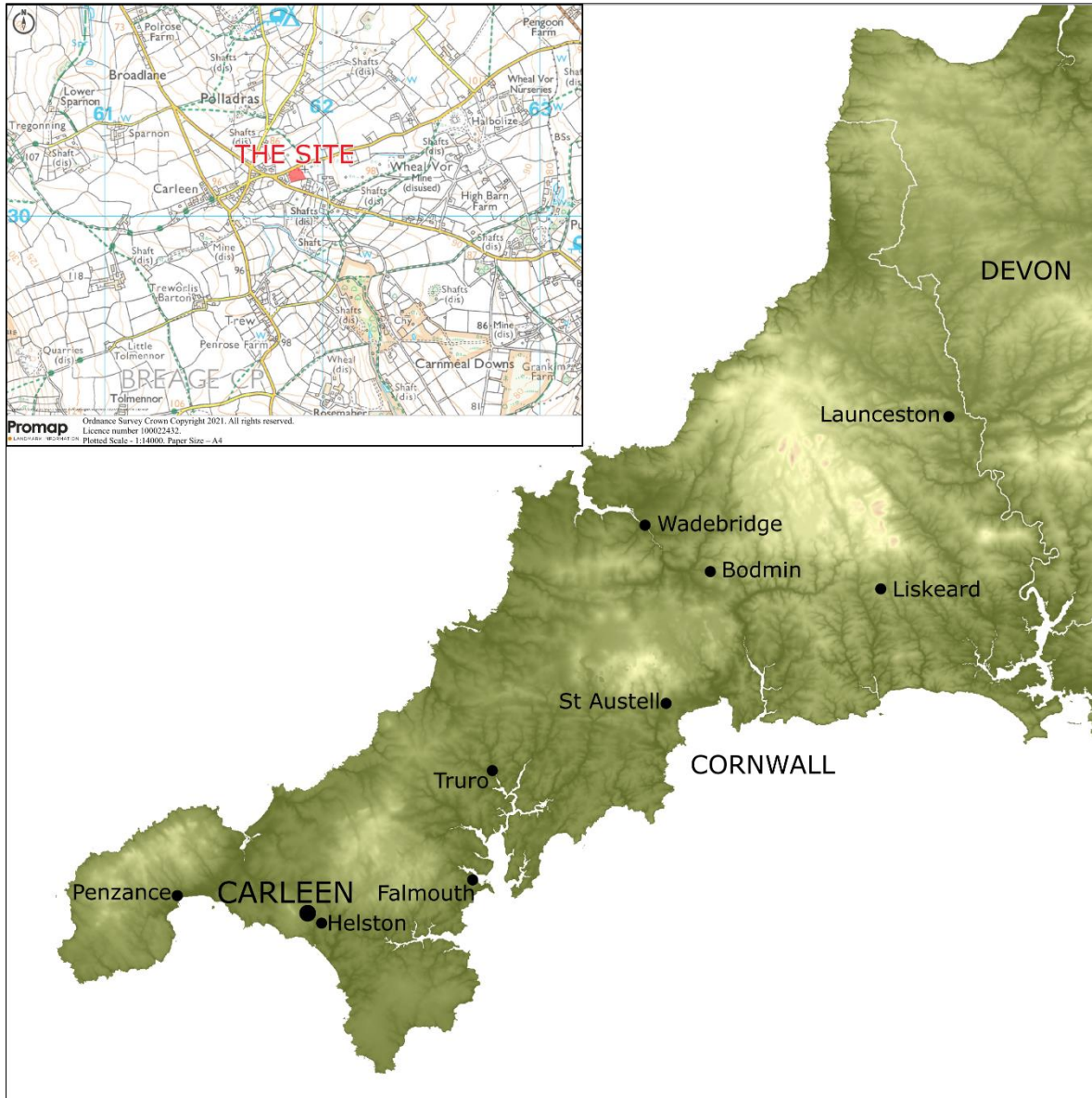


FIGURE 1: SITE LOCATION (THE SITE IS INDICATED).

2.0 HERITAGE IMPACT ASSESSMENT

2.1 HERITAGE IMPACT ASSESSMENT - OVERVIEW

The purpose of heritage impact assessment is twofold: Firstly, to understand – insofar as is reasonably practicable and in proportion to the importance of the asset – the significance of a historic building, complex, area, monument or archaeological site (the ‘heritage asset’). Secondly, to assess the likely effect of a proposed development on the heritage asset (direct impact) and/or its setting (indirect impact). The methodology employed in this assessment is based on the approach outlined in the relevant DoT guidance (DMRB vol.11; WEBTAG), used in conjunction with the ICOMOS (2011) guidance and the staged approach advocated in *The Setting of Heritage Assets* (GPA3 Historic England 2015). The methodology employed in this assessment can be found in Appendix 1.

2.2 NATIONAL POLICY

2.2.1 NATIONAL PLANNING POLICY FRAMEWORK

General policy and guidance for the conservation of the historic environment are now contained within the *National Planning Policy Framework* (Department for Communities and Local Government 2021). The relevant guidance is reproduced below:

194. *In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.*

195. *Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset’s conservation and any aspect of the proposal.*

A further key document is the Planning (Listed Buildings and Conservation Areas) Act 1990, in particular section 66(1), which provides *statutory protection* to the setting of Listed buildings:

In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.

2.2.2 WORLD HERITAGE SITE

For World Heritage Sites the following paragraphs of the NPPF should also be considered:

199. *When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset’s conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.*

200. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:

- a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;
- b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.

206. Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

207. Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 195 or less than substantial harm under paragraph 196, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.

2.3 LOCAL POLICY

Policy 24: *Historic Environment* in *The Cornwall Local Plan: Strategic Policies 2010-2030* makes the following statement:

All development proposals should be informed by proportionate historic environment assessments and evaluations... identifying the significance of all heritage assets that would be affected by the proposals and the nature and degree of any affects and demonstrating how, in order of preference, any harm will be avoided, minimised or mitigated.

Great weight will be given to the conservation of Cornwall's heritage assets... Any harm to the significance of a designated or non-designated heritage asset must be justified... In those exceptional circumstances where harm to any heritage assets can be fully justified, and the development would result in the partial or total loss of the asset and/or its setting, the applicant will be required to secure a programme of recording and analysis of that asset, and archaeological excavation where relevant, and ensure the publication of that record to an appropriate standard in public archive.

2.4 STRUCTURE OF ASSESSMENT – DIRECT AND INDIRECT IMPACTS

This assessment is broken down into two main sections. Section 3.0 addresses the *direct impact* of the proposed development i.e. the physical effect the development may have on heritage assets within, or immediately adjacent to, the development site. Designated heritage assets on or close to a site are a known quantity, understood and addressed via the *design and access statement* and other planning documents. Robust assessment, however, also requires a clear understanding of the value and significance of the *archaeological* potential of a site. This is achieved via the staged process of archaeological investigation detailed in Section 3.0. Section 4.0 assesses the likely effect of the proposed development on known and quantified designated heritage assets in the local area. In this instance the impact is almost always indirect i.e. the proposed development impinges on the *setting* of the heritage asset in question, and does not have a direct physical effect.



FIGURE 2: PROPOSED DEVELOPMENT PLANS (COURTESY OF THE CLIENT).

3.0 DIRECT IMPACTS

3.1 STRUCTURE OF ASSESSMENT

For the purposes of this assessment, the *direct effect* of a development is taken to be its direct physical effect on the buried archaeological resource. In most instances the effect will be limited to the site itself. However, unlike designated heritage assets (see Section 4.0) the archaeological potential of a site, and the significance of that archaeology, must be quantified by means of a staged programme of archaeological investigation. Sections 3.2-3.5 examine the documentary, cartographic and archaeological background to the site; Section 3.6 details the results of a walkover survey undertaken; and Section 3.7 details the results of a geophysical survey undertaken across the site. Appendix 1 details the methodology employed to make this judgement.

3.2 DOCUMENTARY HISTORY

The site lies to the north west of Helston in the parish of Breage in the deanery and west division of the hundred of Kirrier. Godolphin, seat of the Godolphin family who were lords of the manor, lies to the north west of Carleen. The tithe apportionment indicates that the land *around* the proposed site lies within the manor of Treworlis and therefore it is likely that the site also fell within this manor. Treworlis is not mentioned by name in the Domesday Book, but the place-name element **tre* indicates pre-Conquest origins. In 1086 it is probable the site lay within the larger manor of Crawles; this manor was documented as partly *waste* and this probably included much of the land in this area. The manor of Crawles was recorded as having a number of Lords. Its tenant in chief in 1086 was King William; the overlord in 1066 having been Earl Harold.

Lysons (1814) notes that the manor of Treworlis was the property of Charles Trelawney Esq. Charles Trelawney Esq appears to have resided at Coldrenick, Menheniot and inherited the manor of Treworlis from his father, Edward Stephens; he took the name Trelawney on inheriting the Coldrenick Estates from his cousin, who had inherited from his cousin, who in turn had inherited the estate from Charles Trelawney Esq (Burke 1847). He had inherited the estates from his brother Darrell Trelawney with the stipulation that they must pass down their mother's line (the Darrells) rather than to the Trelawneys of Trelawne as this family had treated him with such disrespect (History of Parliament Online 2021). A number of documents relating to the Trelawney Family of Coldrenick, including documents pertaining to land in Breage are held at Kresen Kernow (catalogue ref SN 1-419). This includes estate accounts for Treworlis Manor (SN368) and accounts of mines in the Manor of Treworlis (SN385/1-7). It is possible details relating to the proposed site are located within these documents.

The site is located close to the historic centre of Wheal Vor, one of the richest tin mines in 19th century Cornwall.

A significant number of documents relating to the operation of Wheal Vor are held at Kresen Kernow, and a substantial book utilising that material was published in 2015 (Bennett 2015). The archive contains correspondence (e.g. V/EB/47), Leases and rent agreements (e.g. SN/152; SN374), Court cases (e.g. c101/4278), Bounds (e.g. X293/10), Mine records (J/1/1315; H/53; H/209/197) and Machinery (H/1/31/1-343). The archive also holds documents relating to mid 20th century attempts to exploit the resources at Wheal Vor (HLG 89/624). An assignment of mine shares dated 1845 from Charles Trelawney to be held in trust for Thomas Gundry as part of a bankruptcy commission suggests that this could mark the end of the Trelawney ownership of Wheal Vor (BRA833/350). Early 20th century survey documents which include Wheal Vor are held at The Box, Plymouth (1023/243). Documents relating to formation and dissolution of mine companies working Wheal Vor held at National Archives, Kew.

The 1841 census does not list Wheal Vor as a settlement but gives a number of households at Carleen, including one of a Thomas Benett or Baratt who may be the occupier of the adjacent plots as recorded on the tithe apportionment. His occupation is recorded as ‘miner on tin’. In the 1851 census Wheal Vor is recorded separately to Carleen but only 3 households are documented; one being the mine cook and another a farmer of 5 acres. The majority of mine workers appear to reside in Carleen and the surrounding settlements. Subsequent Census entries tend to list Wheal Vor separately to Carleen but up to and including the 1939 England and Wales Register no house names are used, meaning that the occupier of the land on which the proposed site is located is difficult to trace.

3.3 CARTOGRAPHIC DEVELOPMENT

The earliest detailed cartographic source available to this study is the 1809 Ordnance Survey (OS) surveyor’s draft map (Figure 3). The site is located in an unenclosed area of land to the east of Carleen, which is labelled as ‘Caleen’. A number of small settlements and tenements are labelled in the landscape around the site and the road pattern, although similar to that shown on later mapping, does not appear to have been entirely formed by this date, in particular in the area of the site. The stippling shown in the area of the site may indicate mining activity and there are potentially two small structures indicated in the eastern part of the site.



FIGURE 3: EXTRACT FROM ORDNANCE SURVEY (OS) SURVEYOR’S DRAFT MAP FOR LANDS’ END, 1809 (BL); THE APPROXIMATE LOCATION OF THE SITE IS INDICATED.

The 1842 Breage Tithe map (Figure 4) shows the proposed development area as part of Wheal Vor, although it is identified on the Tithe Apportionment as ‘Wheal Vor mine waste and roads in Treworlis’ and no landowner is given. The road pattern in this area appears to have become more formalised, with some enclosure of the land to the north of the site which appears to be in the ownership of Christopher Wallis Popham Esq. The land around the proposed site, to the south of

the road all appears to be in the ownership of Charles Trelawney Esq. Two buildings are shown in the northern area of the site and another overlapping the eastern site boundary. A large structure is shown within an enclosure to the west, in the location of Gannilly. Plot 3379, to the south of the site is named Stamps Field, suggesting the nearby location of a stamping mill.

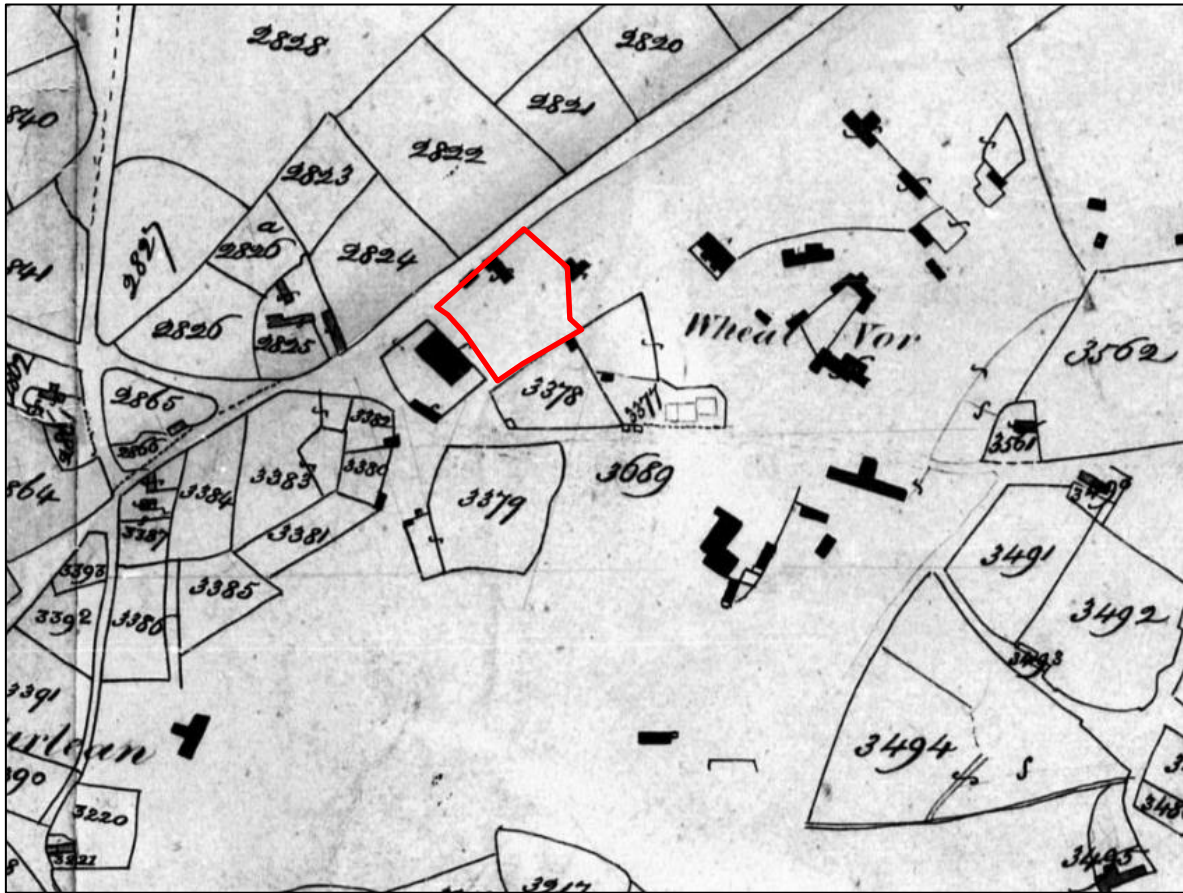


FIGURE 4: EXTRACT FROM BREAGE TITHE MAP, 1842 (PRO); THE APPROXIMATE LOCATION OF THE SITE IS OUTLINED IN RED.

TABLE 1: EXTRACT FROM THE 1842 BREAGE TITHE APPORTIONMENT; THE SITE IS HIGHLIGHTED IN GREEN (TNA).

Plot No.	Owner	Occupier	Field Name	Field Use
Polladras Downs				
2821	Christopher Wallis Popham Esq. Edward Gilbert lessee	Himself	Square Croft	Waste
2822			West Croft	Pasture
2824			Field behind house	Arable
Manor of Treworlis				
3377	Charles Trelawney Esq.	Thomas Bennatts	Dwelling House, Courtlage	And mowhay
3378			The Close	Arable
3379			Stamps Field	Arable
3689	-	-	Wheat Vor Mine Waste and Roads in Treworlis	-

The Ordnance Survey First 6-inch map surveyed 1877 (Figure 5) shows the site to still lie within the Wheal Vor mine. A shaft (known as *Powder House*) is marked close to the north-eastern boundary of the site, within the proposed development area and a small structure also lies over the north eastern boundary of the site, in the location of a larger structure shown on the Tithe map. The buildings shown on the Tithe map do not appear to be depicted on this map and the large building in the location of Gannilly has been replaced with a smaller structure within a subdivided enclosed area. Some further enclosure of the land around the site is evident on this map. A number of chimneys, shafts and spoil heaps are marked within the surrounding landscape.

By the Ordnance Survey Second Edition 25-inch map of 1906 (Figure 6) Wheal Vor is still marked as a tin mine. There appears to be no observable changes to the land on which the proposed site lies from the earlier mapping, although a number of changes to the buildings at Wheal Vor, to the south and east are visible. Further enclosure of the landscape around the site appears to have taken place, with an increase in rectilinear agricultural fields evident.

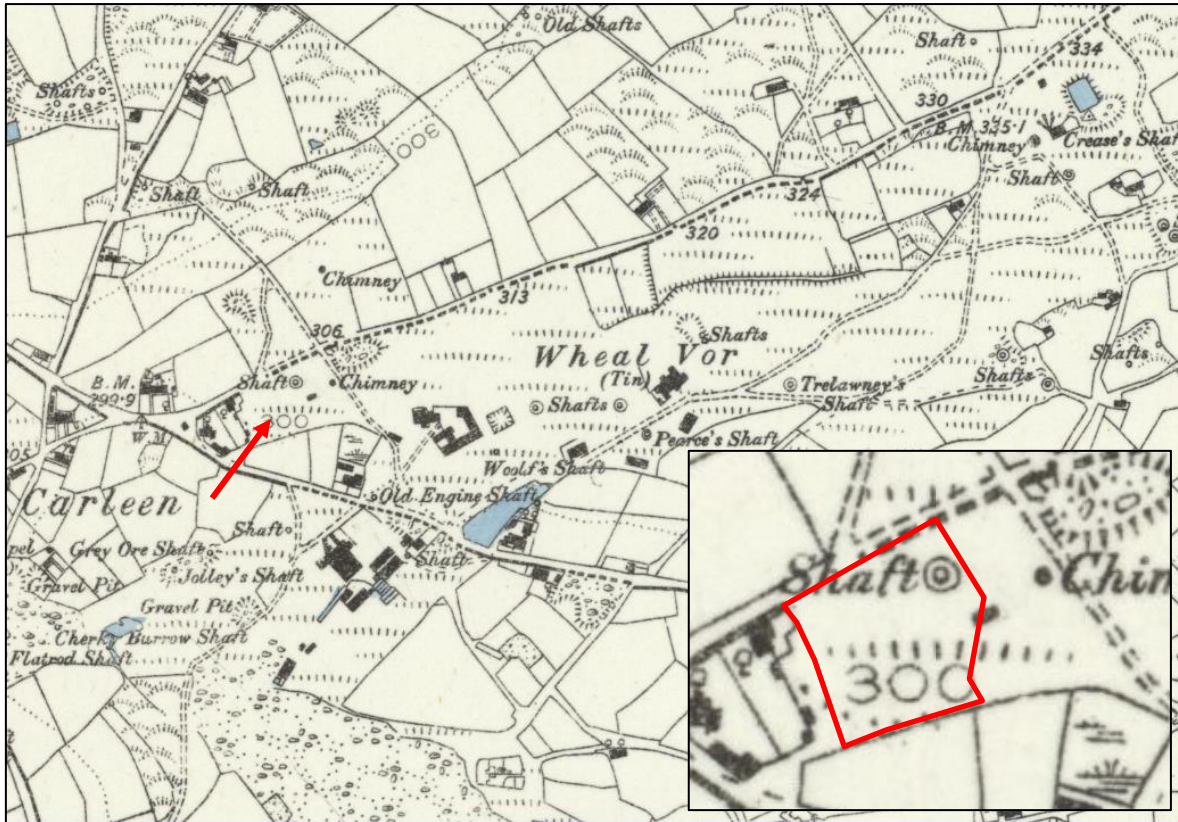


FIGURE 5: EXTRACT FROM THE OS 1ST EDITION 6 INCH MAP, SURVEYED 1877 SHOWING THE SITE AS PART OF WHEAL VOR (NLS); THE APPROXIMATE SITE IS OUTLINED IN RED ON THE INSET MAP.

Historic Ordnance Survey mapping from the 1960s (not illustrated) shows that the mine shafts were still depicted within and around the development site at this date. The church to the east of the site was constructed prior to the early 1960s. By the 1970s Wheal Vor is labelled as disused, which accords with records of final attempts to exploit its resources in the 1960s (abandoned in 1966). The field in which the site lies does not appear to have been enclosed until the late 20th century.

3.4 SATELLITE AND LIDAR IMAGERY

Recent satellite imagery of the site (Figure 8) shows it forms one large enclosed agricultural field, with a residential property to the west and a community church to the east. Processed 1m DTM LiDAR images (Figure 9) of the proposed development site is limited in its ability to illustrate archaeological features due to the 1m sample interval however it indicates a depression in the area of the (Powder House) shaft shown on historic mapping and some undulations of the ground which may relate to vegetation cover or to previous mining activities and probably a further shaft (Culm's Shaft) to the western side of the site.

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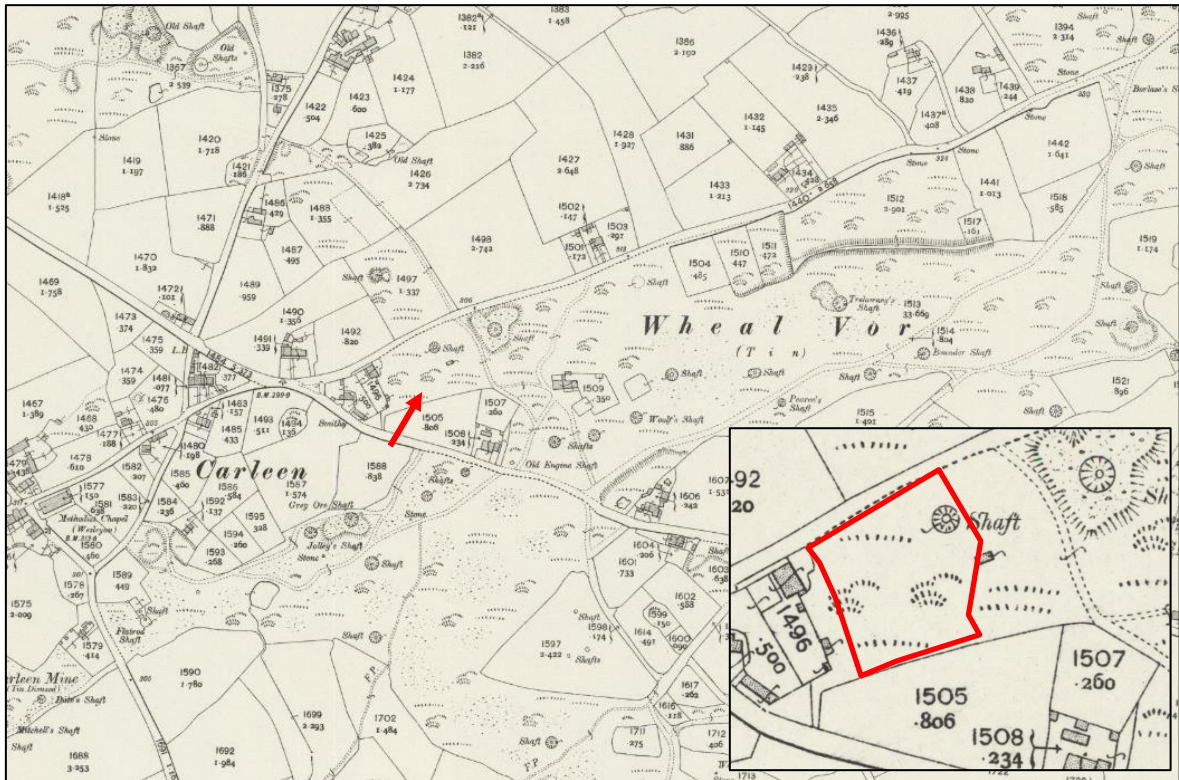


FIGURE 6: EXTRACT FROM OS 2ND EDITION 25 INCH MAP, SURVEYED 1906 SHOWING THE SITE AS PART OF WHEEL VOR (NLS) THE APPROXIMATE SITE IS OUTLINED IN RED IN THE INSET MAP.

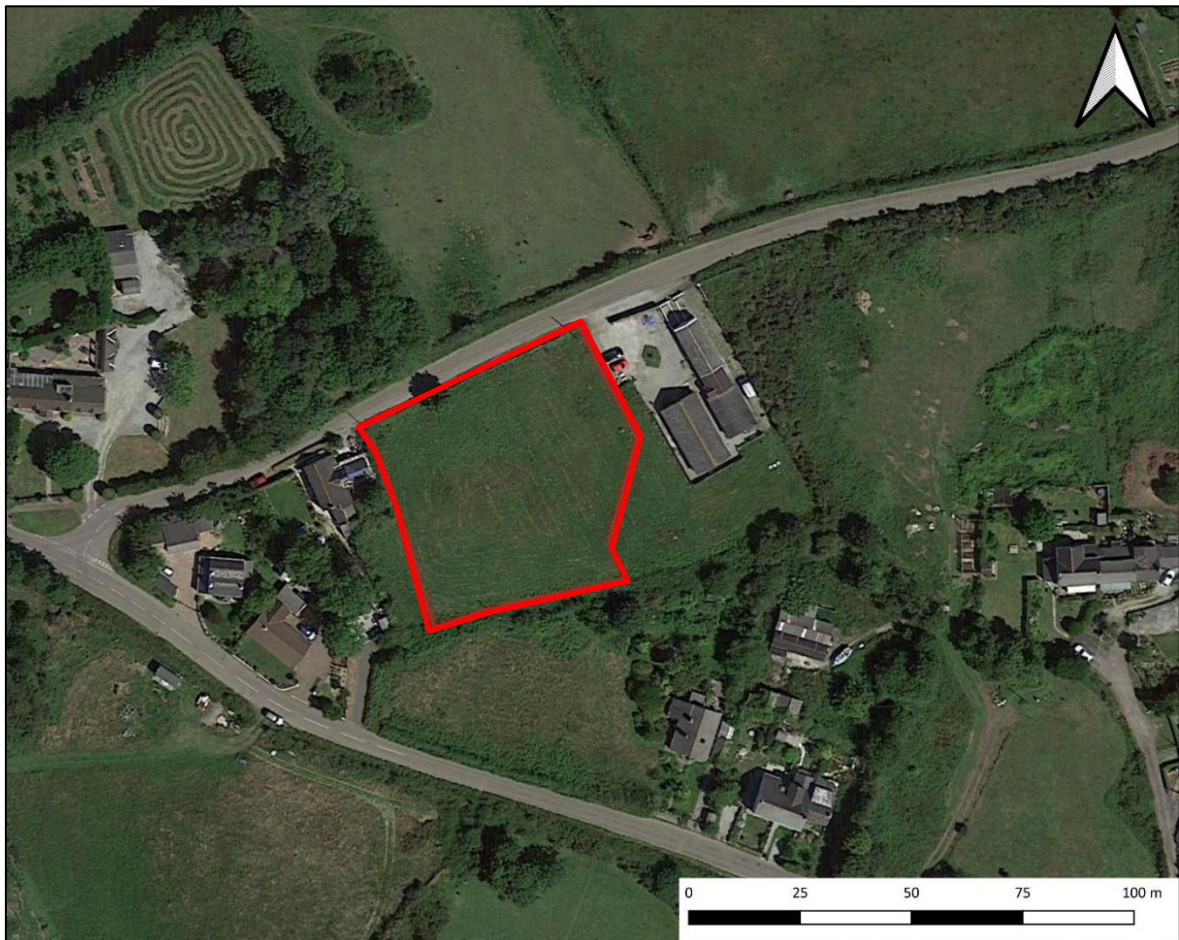


FIGURE 7: 2020 SATELLITE IMAGERY OF THE SITE. ©GOOGLE MAPS. THE APPROXIMATE PROPOSED SITE IS INDICATED IN RED.

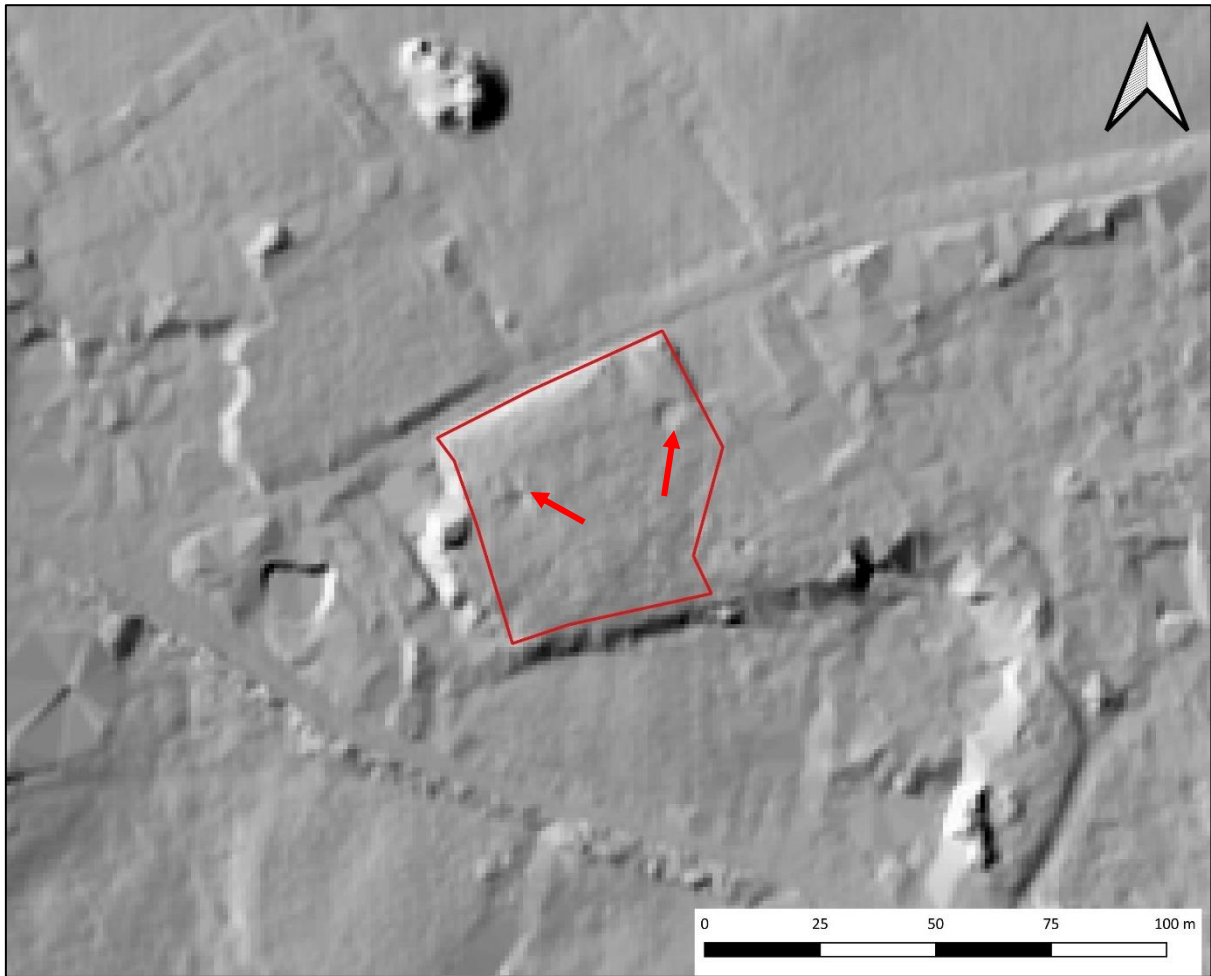


FIGURE 8: LIDAR 1M DTM HILLSHADE IMAGE. GENERATED USING QGIS 3.16 MULTIHILLSHADE 315_35_Z2 USING DATA PROVIDED BY THE ENVIRONMENT AGENCY UNDER CREATIVE COMMONS LICENCE 3.0 THE APPROXIMATE PROPOSED SITE IS BOUNDED IN RED, WITH SHAFTS ARROWED.

3.5 ARCHAEOLOGICAL BACKGROUND

The site lies within land recorded on the Cornwall and Scilly Historic Landscape Characterisation (HLC) as 'Modern Enclosed Land'. This includes Anciently Enclosed Land and Post Medieval Enclosed Land, whose field systems have been substantially altered by large scale hedge removal in the 20th century.

The site lies within the *Tregonning and Gwinear Mining Districts of the Cornwall and West Devon Mining Landscape World Heritage Site (WHS)*. Mine sites are an attribute of the Outstanding Universal Value (OUV) of the WHS. As part of Wheal Vor, and with a shaft shown on historic mapping within the development boundary, the site clearly contributes to this. Wheal Vor is believed to have been the first metal mine in the world to have a steam pumping engine installed (c.1710). The Cornwall and Scilly Historic Environment Record (HER) records a number of designated (Figure 11) and undesignated (Figure 12) heritage assets within 1km of the proposed development site. The documented heritage assets are discussed by period below.

3.5.1 PREHISTORIC AND ROMANO-BRITISH

The sites of several possible rounds are located to the north, south and west of the site, identified either through cropmark or name evidence. To the north a stone axe of Neolithic date is documented and to the south a Bronze Age barrow is recorded (MCO3415). A Roman coin is recorded as having been found at Wheal Vor in the 19th century.

3.5.2 EARLY MEDIEVAL AND MEDIEVAL

To the east of the site, an early medieval field system is recorded at Wheal Vor (MCO35990). Medieval field systems are also recorded to the north-east of the site at Wheal Vor (MCO27188). Medieval settlements are also documented at Sparnon, Chytodden, Carleen, Trew and Chynoweth with an early medieval chapel recorded at the latter (MCO11513). An early medieval trackway is documented to the west of the site at Carleen (MCO35019). Medieval Crosses are recorded at Carleen, Sparnon, Chytodden and Trew.

3.5.3 POST-MEDIEVAL AND MODERN

Most of the Post Medieval activity in the landscape around the site relates to the mining activity of Wheal Vor, Wheal Vreah, Gwinn and Singer, Penhale Wheal Vor, Polladras, Wheal Leeds, Wheal Corn and Wheal Metal. This includes structures associated with the mines including smiths workshops and stamping mills. A number of Post Medieval quarries are also documented in the wider landscape. A chimney and engine house at West Wheal Metal and an engine house at Polrose Mines are Grade II Listed.

3.5.4 HER EVENTS

No previous archaeological works have taken place on the site. The historical/archaeological events recorded on the HER are regarding assessments and recommendations of aspects of the World Heritage Site. The National Mapping Programme recorded significant traces of earthworks related to mining activity on and around this site. Not all of these are included in the CSHER and so the NMP transcription has been included on the map below (Figure 12), along with the recorded locations of mines and engine houses, for completeness.

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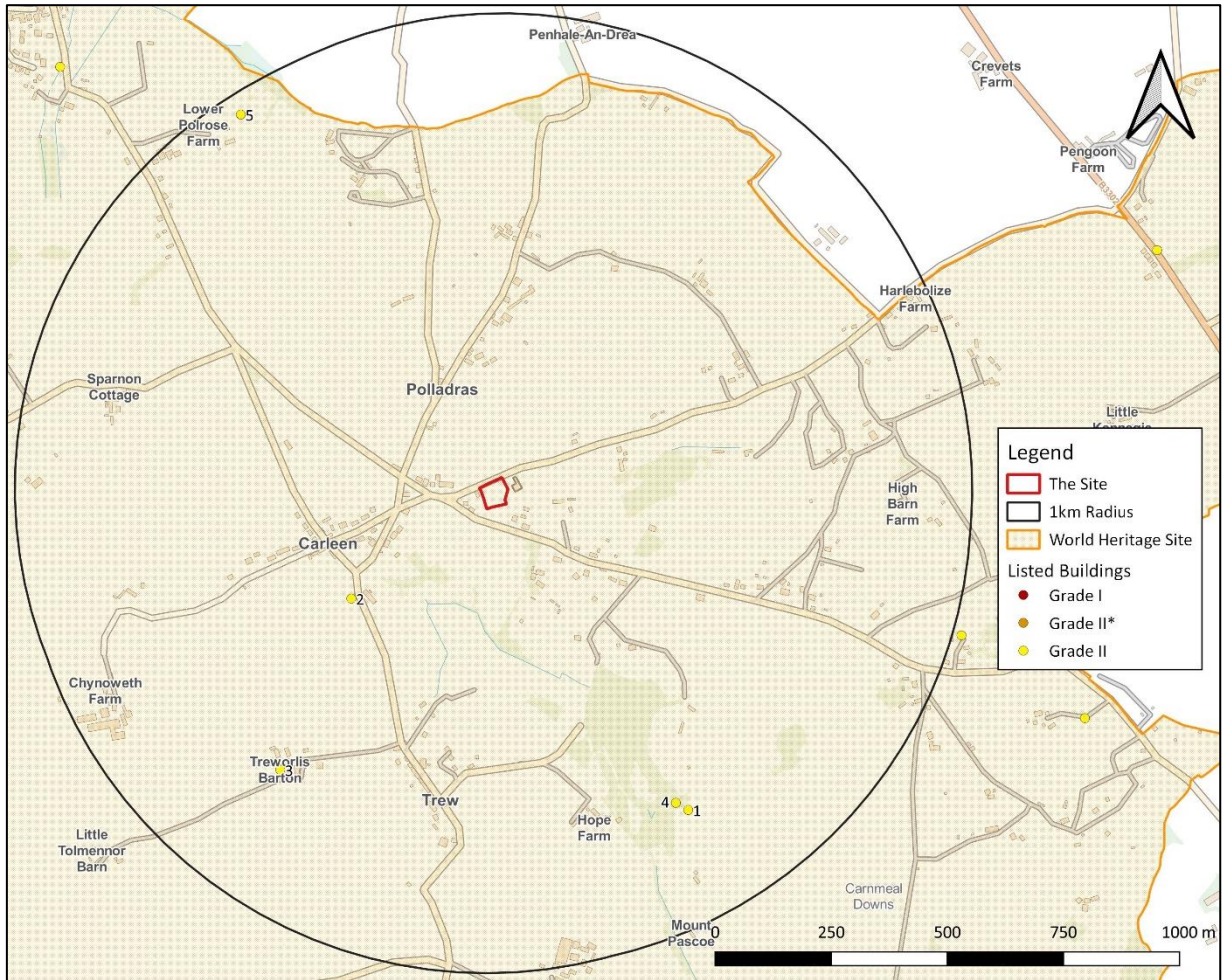


FIGURE 9: DESIGNATED HERITAGE ASSETS WITHIN 1KM OF THE PROPOSED SITE (SOURCE HE) CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2021

TABLE 2: DETAILS OF DESIGNATED HERITAGE ASSETS SHOWN IN FIGURE 11 (HE)

No	Grade	List No.	Name
1	II	1142251	DETACHED CHIMNEY AT SW6232295, WEST WHEAL METAL
2	II	1142270	MERRIFIELD'S COTTAGE
3	II	1158210	TREWORLIS BARTON FARMHOUSE
4	II	1158216	ENGINE HOUSE AT SW623295, WEST WHEAL METAL AND FLOW OR GOLD HILL TIN MINE
5	II	1328331	ENGINE HOUSE AT SW613310 POLROSE MINES

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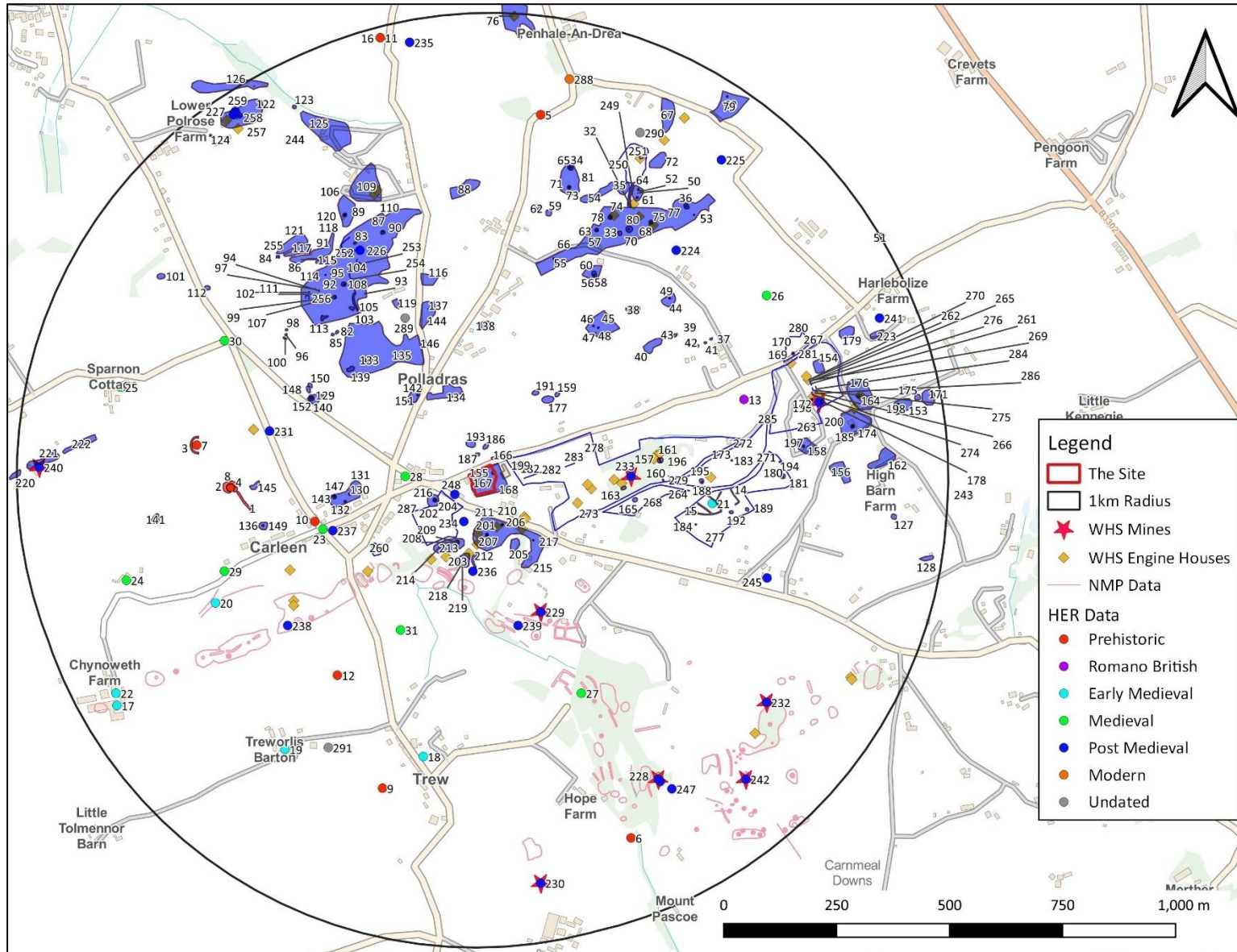


FIGURE 10: HERITAGE ASSETS RECORDED IN THE CSHR WITHIN 1KM OF THE PROPOSED DEVELOPMENT SITE (SOURCE CSHR) CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2021.

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TABLE 3: DETAILS OF HERITAGE ASSETS SHOWN IN FIGURE 12 (CSHER)

No	CSHER No	Name	Form	Summary
1	MCO35953	CARLEEN - Prehistoric enclosure, Undated enclosure	CROPMARK	A small sub-circular banked enclosure, 25m by 21m, is visible as cropmarks on vertical aerial photographs.
2				
3	MCO35952	CARLEEN - Prehistoric enclosure, Undated enclosure	CROPMARK	The western half of a sub-circular banked enclosure, 38m across, is visible as cropmarks on vertical aerial photographs.
4	MCO35953	CARLEEN - Prehistoric enclosure, Undated enclosure	CROPMARK	A small sub-circular banked enclosure, 25m by 21m, is visible as cropmarks on vertical aerial photographs.
5	MCO1097	PENGWEDNA - Neolithic findspot	FIND	
6	MCO3415	ROSEMERGEY - Bronze Age barrow	DOCUMENTARY EVIDENCE	A barrow at Rosemergey is recorded by Thomas in 1851.
7	MCO35952	CARLEEN - Prehistoric enclosure, Undated enclosure	CROPMARK	The western half of a sub-circular banked enclosure, 38m across, is visible as cropmarks on vertical aerial photographs.
8	MCO35953	CARLEEN - Prehistoric enclosure, Undated enclosure	CROPMARK	A small sub-circular banked enclosure, 25m by 21m, is visible as cropmarks on vertical aerial photographs.
9	MCO6897	TREW - Iron Age fogou	DOCUMENTARY EVIDENCE	The name Giant's Holt may indicate the site of a fogou but its location is unknown.
10	MCO7742	CARLEEN - Iron Age round, Romano British round	DOCUMENTARY EVIDENCE	The place-name Carleen suggests the site of a round but there are no remains.
11	MCO7893	CRAWLE - Iron Age round, Romano British round	DOCUMENTARY EVIDENCE	The place-name Crawle suggests the site of a round but there are no remains.
12	MCO8864	TREWORLIS - Iron Age round, Romano British round	DOCUMENTARY EVIDENCE	The field-name 'Carleen Field' suggests the site of a round but there are no remains.
13	MCO1838	WHEAL VOR - Romano British findspot	FIND	In 1886 the Rev S Rundle showed to the Penzance Natural History and Antiquarian society a coin of Maximin found some years earlier at Wheal Vor.
14	MCO35990	WHEAL VOR - Early Medieval field system, Medieval field system	EXTANT STRUCTURE	
15	MCO35990	WHEAL VOR - Early Medieval field system, Medieval field system	EXTANT STRUCTURE	
16	MCO11141	CRAWLE - Early Medieval settlement, Medieval manor, Medieval settlement	DOCUMENTARY EVIDENCE	The settlement and manor of Crawle is first recorded as "Cariahoil" in the Domesday survey of 1086.
17	MCO11513	CHYNOWETH - Early Medieval settlement, Medieval settlement	DOCUMENTARY EVIDENCE	The settlement of Chynoweth is first recorded in 1399 when it is spelt "Treneweth". It was first recorded as "Chynowyth" in 1524
18	MCO11613	TREW - Early Medieval settlement, Medieval settlement	DOCUMENTARY EVIDENCE	The settlement of Trew is first recorded in 1284 when it is spelt "Trethu".
19	MCO11645	TREWORLIS - Early Medieval settlement, Medieval settlement	DOCUMENTARY EVIDENCE	The settlement and manor of Treworlis is first recorded in 1262 when it is spelt "Trevurles".
20	MCO35019	CARLEEN - Early Medieval trackway, Post Medieval trackway	CROPMARK	
21	MCO35990	WHEAL VOR - Early Medieval field system, Medieval field system	EXTANT STRUCTURE; EXTANT STRUCTURE	
22	MCO9900	CHYNOWETH - Early Medieval chapel	DOCUMENTARY EVIDENCE	The OS map of 1880 shows the "Supposed Site of St Breaca's Church" at Chynoweth
23	MCO13775	CARLEEN - Medieval settlement	DOCUMENTARY EVIDENCE	The settlement of Carleen is first recorded as "Caerylion" in 1331.
24	MCO14008	CHYTODDEN - Medieval settlement	DOCUMENTARY EVIDENCE	The settlement of Chytodden is first recorded in 1524 when it is spelt "Chywarton".
25	MCO16821	SPARNON - Medieval settlement	DOCUMENTARY EVIDENCE	The settlement of Sparnon is first recorded as "Spernen" in 1320.
26	MCO27188	WHEAL VOR - Medieval field system, Post Medieval field system	DOCUMENTARY EVIDENCE; DOCUMENTARY	

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			EVIDENCE	
27	MCO35806	TREW - Medieval field system, Post Medieval field system	EXTANT STRUCTURE	
28	MCO5092	CARLEEN - Medieval cross	DEMOLISHED STRUCTURE	The former site of a cross used as a gatepost at Chytodden, and now in Godolphin Cross churchyard, is reputed to be at Carleen.
29	MCO5128	CHYTODDEN - Medieval cross	DEMOLISHED STRUCTURE	A cross in use as a gatepost at Chytodden was removed to Godolphin Cross churchyard in 1886.
30	MCO5786	SPARNON CROSS - Medieval cross	DEMOLISHED STRUCTURE	An ornamented cross built into a stone hedge at Sparnon Cross is now in the churchyard at Godolphin Cross.
31	MCO6165	TREW - Medieval cross	DOCUMENTARY EVIDENCE	The field-name 'Crow Close' suggests the site of a cross but there are no remains.
32-36	MCO12394	PENHALE WHEAL VOR - Post Medieval mine	DOCUMENTARY EVIDENCE	
37-49	MCO12158	GWINN AND SINGER - Post Medieval mine	DOCUMENTARY EVIDENCE	
50-81	MCO12394	PENHALE WHEAL VOR - Post Medieval mine	DOCUMENTARY EVIDENCE	
82-121	MCO12432	POLLADRAS - Post Medieval mine	EXTANT STRUCTURE	Several very ancient setts later combined to form Polladras Mine which was itself incorporated into Great Wheal Vor United in the mid nineteenth century
122-126	MCO12435	POLROSE - Post Medieval mine	DOCUMENTARY EVIDENCE	A small tin mine working from at least the 1820s but never very successful
127-128	MCO12512	SITHNEY WHEAL METAL - Post Medieval mine	DOCUMENTARY EVIDENCE	Also known as Sithney Wheal Buller and at one time worked with Great Wheal Vor United
129-152	MCO13019	WHEAL LEEDS - Post Medieval mine	DOCUMENTARY EVIDENCE	A mid nineteenth century copper mine that closed during the tin depression in 1873.
153-200	MCO13193	WHEAL VOR - Post Medieval mine	DOCUMENTARY EVIDENCE	An ancient mine believed to have been the first to use steam power in Cornwall, the first to have a beam engine in the early eighteenth century and the first to erect a Brunton calciner in 1835. In 1854 it erected the largest beam engine to date - a 100'
201-219	MCO35000	CARLEEN - Post Medieval mine	EXTANT STRUCTURE	Also known as West Wheal Vor, Carleen was a fairly unsuccessful tin and copper mine later worked as part of Great Wheal Vor United Mines
220-222	MCO35951	TREGONNING - Post Medieval mine	EXTANT STRUCTURE	
223	MCO35991	HABOLIZE - Post Medieval quarry	EXTANT STRUCTURE	
224	MCO12158	GWINN AND SINGER - Post Medieval mine	DOCUMENTARY EVIDENCE	
225	MCO12394	PENHALE WHEAL VOR - Post Medieval mine	DOCUMENTARY EVIDENCE	
226	MCO12432	POLLADRAS - Post Medieval mine	EXTANT STRUCTURE	Several very ancient setts later combined to form Polladras Mine which was itself incorporated into Great Wheal Vor United in the mid nineteenth century
227	MCO12435	POLROSE - Post Medieval mine	DOCUMENTARY EVIDENCE	A small tin mine working from at least the 1820s but never very successful
228	MCO12504	SCOTTS - Post Medieval mine	EXTANT STRUCTURE	Sheppard in 1977 locates Scotts Mine at the above grid reference. He notes from local information that the engine house is extant and has a separate chimney.
229	MCO12885	WHEAL CORN - Post Medieval mine	DOCUMENTARY EVIDENCE	
230	MCO12917	WHEAL EMMA - Post Medieval mine	DOCUMENTARY EVIDENCE	A small mine that produced copper in the late nineteenth century
231	MCO13019	WHEAL LEEDS - Post Medieval mine	DOCUMENTARY EVIDENCE	A mid nineteenth century copper mine that closed during the tin depression in 1873.
232	MCO13051	WHEAL METAL - Post Medieval mine	EXTANT STRUCTURE	Wheal Metal, also known as Poldown (Pulldown) Mine, was in operation from 1855-8 and 1865-9. It was worked as a Metal and Flow between approximately 1885 and 1901 when it ceased operation.
233	MCO13193	WHEAL VOR - Post Medieval mine	DOCUMENTARY EVIDENCE	An ancient mine believed to have been the first to use steam power in Cornwall, the first to have a beam engine in the early eighteenth century and the first to erect a Brunton calciner in 1835. In 1854 it erected the largest beam engine to date - a 100'

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234	MCO27187	CARLEEN - Post Medieval stamping mill	DOCUMENTARY EVIDENCE	
235	MCO27208	PENHALE AN DREA - Post Medieval stamping mill	DOCUMENTARY EVIDENCE	
236	MCO28778	CARLEEN - Post Medieval gravel pit	DOCUMENTARY EVIDENCE	
237	MCO32430	CARLEEN - Post Medieval nonconformist chapel	EXTANT STRUCTURE	A fairly large Wesleyan chapel with schoolroom added at rear end survives at Carleen.
238	MCO35000	CARLEEN - Post Medieval mine	EXTANT STRUCTURE	Also known as West Wheal Vor, Carleen was a fairly unsuccessful tin and copper mine later worked as part of Great Wheal Vor United Mines
239	MCO35034	CARLEEN - Post Medieval settlement	DEMOLISHED STRUCTURE	Remains of a C19 miner's smallholding, visible as earthworks on vertical aerial photographs.
240	MCO35951	TREGONNING - Post Medieval mine	EXTANT STRUCTURE	
241	MCO35991	HABOLIZE - Post Medieval quarry	EXTANT STRUCTURE	
242	MCO39838	WEST WHEAL METAL - Post Medieval mine	EXTANT STRUCTURE	A tin producing mine working after 1876 as a part of New Carleen Vor.
243	MCO39910	WHEAL VREAH - Post Medieval mine	EXTANT STRUCTURE	Wheal Vreah sett was incorporated into that of Wheal Vor
244	MCO52457	POLROSE - C19 engine house	EXTANT STRUCTURE	A disused and roofless engine house is situated at Polrose.
245	MCO52938	WHEAL VOR - Post Medieval school	EXTANT STRUCTURE	A "School (Boys & Girls)" is recorded on the 1st Edition OS map c1880 to the south of Wheal Vor and the building may still survive.
245	MCO56548	WHEAL METAL AND FLOW - C19 engine house	EXTANT STRUCTURE	A disused beam engine house and stamps that operated between 1881 and 1906.
247	MCO56549	WEST WHEAL METAL - C19 chimney	EXTANT STRUCTURE	A detached chimney which served a C19 beam engine house sited immediately to the NE.
248	MCO9004	CARLEEN - Post Medieval blacksmiths workshop	DOCUMENTARY EVIDENCE	A smithy is recorded at this location on recent OS maps may have originated as a mine smithy, associated with the Carleen mine - Wheal Vor complex.
249-251	MCO12394	PENHALE WHEAL VOR - Post Medieval mine	DOCUMENTARY EVIDENCE	
252-256	MCO12432	POLLADRAS - Post Medieval mine	EXTANT STRUCTURE	Several very ancient setts later combined to form Polladras Mine which was itself incorporated into Great Wheal Vor United in the mid nineteenth century
257-259	MCO12435	POLROSE - Post Medieval mine	DOCUMENTARY EVIDENCE	A small tin mine working from at least the 1820s but never very successful
260	MCO13019	WHEAL LEEDS - Post Medieval mine	DOCUMENTARY EVIDENCE	A mid nineteenth century copper mine that closed during the tin depression in 1873.
261-286	MCO13193	WHEAL VOR - Post Medieval mine	DOCUMENTARY EVIDENCE	An ancient mine believed to have been the first to use steam power in Cornwall, the first to have a beam engine in the early eighteenth century and the first to erect a Brunton calciner in 1835. In 1854 it erected the largest beam engine to date - a 100'
287	MCO35000	CARLEEN - Post Medieval mine	EXTANT STRUCTURE	Also known as West Wheal Vor, Carleen was a fairly unsuccessful tin and copper mine later worked as part of Great Wheal Vor United Mines
288	MCO55763	PENHALE-AN-DREA - Modern signpost	ALUMINIUM; EXTANT STRUCTURE	An aluminium fingerpost survives on the west side of an unclassified road junction south of Penhale-an-drea.
289	MCO27185	POLLADRAS - Undated earthwork	DOCUMENTARY EVIDENCE	
290	MCO27186	PENHALE WHEAL VOR - Undated earthwork	DOCUMENTARY EVIDENCE	The field name "Burrows Field" on the Tithe Award is more likely to be associated with the mining activity in the area rather than a possible prehistoric site.
291	MCO27079	TREWORLIS - Undated pound	DOCUMENTARY EVIDENCE	

4.0 GEOPHYSICAL SURVEY

4.1 INTRODUCTION

An area of c.0.3ha was the subject of a magnetometry (gradiometer) survey. The purpose of this survey was to identify and record magnetic anomalies within the proposed site. While identified anomalies may relate to archaeological deposits and structures the dimensions of recorded anomalies may not correspond directly with any associated features. The following discussion attempts to clarify and characterise the identified anomalies. The survey was undertaken on 18th August 2021 by P. Webb; the survey data was processed by P. Webb. Additional graphic images of the survey data and numbered grid locations can be found in Appendix 1; and supporting photographs for the site inspection can be seen in Appendix 2.

4.2 SITE INSPECTION

The site comprises a single north-east to south-west orientated field at the north-eastern edge of the historic mining settlement of Carleen. The topography of the survey area was largely flat. At the time of survey, the site was under pasture. The site is bounded to all sides by overgrown hedgebank boundaries, with a concrete blockwork wall and chain-link fence with concrete posts surrounding the residential property to the north-east corner.

The ground across site was very uneven, with several sub-circular to irregular shallow hollows being identified within the survey area. Of particular note were: a large overgrown pit in the south-western corner; and two recently infilled hollows, one towards the western boundary, the other towards the north-eastern corner. A metal manhole cover set in concrete was also identified towards the southern boundary.

4.3 METHODOLOGY

The gradiometer survey follows the general guidance as outlined in: *EAC Guidelines for the use of geophysics in Archaeology: Questions to Ask and Points to Consider* (Europae Archaeologiae Consilium/European Archaeological Council 2016) and *Standard and Guidance for Archaeological Geophysical Survey* (ClfA 2014b).

The survey was carried out using a twin-sensor fluxgate gradiometer (Bartington Grad601). These machines are sensitive to depths of up to 1.50m. The survey parameters were: sample intervals of 0.25m, traverse intervals of 1m, a zigzag traverse pattern, traverse orientation was circumstantial, grid squares of 30×30m. The gradiometer was adjusted ('zeroed') every 0.5-1ha. The survey grid was tied into the Ordnance Survey National Grid- and set out using a Leica CS15 GNSS Rover GPS. The data was downloaded onto *Grad601 Version 3.16* and processed using *TerraSurveyor Version 3.0.36.0*. The primary data plots and analytical tools used in this analysis were *Shade* and *Metadata*. The details of the data processing are as follows:

Processes:

Clip +/- 1SD; removes extreme data point values.

DeStripe all traverses, median; used to equalise underlying differences between grids (potentially caused by instrument drift or orientation, directional effects inherent in magnetic instrument, or differences in instrument set up during survey e.g. using two gradiometers).

TABLE 4: SURVEY DETAILS (UNADJUSTED).

Field	Area (ha)	Max (nT)	Min (nT)	Standard Deviation (nT)	Mean (nT)	Median (nT)
1	0.3038	98.60	-100.00	30.40	-2.80	-2.10

4.4 RESULTS

Table 5 with the accompanying Figures 11 and 12 show the analyses and interpretation of the geophysical survey data.

TABLE 5: INTERPRETATION OF GRADIOMETER SURVEY DATA.

Anomaly Group	Class and Certainty	Form	Archaeological Characterisation	Comments
1	Very strong positive with associated negative, probable	Discrete ovoid to irregular	Mine shaft/working	Indicative of cut and infilled features such as pits or shafts with associated spoil material. Responses of between -101.81nT and +103.28nT.
2	Very strong positive with associated negative, possible	Discrete ovoid to irregular	Mine working / disturbed ground	Indicative of cut and infilled features such as pits or shafts with associated spoil material. Responses of between -111.73nT and +126.65nT.
3	Moderate positive and negative (mixed response), possible	Irregular	Disturbed ground	Indicative of disturbed ground. May indicate geological variation. Responses of between -17.93nT and +18.65nT.
4	Moderate to strong positive with associated negative, probable	Linear	Modern drain	Indicative of a buried modern service. Presence of manhole indicates a drain. Responses of between -17.93nT and +18.65nT.
	Strong dipolar (mixed response)	Discrete	Ferrous anomaly	Indicative of metallic object. Responses of between c.+/-115nT.
	Strong bipolar (mixed response)	Irregular	Modern disturbance	Indicative of disturbed ground and disturbance caused by proximity to metallic fences and debris. Responses of between c.+/-110nT.

4.5 DISCUSSION

The survey identified four groups of anomalies. These were predominantly discrete ovoid and irregular anomalies likely associated with historic mining. The identified anomaly groups include: mining pits/shafts; disturbed ground; and a modern service. Evidence of metallic debris was also identified.

The general response variation across the site was between +/-5nT, though background response were up to +/-10nT. The response strength of probable archaeological activity was very high (typically between +/-80nT). The strength of the responses of many of the anomalies indicates that the majority may include metallic debris.

The identified anomalies include: four probable mine shaft/workings (Group 1); 13 possible mine workings or disturbed ground (Group 2); and three areas of disturbed ground (Group 3).

Anomaly Group 1 consists of three very strong positive (+0.86n to +103.28nT) and negative (-101.81nT to -0.05nT) discrete sub-circular to irregular anomalies indicative of a cut and infilled features such as pits with surrounding spoil material. Mining investigation works previously carried out on the site (Poole 2019) identified substantial mine workings at these locations. Two named mine shafts are known to be located on the site (Culm's and Powder House).

Anomaly Group 2 consists of 13 very strong positive (+0.04nT to +126.65nT) and negative (-111.73nT to -0.10nT) discrete sub-oval to irregular anomalies indicative of cut and infilled features such as pits with surrounding spoil material. Given the presence of known mining features on the site these may be additional associated features, though the responses may reflect disturbed ground with metallic debris.

Anomaly Group 3 consists of four areas of moderate positive (+0.61nT to +18.65nT) and negative (-17.93nT to -0.15nT) irregular to linear anomalies indicative of disturbed ground. These approximately follow areas identified as mineralised veins identified by the mining survey, and it is likely that these responses reflect this geological variation and possible mine workings along

these, though in the south-eastern corner there is likely disturbance associated with the construction of the current property boundary.

Anomaly Group 4 consists of a moderate to strong positive (+0.60nT to +25.38nT) and negative (-52.24nT to -8.64nT) linear anomaly indicative of a buried modern service. It is aligned approximately north-east to south-west and has a metal manhole cover set in concrete.

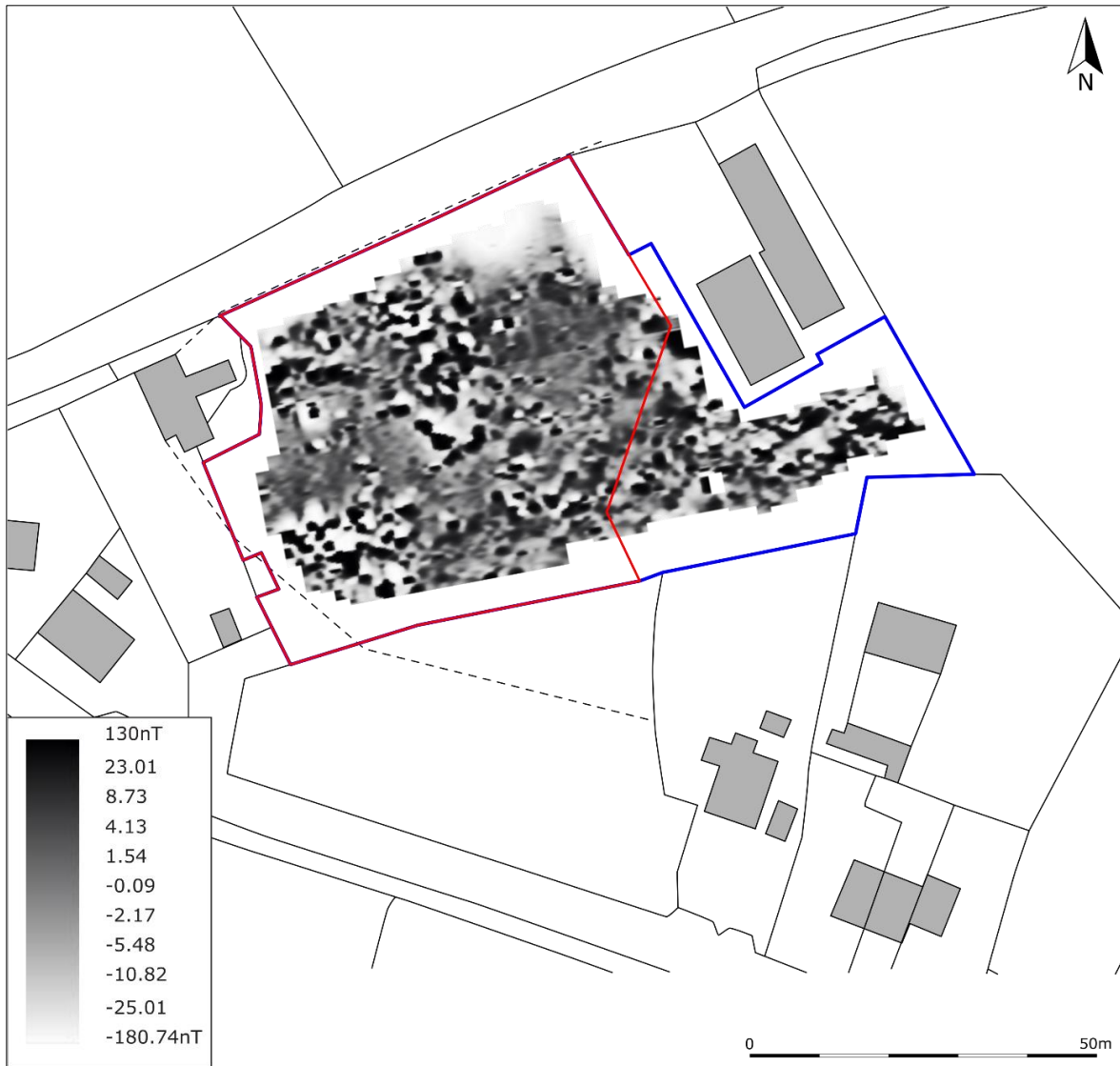


FIGURE 11: SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALIZED, GRADIATED SHADING.

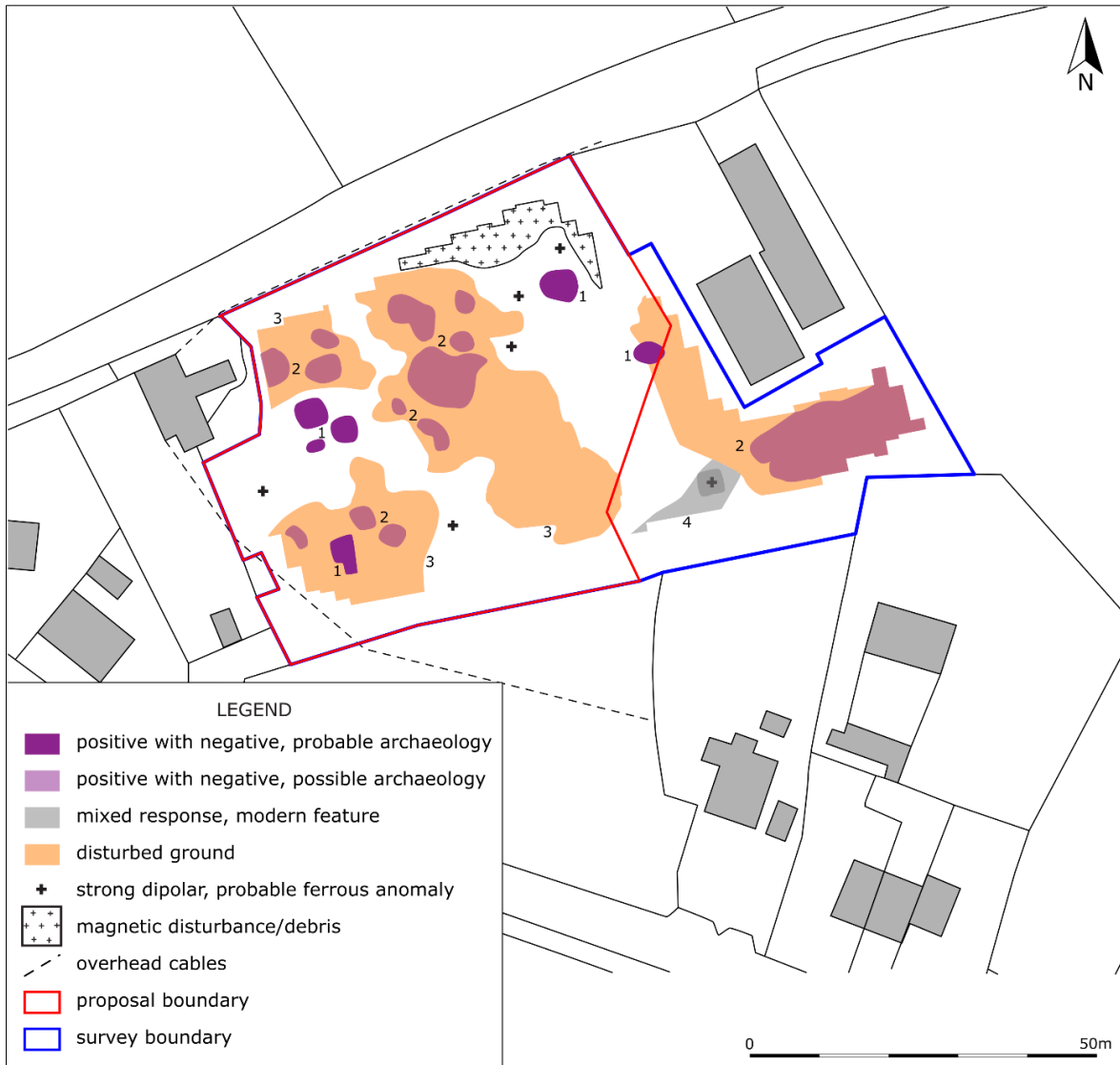


FIGURE 12: INTERPRETATION OF THE GRADIOMETER SURVEY DATA.

4.6 ARCHAEOLOGICAL POTENTIAL

The survey identified four groups of anomalies. These were discrete features associated with historic mine workings (Group 1) and possible mine workings or disturbed ground (Group 2), as well as possible disturbed ground associated with mineralised vein outcrops (Group 3) and a modern drain (Group 4).

Whilst all of the features at this stage are inherently undated, the surrounding area is littered with shafts and structures historic mining, the proposal site itself being identified as the site of Wheal Vor mine, which was worked predominantly during the 18th and 19th centuries and into the 20th century; surrounding mining activity suggested as having Romano-British origins, though mining proper in the area began during the 15th century. It is likely, therefore, that the identified anomalies reflect this largely post-medieval activity.

The degree of preservation of the identified features is unclear due to the level of associated disturbance, though is likely to be good, the mining investigations indicating that the features are all substantial in scale. It is also possible that additional, more ephemeral features, are masked by the strength of the responses caused by the mining activity.

Any development of the site is likely to encounter and destroy the buried archaeological resource, and whilst there is a *high* potential suggested by the surrounding prehistoric and post-medieval mining landscape, the results of the geophysical survey would suggest that the archaeological potential for the site is *high*, many of the identified anomalies likely post-medieval mining on the site, though earlier prehistoric or Romano-British features cannot be ruled out. Whilst further archaeological mitigation in the form of targeted evaluation trenching would validate and clarify the results of the geophysical survey, previous episodes of mining survey trenching have located and demonstrated the scale and nature of the mining features on the site.

5.0 INDIRECT IMPACTS

5.1 STRUCTURE OF THE ASSESSMENT

For the purposes of this assessment, the *indirect effect* of a development is taken to be its effect on the wider historic environment. The principal focus of such an assessment falls upon identified designated heritage assets like Listed buildings or Scheduled Monuments. Depending on the nature of the heritage asset concerned, and the size, character and design of a development, its effect – and principally its visual effect – can impact on designated assets up to 20km away.

The methodology adopted in this document is based on that outlined in *The Setting of Heritage Assets* (GPA3 Historic England 2015), with reference to ICOMOS (2011) and DoT (DMRB, WEBTAG) guidance. The assessment of effect at this stage of a development is an essentially subjective one, but one based on the experience and professional judgement of the authors. Appendix 1 details the methodology employed.

This report follows the staged approach to proportionate decision making outlined in *The Setting of Heritage Assets* (Historic England 2015, 6). *Step one* is to identify the designated heritage assets that might be affected by the development. The first stage of that process is to determine an appropriate search radius, and this would vary according to the height, size and/or prominence of the proposed development. For instance, the search radius for a wind turbine, as determined by its height and dynamic character, would be much larger than for a single house plot or small agricultural building. The second stage in the process is to look at the heritage assets within the search radius and assign to one of three categories:

- Category #1 assets: Where proximity to the proposed development, the significance of the heritage asset concerned, or the likely magnitude of impact, demands detailed consideration.
- Category #2 assets: Assets where location and current setting would indicate that the impact of the proposed development is likely to be limited, but some uncertainty remains
- Category #3 assets: Assets where location, current setting, significance would strongly indicate the impact would be no higher than negligible and detailed consideration both unnecessary and disproportionate. These assets are included on assets in Table 6.

For *Step two* and *Step three*, and with an emphasis on practicality and proportionality (*Setting of Heritage Assets* p15 and p18), this assessment then groups and initially discusses heritage assets by category (e.g. churches, historic settlements, funerary remains etc.) to avoid repetitious narrative; each site is then discussed individually, and the particulars of each site teased out. The initial discussion establishes the baseline sensitivity of a given category of monument or building to the potential effect, the individual entry elaborates on local circumstance and site-specific factors. The individual assessments should be read in conjunction with the overall discussion, as the impact assessment is a reflection of both.

5.2 QUANTIFICATION

The size of the proposed development, approximately 6 dwellings across c.0.3ha, would indicate a search radius of 1km is sufficient to identify those designated heritage assets where an appreciable effect might be experienced. A search radius of up to 1.5km is appropriate for high-value assets where distance views are integral to the significance of the asset in question.

There are only a few designated heritage assets in the local area: the World Heritage Site, two Scheduled Monuments, one Grade I listed structure and 11 Grade II structures, of which most are

within the World Heritage Site. There are no GII* Listed buildings in this study area, nor any Registered Parks and Gardens or Battlefields.

With an emphasis on practicality and proportionality (see *Setting of Heritage Assets* p15 and p18), only those assets where there is the possibility for an effect greater than negligible (see Table 4 in Appendix 3) are considered here in detail and in summary Table 6. All other Scheduled and Listed assets can be seen listed and mapped in Appendix 4, although they have been scoped out of this assessment due to their neutral relationship to the proposed development.

- Category #1 assets: the Tregonning and Gwinear Mining District World Heritage Site; the Scheduled Multi-period Archaeological Landscape on Tregonning Hill, and Round Cairn north-north-west of Tregonning Hill House; and the Grade I Listed Church of St Breaca and associated monuments.
- Category #2 assets: the brick kiln at SW60492991, the engine houses and chimneys at Polrose, Wheal West, West Wheal Metal mines, Merrifield's Cottage, Pixie's Hall, Tregonning Farmhouse, Treworlis Barton Farmhouse and the war memorial near Castle Pencaire Fort.
- Category #3 assets: All other assets within 1km of the site.

5.3 IMPACT BY CLASS OF MONUMENT OR STRUCTURE

5.3.1 CHURCHES AND PRE-REFORMATION CHAPELS

Church of England parish churches and chapels; current and former places of worship

Most parish churches tend to be associated with a settlement (village or hamlet), and therefore their immediate context lies within the setting of the village (see elsewhere). Church buildings are usually Grade II* or Grade I Listed structures, on the basis they are often the only surviving medieval buildings in a parish, and their nature places of religious worship.

In more recent centuries the church building and associated structures functioned as *the* focus for religious devotion in a parish. At the same time, they were also theatres of social interaction, where parishioners of differing social backgrounds came together and renegotiated their social contract.

In terms of setting, many churches are still surrounded by their churchtowns. Viewed within the context of the settlement itself, churches are unlikely to be affected by the construction of residential developments unless it is to be located in close proximity. The location of the church within its settlement, and its relationship with these buildings, would remain unchanged: the church often being the visual focus on the main village street.

This is not the case for the church tower. While these structures are rarely open to the public, in rural communities they are frequently the most prominent visual feature in the landscape, especially where the church is itself located in a topographically prominent location. The towers of these structures were clearly *meant* to be highly visible, ostentatious reminders of the presence of the established church with its message of religious dominance/assurance. However, churches were often built and largely maintained by their laity, and as such were a focus for the *local* expression of religious devotion. It was this local devotion that led to the adornment of their interiors and the elaboration of their exteriors, including the tower.

Where parishes are relatively small, the tower would be visible to the residents of multiple parishes. This would have been a clear expression of the religious devotion – or rather, the competitive piety – of a particular social group. This competitive piety that led to the building of

these towers had a very local focus, and very much reflected the aspirations of the local gentry. If the proposed development is located within the landscape in such a way to interrupt line-of-sight between church towers, or compete with the tower from certain vantages, then it would very definitely impact on the setting of these monuments.

As the guidance on setting makes clear, views from or to the tower are less important than the contribution of the setting to the significance of the heritage asset itself. The higher assessment for the tower addresses the concern it will be affected by a new and intrusive element in this landscape.

Churchyards often contained Listed gravestones or box tombs, and associated yard walls and curtilage are usually also Listed. The setting of all of these assets is usually extremely local in character, and local blocking, whether from the body of the church, church walls, shrubs and trees, and/or other buildings, always plays an important role. As such, the construction of a wind turbine is unlikely to have a negative impact.

What is important and why

Churches are often the only substantial medieval buildings in a parish, and reflect local aspirations, prosperity, local and regional architectural trends; they usually stand within graveyards, and these may have pre-Christian origins (evidential value). They are highly visible structures, identified with particular geographical areas and settlements, and can be viewed as a quintessential part of the English landscape (historical/illustrative). They can be associated with notable local families, usually survive as places of worship, and are sometimes the subject of paintings. Comprehensive restoration in the later 19th century means many local medieval churches are associated with notable ecclesiastical architects (historical/associational). The 19th century also saw the proliferation of churches and parishes in areas like Manchester, where industrialisation and urbanisation went hand-in-hand. Churches are often attractive buildings that straddle the distinction between holistic design and piecemeal/incremental development, all overlain and blurred with the 'patina of age' (aesthetic/design and aesthetic/fortuitous). They have great communal value, perhaps more in the past than in the present day, with strong commemorative, symbolic, spiritual and social value.

Asset Name: Church of Saint Breaca, with surrounding monuments	
<i>Parish:</i> Breage	<i>Value:</i> High
<i>Designation:</i> GI	<i>Distance to Development:</i> c.1.70km.
<p><i>Description: Listing:</i> (List entry no. 1158264) Parish church. Incorporating part of pre C15 chancel but mostly rebuilt by and reconsecrated in 1466 (Church Guide) with south porch added soon after and north and south transept are possibly later C15; restored in 1891. Granite ashlar walls with mostly granite dressings. Dry Delabole slate roofs over the nave/chancel and over the parallel roofs of the north and south aisles, all with granite coped gable ends. The nearly flat roofs of the porch, transepts and tower (hidden by embattled parapets) are presumably sheathed in lead. Large ashlar stack clasping north west corner of north transept.</p> <p>PLAN: nave/chancel (with chancel roof stepped down) west tower, north and south aisles are all of one build taking 6 years 1460-1466 (Church Guide); chancel incorporates earlier fabric. The south porch was probably added next and finally the north and south transepts just west of the rood screen which are probably late C15. The restoration in 1891 involved re-roofing the nave/chancel and repair or reconstruction of the aisle roofs. Probably old fittings removed at the same time.</p> <p>Three-stage tower with plinth and set back weathered corner buttresses with set-offs, strings dividing stages, carved head gargoyles under cornice of embattled parapet and crocketed corner pinnacles over blind-panelled embattled turrets. The bracket-moulded west doorway is 4-centred with carved spandrels and label stops terminating at plinth moulding level; C19 door. The traceried 4-light granite window directly over the doorway is C15 Perpendicular with hoodmould as are all the other windows in the church but there is variation in the detail. Second stage is blind but the upper stage has slate louvred 3-light traceried window to each side. North aisle has 4-light window at west gable end and Slight window at east gable end. The north wall has two windows close together left of the north transept and two windows wider spaced right of the transept with moulded 4-centred doorway between. The windows have cinquefoil headed lights and cusped tracery. These windows are similar to the chancel east window and the south and west windows of the south aisle. The other windows are</p>	

uncusped, untracried except for tracried east windows of aisle with steep 4-centred arched lights under shallow 4-centred arches. The windows of both transepts are without hoodmoulds. The leaded glazing is either rectangular or latticed panes but some windows have both types. The north transept has 4-light north window, 3-light east window and 4-centred arched doorway towards the angle in the west wall. The east gable end of the chancel projects and has 3-light Perpendicular window with cusping in the tracery. Pre C15 plinth and other masonry. C17 inscribed former chest tomb slate attached to south wall of chancel. The east gable ends of the north and south aisles have 5-light Perpendicular windows with uncusped tracery. The south aisle 3-light south windows are similar to the chancel window: one window left of the porch; 2 windows between the porch and the south transept and 2 windows right of the transept with blocked 4-centred arched Godolphin family door between. The south transept has similar windows to the north transept: 4-light south window and 3-light east window. The porch has weathered set back buttresses with set-offs like the tower. Over the doorway is a sundial dated 1795. The doorway is late Perpendicular with panelled octagonal jambs (compare doorways of churches at St Just in Roseland, Mylor, Budock, Gunwalloe, and the resited courtyard doorway at Godolphin Hall qv.) The moulded inner doorway is like the north doorway with 4-centred arch and square hoodmould (suggesting that the porch is later than the aisle). Studded, probably C17, 2 panel door.

INTERIOR has much C15 timberwork: ceiled waggon roofs with carved bosses over the aisles; coffered ceiling with cross braced panels and carved bosses over the north aisle and a moulded beam and some moulded joists to the tower ceiling. There is a 7-bay arcade with standard A (Pevsner) type piers on either side of the nave/chancel and moulded basket arches between. The tower arch is carried on octagonal panelled jambs. Incorporated into windows in the south wall right (east) of the transept and the east window of the south transept is some medieval glass; holy water stoup with convex sided arched head in the porch and a curious corbel with dogs tooth and fluted decoration over the left hand respond of the north transept arch. Murals: Arguably the most remarkable C15 features however are the fine painted murals on the north and south walls including a very striking figure of Saint Christopher on the left of the north doorway. Fittings: mostly C19 including round granite font with round corner shafts in the Norman manner; tracried oak rood screen; reredos; oak choir stalls and pews; free standing cast iron candelabra; tracried granite tower screen (given as a memorial to James Jewill Hill). Earlier fittings include: in the north west corner of the north aisle, a Roman milestone bearing the name of Emperor Cassianus Posthumus (260-268 A.D.) found a few hundred yards from the church in 1924 (Church Guide); a probably C14 stone representing the crucifixion in the Godolphin Chapel, found by the coast near Tremearne (Church Guide); and a painted copy of a letter from Charles I 1643, at 'Sudly' Castle.

This church, despite being reputedly of one build, has some curious design changes and anomalies. The east windows of the aisles, the transept windows, the porch doorway and the tower arch are in a later Perpendicular style. Another explanation might be that there was a clear distinction being made architecturally to use the more traditional style for the more important ecclesiastical parts of the church and using the modern style for the lay entrances and the chapels. For whatever reason the result is a remarkably complete C15 building. The only serious change since built (excluding the loss of all the C15 and C16 fittings) is the replacement of the nave and chancel roofs in the C19. Fortunately, the practice of skinning the walls of plaster, so popular with Victorian architects, did not take place at Breage and the painted murals that survive are some of the best examples in Cornwall and for that matter in England.

Conservation Value: The church has a complex developmental history and inherently holds evidential value. The church is of local communal value, a serving parish church.

Authenticity and Integrity: The church is well maintained and still functional as a place of worship, and whilst some modernisation has occurred, it is still largely traditional.

Setting: The church stands on slightly raised ground in the core of the settlement, surrounded by residential properties.

Contribution of Setting to the Significance of the Asset: Intentional. The church would have stood as a visual marker to the piety of the local community, and whilst the settlement has grown over the centuries, the nature of the setting has not altered.

Magnitude of Effect: The proposed development would be situated to the north and is not visible from the church, views both to and from being screened in the first instance by the residential properties surrounding the church, but also by woodland and topographic screening in the wider landscape. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing woodland screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the distance to the site means that this will be minimal.

Magnitude of Impact: High value asset and Negligible = **Slight** impact

Overall Impact Assessment: **Negligible**



FIGURE 13: THE CHURCH OF ST BREACA; VIEWED FROM THE NORTH.

5.3.2 FARMHOUSE AND FARM BUILDINGS

These have been designated for the completeness of the wider group of buildings or the age or survival of historical or architectural features. The significance of all of these buildings lies within the farmyard itself, the former historic function of the buildings and how they relate to each other. For example, the spatial and functional relationships between the stables that housed the cart horses, the lincay in which the carts were stored, the lofts used for hay, the threshing barn to which the horses brought the harvest, or to the roundhouse that would have enclosed a horse engine and powered the threshing machine. Many of these buildings were also used for other mechanical agricultural processes, the structural elements of which are now lost or rare, such as apple pressing for cider or hand threshing, and may hold separate significance for this reason. The farmhouse is often listed for its architectural features, usually displaying a historic vernacular style of value; they may also retain associated buildings linked to the farmyard, such as a dairy or bakehouse, and their value is taken as being part of the wider group as well as the separate structures.

The setting of the farmhouse is in relation to its buildings or its internal or structural features; farmhouses were rarely built for their views, but were practical places of work, developed when the farm was profitable and neglected when times were hard. In some instances, model farms were designed to be viewed and experienced, and the assessment would reflect this. Historic farm buildings are usually surrounded by modern industrial farm buildings, and if not, have been converted to residential use, affecting the original setting. Unless in close proximity, new developments will usually have a restricted impact on the meaning or historical relevance of these sites.

What is important and why

Farmhouses and buildings are expressions of the local vernacular (evidential) and working farms retain functional interrelationships (historical/associational). Farms are an important part of the rural landscape, and may exhibit levels of formal planning with some designed elements (aesthetic/designed but more often aesthetic/fortuitous). However, working farms are rarely

aesthetically attractive places, and often resemble little more than small industrial estates. The trend towards the conversion of historic farm buildings and the creation of larger farm units severely impacts on historical/associational value.

Asset Name: Treworlis Barton Farmhouse	
Parish: Breage	Value: Medium
Designation: GII	Distance to Development: c.0.65km
<i>Description:</i> Listing: (List Entry no. 1158210) Farmhouse. Circa early-mid C19. Dressed coursed granite front with ashlar plinth and lintel course, dressed granite quoins, sills, jambstones and lintels; rubble at sides and rear. Hipped scantle slate roof with brick chimneys over side walls, cast iron ogee gutters. Double depth nearly square plan: 2 equal front rooms flanking central through passage leading to central stair between rear service rooms plus C20 lean to at right hand side. 2 storeys. Symmetrical 3 window south front with central doorway and C20 door. The windows are the original 12-pane hornless sashes. Interior not inspected. At approx 10 metres from the rear of the house is the C17 former farmhouse with stone chimney and kneeler stones, partly rebuilt front, refloored and re-roofed (not included in the listing but enhances the interest of present farmhouse.)	
<i>Conservation Value:</i> Listed for its architectural value as a good example of its type, within a wider historical context. There will be aesthetic value, in the use of vernacular materials and functional use.	
<i>Authenticity and Integrity:</i> The exterior appears little altered, though it is not known how the interior has changed. The farmhouse is still associated with a working farm and remains relatively isolated within the landscape.	
<i>Setting:</i> The farmhouse is located along a track setting it back from the nearby settlement of Trew, and is surrounded on all sides by agricultural fields.	
<i>Contribution of Setting to the Significance of the Asset:</i> Incidental. The intended setting of the farmhouse on its land-holding would have been integral to the form and function of the building.	
<i>Magnitude of Impact and Effect:</i> The proposed development would be located to the north-east, and higher up a slope, whilst primary views from the house are north and south. Wider views both to and from the farmhouse are screened in the first instance by the trees surrounding the house, and by topographic and woodland screening in the wider landscape. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing woodland screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the existing screening would limit this.	
<i>Magnitude of Impact:</i> Medium value asset + negligible effect = Neutral/Slight impact	
<i>Overall Impact Assessment:</i> Negligible.	



FIGURE 14: TREWORLIS BARTON FARMHOUSE; VIEWED FROM THE SOUTH.

5.3.3 INDUSTRIAL BUILDINGS AND INFRASTRUCTURE

A range of industrial and extractive structures, often exhibiting elements of formal planning, rarely with a view to aesthetics

A whole range of structures relating to a whole range of industries falls under this broad category, and include ruined, standing and functioning buildings. This might include: bridges, canals, capstans, clay-drying facilities, engine houses, fish cellars, gunpowder mills, railways, warehouses and so forth. However, in most instances industrial buildings were not built with aesthetics in mind, despite the elements of formal planning that would often be present. The sensitivity of these structures to the visual intrusion of a development depends on type, age and location.

It is usually the abandoned and ruined structures, now overgrown and 'wild', that are most sensitive to intrusive new visual elements. The impact on these buildings could be significant. Where they occur in clusters – as they often do – the impact of an isolated development is lessened, but the group value of the heritage asset is enhanced.

What is important and why

This is a very heterogeneous group, though all buildings and associated structures retain some evidential value, which ranges with the degree of preservation. Some structures are iconic (e.g. Luxulyan viaduct) and quite often others are, due to the rapid intensification of industry in the 18th and 19th centuries, innovative in both design and application (historical/illustrative). Some may survive as working examples – in which case the associational value is maintained – but many are ruinous or converted (historical/associational). All were designed, and many conform to a particular template (e.g. engine houses) although incremental development through use-life and subsequent decrepitude may conceal this. Fortuitous development may then lead to ruinous or deserted structures or building complexes taking on the air of a romantic ruin (e.g. Kennall Vale gunpowder works), imagery quite at odds with the bustle and industry of their former function. Some of the more spectacular or well-preserved structures may become symbolic (e.g. South Crofty Mine), but communal value tends to be low, especially where public access is not possible.

Asset Name: Engine House at SW628298, Ivey's Shaft, Wheal Metal	
Parish: Breage	Value: High
Designation: GII; within the WHS	Distance to Development: c.0.95km
<i>Description:</i> Listing: (List Entry no. 1158231) Disused beam engine house. Circa 1859. Granite rubble walls with dressed granite quoins jambstones and lintels with much dressed granite, in places almost ashlar, especially to the gable end wall and the bob wall. Round brick arches to the 2 principal openings, some timber lintels. The 2 stage chimney has a rubble lower stage and a brick upper stage. Rectangular single cell plan with round chimney clasping the west corner, thicker bob wall at north-east side. Three storeys over basement but floors and cylinder removed. North-east bob wall has central large round-headed brick arch to ground floor, blind above and former weather-boarded upper floor and gable removed. The opposite south west gable end wall has similar ground floor opening and a smaller square headed opening to both the 1st and second floors. Similar square headed openings to each side wall, the second floor unpierced. The rubble chimney tapers to a brick collar at ridge level surmounted by a tall tapered brick shaft with a cornice resembling a Doric capital. The masonry of this engine house is remarkably complete but fallen timber lintels are causing some deterioration. An unusually large engine house. In 1859 the building was fitted with an 1846 Harvey 85" engine, moved from Wheal Vor Trelawney's Shaft, and it is said that the engine house was also moved stone by stone. It has been suggested that this event was the origin of the name 'Pulldown'. Work came to an end in the early 1870s and in 1877 the 85-inch engine was removed from the house and despatched to Gateshead Waterworks where it survived until the 1940s.	
<i>Supplemental Comments:</i> The chimney is currently undergoing renovation/restoration works.	
<i>Conservation Value:</i> Listed for its historic and architectural value as a good example of its type, within a wider historical context, particularly as part of the wider WHS area. There will be aesthetic value, in the use of vernacular materials and functional use. As upstanding remains of the Wheal Metal Mine, which sits within an extensive extractive landscape, the asset has considerable narrative value.	
<i>Authenticity and Integrity:</i> The engine house is an authentic structure of the 19 th century, subject to some	

alteration in the early 2000s during conservation works. Modern houses and gardens surround the monument to the south, east and west altering the industrial nature of the site; though the regenerating scrub immediately adjacent contributes to an aesthetic air of ruinous dereliction; however, the conservation works have introduced a degree of artificiality to its appearance which has yet to subside.

The engine house survives to eaves height as a shell. All internal and most external fixtures and fittings have decayed or have been removed.

Setting: The engine house is located adjacent to modern residential development and a holiday park, with small areas of woodland. The immediate surroundings are partially overgrown, though there are also maintained garden as part of the residential properties.

Contribution of Setting to the Significance of the Asset: Incidental. The engine house had a specific function within an industrial landscape. Its location was determined by the presence of copper, tin and land ownership, and it was not clearly designed for outward views or to create a landmark. The engine house is a solid looking structure which dominates its immediate environs and is visible on a landscape scale. The immediate setting is fairly constrained, with scrub regeneration around the base of the building and surrounding garden/field hedgerows restricting outward views. However, the fact the site is growing into the landscape as a ruin, renders it more sensitive to unsympathetic development in the wider area.

Magnitude of Impact and Effect: The proposed development would be located to the north-west and surrounding by existing settlement, screening it from views from the asset. Existing residential development in close proximity to the asset blocks wider views both to and from the asset. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing urban screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the existing screening would limit this.

Magnitude of Impact: High value asset (upgraded from Medium value to account for the WHS) + negligible effect = **Slight** impact

Overall Impact Assessment: **Negligible.**



FIGURE 15: THE ENGINE HOUSE AND CHIMNEY AT IVEY'S SHAFT; VIEWED FROM THE NORTH.

Asset Name: Engine House at SW613310, Polrose Mines	
Parish: Breage	Value: High
Designation: GII; within the WHS	Distance to Development: c.0.95m
<p><i>Description:</i> Listing: (List Entry no. 1328331) Disused beam engine house. Circa 1873. Granite rubble walls with dressed granite quoins; coursed dressed granite to bob wall, round-headed brick arches and some wooden lintels; round granite rubble chimney clasping north-east corner with moulded brick cornice/collar and tapered brick shaft with traces of cornice over. Plan: rectangular single cell house originally with 3 floors round chimney at north-east corner; lower bob wall to south. North wall has large ground floor opening (boiler doorway) with small opening over, both round headed; gable above fallen, chimney adjoining at left with small flue opening at the bottom. South (bob) wall has large round-headed opening (plug doorway); the east and west walls each have 2 principal window openings irregularly disposed, all with round-headed brick arches except for the lintelled opening to the ground floor of the west wall. There are possibly remains of associated structures in the overgrown land adjoining, Except for the fallen north gable, the masonry of this engine house is virtually complete and the building stands in unspoiled open farmland. This engine house had a 40 inch cylinder pumping engine. When reworking started in 1880, the engine was still there (along with 2 others) and it apparently worked until abandonment in 1884.</p>	
<p><i>Supplemental Comments:</i> The engine house is covered in ivy and surrounded by trees.</p>	
<p><i>Conservation Value:</i> Listed for its historic and architectural value as a good example of its type, within a wider historical context, particularly as part of the wider WHS area. There will be aesthetic value, in the use of vernacular materials and functional use. As upstanding remains of the Polrose Mines, which sits within an extensive extractive landscape, the asset has considerable narrative value.</p>	
<p><i>Authenticity and Integrity:</i> The engine houses are an authentic structure of the 19th century, subject to some alteration in the early 2000s during conservation works. The ivy growth over the structure contributes to an aesthetic air of ruinous dereliction; however, the conservation works have introduced a degree of artificiality to its appearance which has yet to subside. The engine house survives to eaves height as shells. All internal and most external fixtures and fittings have decayed or have been removed.</p>	
<p><i>Setting:</i> The engine house is located at Lower Polrose Farm, surrounded by woodland and in close proximity to agricultural buildings. The surrounding land is either overgrown as part of the historic mining sites or agricultural land.</p>	
<p><i>Contribution of Setting to the Significance of the Asset:</i> Incidental. The engine house had a specific function within an industrial landscape. Its location was determined by the presence of copper, tin and land ownership, and it was not clearly designed for outward views or to create a landmark. The engine house is a solid looking structure which dominates its immediate environs and is visible on a landscape scale. The immediate setting is fairly constrained, with limited woodland around the building restricting outward views. However, the fact the site is growing into the landscape as a ruin, renders it more sensitive to unsympathetic development in the wider area.</p>	
<p><i>Magnitude of Impact and Effect:</i> The proposed development would be located to the south-east, and higher up a valley slope, surrounding by existing settlement, partially screening it from views from the asset. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing urban screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the existing screening would limit this.</p>	
<p><i>Magnitude of Impact:</i> High value asset (upgraded from Medium value to account for the WHS) + negligible effect = Slight impact</p>	
<p><i>Overall Impact Assessment:</i> Negligible.</p>	



FIGURE 16: THE ENGINE HOUSE AT POLROSE MINES; VIEWED FROM THE SOUTH-WEST.

Asset Name: Engine House at SW623295, West Wheal Metal and Flow or Gold Hill Tin Mine; Detached Chimney at SW6232295, West Wheal Metal	
Parish: Breage	Value: Medium
Designation: GII; within the WHS	Distance to Development: c.0.75m
<p><i>Description:</i> Listing: (List Entry no. 1158216) Disused beam engine house. 1881. Killas and granite rubble walls with dressed granite quoins and jambstones, granite ashlar bob wall, round brick arches and timber lintels. Rectangular single cell plan, thicker bob wall at west side. Three storeys over basement, floors and machinery removed. West bob wall has large central ground floor round-arched opening, blind over, and former weatherboarded 2nd floor and gable removed. The opposite east wall has similar ground floor opening. Gable over fallen. The side walls have ground floor openings with granite lintels over and 1st and second floor openings spanned by wooden lintels. This engine house contained a rotative beam engine of about 30 inch cylinder diameter. It drove a set of stamps and also drew water for dressing purposes from the adit level via a shaft at the rear by means of a 'back-bob'. The machinery was used for some years to treat the huge waste dumps of Wheal Vor and Wheal Metal but underground operation was minimal. The engine house is of technical interest in that it is one of only two in Cornwall which show clearly where the back bob was mounted. There is a fine detached chimney at a short distance to the south-east (see Detached Chimney at SW623295 NW, West Wheal Metal, qv) and traces of a former underground flue leading to this survive.</p> <p><i>Description:</i> Listing: (List Entry no. 1142251) Detached chimney serving beam engine house on lower ground. 1881. Killas rubble with some granite rubble to lower stage, polychrome brick to upper stage. Round-on-plan 2 stage tapered chimney with echinus mould to brick collar surmounted by tapered brick shaft with polychrome banding and diaper work. This chimney has possibly unique decoration to the brickwork of the chimney and the contemporary engine house survives to the north-west</p> <p><i>Supplemental Comments:</i> Immediate area surrounding the asset is heavily overgrown.</p> <p><i>Conservation Value:</i> Listed for their historic and architectural value as good examples of their type, within a wider historical context, particularly as part of the wider WHS area. There will be aesthetic value, in the use of vernacular materials and functional use.</p> <p>As upstanding remains of the West Wheal Metal, which sits within an extensive extractive landscape, the asset has considerable narrative value.</p> <p>Structures immediately associated with the engine houses may survive hidden by the scrub.</p> <p><i>Authenticity and Integrity:</i> The engine houses are an authentic structure of the 19th century, subject to some alteration in the early 2000s during conservation works. The regenerating scrub around the site is only managed in a limited way and contributes to an aesthetic air of ruinous dereliction; however, the conservation works have introduced a degree of artificiality to its appearance which has yet to subside.</p>	

The engine houses survive to eaves height as shells. All internal and most external fixtures and fittings have decayed or have been removed.

Setting: The engine house and chimney are located within an area of woodland at the mouth of a steep stream valley, surrounded by the open landscape of the wider mining area.

Contribution of Setting to the Significance of the Asset: Incidental. Engine houses had a specific function within an industrial landscape. Their location was determined by the presence of copper, tin and land ownership, and it was not clearly designed for outward views or to create a landmark. Both the engine house and chimney are solid looking structures which dominate their immediate environs and are visible on a landscape scale. The immediate setting is fairly constrained, with scrub regeneration around the base of the buildings restricting outward views. However, the fact the site is growing into the landscape as a ruin, renders it more sensitive to unsympathetic development in the wider area.

Magnitude of Impact and Effect: The proposed development would be located to the north-west, and higher up a slope, surrounding by existing settlement, screening it from views from the asset. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing urban screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the existing screening would limit this.

Magnitude of Impact: High value asset (upgraded from Medium value to account for the WHS) + negligible effect = **Slight** impact

Overall Impact Assessment: **Negligible.**



FIGURE 17: THE ENGINE HOUSE AND DETACHED CHIMNEY AT WEST WHEAL METAL; VIEWED FROM THE NORTH-NORTH-EAST.

5.3.4 LISTED COTTAGES AND STRUCTURES WITHIN HISTORIC SETTLEMENTS

Clusters of Listed Buildings within villages or hamlets; occasionally Conservation Areas

The setting of the (usually) Grade II Listed buildings within settlements is defined by village context. Their significance is determined by their architectural features, historical interiors or role/function in relation to the other buildings. The significance of their setting to the experience of these heritage assets is of key importance and for this reason the curtilage of a property and any small associated buildings or features are often included in the Listing and any changes must be scrutinised under relevant planning law.

Most village settlements have expanded significantly during the 20th century, with rows of cottages and modern houses and bungalows being built around and between the older ‘core’ Listed structures. The character of the settlement and setting of the heritage assets within it are continually changing and developing, as houses have been built or farm buildings have been converted to residential properties. The setting of these heritage assets within the village can be impacted by new residential developments especially when in close proximity to the settlement. The relationships between the houses, church and other Listed structures will not be altered, and it is these relationships that define their context and setting in which they are primarily to be experienced. The larger settlements and urban centres usually contain a large number of domestic and commercial buildings, only a very small proportion of which may be Listed or protected in any way. The setting of these buildings lies within the townscape, and the significance of these buildings, and the contribution of their setting to that significance, can be linked to the growth and development of the individual town and any associated industries. The original context of any churches may have changed significantly since construction, but it usually remains at the heart of its settlement. Given the clustering of numerous individual buildings, and the local blocking this inevitably provides, a distant development is unlikely to prove particularly intrusive.

What is important and why

Historic settlements constitute an integral and important part of the historic landscape, whether they are hamlets, villages, towns or cities. The physical remains of previous occupation may survive beneath the ground, and the built environment contains a range of vernacular and national styles (evidential value). Settlements may be archetypal, but development over the course of the 20th century has homogenised most, with streets of terraced and semi-detached houses and bungalow growths arranged around the medieval core (limited historical/illustrative value). As dynamic communities, there will be multiple historical/associational values relating to individuals, families, occupations, industry, retail etc. in proportion to the size and age of the settlement (historical/ associational). Settlements that grew in an organic fashion developed fortuitously into a pleasing urban environment (e.g. Ledbury), indistinguishable suburbia, or degenerate urban/industrial wasteland (aesthetic/fortuitous). Some settlements were laid out quickly or subject to the attention of a limited number of patrons or architects (e.g. late 19th century Redruth and the architect James Hicks, or Charlestown and the Rashleigh family), and thus strong elements of design and planning may be evident which contribute in a meaningful way to the experience of the place (aesthetic/ design). Component buildings may have strong social value, with multiple public houses, clubs, libraries (communal/social), chapels and churches (communal/spiritual). Individual structures may be commemorative, and whole settlements may become symbolic, although not always in a positive fashion (e.g. the Valleys of South Wales for post-industrial decline) (communal/symbolic). Settlements are complex and heterogeneous built environments filled with meaning and value; however, beyond a certain size threshold distant sight-lines become difficult and local blocking more important.

Asset Name: Merrifield's Cottage	
<i>Parish:</i> Breage	<i>Value:</i> Medium
<i>Designation:</i> GII; within the WHS	<i>Distance to Development:</i> c.0.35m
<i>Description:</i> Listing (List Entry no. 1142270): Cottage. Circa late C18. Painted rubble and cob walls, slate sills, wooden lintels. Steep corrugated iron roof with gable ends. Brick chimneys, the left hand chimney over an external rubble stack. Two storeys. One window south-east front with one window lean to on right. The windows are towards the left and the doorway is on the right of the original front. The 1st floor window, partly above the ground window, is very small with a 4-pane horned sash. The ground floor window openings are larger with C20 windows. Old 4- panel door. Interior not inspected. This is a rare example of a detached single-cell plan house not extended since the C19. 1 room plan house heated from a stack on the left hand gable end and with the doorway at the right hand end of the front. At the right hand end there is a single storey lean-to extension probably a scullery.	
<i>Conservation Value:</i> Listed for its value as a vernacular structure of its type. A rare example having not been	

extended since the 19 th century.
<i>Authenticity and Integrity:</i> The house appears to be in moderate condition, with some repairs evident.
<i>Setting:</i> Located outside of the village in a relatively isolated position, set back from the road. The building is largely obscured from view by trees.
<i>Contribution of Setting to Significance of Asset:</i> Incidental. The house was built as a practical domestic dwelling, the roadside location of more intrinsic value than wider landscape considerations.
<i>Magnitude of Effect:</i> The site of the proposed development is not visible from the asset, being blocked by topography and woodland screening, primary views also not being in the direction of the site. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing woodland screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the existing screening would limit this.
<i>Magnitude of Impact:</i> Medium value asset and Negligible change = Neutral/Slight Impact.
<i>Overall Impact Assessment:</i> Negligible



FIGURE 18: MERRIFIELD'S COTTAGE; VIEWED FROM THE EAST-SOUTH-EAST.

5.3.5 MEMORIALS AND WAYSIDE CROSSES

Memorials and wayside crosses are typically located at highly visual locations: road junctions, high points, or other relevant central place within their community. Wayside crosses served the function of reiterating and reinforcing the Christian faith amongst those who passed by and were located on routes linking ordinary settlements or routes with a more religious function. Many examples are located within churchyards or cemeteries. Context and setting are often confined to the settlement with which they are associated and therefore modern developments, when visible at a distance, do not affect their relationships with their surroundings or public understanding of their meaning and significance. Some large (primarily 19th century) memorials are afforded a much wider setting by their prominent positioning on hilltops above settlements, and in these instances they may be more sensitive to modern developments.

What is important and why

All have strong communal value, in terms of commemorative power and symbolism (communal).

Asset Name: War Memorial near Castle Pencaire Fort	
<i>Parish:</i> Germoe	<i>Value:</i> Medium
<i>Designation:</i> GII	<i>Distance to Development:</i> 1.95km
<i>Description:</i> Listing (List Entry no. 1392562) War Memorial. Granite. A three stepped square base of coursed snecked stone surmounted by a roughly hewn granite Celtic cross on a plinth. On the stone plinth to the base of the cross is the inscription in lead lettering: "TO THE GLORY OF GOD/AND IN REVERED AND HONOURED MEMORY/OF THE BRAVE MEN OF ST GERMOE,/WHO GAVE THEIR LIVES FOR KING & COUNTRY/1914 - 1918./ERNEST ANDREW./LEONARD LAITY./ERNEST RICHARDS./SAMPSON RICHARDS./LEST WE FORGET". A granite stone plaque has been inserted into the top stone step with the inscription in lead lettering: "ALSO IN MEMEORY OF THOSE WHO/FELL IN THE WAR 1939-1945./ERVIN ANDREWS/STANLEY JOHNS/WILLIAM COURTENY WHITE".	
<i>Conservation Value:</i> Considerable communal value as a war memorial; aesthetically pleasing. Set in a prominent location.	
<i>Authenticity and Integrity:</i> The memorial is well maintained as a dominant feature in the landscape.	
<i>Setting:</i> Set on the summit of a hill overlooking the parish, the memorial occupies a prominent position. Much of the surrounding environs is scrub, the monument standing proud above.	
<i>Contribution of Setting to the Significance of the Asset:</i> Intentional. The memorial stands at the top of a hill, visible not just to those walking past, but across the wider landscape, particularly the parish of Germoe over which its primary view surveys. Its setting has been chosen to ensure the memory of the war and the losses suffered are retained at the heart of the community. The setting is important to the monument's primary function.	
<i>Magnitude of Effect:</i> The site of the proposed development is not visible from the asset, being blocked by topography and woodland screening, primary views also not being in the direction of the site. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing woodland screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the existing screening would limit this.	
<i>Magnitude of Impact:</i> Medium value asset and Negligible = Neutral/Slight impact	
<i>Overall Impact Assessment:</i> Negligible	



FIGURE 19: THE WAR MEMORIAL NEAR CASTLE PENCAIRE FORT; VIEWED FROM THE WEST-SOUTH-WEST.

5.3.6 PREHISTORIC RITUAL/FUNERARY MONUMENTS

Stone circles, stone rows, barrows and barrow cemeteries

These monuments undoubtedly played an important role in the social and religious life of past societies, and it is clear they were constructed in locations invested with considerable religious/ritual significance. In most instances, these locations were also visually prominent, or else referred to prominent visual actors, e.g. hilltops, tors, sea stacks, rivers, or other visually prominent monuments. The importance of intervisibility between barrows, for instance, is a noted phenomenon. As such, these classes of monument are unusually sensitive to intrusive and/or disruptive modern elements within the landscape. This is based on the presumption these monuments were built in a largely open landscape with clear lines of sight; in many cases these monuments are now to be found within enclosed farmland, and in varying condition. Sensitivity to development is lessened where tall hedgebanks restrict line-of-sight.

What is important and why

Prehistoric ritual sites preserve information on the spiritual beliefs of early peoples, and archaeological data relating to construction and use (evidential). The better examples may bear names and have folkloric aspects (historical/illustrative) and others have been discussed and illustrated in historical and antiquarian works since the medieval period (historical/associational). It is clear they would have possessed design value, although our ability to discern that value is limited; they often survive within landscape palimpsests and subject to the ‘patina of age’, so that fortuitous development is more appropriate. They almost certainly once possessed considerable communal value, but in the modern age their symbolic and spiritual significance is imagined or attributed rather than authentic. Nonetheless, the location of these sites in the historic landscape has a strong bearing on the overall contribution of setting to significance: those sites located in ‘wild’ or ‘untouched’ places – even if those qualities are relatively recent – have a stronger spiritual resonance and illustrative value than those located within enclosed farmland or forestry plantations.

Asset Name: Round Cairn 225m NNW of Tregonning Hill House	
<i>Parish:</i> Breage	<i>Value:</i> High
<i>Designation:</i> Scheduled Monument	<i>Distance to Development:</i> c.1.60km
<i>Description: Listing:</i> (SAM 1004611) The monument includes a round cairn, situated on the southern summit of the prominent granite outcrop of Tregonning Hill. The cairn survives as a circular, flat-topped stony mound measuring approximately 20m in diameter and up to 0.5m high. There are two early partial excavation trenches on the mound.	
<i>Supplementary Comments:</i> The monument was is completely overgrown with scrub.	
<i>Conservation Value:</i> Scheduled for their high evidential value, they provide evidence for funerary and ritual practices during prehistoric periods. Though previous archaeological excavations have been carried out, further archaeological and environmental evidence will survive.	
<i>Authenticity and Integrity:</i> Appears in relatively good condition, though difficult to assess with scrub regeneration, and is unlikely to survive to its original height. However, archaeological investigation will have damaged the monument. Would have formed part of a wider Neolithic and Bronze Age largely open landscape, although this landscape has been drastically altered by modern infrastructure and development.	
<i>Setting:</i> The monument stands as a (low) visible monument above ground on the summit of hill overlooking the surrounding landscape. It is surrounded by scrub regeneration, with quarry pits and Tregonning Hill House in close proximity.	
<i>Contribution of Setting to Significance of Asset:</i> Paramount. Barrows and round cairns formed part of a wider landscape of ceremony and ritual incorporating many other monuments and intended to be intervisible, of as part of a wider funerary landscape as a means of memorializing the dead. The lack of a shared ritual culture with our ancestors does not detract from our own appreciation of a setting and/or its use.	
<i>Magnitude of Effect:</i> The proposed development is located a distance from the monument, and would form an intrusive element into what would originally have been an open landscape, though would be largely screened by woodland blocking. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing woodland screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution,	

particularly larger vehicles during the construction phases, though the distance to the site means that this will be minimal.

Magnitude of Impact: High value asset + negligible effect = **Slight** impact

Overall Impact Assessment: **Negative/minor impact.**



FIGURE 20: THE ROUND CAIRN NORTH-NORTH-WEST OF TREGONNING HILL HOUSE; VIEWED FROM THE EAST.

5.3.7 HILLFORTS

Hillforts, tor enclosures, cross dykes, promontory forts

Hillforts are large embanked enclosures, most often interpreted as fortifications, and usually occupy defensible and/or visually prominent positions in the landscape. They are typically visible from all or most of the surrounding lower and higher ground, with the corollary that they enjoyed extensive views of the surrounding countryside. As such, they are as much a visible statement of power as they are designed to dissuade or repel assault. The location of these sites in the landscape must reflect earlier patterns of social organisation, but these are essentially visual monuments. They are designed to see and be seen, and thus the impact of wind turbines is often disproportionately high compared to their height or proximity.

Tor enclosures are less common, and usually only enclose the summit of a single hill; the enclosure walls is usually comprised of stone in those instances. Cross dykes and promontory forts are rather similar in nature, being hill spurs or coastal promontories defended by short lengths of earthwork thrown across the narrowest point. Both classes of monument represent similar expressions of power in the landscape, but the coastal location of promontory forts makes them more sensitive to visual intrusion along the coastal littoral, due to the contrast with the monotony of the sea. Linear earthworks are the cross dyke writ large, enclosing whole areas rather than individual promontories. The investment in time and resources these monuments represent is usually far greater than those of individual settlements and hillforts, requiring a strong centralised authority or excellent communal organisation.

Asset Name: Multi-period archaeological landscape on Tregonning Hill	
Parish: Breage	Value: High
Designation: SAM	Distance to Development: c.1.40km
<p><i>Description:</i> Listing: (List Entry no. 1007293) The monument includes a multi-period landscape, situated on the prominent Tregonning Hill, one of two hills with outcropping granite in this area. The landscape includes a small multivallate hillfort called 'Castle Pencair'; barrows; two rounds; a field system; an 18th century watch house; extensive mineral working and prospecting pits; and part of a china clay works notable for being the place where William Cookworthy discovered china clay. The small multivallate hillfort survives as an oval enclosure defined by concentric double ramparts standing up to 6m high with ditches up to 0.6m deep, partly cut by later mining activity. There is an Ordnance Survey triangulation pillar and a war memorial within the enclosed area. Aerial photographs indicate potential internal structures and hut circles and a possible in-turned entrance. It was first described by Thomas in 1851 and mentioned by many other antiquarians who also noted it was traditionally 'the home of giants'. The north eastern round survives as an oval enclosed area measuring approximately 86m long by 76m wide defined by a single rampart of up to 2.6m high and outer ditch of 2.4m deep. The south eastern round is also oval in shape and measures approximately 90m long by 80m wide. It is defined by a single rampart of up to 2.6m high and a ditch of 1.5m deep. The interior contains the remains of at least two stone hut circles attached to the outer bank on the north west, and surface undulations suggest further features ranged around the walls and entrances. The area between the hillfort and rounds contains an extensive field system defined by low stony banks and field clearance cairns thought to be of prehistoric date and thus contemporary with the hillfort and rounds. Individual fields contain ridge and furrow from cultivation which suggests re-use as medieval strip fields.</p>	
<p><i>Conservation Value:</i> Listed for its value as multi-period site, incorporating Bronze Age barrows, an Iron Age hillfort, settlement and field-system, an 18th century watch house, extensive mineral working and prospecting pits, and china clay works; and its position within a wider changing historical context for each of these features. There will be aesthetic value in its rugged landscape setting.</p>	
<p><i>Authenticity and Integrity:</i> The surviving earthwork features are completely overgrown and not clearly identifiable on a landscape scale, only from close up. Earlier remains have been impacted by later industrial activity. However, the landscape setting of the hillfort is still clear, the hilltop dominating the surrounding landscape.</p>	
<p><i>Setting:</i> The site covers a large portion of the summit of a substantial hill which dominates the wider landscape and is visible from other surrounding hilltops. The site has been completely covered with scrubland regeneration.</p>	
<p><i>Contribution of Setting to the Significance of the Asset:</i> Intentional. The hilltop setting of the hillfort, a former defensive enclosure, is paramount to its form and function. The contribution for the associated 'round' settlements would be more incidental, their proximity to the fort of more importance; whilst the focus for the extractive features would solely be on the immediate geology. The setting of the watch house on the summit of the hill would also be intentional, outward views being of primary importance.</p>	
<p><i>Magnitude of Impact and Effect:</i> The proposed development would be located to the east, the extent of the monument and the wide ranging views meaning that even with existing screening, the site will be visible from some parts; though equally is screened from some locations on the monument. Whilst there would be a change in function of the land, the proposal site is surrounded on three sides by existing residential settlement and development would therefore appear as a growth of this rather than a new intrusion, reducing the level of impact. The existing woodland screening reduces the impact of any development further. Indirect effects may be an increase in traffic with resultant audio-visual pollution, particularly larger vehicles during the construction phases, though the distance to the site means that this will be minimal.</p>	
<p><i>Magnitude of Impact:</i> High value asset + Negligible effect = Slight impact</p>	
<p><i>Overall Impact Assessment:</i> Negative/minor impact</p>	



FIGURE 21: VIEW OF ONE OF THE 'ROUND' SETTLEMENTS ON TREGONNING HILL; VIEWED FROM THE NORTH-EAST.

5.3.8 WORLD HERITAGE SITE

Mines, Engine Houses, Smallholdings, Ports, Harbours, Canals, Railways, Tram roads and waste heaps.

Much of the landscape of Cornwall and West Devon was transformed in the 18th and early 19th centuries as a result of the rapid growth of pioneering copper and tin mining. Its deep underground mines, engine houses, foundries, new towns, smallholdings, ports and harbours, and their ancillary industries together reflect prolific innovation which, in the early 19th century, enabled the region to produce two-thirds of the world's supply of copper. The substantial remains are a testimony to the contribution Cornwall and West Devon made to the Industrial Revolution in the rest of Britain and to the fundamental influence the area had on the mining world at large. Cornish technology embodied in engines, engine houses and mining equipment was exported around the world. Cornwall and West Devon were the heartland from which mining technology rapidly spread (unesco.org).

What is important and why

The mining landscape of Cornwall and west Devon, and particularly its characteristic engine houses and beam engines as a technological ensemble in a landscape, reflect the substantial contribution the area made to the Industrial Revolution and formative changes in mining practices around the world.

Asset Name: Tregonning and Gwinear Mining Districts with Trewavas - (Area A3 of the World Heritage Site – Cornwall and West Devon)	
<i>Parish:</i> Breage, Cornwall	<i>Value:</i> Very High
<i>Designation:</i> World Heritage Site	<i>Distance to Development:</i> within
<i>Description:</i> Statement of outstanding universal value: A3 – the granite cone of Godolphin Hill and the long ridge of Tregonning Hill with the engine house and chimney stack of Great Work mine prominently visible in the saddle between them, dominate the southern part of this ancient mining district. Some of the richest and, at times, the deepest tin and copper mines in the region occur within this Area. To the north, the landscape is a mixture of gently-rising downland on which a patchwork of smallholdings and new farms has been created, interspersed with long established farms and parkland associated with the great mining estates of Godolphin and Clowance. Most mineworkers' cottages are dispersed in a landscape of small fields or set in small groups, though larger settlements of highway villages with fine industrial terraced cottages exist, notably at Praise-an-Beeble and Leedstown. Small groups of mineworkers' cottages set within substantial blocks of early-nineteenth century mineworkers' smallholdings flank the A394 road through the southern part of the mining district. A number of engine houses form landmarks in the Area and the sheer density of mine shafts in the landscape is particularly impressive. Some mark the site of some of the earliest steam engines on metal mines in the world.	
<i>Supplementary Comments:</i> There is an inherent conflict between the protection and preservation of this landscape, the duty to 'protect, conserve and enhance historical authenticity, integrity and historic character' and the need to appreciate that this is a living landscape that continues to evolve and where sustainable	

development must be encouraged (WHS Management Plan). The upland parts of this landscape form a highly distinctive landform (Godolphin and Tregonning Hills), in which the relicts of its mining heritage form prominent components.

The Tregonning and Gwinear mining district is focussed on its upland setting, with the many of the mines intervisible across the landscape of high granite ridges.

Evidential Value: The evidential value of the standing structures which define the WHS is limited to some extent, as they conform to a standardised type that operated in a known way and utilised traditional materials, however, there is further capacity for investigation and assessment/recording as specific locations within the Site are maintained and preserved. There is currently little understanding of the below-ground resource, mining activity was not restricted to the mine sites and lode-back pits etc. can be found at some distance from the established mines. Understanding of other key attributes of the WHS (infrastructure, settlements, great houses, mineralogy etc.) is similarly important, and has often been under-studied in comparison to the more impressive mining sites.

Historical Value: The landscapes of Cornwall and West Devon were radically re-shaped during the 18th and 19th centuries by deep mining for predominantly copper and tin; the refinement of mineral extraction in Cornwall and its related technological innovations influenced later commercial mining around the world. The products from Cornish mining helped fuel the industrial revolution. The historical value of the Tregonning and Gwinear mining district, as part of the World Heritage Site, is recognised as of international significance. The remains of mines, engine houses, smallholdings, ports, harbours, canals, railways, tramroads, and industries allied to mining, along with new towns and village reflect an extended period of industrial expansion and prolific innovation. Together these are testimony, in an inter-linked and highly legible way, to the sophistication and success of early, large-scale, industrialized nonferrous hard-rock mining.

Aesthetic Value: The aesthetic value of the WHS varies across the Site; with three key elements: built heritage, the upland landscape and the urban historic centre. The 18th and 19th century built heritage which forms the most visually distinctive element were solidly constructed in traditional materials and the massive scale of the engine house walls and chimneys are obvious and impressive. The engine houses, roofless and maintained under a scheme of managed dereliction, retain a certain desolate grandeur, 'romantic ruins'.

The landscape has largely been re-wilded, allowing natural undergrowth to populate the area in and around the mining assets.

Breage, Carleen, Godolphin Cross and Trew as settlements have retained some elements of their historic character, groupings of roadside terraced cottages evidence of the working-class population who lived near the mines they worked. The settlements, and particularly those of Carleen and Trew have only grown slightly through the 20th century.

Authenticity: Inscription as a WHS implies authenticity, but as an extensive site within a living landscapes authenticity will vary. Whilst many of the mine buildings (engine houses, chimneys) survive to a greater or lesser extent, and are visible across the landscapes much as they would have been, re-wilding means that the landscape is no longer scarred by raw open workings, everything is softened and overgrown. The landscape is no longer characterized by steaming chimneys, coal piles or tips of poisonous waste associated with mineral extraction. The reality of the lifestyle in the region during the mining heyday, the pollution, low life expectancy, poverty and hard work is not often explored in the information provided to visitors across the WHS locations. Further settlement since mining ceased, particularly concentrated around the existing historic urban centres means that these areas are also no longer truly authentic, although where traditional miners cottages such as within Carleen and Breage survive, it has not been lost entirely.

Integrity: The historical integrity of the landscape when assessed by its individual heritage assets is very high, as the engine houses, buildings and workings of the mines generally survive well. The mining settlements of Breage, Carleen, Godolphin Cross and Trew also survive well, the traditional terraced cottages retaining much of what would have been the original character of the towns despite modern growth.

Topographical Location and Landscape Context: The high granite ridges of Godolphin and Tregonning Hills form the focus of the mining district, with surrounding hills and valleys creating a landscape in which the mines are intervisible with each other. The landscape slopes to the south down to the coast, where there is the additional dramatic mining cliffscapes of Tewavas and Wheal Prosper mines. Many of the engine houses, and particularly their chimneys are visible from one hilltop to the next. The whole mining area is framed by undulating farmland. Settlement at Carleen is located towards the base of the eastern slopes of Tregonning Hill towards the south-eastern end of the WHS area; the proposed development site framed to three sides by parts of the mining settlement, the buildings to the north-east being constructed following the closure of Wheal Vor. To the north is open agricultural land associated with Polladras Farm.

Principle Views: The key views are inwardly across the district, typically from each of the hill summits, and extend across the whole WHS area, and particularly across the central Godolphin Hill. Multiple engine houses and chimneys are visible across the landscape in all directions. Outward views incorporate other mining areas within the WHS.

The principal views within Carleen itself tend to focus along the roads within the settlement.

Views to and from the proposal site are restricted by roadside and field boundary hedgebanks, as well as woodland regeneration across several of the former mine sites, the site only being visible from within the Tregonning/Gwinear mining area from the houses/streets immediately adjacent. Wider views to/from the site are restricted.

Landscape Presence: Elements of the WHS in this area are visible on a landscape scale, particularly the engine houses and chimneys of the Polrose, Wheal Metal and Wheal Vor Mines. Individual settlements are less dominant, often situated down slope from the mines themselves and often only visible within the immediate area.

Enhancing Elements: The density of surviving mining heritage across this Site allows the visitor to really gain an understanding of the importance of mining to this region, with footpaths allowing access to many of the assets.

Detracting Elements: The re-wilding of the mining sites, whilst attractive and successful as far as tourism goes, has led to a misrepresentation of the realities of the assets and their functions.

Direct Effects: The proposed development would have a direct effect on the archaeology beneath the site. It is part of a wider expansion of Carleen, which has already seen limited building around the former Methodist chapel impacting on its character. Mining relating industrial activity is recorded as having occurred on the site, the cartographic record, geotechnical investigations and the geophysical survey all confirm the presence of shafts and prospection pits/mine workings and likely mining waste within the site.

Indirect Effects: There will be a very slight cumulative effect impact through the infilling of an area of pastoral land immediately surrounded by existing settlement. Whilst developing the former mine site, the infilling nature of the proposed development would continue the roadside 'ribbon' character of the village; and whilst there is a cumulative impact through the continued growth of the settlement the proposed development does not expand the settlement outwards, and the small scale of the proposals suggests this development would not reach a critical point.

Contribution of Setting to the Significance of the Asset: The original setting of the WHS was purely functional, each mine positioned to make best use of the identified lodes, the nature of the geology beneath being of primary concern. It is only now that mining has ceased that wider landscape considerations are important. The visibility of mining assets across the wider landscape allows visitors to the area to appreciate the importance of mining to the whole of the Cornish economy in a way that a visit to an isolated and tightly surrounded site cannot.

Magnitude of Effect: The proposed development would be located within the WHS. It is within the village of Carleen, with several traditional miners cottages, but also including more recent development. The development would cover a field which is already surrounded by housing and as such would not extend the settlement any further, merely infill an area between existing housing/developments.

The development will not much encroach, if at all on the wider views associated with the WHS, being screened by the local topography and immediately surrounding housing. Use of traditional and sympathetic materials in the construction of the houses will reduce the impact of the development.

Magnitude of Impact: Very High value asset + Minor effect = **Moderate/Large** impact

Overall Impact: **Negative/Moderate Impact.**



FIGURE 22: THE TRADITIONAL MINERS COTTAGES OF GILBERTS ROW, CARLEEN; VIEWED FROM THE EAST.

5.3.9 HISTORIC LANDSCAPE

General Landscape Character

The landscape of the British Isles is highly variable, both in terms of topography and historical biology. Natural England has divided the British Isles into numerous 'character areas' based on topography, biodiversity, geodiversity and cultural and economic activity. The County Councils and AONBs have undertaken similar exercises, as well as Historic Landscape Characterisation.

Some character areas are better able to withstand the visual impact of development than others. Rolling countryside with wooded valleys and restricted views can withstand a larger number of sites than an open and largely flat landscape overlooked by higher ground. The English landscape is already populated by a large and diverse number of intrusive modern elements, e.g. electricity pylons, factories, modern housing estates, quarries, and turbines, but the question of cumulative impact must be considered. The aesthetics of individual developments is open to question, and site specific, but as intrusive new visual elements within the landscape, it can only be **negative**.

The proposed site would be constructed within the *Mount's Bay East* Landscape Character Area (LCA):

This Landscape Character Area comprises a gently undulating low plateau inland, dissected by shallow valleys and rising in the centre to the twin peaks of Godolphin Hill and the elongated Tregonning Hill. The plateau reaches the coast along its southern edge where there are dramatic steep cliffs, rocky headland and coastal beaches, notably the sand bar and extensive beach at Loe Bar. The area is mainly drained by the headwaters of the River Hayle as well as the Roseworthy Stream that enters the Hayle Estuary at Phillack. Along the south coast short streams flow in narrow valleys down to the sea and further eastwards closer to Helston there is a complicated network of small streams that flow out to the sea at Porthleven. There are few trees and dwellings along the coast and the area is mainly used for amenity/recreation. Inland there are river valleys with scattered farms with small stream-intersected fields enclosed by woodland, and open, slightly undulating farmland on the valley sides. There are few buildings except farms and barns. Much of this landscape is of medieval origin but there are also substantial areas of former rough ground enclosed in the post-medieval period into straight sided fields. Hayle and Helston are spreading out from their traditional cores over the surrounding valley sides. Mullion village has thatched cob and stone houses, hidden green spaces and many trees and hedges, awash with wildflowers, and lies within a more open area where views are framed by field boundaries rather than landform. Besides the two towns of Hayle and Helston there are a number of large villages: Goldsithney, Praa Sands, Porthleven and Mullion in the south, and Connor Downs, Baripper and Leedstown in the north. The evidence of former mining activity is evident throughout much of the northern and western portion of the Landscape Character Area, with mine remains, mining settlements and miners smallholdings, but absent from the Lizard area to the south. Small areas of Lowland Heathland survive in and around the former mine sites. Most of the nucleated settlement in the LCA is of 19th century origin and associated with mining. The settlements are often focused on crossroads, though others are set along axial roads and comprise small clusters of scattered miners' cottages, particularly along the southern part of the mining district.

Regenerating heath vegetation also exists on former mine sites, fringing areas of bare ground that reflect the latent toxicity of the ground, stained a rust colour with metallic ores. The surrounding area is scattered with former miners' cottages within the quiet pastoral landscape which contrasts greatly with the area's heavy industrial past. Although the proposed development would infill more of the pastoral landscape, it is in keeping with the 20th and 21st century extensions within Carleen and relatively limited in extent. On that basis the impact is assessed as **negligible**.

5.3.10 AGGREGATE IMPACT

The aggregate impact of a proposed development is an assessment of the overall effect of a single development on multiple heritage assets. This differs from cumulative impact (below), which is an assessment of multiple developments on a single heritage asset. Aggregate impact is particularly difficult to quantify, as the threshold of acceptability will vary according to the type, quality, number and location of heritage assets, and the individual impact assessments themselves.

Based on the restricted number of assets where any appreciable effect is likely, the aggregate impact of this development is **negligible**.

5.3.11 CUMULATIVE IMPACT

Cumulative impacts affecting the setting of a heritage asset can derive from the combination of different environmental impacts (such as visual intrusion, noise, dust and vibration) arising from a single development or from the overall effect of a series of discrete developments. In the latter case, the cumulative visual impact may be the result of different developments within a single view, the effect of developments seen when looking in different directions from a single viewpoint, of the sequential viewing of several developments when moving through the setting of one or more heritage assets.

The Setting of Heritage Assets 2011a, 25

*The key for all cumulative impact assessments is to focus on the **likely significant** effects and in particular those likely to influence decision-making.*

GLVIA 2013, 123

An assessment of cumulative impact is, however, very difficult to gauge, as it must take into account existing, consented and proposed developments. The threshold of acceptability has not, however, been established, and landscape capacity would inevitably vary according to landscape character. The principal issue for this development is the effect on the Listed Engine Houses and the wider Tregonning and Gwinear World Heritage Site. The proposed development would have a negative impact on its setting. Additional development proposals in close proximity to the current proposal site include single dwellings (PA21/01053/PREAPP; PA21/02920) and loft conversions (PA21/05066) each of which would have a neutral to negligible impact. A wider application to carry out exploratory drilling within the historic Wheal Vor mine complex area (PA21/06669) would essentially have a positive impact, returning industrial extractive processes to the area, though risks causing damage to the surviving monuments of the area. Visibility of the existing proposal would be limited and part of an existing intrusion. With this in mind, an assessment of **negligible to negative/minor** is appropriate.

TABLE 6: SUMMARY OF IMPACTS.

Asset	Type	Distance	Value	Magnitude of Impact	Assessment	Overall Assessment
Indirect Impacts						
Church of St Breaca	GI	1.70km	High	Negligible	Slight	Negligible
Engine House at Ivey's Shaft	GII (WHS)	0.95km	Medium (High)	Negligible	Slight	Negligible
Engine House at Polrose Mine	GII (WHS)	0.95km	Medium (High)	Negligible	Slight	Negligible
Engine House at West Wheal Metal	GII (WHS)	0.75km	Medium (High)	Negligible	Slight	Negligible
Detached Chimney at West Wheal Metal	GII (WHS)	0.75km	Medium (High)	Negligible	Slight	Negligible
Merrifields Cottage	GII	0.35km	Medium	Negligible	Neutral/slight	Negligible
Multi-period Landscape on Tregonning Hill	SAM	1.40km	High	Negligible	Slight	Negative/Minor
Round Cairn NNW of Tregonning Hill House	SAM	1.60km	High	Negligible	Slight	Negative/Minor
Treworlis Barton Farmhouse	GII	0.65km	Medium	Negligible	Neutral/slight	Negligible
War Memorial at Castle	GII	1.95km	Medium	Negligible	Neutral/slight	Negligible

LAND AT WHEAL VOR ROAD, CARLEEN, BREAGE, CORNWALL

Pencair Fort						
Tregonning and Gwinear Mining District	WHS	Within	Very High	Minor	Moderate/Large	Negative/moderate
Landscape Character						
Historic Landscape	n/a	n/a			Neutral/Slight	Negligible
Aggregate Impact	n/a	n/a				Negligible
Cumulative Impact	n/a	n/a				Negligible to Negative/Minor

6.0 CONCLUSION

The site comprises a single field surrounded by the post-medieval and modern development of the medieval settlement of Carleen. The site falls within land designated on the Historic Landscape Characterization as 'Modern Enclosed Land', incorporating Anciently Enclosed Land and Post Medieval Enclosed Land, whose field systems have been substantially altered by large scale hedge removal in the 20th century. There is clear evidence of prehistoric funerary and ritual activity within the surrounding landscape; though much of the evidence reflects historic medieval and post-medieval field-systems, and more immediately post-medieval mining.

The Tregonning and Gwinear mining area has a rich mining history and forms part of the Cornwall and West Devon World Heritage Site, assessment of the historic and cartographic sources indicating that the site forms part of the former Wheal Vor mine and is likely to have previously been common land open as grazing. Whilst Carleen has medieval origins, much of the village grew during the post-medieval period as a result of the significant mining in the area.

The geophysical survey identified four groups of anomalies. The anomalies identified include: known (Group 1) and possible (Group 2) shafts or mine workings; disturbed ground as a result of mine workings (Group 3); and a modern drain (Group 4).

Whilst all of the features at this stage are inherently undated, the site is situated within the area of an 18th-19th century mine and whilst there may be earlier origins to some of the mining activity, the identified features are likely to be associated with the post-medieval Wheal Vor mine. The presence of prehistoric or Romano-British settlement features within the surrounding wider landscape, however, means that origins dating to this period cannot be ruled-out for some of the features.

The degree of preservation of the identified features is likely to be good. Many of the anomaly responses are strong and may indicate the substantial size to the features (as demonstrated by previous mine investigation works) and/or the presence of metallic debris within the backfill. It is also possible that additional, more ephemeral features, are masked by the strength of the responses.

Any development of the site is likely to encounter and destroy the buried archaeological resource, and whilst there is a *high* potential suggested by the surrounding prehistoric and post-medieval mining landscape, the results of the geophysical survey would suggest that the archaeological potential for the site is *moderate*, many of the identified anomalies likely reflecting post-medieval mining, though earlier prehistoric or Romano-British features cannot be ruled out. Whilst further archaeological mitigation in the form of a conditioned watching brief or targeted evaluation trenching may be required to validate and clarify the results of the geophysical survey, previous mining survey trenching has already identified the scale of the features present on the site.

In terms of indirect impacts, most of the designated heritage assets in the wider area are located at such a distance as to minimize the impact of the proposed development, or else the contribution of setting to overall significance is less important than other factors. The landscape context of many of these buildings and monuments is such that they would be partly or wholly insulated from the effects of the proposed development by a combination of local blocking from trees, topography, buildings or embankments, or that other modern intrusions have already impinged upon their setting. The only sites where there might be the potential for an appreciable impact are the Tregonning and Gwinear Mining Area World Heritage Site; and the Multi-period Landscape and Round Cairn on Tregonning Hill (all **negative/minor**). In the instance of the WHS (**negative/moderate**), it is the location of the proposed development within the WHS which

means that an impact is unavoidable, though any visual/setting harm is restricted to the immediately surrounding roads. The proposal site is not clearly visible from Tregonning Hill, largely being screened by woodland blocking, and whilst its location would make it visible within wider landscape views which were important to the setting of the monument, it would not be discernible from the existing settlement with which it would form a part.

With this in mind, the overall impact of the proposed development can be assessed as **negligible** to **negative/minor**. The impact of the development on any buried archaeological resource may be **permanent** and **irreversible** but can be mitigated through an appropriate programme of archaeological investigation and recording.

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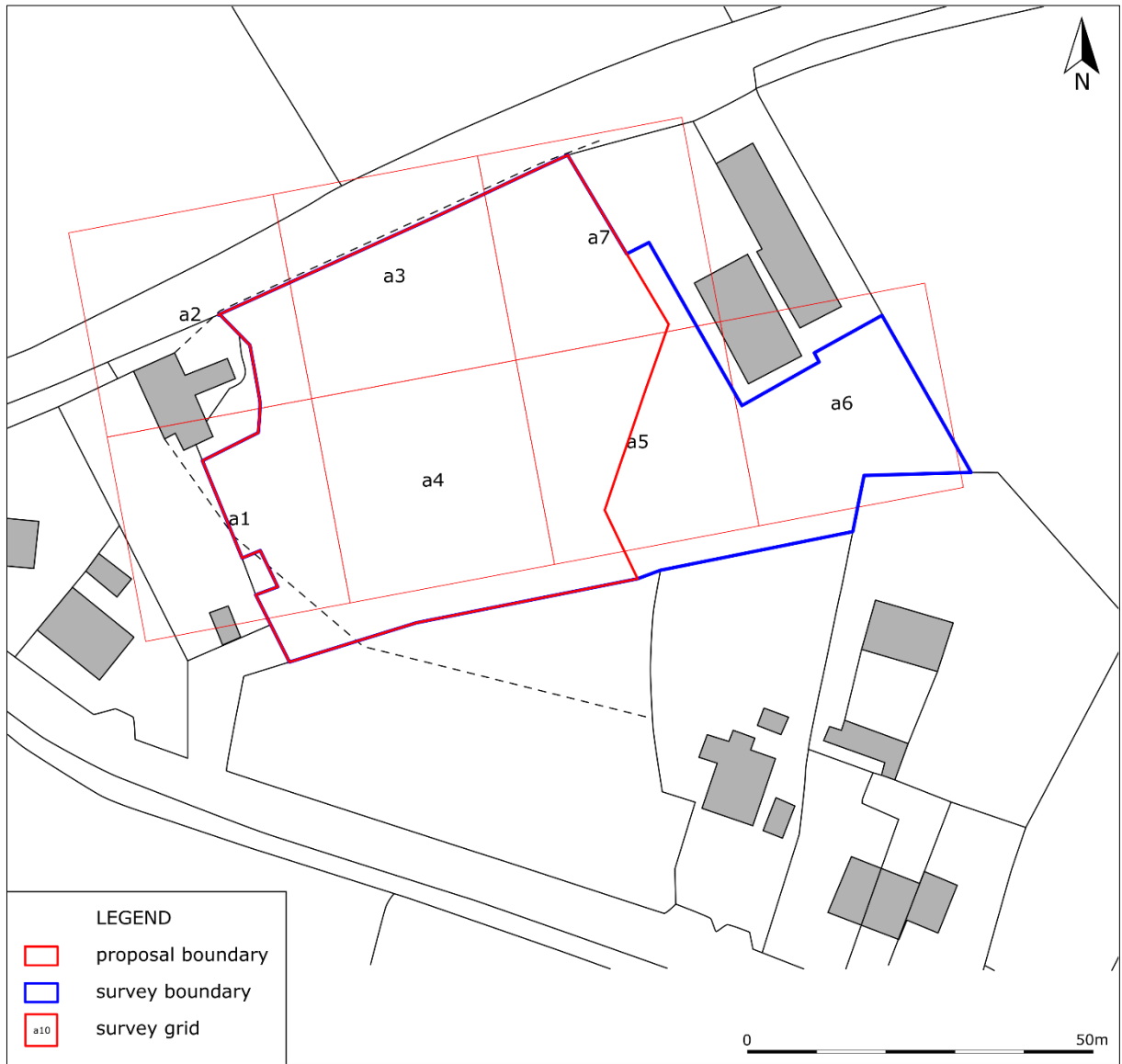
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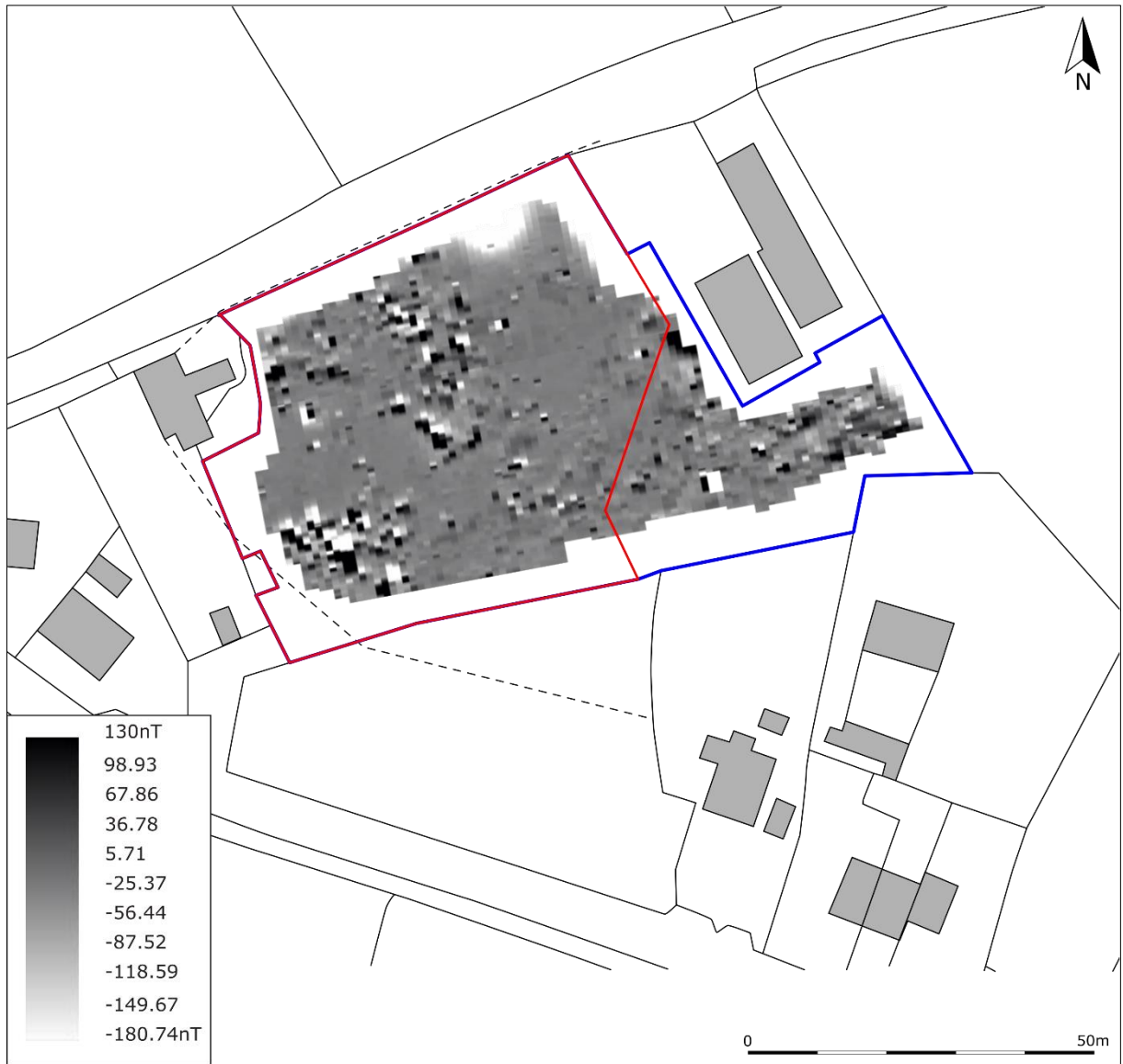
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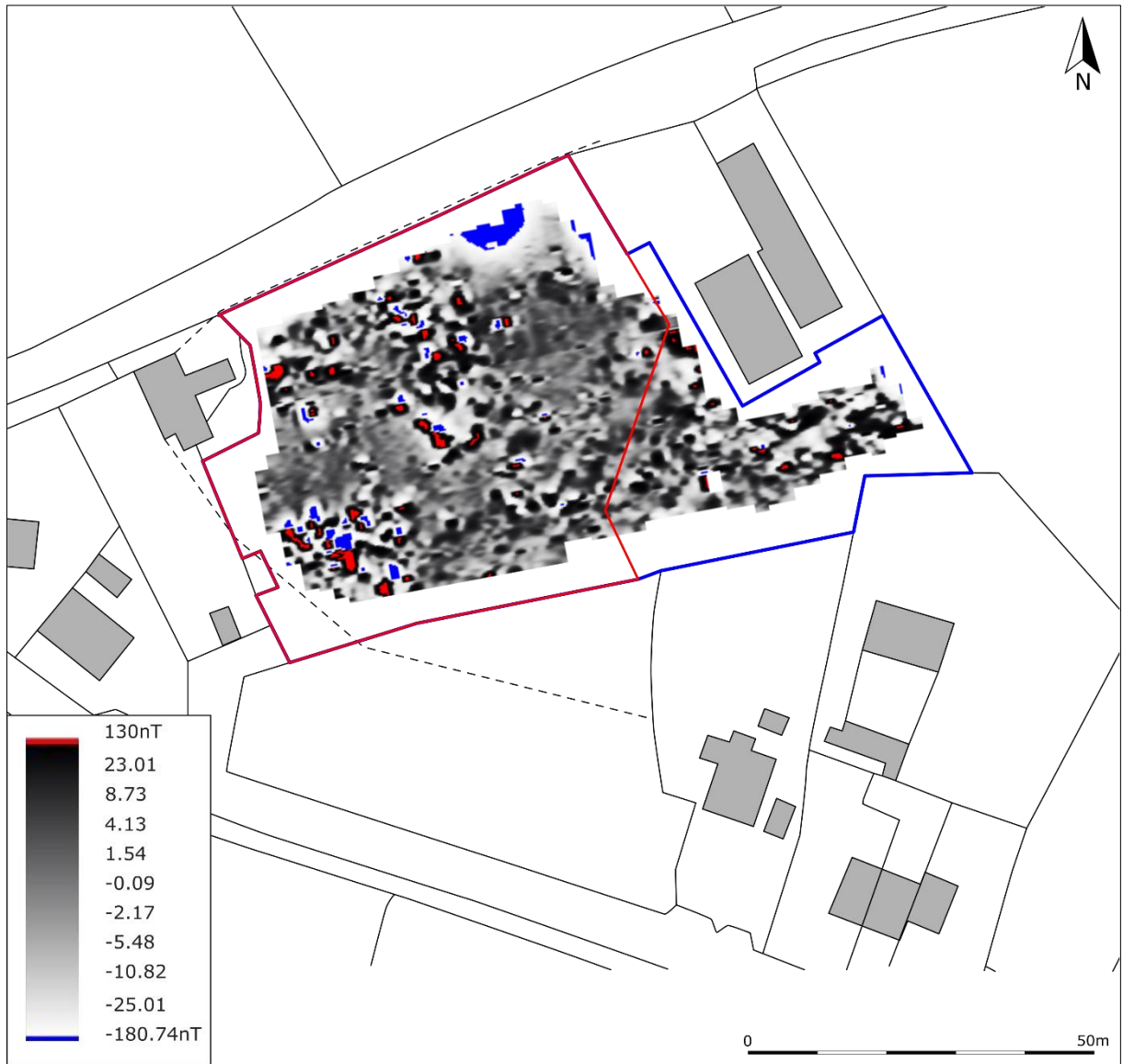
APPENDIX 1: ADDITIONAL GRAPHICAL IMAGES OF THE GRADIOMETER SURVEY



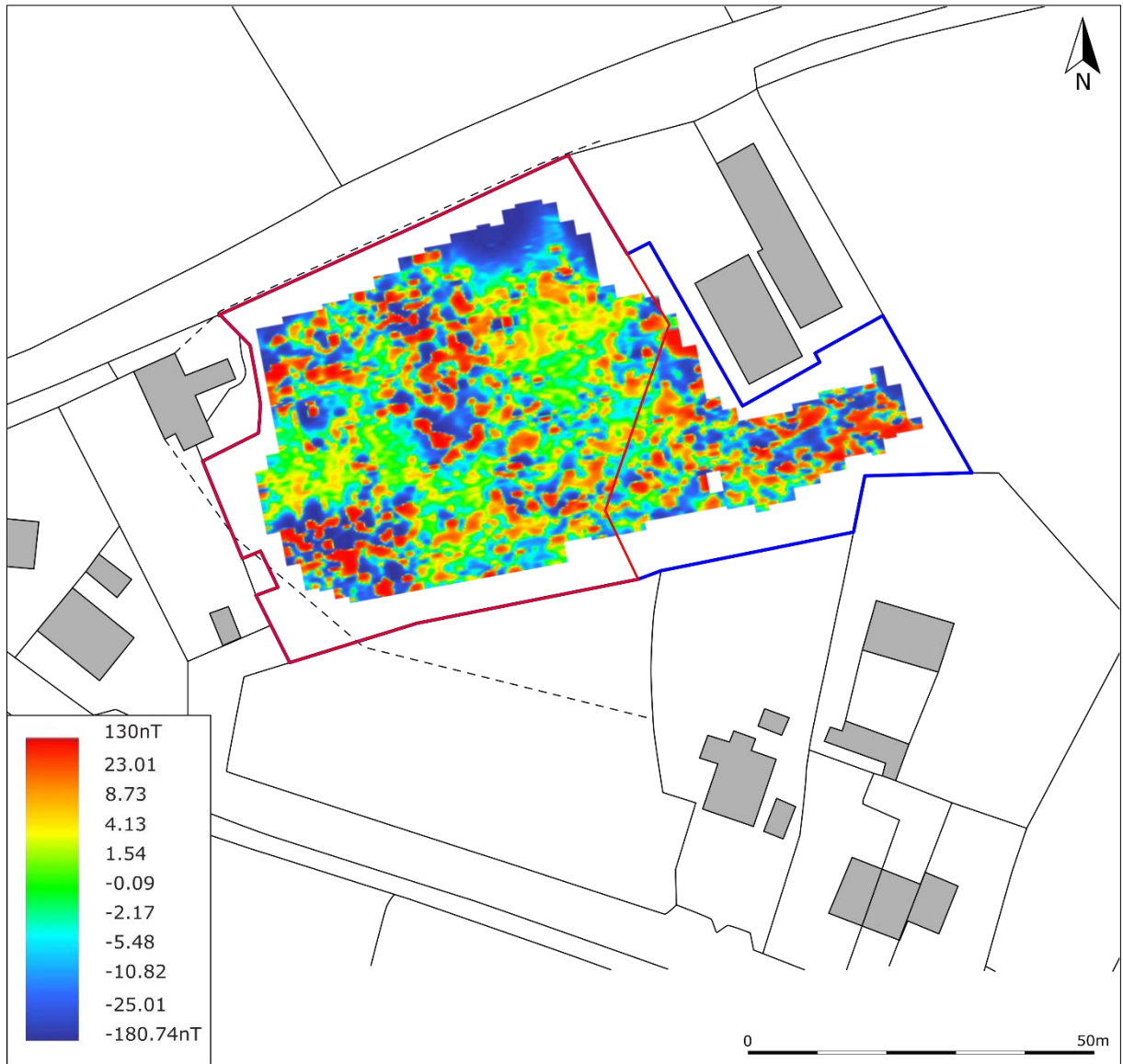
1. GEOPHYSICAL SURVEY GRID LOCATION AND NUMBERING.



2. SHADE PLOT OF THE GRADIOMETER SURVEY DATA; MINIMAL PROCESSING.



3. RED-GREY-BLUE SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALIZED; GRADIATED SHADING.



4. RED-GREEN-BLUE 2 SHADE PLOT OF THE GRADIOMETER SURVEY DATA; BAND WEIGHT EQUALIZED, GRADIATED SHADING.

APPENDIX 2: SUPPORTING PHOTOGRAPHS - GEOPHYSICAL SURVEY



1. DETAIL OF THE NORTHERN SITE BOUNDARY; VIEWED FROM THE EAST (1M SCALE).



2. DETAIL OF SHALLOW HOLLOW DEPRESSION TOWARDS MID NORTH SITE BOUNDARY; VIEWED FROM THE NORTH-EAST (1M SCALE).



3. DETAIL OF SHALLOW HOLLOW DEPRESSION TOWARDS NORTH-WESTERN CORNER OF THE SITE; VIEWED FROM THE SOUTH (1M SCALE).



4. DETAIL OF WESTERN SITE BOUNDARY; VIEWED FROM THE NORTH-NORTH-EAST (1M SCALE).



5. DETAIL OF LARGE RECENTLY INFILLED HOLLOW TOWARDS MID WESTERN SITE BOUNDARY; VIEWED FROM THE SOUTH (1M SCALE).



6. DETAIL OF POSSIBLE HOLLOW/DISTURBANCE ALONG WESTERN SITE BOUNDARY; VIEWED FROM THE NORTH-NORTH-EAST (1M SCALE).



7. DETAIL OF LARGE OVERGROWN PIT IN SOUTH-WESTERN CORNER OF THE SITE; VIEWED FROM THE NORTH-EAST (1M SCALE).



8. VIEW ACROSS THE SITE; VIEWED FROM THE SOUTH-SOUTH-WEST (1M SCALE).



9. DETAIL OF THE SOUTHERN SITE BOUNDARY; VIEWED FROM THE WEST (NO SCALE).



10. DETAIL OF 'L'-SHAPED SHALLOW HOLLOW DEPRESSION TOWARDS MID SOUTH SITE BOUNDARY; VIEWED FROM THE NORTH-WEST (1M SCALE).



11. DETAIL OF SHALLOW HOLLOW DEPRESSION TOWARDS MID SOUTH SITE BOUNDARY; VIEWED FROM THE NORTH-WEST (1M SCALE).



12. DETAIL OF SHALLOW HOLLOW DEPRESSION TOWARDS CENTRE OF SITE; VIEWED FROM THE EAST (1M SCALE).



13. DETAIL OF SHALLOW HOLLOW DEPRESSION TOWARDS SOUTH-EASTERN CORNER OF THE SITE; VIEWED FROM THE NORTH-WEST (1M SCALE).



14. DETAIL OF OVERGROWN HOLLOW SURROUNDING MODERN MANHOLE; VIEWED FROM THE NORTH-NORTH-WEST (1M SCALE).



15. DETAIL OF THE MODERN MANHOLE TOWARDS THE SOUTH-EASTERN CORNER OF THE SITE; VIEWED FROM THE SOUTH (1M SCALE).



16. VIEW ACROSS THE SITE; VIEWED FROM THE SOUTH-EAST (1M SCALE).



17. DETAIL OF THE RECENTLY INFILLED HOLLOW TOWARDS THE NORTH-EASTERN CORNER OF THE SITE; VIEWED FROM THE NORTH-NORTH-EAST (1M SCALE).



18. DETAIL OF EASTERN SITE BOUNDARY; VIEWED FROM THE NORTH-WEST (1M SCALE).



19. DETAIL OF THE EASTERN SITE BOUNDARY (NORTH END); VIEWED FROM THE SOUTH (1M SCALE).

APPENDIX 3: IMPACT ASSESSMENT METHODOLOGY

Heritage Impact Assessment - Overview

The purpose of heritage impact assessment is twofold: Firstly, to understand – insofar as is reasonably practicable and in proportion to the importance of the asset – the significance of a historic building, complex, area or archaeological monument (the ‘heritage asset’). Secondly, to assess the likely effect of a proposed development on the heritage asset (direct impact) and its setting (indirect impact). This methodology employed in this assessment is based on the staged approach advocated in *The Setting of Heritage Assets* (GPA3 Historic England 2015), used in conjunction with the ICOMOS (2011) and DoT (DMRB vol.11; WEBTAG) guidance. This Appendix contains details of the methodology used in this report.

National Policy

General policy and guidance for the conservation of the historic environment are now contained within the *National Planning Policy Framework* (Department for Communities and Local Government 2012). The relevant guidance is reproduced below:

Paragraph 189

In determining applications, local planning authorities should require the applicant to describe the significance of any heritage assets affected, including the contribution made by their setting. The level of detail should be proportionate to the assets’ importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should be consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which a development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

Paragraph 190

Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset’s conservation and any aspect of the proposal.

A further key document is the Planning (Listed Buildings and Conservation Areas) Act 1990, in particular section 66(1), which provides *statutory protection* to the setting of Listed buildings:

In considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority or, as the case may be, the Secretary of State shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses.

Cultural Value – Designated Heritage Assets

The majority of the most important (‘nationally important’) heritage assets are protected through *designation*, with varying levels of statutory protection. These assets fall into one of six categories, although designations often overlap, so a Listed early medieval cross may also be Scheduled, lie within the curtilage of Listed church, inside a Conservation Area, and on the edge of a Registered Park and Garden that falls within a world Heritage Site.

Listed Buildings

A Listed building is an occupied dwelling or standing structure which is of special architectural or historical interest. These structures are found on the *Statutory List of Buildings of Special Architectural or Historic Interest*. The status of Listed buildings is applied to 300,000-400,000 buildings across the United Kingdom. Recognition of the need to protect historic buildings began after the Second World War, where significant numbers of buildings had been damaged in the county towns and capitals of the United Kingdom. Buildings that were considered to be of ‘architectural merit’ were included. The Inspectorate of Ancient Monuments supervised the collation of the list, drawn up by members of two societies: The Royal Institute of British Architects and the Society for the Protection of Ancient Buildings. Initially the lists were only used to assess which buildings should receive government grants to be repaired and conserved if damaged by bombing. The *Town and Country Planning Act 1947* formalised the process within England and Wales, Scotland and Ireland following different procedures. Under the 1979 *Ancient Monuments and Archaeological Areas Act* a structure cannot be considered a Scheduled Monument if it is occupied as a dwelling, making a clear distinction in the treatment of the two forms of heritage asset. Any alterations or works intended to a

Listed Building must first acquire Listed Building Consent, as well as planning permission. Further phases of 'listing' were rolled out in the 1960s, 1980s and 2000s; English Heritage advise on the listing process and administer the procedure, in England, as with the Scheduled Monuments. Some exemption is given to buildings used for worship where institutions or religious organisations (such as the Church of England) have their own permissions and regulatory procedures. Some structures, such as bridges, monuments, military structures and some ancient structures may also be Scheduled as well as Listed. War memorials, milestones and other structures are included in the list, and more modern structures are increasingly being included for their architectural or social value.

Buildings are split into various levels of significance: Grade I (2.5% of the total) representing buildings of exceptional (international) interest; Grade II* (5.5% of the total) representing buildings of particular (national) importance; Grade II (92%) buildings are of merit and are by far the most widespread. Inevitably, accuracy of the Listing for individual structures varies, particularly for Grade II structures; for instance, it is not always clear why some 19th century farmhouses are Listed while others are not, and differences may only reflect local government boundaries, policies and individuals. Other buildings that fall within the curtilage of a Listed building are afforded some protection as they form part of the essential setting of the designated structure, e.g. a farmyard of barns, complexes of historic industrial buildings, service buildings to stately homes etc. These can be described as having *group value*.

Conservation Areas

Local authorities are obliged to identify and delineate areas of special architectural or historic interest as Conservation Areas, which introduces additional controls and protection over change within those places. Usually, but not exclusively, they relate to historic settlements, and there are c.7000 Conservation Areas in England.

Scheduled Monuments

In the United Kingdom, a Scheduled Monument is considered an historic building, structure (ruin) or archaeological site of '**national importance**'. Various pieces of legislation, under planning, conservation, etc., are used for legally protecting heritage assets given this title from damage and destruction; such legislation is grouped together under the term 'designation', that is, having statutory protection under the *Ancient Monuments and Archaeological Areas Act 1979*. A heritage asset is a part of the historic environment that is valued because of its historic, archaeological, architectural or artistic interest; those of national importance have extra legal protection through designation. Important sites have been recognised as requiring protection since the late 19th century, when the first 'schedule' or list of monuments was compiled in 1882. The conservation and preservation of these monuments was given statutory priority over other land uses under this first schedule. County Lists of the monuments are kept and updated by the Department for Culture, Media and Sport. In the later 20th century sites are identified by English Heritage (one of the Government's advisory bodies) of being of national importance and included in the schedule. Under the current statutory protection any works required on or to a designated monument can only be undertaken with a successful application for Scheduled Monument Consent. There are 19,000-20,000 Scheduled Monuments in England.

Registered Parks and Gardens

Culturally and historically important 'man-made' or 'designed' landscapes, such as parks and gardens are currently "listed" on a non-statutory basis, included on the 'Register of Historic Parks and Gardens of special historic interest in England' which was established in 1983 and is, like Listed Buildings and Scheduled Monuments, administered by Historic England. Sites included on this register are of **national importance** and there are currently 1,600 sites on the list, many associated with stately homes of Grade II* or Grade I status. Emphasis is laid on 'designed' landscapes, not the value of botanical planting. Sites can include town squares and private gardens, city parks, cemeteries and gardens around institutions such as hospitals and government buildings. Planned elements and changing fashions in landscaping and forms are a main focus of the assessment.

Registered Battlefields

Battles are dramatic and often pivotal events in the history of any people or nation. Since 1995 Historic England maintains a register of 46 battlefields in order to afford them a measure of protection through the planning system. The key requirements for registration are battles of national significance, a securely identified location, and its topographical integrity – the ability to 'read' the battle on the ground.

World Heritage Sites

Arising from the UNESCO World Heritage Convention in 1972, Article 1 of the Operational Guidelines (2015, no.49) states: 'Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity'.

These sites are recognised at an international level for their intrinsic importance to the story of humanity, and should be accorded the highest level of protection within the planning system.

Value and Importance

While every heritage asset, designated or otherwise, has some intrinsic merit, the act of designation creates a hierarchy of importance that is reflected by the weight afforded to their preservation and enhancement within the planning system. The system is far from perfect, impaired by an imperfect understanding of individual heritage assets, but the value system that has evolved does provide a useful guide to the *relative* importance of heritage assets. Provision is also made for heritage assets where value is not recognised through designation (e.g. undesignated ‘monuments of Schedulable quality and importance’ should be regarded as being of *high* value); equally, there are designated monuments and structures of *low* relative merit.

TABLE 7: THE HIERARCHY OF VALUE/IMPORTANCE (BASED ON THE DMRB VOL.11 TABLES 5.1, 6.1 & 7.1).

Hierarchy of Value/Importance	
Very High	Structures inscribed as of universal importance as World Heritage Sites; Other buildings of recognised international importance; World Heritage Sites (including nominated sites) with archaeological remains; Archaeological assets of acknowledged international importance; Archaeological assets that can contribute significantly to international research objectives; World Heritage Sites inscribed for their historic landscape qualities; Historic landscapes of international value, whether designated or not; Extremely well-preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).
High	Scheduled Monuments with standing remains; Grade I and Grade II* (Scotland: Category A) Listed Buildings; Other Listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the Listing grade; Conservation Areas containing very important buildings; Undesignated structures of clear national importance; Undesignated assets of Schedulable quality and importance; Assets that can contribute significantly to national research objectives. Designated historic landscapes of outstanding interest; Undesignated landscapes of outstanding interest; Undesignated landscapes of high quality and importance, demonstrable national value; Well-preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).
Medium	Grade II (Scotland: Category B) Listed Buildings; Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations; Conservation Areas containing buildings that contribute significantly to its historic character; Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures); Designated or undesignated archaeological assets that contribute to regional research objectives; Designated special historic landscapes; Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value; Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).
Low	Locally Listed buildings (Scotland Category C(S) Listed Buildings); Historic (unlisted) buildings of modest quality in their fabric or historical association; Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures); Designated and undesignated archaeological assets of local importance; Archaeological assets compromised by poor preservation and/or poor survival of contextual associations; Archaeological assets of limited value, but with potential to contribute to local research objectives; Robust undesignated historic landscapes; Historic landscapes with importance to local interest groups; Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	Buildings of no architectural or historical note; buildings of an intrusive character; Assets with very little or no surviving archaeological interest; Landscapes with little or no significant historical interest.
Unknown	Buildings with some hidden (i.e. inaccessible) potential for historic significance; The importance of the archaeological resource has not been ascertained.

Concepts – Conservation Principles

In making an assessment, this document adopts the conservation values (*evidential, historical, aesthetic and communal*) laid out in *Conservation Principles* (English Heritage 2008), and the concepts of *authenticity* and *integrity* as laid out in the guidance on assessing World Heritage Sites (ICOMOS 2011). This is in order to determine the relative importance of *setting* to the significance of a given heritage asset.

Evidential Value

Evidential value (or research potential) is derived from the potential of a structure or site to provide physical evidence about past human activity, and may not be readily recognised or even visible. This is the primary form of data for periods without adequate written documentation. This is the least equivocal value: evidential value is absolute; all other ascribed values (see below) are subjective. However,

Historical Value

Historical value (narrative) is derived from the ways in which past people, events and aspects of life can be connected via a place to the present; it can be *illustrative* or *associative*.

Illustrative value is the visible expression of evidential value; it has the power to aid interpretation of the past through making connections with, and providing insights into, past communities and their activities through a shared experience of place. Illustrative value tends to be greater if a place features the first or only surviving example of a particular innovation of design or technology.

Associative value arises from a connection to a notable person, family, event or historical movement. It can intensify understanding by linking the historical past to the physical present, always assuming the place bears any resemblance to its appearance at the time. Associational value can also be derived from known or suspected links with other monuments (e.g. barrow cemeteries, church towers) or cultural affiliations (e.g. Methodism).

Buildings and landscapes can also be associated with literature, art, music or film, and this association can inform and guide responses to those places.

Historical value depends on sound identification and the direct experience of physical remains or landscapes. Authenticity can be strengthened by change, being a living building or landscape, and historical values are harmed only where adaptation obliterates or conceals them. The appropriate use of a place – e.g. a working mill, or a church for worship – illustrates the relationship between design and function and may make a major contribution to historical value. Conversely, cessation of that activity – e.g. conversion of farm buildings to holiday homes – may essentially destroy it.

Aesthetic Value

Aesthetic value (emotion) is derived from the way in which people draw sensory and intellectual stimulation from a place or landscape. Value can be the result of *conscious design*, or the *fortuitous outcome* of landscape evolution; many places combine both aspects, often enhanced by the passage of time.

Design value relates primarily to the aesthetic qualities generated by the conscious design of a building, structure or landscape; it incorporates composition, materials, philosophy and the role of patronage. It may have associational value, if undertaken by a known architect or landscape gardener, and its importance is enhanced if it is seen as innovative, influential or a good surviving example. Landscape parks, country houses and model farms all have design value. The landscape is not static, and a designed feature can develop and mature, resulting in the 'patina of age'.

Some aesthetic value developed *fortuitously* over time as the result of a succession of responses within a particular cultural framework e.g. the seemingly organic form of an urban or rural landscape or the relationship of vernacular buildings and their materials to the landscape. Aesthetic values are where a proposed development usually have their most pronounced impact: the indirect effects of most developments are predominantly visual or aural and can extend many miles from the site itself. In many instances the impact of a development is incongruous but that is itself an aesthetic response, conditioned by prevailing cultural attitudes as to what the historic landscape should look like.

Communal Value

Communal value (togetherness) is derived from the meaning a place holds for people, and may be closely bound up with historical/associative and aesthetic values; it can be *commemorative*, *symbolic*, *social* or *spiritual*.

Commemorative and symbolic value reflects the meanings of a place to those who draw part of their identity from it, or who have emotional links to it e.g. war memorials. Some buildings or places (e.g. the Palace of Westminster) can symbolise wider values. Other places (e.g. Porton Down Chemical Testing Facility) have negative or uncomfortable associations that nonetheless have meaning and significance to some and should not be forgotten. *Social value* need not have any relationship to surviving fabric, as it is the continuity of function that is important. *Spiritual value* is attached to places and can arise from the beliefs of a particular religion or past or contemporary perceptions of the spirit of place. Spiritual value can be ascribed to places sanctified by hundreds of years of veneration or worship, or

wild places with few signs of modern life. Value is dependent on the perceived survival of historic fabric or character, and can be very sensitive to change. The key aspect of communal value is that it brings specific groups of people together in a meaningful way.

Authenticity

Authenticity, as defined by UNESCO (2015, no.80), is the ability of a property to convey the attributes of the outstanding universal value of the property. 'The ability to understand the value attributed to the heritage depends on the degree to which information sources about this value may be understood as credible or truthful'. Outside of a World Heritage Site, authenticity may usefully be employed to convey the sense a place or structure is a truthful representation of the thing it purports to portray. Converted farm buildings, for instance, survive in good condition, but are drained of the authenticity of a working farm environment.

Integrity

Integrity, as defined by UNESCO (2015, no.88), is the measure of wholeness or intactness of the cultural heritage and its attributes. Outside of a World Heritage Site, integrity can be taken to represent the survival and condition of a structure, monument or landscape. The intrinsic value of those examples that survive in good condition is undoubtedly greater than those where survival is partial, and condition poor.

Summary

As indicated, individual developments have a minimal or tangential effect on most of the heritage values outlined above, largely because almost all effects are indirect. The principle values in contention are aesthetic/designed and, to a lesser degree aesthetic/fortuitous. There are also clear implications for other value elements (particularly historical and associational, communal and spiritual), where views or sensory experience is important. As ever, however, the key element here is not the intrinsic value of the heritage asset, nor the impact on setting, but the relative contribution of setting to the value of the asset.

Setting – The Setting of Heritage Assets

The principle guidance on this topic is contained within two publications: *The Setting of Heritage Assets* (Historic England 2015) and *Seeing History in the View* (English Heritage 2011). While interlinked and complementary, it is useful to consider heritage assets in terms of their *setting* i.e. their immediate landscape context and the environment within which they are seen and experienced, and their *views* i.e. designed or fortuitous vistas experienced by the visitor when at the heritage asset itself, or those that include the heritage asset. This corresponds to the experience of its wider landscape setting.

Where the impact of a proposed development is largely indirect, *setting* is the primary consideration of any HIA. It is a somewhat nebulous and subjective assessment of what does, should, could or did constitute the lived experience of a monument or structure. The following extracts are from the Historic England publication *The Setting of Heritage Assets* (2015, 2 & 4):

The NPPF makes it clear that the setting of a heritage asset is the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve.

Setting is not a heritage asset, nor a heritage designation. Its importance lies in what it contributes to the significance of the heritage asset. This depends on a wide range of physical elements within, as well as perceptual and associational attributes, pertaining to the heritage asset's surroundings.

While setting can be mapped in the context of an individual application or proposal, it does not have a fixed boundary and cannot be definitively and permanently described for all time as a spatially bounded area or as lying within a set distance of a heritage asset because what comprises a heritage asset's setting may change as the asset and its surroundings evolve or as the asset becomes better understood or due to the varying impacts of different proposals.

The HIA below sets out to determine the magnitude of the effect and the sensitivity of the heritage asset to that effect. The fundamental issue is that proximity and visual and/or aural relationships may affect the experience of a heritage asset, but if setting is tangential to the significance of that monument or structure, then the impact assessment will reflect this. This is explored in more detail below.

Landscape Context

The determination of *landscape context* is an important part of the assessment process. This is the physical space within which any given heritage asset is perceived and experienced. The experience of this physical space is related to

the scale of the landform, and modified by cultural and biological factors like field boundaries, settlements, trees and woodland. Together, these determine the character and extent of the setting.

Landscape context is based on topography, and can vary in scale from the very small – e.g. a narrow valley where views and vistas are restricted – to the very large – e.g. wide valleys or extensive upland moors with 360° views. Where very large landforms are concerned, a distinction can be drawn between the immediate context of an asset (this can be limited to a few hundred metres or less, where cultural and biological factors impede visibility and/or experience), and the wider context (i.e. the wider landscape within which the asset sits).

When new developments are introduced into a landscape, proximity alone is not a guide to magnitude of effect. Dependant on the nature and sensitivity of the heritage asset, the magnitude of effect is potentially much greater where the proposed development is to be located within the landscape context of a given heritage asset. Likewise, where the proposed development would be located outside the landscape context of a given heritage asset, the magnitude of effect would usually be lower. Each case is judged on its individual merits, and in some instances the significance of an asset is actually greater outside of its immediate landscape context, for example, where church towers function as landmarks in the wider landscape.

Views

Historic and significant views are the associated and complementary element to setting, but can be considered separately as developments may appear in a designed view without necessarily falling within the setting of a heritage asset *per se*. As such, significant views fall within the aesthetic value of a heritage asset, and may be *designed* (i.e. deliberately conceived and arranged, such as within parkland or an urban environment) or *fortuitous* (i.e. the graduated development of a landscape ‘naturally’ brings forth something considered aesthetically pleasing, or at least impressive, as with particular rural landscapes or seascapes), or a combination of both (i.e. the *patina of age*, see below). The following extract is from the English Heritage publication *Seeing History in the View* (2011, 3):

Views play an important part in shaping our appreciation and understanding of England’s historic environment, whether in towns or cities or in the countryside. Some of those views were deliberately designed to be seen as a unity. Much more commonly, a significant view is a historical composite, the cumulative result of a long process of development.

The Setting of Heritage Assets (2015, 3) lists a number of instances where views contribute to the particular significance of a heritage asset:

- Views where relationships between the asset and other historic assets or places or natural features are particularly relevant;
- Views with historical associations, including viewing points and the topography of battlefields;
- Views where the composition within the view was a fundamental aspect of the design or function of the heritage asset;
- Views between heritage assets and natural or topographic features, or phenomena such as solar and lunar events;
- Views between heritage assets which were intended to be seen from one another for aesthetic, functional, ceremonial or religious reasons, such as military or defensive sites, telegraphs or beacons, Prehistoric funerary and ceremonial sites.

On a landscape scale, views, taken in the broadest sense, are possible from anywhere to anything, and each may be accorded an aesthetic value according to subjective taste. Given that terrain, the biological and built environment, and public access restrict our theoretical ability to see anything from anywhere, in this assessment the term *principal view* is employed to denote both the deliberate views created within designed landscapes, and those fortuitous views that may be considered of aesthetic value and worth preserving. It should be noted, however, that there are distance thresholds beyond which perception and recognition fail, and this is directly related to the scale, height, massing and nature of the heritage asset in question. For instance, beyond 2km the Grade II cottage comprises a single indistinct component within the wider historic landscape, whereas at 5km or even 10km a large stately home or castle may still be recognisable. By extension, where assets cannot be seen or recognised i.e. entirely concealed within woodland, or too distant to be distinguished, then visual harm to setting is moot. To reflect this emphasis on recognition, the term *landmark asset* is employed to denote those sites where the structure (e.g. church tower), remains (e.g. earthwork ramparts) or – in some instances – the physical character of the immediate landscape (e.g. a distinctive landform like a tall domed hill) make them visible on a landscape scale. In some cases, these landmark assets may exert landscape *primacy*, where they are the tallest or most obvious man-made structure within line-of-sight. However, this is not always the case, typically where there are numerous similar monuments (multiple engine houses in mining areas, for

instance) or where modern developments have overtaken the heritage asset in height and/or massing.

Yet visibility alone is not a clear guide to visual impact. People perceive size, shape and distance using many cues, so context is critically important. For instance, research on electricity pylons (Hull & Bishop 1988) has indicated scenic impact is influenced by landscape complexity: the visual impact of pylons is less pronounced within complex scenes, especially at longer distances, presumably because they are less of a focal point and the attention of the observer is diverted. There are many qualifiers that serve to increase or decrease the visual impact of a proposed development (see Table 6), some of which are seasonal or weather-related.

Thus, the principal consideration of assessment of indirect effects cannot be visual impact *per se*. It is an assessment of the likely magnitude of effect, the importance of setting to the significance of the heritage asset, and the sensitivity of that setting to the visual or aural intrusion of the proposed development. The schema used to guide assessments is shown in Table 6 (below).

Type and Scale of Impact

The effect of a proposed development on a heritage asset can be direct (i.e. the designated structure itself is being modified or demolished, the archaeological monument will be built over), or indirect (e.g. a housing estate built in the fields next to a Listed farmhouse, and wind turbine erected near a hillfort etc.); in the latter instance the principal effect is on the setting of the heritage asset. A distinction can be made between construction and operational phase effects. Individual developments can affect multiple heritage assets (aggregate impact), and contribute to overall change within the historic environment (cumulative impact).

Construction phase: construction works have direct, physical effects on the buried archaeology of a site, and a pronounced but indirect effect on neighbouring properties. Direct effects may extend beyond the nominal footprint of a site e.g. where related works or site compounds are located off-site. Indirect effects are both visual and aural, and may also affect air quality, water flow and traffic in the local area.

Operational phase: the operational phase of a development is either temporary (e.g. wind turbine or mobile phone mast) or effectively permanent (housing development or road scheme). The effects at this stage are largely indirect, and can be partly mitigated over time through provision of screening. Large development would have an effect on historic landscape character, as they transform areas from one character type (e.g. agricultural farmland) into another (e.g. suburban).

Cumulative Impact: a single development will have a physical and a visual impact, but a second and a third site in the same area will have a synergistic and cumulative impact above and beyond that of a single site. The cumulative impact of a proposed development is particularly difficult to estimate, given the assessment must take into consideration operational, consented and proposals in planning.

Aggregate Impact: a single development will usually affect multiple individual heritage assets. In this assessment, the term aggregate impact is used to distinguish this from cumulative impact. In essence, this is the impact on the designated parts of the historic environment as a whole.

Scale of Impact

The effect of development and associated infrastructure on the historic environment can include positive as well as negative outcomes. However, all development changes the character of a local environment, and alters the character of a building, or the setting within which it is experienced. Change is invariably viewed as negative, particularly within respect to larger developments; thus while there can be beneficial outcomes (e.g. positive/moderate), there is a presumption here that, as large and inescapably modern intrusive visual actors in the historic landscape, the impact of a development will almost always be **neutral** (i.e. no impact) or **negative** i.e. it will have a **detrimental impact** on the setting of ancient monuments and protected historic buildings.

This assessment incorporates the systematic approach outlined in the ICOMOS and DoT guidance (see Tables 6-8), used to complement and support the more narrative but subjective approach advocated by Historic England (see Table 6). This provides a useful balance between rigid logic and nebulous subjectivity (e.g. the significance of effect on a Grade II Listed building can never be greater than moderate/large; an impact of negative/substantial is almost never achieved). This is in adherence with GPA3 (2015, 7).

TABLE 8: MAGNITUDE OF IMPACT (BASED ON DMRB VOL.11 TABLES 5.3, 6.3 AND 7.3).

Factors in the Assessment of Magnitude of Impact – Buildings and Archaeology	
Major	Change to key historic building elements, such that the resource is totally altered; Change to most or all key archaeological materials, so that the resource is totally altered; Comprehensive changes to the setting.
Moderate	Change to many key historic building elements, the resource is significantly modified; Changes to many key archaeological materials, so that the resource is clearly modified; Changes to the setting of an historic building or asset, such that it is significantly modified.
Minor	Change to key historic building elements, such that the asset is slightly different; Changes to key archaeological materials, such that the asset is slightly altered; Change to setting of an historic building, such that it is noticeably changed.
Negligible	Slight changes to elements of a heritage asset or setting that hardly affects it.
No Change	No change to fabric or setting.
Factors in the Assessment of Magnitude of Impact – Historic Landscapes	
Major	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.
Moderate	Changes to many key historic landscape elements or components, visual change to many key aspects of the historic landscape, noticeable differences in noise quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.
Minor	Changes to few key historic landscape elements, or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in minor changes to historic landscape character.
Negligible	Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No Change	No change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors.

TABLE 9: SIGNIFICANCE OF EFFECTS MATRIX (BASED ON DRMB VOL.11 TABLES 5.4, 6.4 AND 7.4; ICOMOS 2011, 9-10).

Value of Assets	Magnitude of Impact (positive or negative)				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate/Large	Large/Very Large	Very Large
High	Neutral	Slight	Moderate/Slight	Moderate/Large	Large/Very Large
Medium	Neutral	Neutral/Slight	Slight	Moderate	Moderate/Large
Low	Neutral	Neutral/Slight	Neutral/Slight	Slight	Slight/Moderate
Negligible	Neutral	Neutral	Neutral/Slight	Neutral/Slight	Slight

TABLE 10: SCALE OF IMPACT.

Scale of Impact	
<i>Neutral</i>	No impact on the heritage asset.
<i>Negligible</i>	Where the developments may be visible or audible, but would not affect the heritage asset or its setting, due to the nature of the asset, distance, topography, or local blocking.
<i>Negative/minor</i>	Where the development would have an effect on the heritage asset or its setting, but that effect is restricted due to the nature of the asset, distance, or screening from other buildings or vegetation.
<i>Negative/moderate</i>	Where the development would have a pronounced impact on the heritage asset or its setting, due to the sensitivity of the asset and/or proximity. The effect may be ameliorated by screening or mitigation.
<i>Negative/substantial</i>	Where the development would have a severe and unavoidable effect on the heritage asset or its setting, due to the particular sensitivity of the asset and/or close physical proximity. Screening or mitigation could not ameliorate the effect of the development in these instances.

TABLE 11: IMPORTANCE OF SETTING TO INTRINSIC SIGNIFICANCE.

Importance of Setting to the Significance of the Asset	
Paramount	Examples: Round barrow; follies, eyecatchers, stone circles
Integral	Examples: Hillfort; country houses
Important	Examples: Prominent church towers; war memorials
Incidental	Examples: Thatched cottages
Irrelevant	Examples: Milestones

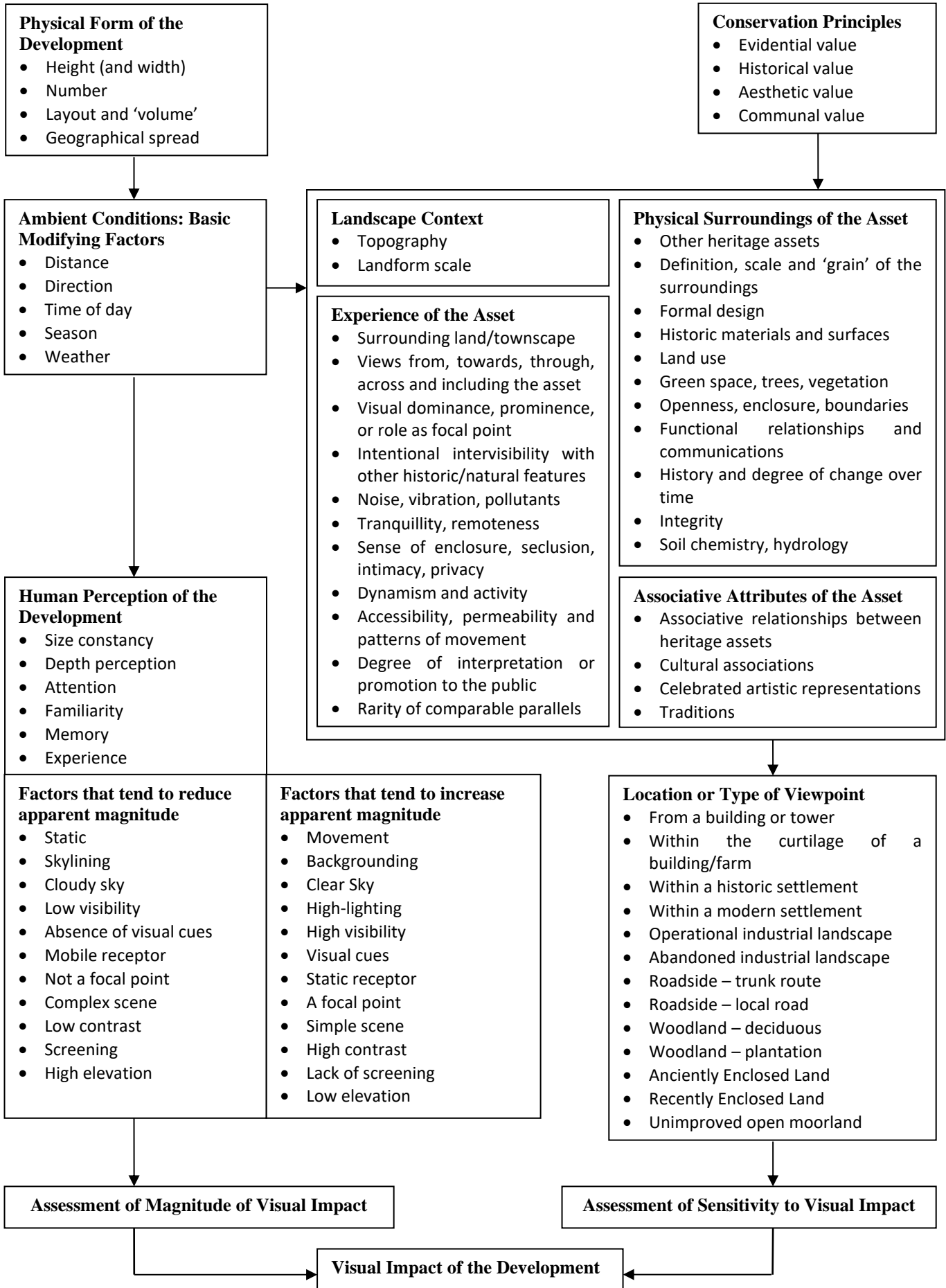


TABLE 12: THE CONCEPTUAL MODEL FOR VISUAL IMPACT ASSESSMENT PROPOSED BY THE UNIVERSITY OF NEWCASTLE (2002, 63), MODIFIED TO INCLUDE ELEMENTS OF ASSESSMENT STEP 2 FROM THE SETTING OF HERITAGE ASSETS (HISTORIC ENGLAND 2015, 9).

APPENDIX 4: SUPPORTING PHOTOGRAPHS - HVIA



1. VIEW TOWARDS THE MULTI-PERIOD LANDSCAPE ON TREGONNING HILL FROM THE SITE, DEMONSTRATING WOODLAND SCREENING; VIEWED FROM THE EAST.



2. THE EASTERN OVERGROWN 'ROUND' WITHIN THE MULTI-PERIOD LANDSCAPE ON TREGONNING HILL; VIEWED FROM THE NORTH-EAST.



3. VIEW TOWARDS THE SITE (THE APPROXIMATE POSITION IS INDICATED) ACROSS THE EASTERN 'ROUND' WITHIN THE MULTI-PERIOD LANDSCAPE ON TREGONNING HILL, DEMONSTRATING DISTANCE AND WOODLAND SCREENING; VIEWED FROM THE WEST.



4. THE NORTHERN OVERGROWN 'ROUND' WITHIN THE MULTI-PERIOD LANDSCAPE ON TREGONNING HILL, WITH WIDER LANDSCAPE VIEWS; VIEWED FROM THE NORTH-WEST.



5. DETAIL OF THE OVERGROWN REMAINS OF CASTLE PENCAIRE FORT ON THE MULTI-PERIOD LANDSCAPE OF TREGONNING HILL; VIEWED FROM THE SOUTH-EAST.



6. DETAIL OF THE OVERGROWN REMAINS OF CASTLE PENCAIRE FORT ON THE MULTI-PERIOD LANDSCAPE OF TREGONNING HILL, WITH VIEWS ACROSS THE WHS; VIEWED FROM THE NORTH-WEST.



7. DETAIL OF ONE OF THE OVERGROWN QUARRY PITS ON THE MULTI-PERIOD LANDSCAPE OF TREGONNING HILL; VIEWED FROM THE NORTH-WEST.



8. DETAIL OF THE 'PREACHING PIT' ON THE MULTI-PERIOD LANDSCAPE OF TREGONNING HILL; VIEWED FROM THE EAST.



9. VIEW TOWARDS THE SITE FROM THE MULTI-PERIOD LANDSCAPE OF TREGONNING HILL, DEMONSTRATING EFFECTS OF INCLEMENT WEATHER ON THE WIDER LANDSCAPE VIEWS; VIEWED FROM THE SOUTH-WEST.



10. VIEW TOWARDS THE SITE (THE APPROXIMATE LOCATION OF THE SITE IS INDICATED) FROM THE ROUND CAIRN SOUTH-EAST OF THE MULTI-PERIOD LANDSCAPE OF TREGONNING HILL, DEMONSTRATING DISTANCE, WOODLAND SCREENING AND INCLEMENT WEATHER; VIEWED FROM THE WEST.



11. VIEW TOWARDS THE SITE FROM THE CHURCH OF ST BREACA DEMONSTRATING WOODLAND AND SETTLEMENT SCREENING; VIEWED FROM THE SOUTH.



12. VIEW TOWARDS MERRIFIELD'S COTTAGE FROM THE SITE, DEMONSTRATING TOPOGRAPHIC SCREENING; VIEWED FROM THE NORTH-EAST.



13. VIEW TOWARDS THE SITE FROM OPPOSITE MERRIFIELD'S COTTAGE, SHOWING WOODLAND SCREENING; VIEWED FROM THE SOUTH-WEST.



14. VIEW FROM MERRIFIELD'S COTTAGE ACROSS THE WIDER WHS AREA, THE CHIMNEY OF THE ENGINE HOUSE AT IVEY'S SHAFT (INDICATED) IS VISIBLE DESPITE WOODLAND SCREENING; VIEWED FROM THE WEST.



15. VIEW TOWARDS THE SITE FROM TREWORLIS BARTON FARMHOUSE, DEMONSTRATING TOPOGRAPHIC AND WOODLAND SCREENING; VIEWED FROM THE SOUTH-WEST.



16. VIEW TOWARDS THE ENGINE HOUSE AT IVEY'S SHAFT FROM NORTH OF THE PROPOSAL SITE, DEMONSTRATING EXISTING SETTLEMENT AND WOODLAND SCREENING; VIEWED FROM THE NORTH-WEST.



17. THE ENGINE HOUSE AT IVEY'S SHAFT; VIEWED FROM THE WEST.



18. VIEW TOWARDS THE SITE FROM WEST OF THE ENGINE HOUSE AT IVEY'S SHAFT, DEMONSTRATING ELEMENTS OF ROADSIDE WOODLAND SCREENING; VIEWED FROM THE SOUTH-EAST.



19. VIEW TOWARDS THE SITE FROM NORTH OF THE ENGINE HOUSE AT IVEY'S SHAFT, DEMONSTRATING WOODLAND SCREENING; VIEWED FROM THE SOUTH-EAST.



20. THE CHIMNEY WITH THE ENGINE HOUSE AT POLROSE FARM, DEMONSTRATING MAINTAINED WOODLAND SURROUNDING THE MONUMENT; VIEWED FROM THE NORTH-WEST.



21. VIEW TOWARDS THE SITE FROM THE ENGINE HOUSE AT POLROSE FARM, DEMONSTRATING WOODLAND SCREENING; VIEWED FROM THE NORTH-WEST.



22. VIEW TOWARDS THE ENGINE HOUSE AND CHIMNEY AT WEST WHEAL METAL FROM THE SITE, DEMONSTRATING WOODLAND AND TOPOGRAPHIC SCREENING; VIEWED FROM THE NORTH-WEST.



23. VIEW TOWARDS THE SITE FROM THE ENGINE HOUSE AT WEST WHEAL, DEMONSTRATING TOPOGRAPHIC AND WOODLAND SCREENING; VIEWED FROM THE SOUTH-EAST.



24. VIEW TOWARDS THE SITE FROM THE MINING SETTLEMENT OF BREAGE WITHIN THE WHS, DEMONSTRATING LIMITING ROADSIDE VIEWS; VIEWED FROM THE SOUTH-SOUTH-WEST.



25. DETAIL OF THE SETTLEMENT OF CARLEEN WITHIN THE WHS MINING AREA, SHOWING 20TH CENTURY HOUSING OF TREGONNING TERRACE; VIEWED FROM THE EAST-SOUTH-EAST.



26. DETAIL OF THE SETTLEMENT OF CARLEEN WITHIN THE WHS MINING AREA, SHOWING THE CONVERTED METHODIST CHAPEL; VIEWED FROM THE WEST-NORTH-WEST.



27. VIEW ACROSS THE WHS MINING AREA FROM THE MULTI-PERIOD LANDSCAPE ON TREGONNING HILL, DEMONSTRATING EXPANSIVE VIEWS; VIEWED FROM THE WEST.



28. VIEW ACROSS THE WHS MINING AREA FROM THE MULTI-PERIOD LANDSCAPE ON TREGONNING HILL, DEMONSTRATING EXPANSIVE VIEWS; VIEWED FROM THE SOUTH-WEST.



29. VIEW ACROSS THE WHS MINING AREA (TO GODOLPHIN HILL) FROM THE MULTI-PERIOD LANDSCAPE ON TREGONNING HILL, DEMONSTRATING THE VISIBILITY OF CHIMNEYS (AT GREAT WORK MINE) WITHIN LANDSCAPE VIEWS; VIEWED FROM THE SOUTH.



30. VIEW ACROSS THE WHS MINING AREA (THE CHIMNEY AT POLROSE FARM IS INDICATED) DEMONSTRATING EFFECTS OF UNDULATING TOPOGRAPHY AND WOODLAND SCREENING; VIEWED FROM THE SOUTH-SOUTH-WEST.



31. VIEW ACROSS FIELDS WITHIN THE AREA OF WHEAL VOR, TO THE SOUTH-WEST OF THE SITE; VIEWED FROM THE NORTH-EAST.



32. VIEW FROM OPPOSITE THE SITE ACROSS THE WIDER LANDSCAPE OF THE WHS MINING AREA; VIEWED FROM THE SOUTH-SOUTH-WEST.



33. VIEW ACROSS SURVIVING EARTHWORK FEATURES OF THE WHEAL VOR SITE, TO THE NORTH OF THE PROPOSAL SITE; VIEWED FROM THE SOUTH-EAST.



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