



WPD depot, Pool, Cornwall

Archaeological Assessment



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

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Cover illustration

Looking south across the WPD pole storage area towards the site of the North Wheal Crofty whim engine house.

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Contents

1	Summary	7
2	Introduction	9
2.1	Project background	9
2.2	Aims	9
2.3	Methods	9
2.3.1	Desk-based assessment	9
2.3.2	Fieldwork	10
2.3.3	Post-fieldwork	10
3	Location and setting	10
4	Designations	10
5	Policies and guidance	11
5.1	Planning policies	11
5.1.1	Cornwall County Council's Structure Plan (2004)	11
5.1.2	Former Kerrier District Council Local Plan (2004)	13
5.1.3	Cornish Mining World Heritage Site (2005-2010)	13
6	Previous archaeological work relating to the site and its surroundings	14
7	Site history	14
8	Historic Landscape Characterisation	18
9	Survey results	20
10	Significance	24
11	Impacts and recommendations for mitigation	24
11.1	Scale and duration of impact	25
11.2	Potential and residual impacts	25
11.3	Assessment of impacts during construction	25
11.4	Assessment of potential impacts during operation	26
11.5	Suggested mitigation measures	26
11.6	Residual impacts	26
12	Conclusions	27
13	References	27
13.1	Primary sources	27
13.2	Publications	28
13.3	Websites	29
14	Project archive	29
15	Appendix: summary results of a watching brief carried out during geotechnical test trenching and test pitting	29

List of Figures

Fig 1. Location map

Fig 2. The extent of the project area at the WPD site, East Hill, Pool, Redruth, showing the reduction of its area on the western side from that formerly existing.

Fig 3. An extract from William Doidge's 1737 survey of the Manor of Tehidy (CRO X/101/5). The WPD site occupies Plots dk and di shown on this plan. Shaft dumps are shown in plot di along the route of Pool Adit.

Fig 4. An extract from Martyn's 1748 map of Cornwall. The WPD site is circled in red and is shown as lying at the crossroads between Pool and Trevenson (the home of Angove Esq.).

Fig 5. An extract from the OS 1809 1st Edition 1" to the mile mapping. No indications of Trevenson Mine are shown on this source.

Fig 6. An extract from Thomas' 1819 Geological map of Camborne and Chasewater, showing, the settlements of Pool and Tuckingmill, and the sett of Trevenson Mine amongst others. The red circle indicates the project area.

Fig 7. An extract from an 1833 Plan of East Wheal Crofty (CRO GHW/P/45); the project area consists of the fields immediately to the east of 'Four Lanes' crossroads circled in blue.

Fig 8. An extract from the 1840 Illogan Tithe Map, showing the southern part of the project area lying within the surface part of East Wheal Crofty.

Fig 9. A circa 1850 Symons' plan of North Wheal Crofty (CRO GHW/P/14). The WPD site occupies the ground to the north east of the crossroads, extending eastwards to Praed's Shaft. The plantation shelter belt was in existence by this date.

Fig 10. An extract from Symons and Son's c1870 Map of Camborne, Illogan, Redruth and Gwennap Mining District showing the sett of North Wheal Crofty amongst the others in the area (CRO 147/3). The red circle indicates the project area.

Fig 11. An extract from the 1877 OS 1st Edition 25" mapping. This provides much useful detail of the surface arrangements of North Wheal Crofty, including the whim engine house and shafts in the south-western corner of the project area.

Fig 12. In contrast to Fig 11 the 1907 2nd Edition of the OS 25" mapping shows that almost all North Crofty surface structures had been demolished by this date.

Fig 13. An extract from 1946 RAF B&W aerial photograph A8 50041 (© Cornwall County Council) showing how the site remained undeveloped at this date. The red circle indicates the project area.

Fig 14. The project area at East Hill as shown on a 2005 Cornwall County Council vertical aerial photograph.

Fig 15. A version of the proposed layout of the WPD site at Pool (source B3 Architects). In this case the south-eastern area proposed for sale is shown as set aside for pole storage.

Fig 16. Sites shown on the Cornwall and Scilly HBSMR. MCO39021 relates to North Crofty Mine.

Fig 17. The location of known mine shafts (red dots) shown in relation to the project area.

Fig 18. Historic landscape character mapping shown in relation to the project area. The brighter red indicates predominantly 19th century urban development.

Fig 19. The spatial relationships between the project area (red line) and the Cornish Mining World Heritage Site (purple hatch).

Fig 20. The spatial relationship between the project area (red line) and the Tuckingmill Conservation Area (Blue).

Fig 21. Looking south across the pole storage area on the western side of the depot towards the site of the North Crofty whim engine house.

Fig 22. The office/workshop/stores complex at the centre of the site, seen from the south-east.

Fig 23. The vehicle workshop on the eastern side of the site, probably the earliest surviving building within the depot.

Fig 24. The eastern elevation of the vehicle workshop at the WPD depot at Pool.

Fig 25. The granite wall facing of the tanks within the yard associated with the former tramway depot just to the south of the WPD depot at Pool.

Fig 26. A portable generator unit located on an area of fresh tarmac which coincides with the location of Praed's Shaft [3].

Fig 27. A view of the depot looking south along the newly-widened Tolvaddon Road. The site of the North Wheal Crofty whim engine straddled the fenceline near the far road sign, whilst one of its shafts was more or less under the silver car.

Fig 28. This transformer drain-down area in the north-eastern corner of the depot occupies part of the site of the former cottage and outbuildings.

Fig 29. The southern side of Trevenson Lane at this point is defined by the truncated remains of one of the outbuildings associated with the cottage complex.

Fig 30. A detail of the walling of the remains of the outbuilding, showing the poor quality of the bag-rubbed shillet, and the brick-quoined blocked window opening.

Fig 31. Inventory key map for the WPD depot at Pool.

Fig 32. The locations of the geotechnical test pits and trenches excavated by Cornwall Mining Services, as well as the locations of the shafts located by drilling.

Abbreviations

CRO	Cornwall County Record Office
EH	English Heritage
HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
NGR	National Grid Reference
OS	Ordnance Survey
PRN	Primary Record Number in Cornwall HER
RIC	Royal Institution of Cornwall

1 Summary

In May 2011, Historic Environment Projects, Cornwall Council were commissioned by Noel O'Donnell of Arcadis to undertake an archaeological assessment of the Western Power Distribution depot at Pool, Redruth in support of a detailed application for planning permission to redevelop the site.

This area at Pool was formerly the site of part of Trevenson Mine, one of the three most important early 18th century copper mines in Cornwall, which was later re-worked as part of East Wheal Crofty and later as part of North Wheal Crofty and eventually South Crofty. The northern part of the site was, during the 18th and 19th centuries, open land associated with the nearby Trevenson House.

Following the closure of North Wheal Crofty in the closing decades of the 19th century, the land remained derelict until after World War 2. The land was acquired by the Cornwall Electric Power Company in 1929, was redeveloped as a storage yard, workshops and offices by the South West Electricity Board in the 1950s, and is still occupied by its successor: Western Power Distribution.

Although no surface remains of these very important early copper mines remain on site, there remains the potential for the survival of associated sub-surface archaeological evidence for their activities, in particular in areas adjacent to the known route of the Pool Adit across the southern part of the site.

This assessment considers the historical development of the site, its significance and the likely impacts of its proposed redevelopment, setting out suggested mitigation measures to minimise these impacts, as well as reporting on the results of a watching brief carried out during geotechnical trenching and trial pitting.

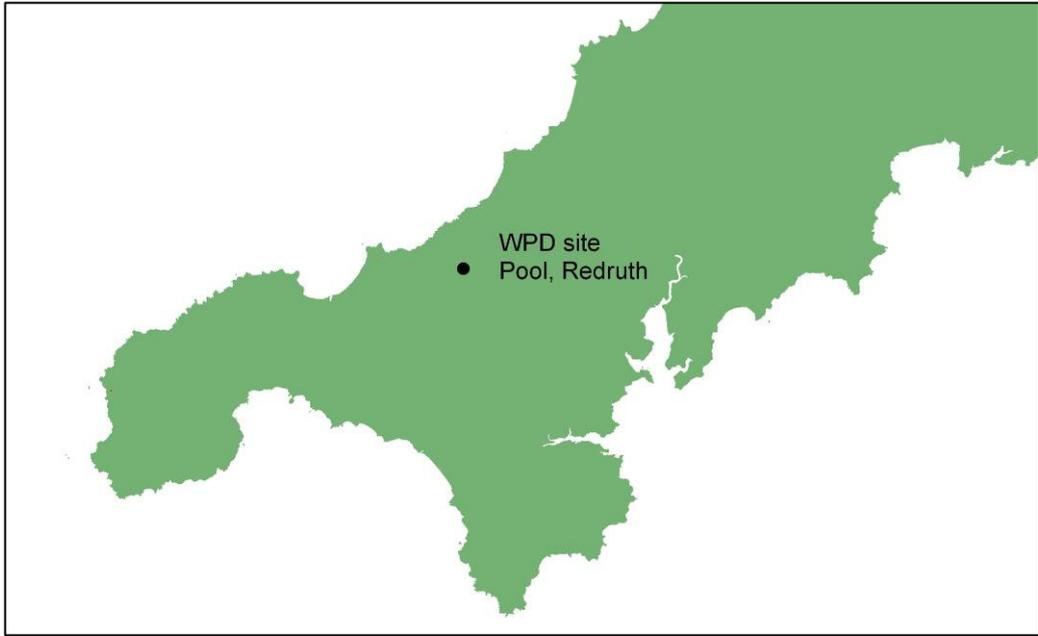


Fig 1. The location of the WPD site, Pool, Redruth.

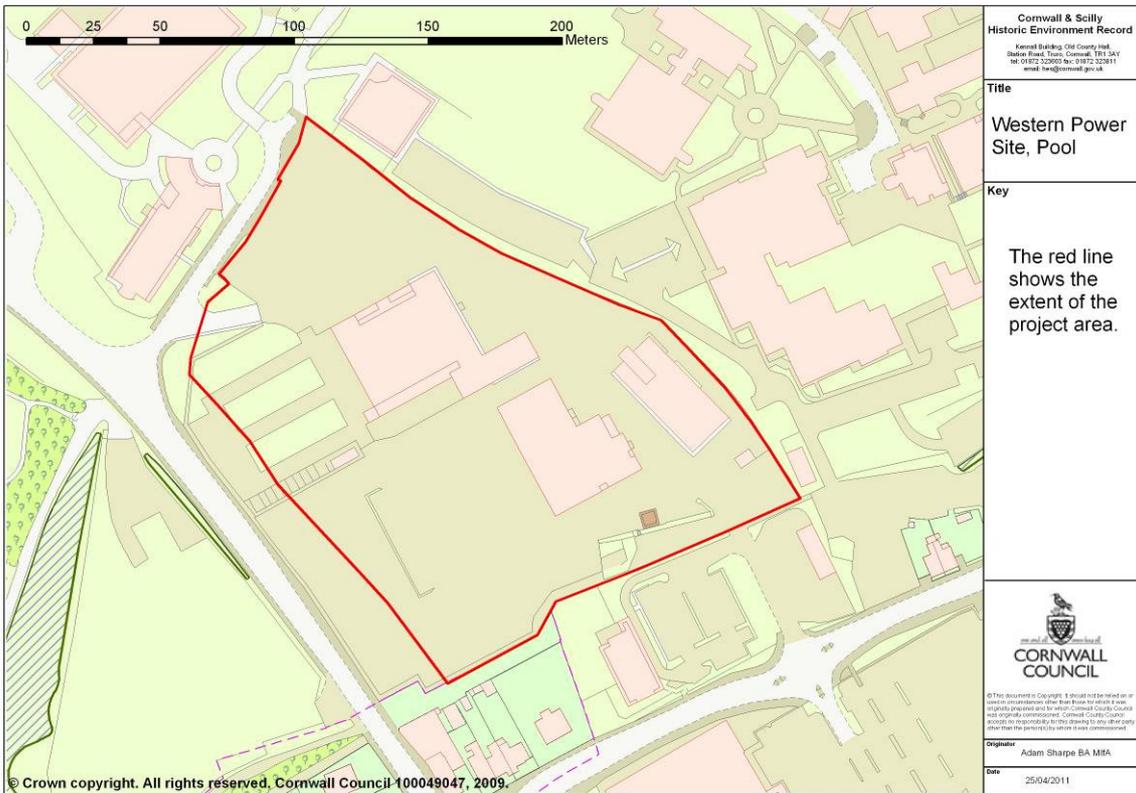


Fig 2. The extent of the project area at the WPD site, East Hill, Pool, Redruth, showing the reduction of its area on the western side from that formerly existing.

2 Introduction

2.1 Project background

Historic Environment Projects, Cornwall Council, were approached by Noel O'Donnell of Arcadis on the 21 April 2011 with a request to provide a quotation for undertaking an archaeological assessment of the Western Power Distribution depot at Pool, Redruth, Cornwall prior to the submission of a detailed planning application for the redevelopment of this site. On the basis of information supplied by Russell Dodge, Business Location Services Ltd. on 27 April, HE Projects submitted a fee quotation for this work on 28 April, this being accepted by Arcadis on 4 May 2011.

The proposal envisages the retention and redevelopment of the majority of the site (22165m²) at Pool for its present function – the storage of equipment required to maintain the local electricity distribution network, together with associated workshops and offices. Some reduction of the area of the site on its western side has taken place to allow for the widening of the adjacent road link from Dudnace Lane to the A30, whilst the B3 Architects plan (1640 Go LY-101A dated 24/3/2011, Fig 15) indicates that an area measuring 4475m² in the north-eastern part of the site is to be sold off for fast food/retail use following its redevelopment. Other plans show this area retained for vehicle parking.

2.2 Aims

The principal aim of this study is to gain a better understanding of the historic development of the site currently in use as a WPD depot at Pool and to identify the potential impacts of the redevelopment of this site on key heritage assets within, beneath and surrounding the site (including the former industrial settlements of Tuckingmill and Pool, and on the Cornwall and West Devon Mining Landscapes World Heritage Site). A further aim is to establish whether any documented or undocumented archaeological sites survive within the depot.

The objective is the production of a section of an archaeological assessment report to accompany an application for planning consent for the WPD proposals for this site.

2.3 Methods

The project consists of three components: desk based assessment, site walkover and reporting/archiving.

2.3.1 Desk-based assessment

During the desk-based assessment historical databases and archives were consulted in order to obtain information about the history of the site and the structures and features that were likely to survive. The principal sources consulted were as follows:

- Cornwall HER
- Images of England online listed buildings database
- Early maps and photographs (see Section 13)
- Published histories (see Section 13)
- Historic maps, including
 - Joel Gascoyne's map of Cornwall (1699)
 - Thomas Martyn's map of Cornwall (1748)
 - OS 1 inch survey (c1810)
 - Illogan Tithe map (c1840)
 - 1st and 2nd Editions of the OS 25 inch maps (c1880 and c1907)

- Modern maps
- Archive mine plans in the Cornwall Record Office
- GIS databases recording geology, soil types, Historic Landscape Character, Designations and Rights of Way
- Historical and modern aerial photographs.

2.3.2 Fieldwork

A brief walkover survey was undertaken on May 10 2011 to check and record the survival or otherwise of features indicated on historic maps and plans, and to record any previously undocumented elements of the site on a base map drawn up during the preliminary assessment.

Key views in and out of the site were noted and photographs of views and site detail recorded using a high resolution digital camera.

2.3.3 Post-fieldwork

The outputs from the project consist of:

- An illustrated and fully referenced written report (this report).
- An entry to the English Heritage OASIS on-line reporting system.
- An archive of project information.

3 Location and setting

The project area consists of the site currently occupied by Western Power Distribution to the east of Tolvaddon Road and the north of Trevenson Road at Pool, Redruth, centred at SW 66312 41434 (Fig 2).

The site is located on broadly level land at the west end of Pool at 100m OD, adjacent to the recently widened A3047 which links this area to the nearby A30. Lying at the heart of the Camborne-Pool-Redruth (CPR) development zone, this area centred on Pool and Tuckingmill is currently witnessing a significant transformation from a ribbon-like historic urban development backed by former mining land and miner-smallholders' fields as new housing, retail parks, industrial estates and expanded facilities for Camborne College are being developed. The Western Power Distribution depot at Pool is one of a number of relatively undeveloped large sites within this area. The southern part of the site had been occupied by copper mines since the early 1700s, whilst the northern part of the site was historically part of the agricultural land surrounding Trevenson House, which lies a short distance to the north-east.

Mining influenced the development of this area from the 18th through the late 20th centuries, whether through the development of mine shafts, the deposition of waste dumps, the creation of mine tramways, the setting out of worker housing, foundries and engineering works, or, not far to the south, the creation of miners' smallholdings.

The underlying geology consists of the late Devonian Mylor formation of metabasaltic rocks, though these are locally much metamorphosed, being underlain at no great depth by coarsely crystalline granite of the Carnmenellis outcrop, the contact occurring immediately to the south of the main railway line. A broad outcrop of unnamed igneous rock of Devonian age runs to the north of Trevenson Road and parallel with it. The soils are recorded as being of the Denbigh 2 Series.

4 Designations

No historic environment designations apply to the site proposed for redevelopment, though the Cornish Mining World Heritage site is close to the WPD site (Fig 19), especially to the south-west. Tuckingmill is designated as a Conservation Area (Fig 20).

5 Policies and guidance

5.1 Planning policies

The following text has been taken from the relevant strategic planning documents at former county and district level (these having been adopted by Cornwall Council) and from key policies in the *World Heritage Site Management Plan 2005-2010* (2005a; 2005b). Key policies from each document relating to the historic environment are highlighted.

5.1.1 Cornwall County Council's Structure Plan (2004)

Policy 1 Principles for Sustainable Development

'Development should be compatible with:

- the conservation and enhancement of Cornwall's character and distinctiveness;
- the prudent use of resources and the conservation of natural and historic assets;
- the regeneration of towns and villages in meeting the needs of their population and surrounding area;
- fostering the links between the environment and the economy.

21. Development must contribute towards sustainable development and the enhancement of the quality of life in Cornwall. Policy 1 requires this and sets out the key principles against which development will need to be assessed. Cornwall has a distinct blend of culture, wildlife, geology, landscape and townscape qualities. It has a range of towns and villages supporting in different ways the needs of their local communities'.

Policy 2 Character Areas, Design & Environmental Protection

'The quality, character, diversity and local distinctiveness of the natural and built environment of Cornwall will be protected and enhanced.

Throughout Cornwall, development must respect local character and:

- retain important elements of the local landscape, including natural and semi-natural habitats, hedges, trees, and other natural and historic features that add to its distinctiveness;
- contribute to the regeneration, restoration, enhancement or conservation of the area;
- positively relate to townscape and landscape character through siting, design, use of local materials and landscaping;
- create safe, aesthetically pleasing and understandable places;
- consider, where appropriate, a mix of uses that create vibrant and active places, including tenure, size and densities.

The conservation and enhancement of sites, areas, or interests, of recognised international or national importance for their landscape, nature conservation, archaeological or historic importance, including the proposed [now inscribed, see Section 4.6.3] WHS, should be given priority in the consideration of development proposals'.

26. People appreciate and value Cornwall's varied character and local distinctiveness. Where there is physical evidence of this character it should be retained and where development is proposed, it should reflect and consolidate the character of Cornwall's natural, semi-natural and man made environments: wildlife, biodiversity, geodiversity, history, landscape, townscape and people.

27. Policy 2 embraces the landscape character assessment approach as a basis for assessing development impacts. It also fully supports national policy (together with

Policy 3) to protect the countryside for the sake of its beauty, the diversity of its landscapes, wildlife and wealth of natural resources.

28. The [former] County Council will work with the [former] District Councils and other partners on the implementation of the character area approach. Further guidance will inform decisions across the County encompassing both the rural and urban environment. In the interim the 1994 Landscape Assessment of Cornwall (published by the County Council) should be used to inform development considerations along with the ongoing [now completed] Cornwall and Scilly Urban Survey and Cornwall Industrial Settlements Initiative. The latter is particularly significant for informing and guiding change in historic settlements.

29. Development must be compatible with the conservation of Cornwall's historic and natural heritage. This is not just confined to designated areas. Local features are an important element of local character and all too often these elements are lost by gradual attrition. The protection, conservation, interpretation and stewardship of the environment for future generations is an important element in sustainable development and one in which local authorities must play a vital role through example and encouragement. Good design should take full account of and respect these features.

The basic information already exists in the Cornwall Landscape Assessment 1994 but this, importantly, will be supplemented by the [now completed] Urban Surveys and updated with additional information on the historic environment and from the Biodiversity Action Plan.

31. It should be recognised that good quality development can and should enhance Cornwall's valued and special environment. The landscapes and townscapes of Cornwall are the combination of the natural environment and the influence of people over centuries. Continuous investment is needed to keep Cornwall a place where people want to live, work and visit. New buildings and spaces are the most noticeable products of the planning system and will always affect the environment in some way. It is, therefore, important that all development has a positive effect on the environment through good design.

34. The impact of development on these areas will require careful consideration. To be acceptable the need for the development will have to outweigh the reasons leading to the designation'.

Historic Settlements

'There is a need to take a more holistic approach to Historic Settlements than in the 1997 Plan, in recognition of the special historic character of Cornwall's medieval, industrial, coastal and tourist settlements. The historic character of many of these settlements is being studied by the ongoing [now completed] Cornwall and Scilly Urban Survey and Cornwall Industrial Settlements Initiative which will build on the Cornwall Landscape Assessment and provide further guidance on development in these urban areas.

35. In addition, it is still considered important to identify particular areas and sites of special importance in the County. The Areas of Great Landscape Value were reviewed in the preparation of the previous Structure Plan (1997) on the basis of the Cornwall Landscape Assessment and have now been incorporated in [adopted] District-wide Local Plans. These are carried forward in the revised Structure Plan'.

Section 2, 'Spatial strategy'

In this section each large urban area in Cornwall is considered and Policy 17 makes specific reference to the 'Camborne-Pool-Redruth' area.

105. The area's mining origins are reflected in an unusually prominent position in the landscape with a backdrop of the historic Carn Brea to the south and the A30 to the north. Past mining has left large areas of derelict land. Whilst some of this can contribute to the potential availability of brownfield land, much of it would be difficult to

redevelop and other areas are increasingly recognised for their heritage value. The brownfield potential in the urban area could account for as little as a quarter of the proposed new homes’.

5.1.2 Former Kerrier District Council Local Plan (2004)

Policy B.EN1: Historic Heritage – Archaeology

‘Development that would significantly harm sites, buildings and other remains of archaeological and historic importance, or their setting, will not be permitted unless there is a need for the development and the benefits for the community outweigh the archaeological importance. Where it affects archaeology that is found to be of national importance, development will only be permitted if the remains can be preserved *in-situ* without significant harm to them and to their setting; where it affects other sites and on-site preservation is impracticable or unnecessary, the development should include excavation and recording of significant remains and a planning obligation to secure this will be sought’.

Policy B.EN4: Historic Heritage - Mining Remains

‘Development likely to significantly harm industrial archaeology, mining heritage, historical, industrial and mining buildings and sites, including former mineral railways, tramways, engine houses and chimneys, will not be permitted unless the importance of the archaeology is outweighed by the benefit of the development to the community’.

Policy B.EN13: Enhancement schemes in town and village centres

‘Schemes to enhance the character of the built environment within town and village centres will be permitted where account is taken of the need for:

- (i) traffic management and improved access to public transport;
- (ii) the improvement of cycling and pedestrian areas;
- (iii) visual environmental improvements, including street lighting, signage and the reduction of overhead services;
- (iv) seating and planting areas;
- (v) schemes of short stay parking;
- (vi) the incorporation of the use of locally distinctive styles and materials’.

Policy B.EN14: Building Design

‘Development will be permitted, in terms of its siting and design, where:

- (i) it does not significantly harm the character and appearance of the built environment, the landscape, quality of the natural environment or historic heritage;
- (ii) the form, scale, bulk, height, design, siting, layout, density and access are in keeping with the character and appearance of nearby buildings and the built environment of the locality and is not significantly harmful to the amenities of the occupiers of nearby property;
- (iii) it incorporates locally distinctive building styles, materials and a scheme of landscaping’.

5.1.3 Cornish Mining World Heritage Site (2005-2010)

(See WHS Bid Team 2005a)

Issue 4 - Strategic framework

‘**Policy 4b** – All relevant strategic planning documents should make provision for the protection, conservation and enhancement of the World Heritage Site and its setting’.

'Policy 4c - Planning authorities should ensure that new development protects, conserves and enhances the Site and its setting'.

Issue 5 - Increasing protection

'Policy 5c - Local authorities and other agencies should make full use of the powers available to them for the protection and conservation of the Site'.

'Policy 5d - There is a presumption against the removal of historic mine waste within the Site'.

Issue 6 - Protecting the Setting

'Policy 6 - Developments outside the Site that will adversely affect its outstanding universal value will be resisted'.

Issue 7 - Sustainable development

'Policy 7a - Sustainable heritage-led regeneration will be encouraged and supported'.

'Policy 7b - New development should add to the quality and distinctiveness of the Site by being of high quality design and respectful of setting'.

'Policy 7c - There should be a presumption in favour of retaining and re-using historic buildings which are important components of the site'.

Issue 8 - Conservation of key components

'Policy 8a - The conservation and continuing maintenance of the historic fabric of the Site should be undertaken to the highest standards to ensure authenticity and integrity'.

'Policy 8b - The historic character and distinctiveness of the Cornwall and west Devon mining landscape should be maintained'.

Issue 14 - Community involvement and social inclusion

'Policy 14a - The communities within and outside the Site should be engaged in the enjoyment, benefits and management of the Site'.

6 Previous archaeological work relating to the site and its surroundings

Whilst the WPD depot itself has not previously been the subject of a specific archaeological assessment, it lies within an area of Camborne Pool Redruth (CPR) which has been studied on a number of occasions in response to large scale proposals for change and redevelopment. These are listed in Section 12, but include studies of Pool, South Crofty and Dudnance Lane (Sharpe 1999, 2003, 2007), Tuckingmill and Roskear (Cahill and CAU 2002), Pool (Cahill and CAU 2002), areas at and adjacent to Cornwall College (Buck 2005), proposed improvements to Dudnance Lane (Parkes 2007) and the Trevenson Park and Trevenson Gateway Areas (Thorpe 2007, Dudley 2008); the context of the site is addressed in studies of the wider CPR regeneration area (Newell 2004a and b, Herring *et al* 2005), the Mineral Tramways network (Sharpe, Smith and Jenkins 1990, Buck 2004 and Cocks 2004) and the work undertaken to prepare the bid for the Cornish Mining World Heritage Site (WHS Bid Team 2005a and b); all help to inform this current assessment.

7 Site history

No prehistoric sites or features have been recorded in the assessment area or the immediate East Hill area and those that formerly existed here may have been destroyed by subsequent mining activity and urban development (however excavation associated with shaft capping works at Carn Brea dressing floors not far to the south-east exposed a deposit of Iron Age pottery, revealing a previously unknown site in an area where evidence for prehistoric activity was thought unlikely to survive). It is likely that the plateau between Carn Brea and the coast would have been extensively settled throughout later prehistory, and sites dating to this period could be expected to have

been sited within the development area and its surroundings. Any survival would depend on the nature of subsequent activities.

In the medieval period the WPD site lay within the tenement of Trevenson, as also during the 18th century. Trevenson is a Cornish place-name containing *tre-*, 'farming settlement, estate' (Padel 1985); the origins of the settlement probably date to between the 6th and 10th centuries AD. Place-name evidence suggests that the area would have been extensively occupied during the early medieval and medieval periods, with scattered farmsteads and perhaps, some early mining activity being the predominant features.

'Tuckingmill' is a Cornish dialect term for a fulling mill, where wool was washed or 'tucked', the term possibly derived from the Cornish *trokya*, 'to dip, wash or full (cloth)' (Padel 1985). It is not clear when the Tuckingmill place-name was first recorded but the fulling mill was probably established during the early post-medieval period, perhaps the 16th century. The site is likely to have lain near to a water course, probably within the Tolvaddon Valley adjacent to the Red River.

Documentary records dating to the 16th and 17th centuries show that early mining operations took place within the Tuckingmill and Pool area, most probably taking the form of outcrop workings exploiting ore found close to the surface, and stream works exploiting tin rich material deposited in the valleys (Buckley 1997). Indeed on Station Road, Pool, shallow workings only 3.0m below the surface were found at the eastern end of Reeves' and Pryces' lodes; these are likely to date to this period (*ibid*). Equivalent shallow workings are known to underlie Chapel Road in Tuckingmill, much of the South Crofty site, the frontage of the Cornwall College site and Barncoose to the east.

By the 16th century the tenement of Trevenson lay in the ownership of three families; the Vyvyans, Praeds and the Angoves. A 1542 description of Trevenson's bounds referred to a 'blowing house' close to the Red River on the east side of the Tuckingmill Valley (Buckley 1997). A settlement on the Camborne side of the Tuckingmill valley was recorded on Gascoyne's 1695 map but not named. However, Doidge's map of 1737 (Fig 3) recorded a few cottages at the bottom of the hill, the majority of Trevenson and the East Hill area at the time being in the ownership of Sir John Pendarves Bassett, (the owner of the mineral rights). Trevenson itself was tenanted at the time by a Mr. Angove, the two plots now partly occupied by the WPD depot being recorded as 'Parkmarth' and 'Little Close'.

Documented mining appears to have first developed on the WPD site as Trevenson Mine in the early 18th century when copper lodes were discovered during the driving of Pool Adit (adit). On the 9th March 1710 Francis Bassett had obtained a lease from the other mineral lords to mine the area, most probably to secure the start of Pool Adit mine, otherwise known as Pool Mine. The lease read:

'Articles of agreement between Sir Richard Vyvyan of Trelowarren Bart., John Praed of Treveshoe, Esq., & Abel Angove of Illogan Gent., of the one part and Francis Bassett of Tehidy of the other.

Whereas Sir R Vyvyan, John Praed and Abel Angove are seized [in possession] of Penhellick Vean in Illogan viz $\frac{1}{4}$ Sir R Vyvyan, $\frac{1}{2}$ John Praed, and the residue A Angove of Trevenson in Illogan, viz $\frac{1}{3}$ in each with all mineral rights to both estates – they lease the above to Francis Basset and give him licence to dig for tin and copper. Francis Basset promises to deliver the landlords the 9th part of all ore he shall raise in Penhellick Vean, and $\frac{2}{3}$ of the 6th part of ore raised in Trevenson and he also undertakes to a quay belonging to John Praed called Lelant Quay in order to have it shipped. John Praed agrees however in case there should be no ship at the quay Mr Basset shall carry off his ore to another quay' (ad verbatim, Buckley 1997).

So rich were these lodes that they are said to have laid the foundations for the fortunes of the Basset Family. Following the construction of Trevenson House the Bassetts only

permitted a narrow strip of land approximately 75m deep to be mined along Trevenson Road. The remainder of the land was kept as open fields and formed the setting for the House. A strip of planting was put in to screen the development of mining from the House (Thorpe 2007).

Pool Adit, the earliest of these ventures, was developed from the base of the Tuckingmill Valley and was driven eastwards at no considerable depth towards Pool under the site now occupied by the WPD depot. Some of its ventilation shafts were shown on Doidge's 1737 map of the Manor of Tehidy (Fig 3). During its heyday Pool Adit mine, developed on lodes discovered in the course of driving the adit, became one of the three principal copper mines in Cornwall (Hamilton Jenkin cited in Buck 2005; Morrison 1980). The Reverend William Borlase recorded the mining operations at the eastern end of the Pool Adit in 1746 as an illustrated section of how ore was mined, dressed and worked at the time (1758). The adit also drained other nearby mines and earlier shallow and surface workings, eventually interlinking several mine setts including Cherry Garden Mine (to the west of Tolvaddon Road), Trevenson Mine (to the north of the A3047 and east of Tolvaddon Rd,) and Dudnance Mine (to the south of the A3047 and to the east of Dudnance Road). Martyn's 1748 map of Cornwall (Fig 4), though showing little detail, clearly showed features associated with the eastern workings of Pool Adit copper mine.

Records for Pool Adit show that between December 1739 and November 1742 the mine sold 2,700 tons of copper ore, with a further 1,219 tons being sold between 1756 and 1762 when the mine was operating as Trevenson Mine (Morrison 1980). Trevenson Mine, like its neighbours was also an early adopter of the then newly-developed beam engine powered pumping equipment. The mine closed in 1787 (Buckley 1997) although records show that the Cherry Mine sett continued to be worked during the 1790s by a Joseph Vivian and fellow adventurers (*ibid*; Morrison 1980).

The 1809 OS map (Fig 5) recorded little detail of mining within this area but recorded 'Tuckingmill' with further housing having been constructed at the lower end of East Hill. James Mills' survey of the Manor of Tehidy (CRO/AD/894/7/10) dating to three years before this recorded Trevenson as occupied by Thomas Kevill, the northern plot being then known as 'Little Field' and measuring 3 acres, 2 rods and 21 perches in statute measurement, the southern plot being known as 'Shaft Close' and measuring 2 acres, 1 rod and 27 perches.

Thomas's 1819 *Geological map of Camborne and Chasewater* (Fig 6) recorded this area as part of the Trevenson Mine sett (by this date having absorbed the earlier Cherry Garden and Pool Adit setts) but recorded little surface detail. In 1819 Trevenson and Pool mines were idle, but by 1823 Trevenson and Dudnance mines had been amalgamated with Pool, and the nearby Longclose and Penhellick mines to form East Wheal Crofty, again principally working copper, though by this date producing some tin at depth (Buck 2005; Buckley 1997; Morrison 1980). The mine temporarily closed in 1827 due to a national economic depression and it took until 1831 for production to begin again with the sale of 238 tons of copper ore. In 1838, when production was at its peak the mine was one of the largest employers in the area, employing 456 men, 404 women and 144 children, and selling 7,955 tons of ore. The East Wheal Crofty workings were recorded in plan on a map amongst the Praed papers (GHW/P/45, Fig 7) dating to 1833, this showing the locations of the account house, pumping engine house, lodes and shafts.

The mine was named on the 1840 Illogan Tithe Map (Fig 8), a small number of buildings and some spoil dumps being depicted. The land was jointly owned by Lady Basset (2/3) and William B. Praed (1/3). Plot 674 was leased to Thomas Kevill and occupied by Henry Willoughby, this plot being referred to as 'Land' measuring 4 acres, 3 poles and 23 perches. Plot 675 to the south was described as being occupied by East Wheal Crofty Mine and extending to 13 acres, 12 pole and 38 perches.

Production at East Wheal Crofty declined in 1840-2, rose again in 1845 to 6,173 tons before again declining sharply in the late 1840s. The sett continued to be worked until 1850 as one of the most successful copper mines in west Cornwall, and by the time of Symons's 1850 map of the *Camborne, Illogan Mining District* (and Fig 9 by the same surveyor, again dating to about 1850), far more buildings were depicted on the site. In 1853 the plant is known to have included an 80-inch engine, with two 22-inch winders, a 26-inch stamps engine working 24 head of stamps and a copper crusher (Morrison 1980).

Production continued but in this year only 1,655 tons of ore were sold (Buck 2005; Morrison 1980). As a result, the northern section of the Trevenson section was considered no longer viable and the adventurers put an advertisement in the *Mining Journal* for the sale of its machinery (Buckley 1997). By the following year (1854) the East Wheal Crofty sett had been split into North Wheal Crofty and South Wheal Crofty, the setts being divided by the road running between Tuckingmill and Pool (Buckley 1997; Morrison 1980). Dines recorded the output East Crofty between 1832-6, 1838 and 1848-53 as 100, 952 tons of 7 per cent copper ore and 41 tons of black tin, and as North Crofty, between 1854-99, 170 tons of 6 per cent copper ore and 1,610 tons of black tin (Dines 1956). The output recorded by Morrison (1980) is slightly different given that it relates to copper production between 1818 and 1854. Symons and Sons recorded the surface arrangement of the mine around 1850 (GHW/P/14, Fig 9), showing the sett boundaries and those of its immediate neighbours, the lodes traversing the sett, the principal structures on it and its shafts, some of these being named. Symons and Son's *Mining map of Camborne, Illogan, Redruth and Gwennap mines* drawn c1870 (Fig 10) recorded a similar landscape to that recorded in 1850.

The mine had a patchy career initially selling copper ore and then tin as its workings grew progressively deeper. It appears that the copper deposits within the former Trevenson/East Wheal Crofty sett were richest near surface. North Crofty never became a major producer of these ores, though managed to survive the copper price depression of the mid 1860s and saw its best year in 1870 when tin production and prices were at their highest. However, cumulative losses eventually forced the mine to close in March 1874 and the machinery was offered for sale in the following January (Cocks 2004). In 1879 an article in the *Mining Journal* suggested that South Wheal Crofty had purchased the North Wheal Crofty sett (Buckley 1997); the 1877 OS map (Fig 11) recorded 'North Wheal Crofty (Tin and Copper Disused)' and it is likely that South Wheal Crofty exploited only its underground elements. The Ordnance Survey at this date showed the mine immediately following its abandonment, its pumping and winding engine houses still roofed and still served by a dedicated branch of the main line railway to the south. Extensive spoil dumps occupied the southern part of the WPD site and the western part of the site beyond Tolvaddon Road, spilling down into the Tolvaddon Valley.

Records suggest that North Wheal Crofty was reworked sporadically between 1897-1900 and 1907-1911, mainly for arsenic, the work perhaps re-processing existing waste dumps. The infrastructure serving these small-scale reworkings may have been sited away from the Trevenson end of the sett, as the 1907 OS 25" mapping (Fig 12) indicated that the engine houses shown in 1877 had been completely demolished and the branch line truncated. The only evidence on this mapping for a mine which had worked almost continuously for almost a century and a half consisted of extensive spoil dumps and a few hedged shafts.

What had previously been an almost continuous expansion of mining within the surrounding landscape halted during the early 20th century as a result of the more or less complete collapse of the Cornish mining economy. Infill of settlements like Pool and Tuckingmill continued sporadically during the following decades, though substantial growth did not take place until the 1960s. During the following decades, many of the former mining sites were cleared of what was left of their buildings, their shafts capped and the sites given over to large industrial and retail developments. This continued a process characteristic of the late 19th and early 20th centuries whereby mining activity

had increasingly been concentrated on a limited number of large sites. Scattered, small, early sites were often reclaimed to agriculture or to housing development, the residual evidence for mining often consisting of little more than islanded shaft dumps.

After 1911, South Crofty sold off the land to the north of Trevenson Road (Cocks 2004) but despite increasing urban development within this area during the 20th century, until very recently the East Hill area retained a semi-rural feel; former miners' cottages and industrial sites backed onto areas of mine waste which had gradually scrubbed over and many of the fields recorded on earlier historic maps were still in active use; this is clearly evident on the 1946 aerial photograph for the area (Fig 13). The southern section of the site remained semi-derelict for many decades, the mine shafts, spoil dumps and extensive shallow underlying workings precluding its redevelopment at least as late as this date. The northern section of the project area remained as agricultural land in 1946.

In 1929 these plots of land had been acquired by the Cornwall Electric Power Company and though part of the North Crofty site had sited a CEPC canteen during the 1930s, was brought into full use during the 1950s by the South Western Electricity Board (SWEB) as a depot for the storage of power poles, transformers and the other hardware associated with electricity distribution, as well as related workshops and offices (pers. comm. Steve Kingstone, WPD). A further associated unsurfaced storage area on another part of North Wheal Crofty lay to the west of Tolvaddon Road. During the development of the eastern area it is assumed that the underlying shafts were capped over and the extensive area of mine waste shown on the 1946 aerial photograph was landscaped prior to the creation of the hard surfaced yard which now occupies the eastern part of the Trevenson Mine/East Wheal Crofty/North Crofty site (Fig 14).

This area between the centres of Pool and Tuckingmill is now the heart of the Camborne Pool Redruth development zone and is witnessing considerable change, including the upgrading of transport links necessitating demolition of some buildings fronting existing roads, the partial redevelopment of the Cornwall College site, extensive new build on the Heartlands site, proposed redevelopment of the South Crofty site and landscaping works in advance of development at East Hill crossroads, including the western part of the former Trevenson/East Wheal Crofty/North Wheal Crofty site.

8 Historic Landscape Characterisation

Our environment is now either filled with or relatively empty of people, but all of it is their product, and all is experienced and perceived, and thus has meaning and value for people today. This includes everyone, not just specialists or enthusiasts - artists, photographers, writers, local historians and archaeologists - but all individuals and all communities, all adults and all children. Historic landscapes need not be experienced, perceived or valued with historical consciousness or awareness; they may just be enjoyed, loved or loathed, lived in or lived around, and are often just regarded as 'home'.

All these things - the individual historical and archaeological components; patterns and palimpsests of components; gaps between components; semi-natural or semi-cultural habitats; and the perceived or experienced historic landscapes - should be considered when recording, interpreting, assessing, and evaluating the historic landscape, and when guiding change within it. It is such a broad, holistic and inclusive conception of the historic landscape that enables change to be accommodated through an adequate breadth of understanding to ensure that we maintain the rich and meaningful historic environment that a healthy society, and its various agencies, wishes to sustain. It is now increasingly accepted that the method that most effectively and most systematically records, analyses and evaluates the historic environment is Historic Landscape Characterisation.

Historic Landscape Characterisation (HLC) can be seen as an equivalent for the historic environment of habitat mapping for the natural environment. It allows the historic dimension of the whole landscape to be fully considered and provides a readily understood context for the surviving features: buildings, structures, hedges, archaeological remains etc.

In 1994 the HLC of the whole of Cornwall was undertaken by CAU as part of a general Landscape Assessment of the county (published as Cornwall County Council 1996). The HLC was supported and funded by the Countryside Commission (now the Countryside Agency), English Heritage, Cornwall County Council, and the District Councils, including Kerrier. The Cornwall HLC was a pilot study encouraged by English Heritage who were then investigating ways of assessing the historic environment, to enable it to be placed alongside the natural environment in discussions of sustainable development. The method was based on a comprehensive and systematic collection of disparate data that was then mapped, assessed and interpreted by CAU. It represented a new way of characterizing the landscape and understanding its evolution. The Cornwall Method has since been adopted and adapted by local authorities and heritage agencies throughout the British Isles and Europe. During 2005 the Camborne-Pool-Redruth development area was subjected to a significantly more detailed level of HLC in order to provide a level of mapping which could be used to inform the development process and ensure that its most significant landscape components could be recognised and, where possible retained (Herring *et al* 2005).

It is possible to establish the predominant historic landscape character of each parcel of land in Cornwall, in the case of the project area this being former mining land surrounded by a 19th century industrial settlement within a wider setting of post-medieval agricultural land.

The historic landscape is comprised of a mosaic of blocks of land whose predominant historical landscape character is both various and repeating. This quality allows parcels to be assigned, using a number of systematic sources (mainly maps), to one of around fifty clearly distinguishable HLC Types, some urban, some rural. Most Types can be further subdivided according to the sensitivity of characterisation required. Conversely, to create a smaller-scale and simplified characterisation of the whole county, or a part of it, the Types mapping can be simplified, generalised and, to some extent, reinterpreted to produce a map of Historic Landscape Character Zones.

The following HLC Types described by Herring *et al* (2005) are found within the Pool Heartlands study area which forms the context for the WPD site:

Mining activity (shaft and adit mining)

This type is best represented by the above ground structures and areas of derelict mining land at both the Robinson's Shaft site and the related South Wheal Crofty to its east, and at South Crofty to its west, though former mining activity has shaped much of this landscape, steering or preventing development in many areas. Mining activity was particularly important along the frontage with Trevenson Road and to its north, though in these areas evidence for mining tends to survive as buried archaeology rather than above-ground structures.

Twentieth century industrial and commercial

This Type is found on former mining land to both the north and south of the area. Retail developments line Trevenson Road where earlier units on former industrial land are gradually being replaced with newer, larger buildings housing national retail businesses whose characters are essentially non-local.

Industrial workers' housing

This Type is well represented in the rows of miners' cottages within nearby Pool and Tuckingmill.

9 Survey results

A site walkover was undertaken on May 10 2011, following the arrangement of access with the site manager, Steve Kingstone.

The WPD depot at East Hill crossroads, Pool is trapezoidal in shape and predominantly level, open, hard-surfaced land with an entrance off Trevenson Lane in its north-western corner. Within the site are three large storage/workshop/office buildings, two of these being formed of groups of four portal-framed sheds, the central group (used for offices and stores) showing signs of accretion in two main phases, the northern group (again offices and stores) apparently being of contemporary build. A third large structure is adjacent to the south-eastern corner of the site, this building functioning as a vehicle workshop. These structures clearly date from a number of periods, the oldest being the workshop in the south-eastern corner of the site, which may well date to the late 1950s or early 1960s; the remainder are rendered portal frame structures which are likely to be of 1980s construction. Other smaller buildings of relatively modern date are found around the north-western, north-eastern and southern boundaries of the site. The open south-western part of the site is predominantly used for car parking, whilst the perimeter of the site is divided into discrete storage areas for power poles, transformers, cable, insulators, oil drums, lamp posts, brackets and various types of recycling. An elevated area in the south-eastern corner of the site provides a vehicle inspection pit, whilst a bunded area in the north-eastern corner of the site appears to be used for draining redundant transformers of their oil. The remainder of the site is open, and shows signs of some degree of reorganisation, including evidence for the relatively recent demolition of some small store buildings and the removal of internal fencelines.

The present site boundary consists of new steel security fencing topped with barbed wire to the west; the remainder of the site perimeter is marked by high chainlink fencing topped with barbed wire on cranked concrete posts. On the eastern side of the site, the hedgeline shown on the Tithe Award mapping dating to 1840 (Fig 8) survives immediately beyond the security fence and is lined with 7m high elm, ash and conifer trees along most of its length, forming an effective screen between Cornwall College and the depot. Along the northern perimeter, the original (pre-1809) hedging along Trevenson Lane has survived most of the way to the junction with the link road to the A30, though new mortared stone walling replaces it at its western end. The eastern section of the hedge flanking this lane consist of the much reduced remains of the northern wall of one of the outbuildings associated with a cottage established here between 1840 and 1877 and surviving until at least 1946 (TA Map, OS 1st Edition 25" mapping and 1946 RAF AP evidence).

The site is flanked to the north and east by parts of the Cornwall College campus, which consists of large buildings set within significant expanses of lawns, shrubs and open green space. To the south the depot is abutted by a branch of McDonald's, whose curtilage includes a carparking area and some green space. To the west the site is abutted by Tolvaddon Road, which has recently been upgraded and widened.

Known sites formerly located within the area occupied by the Pool WPD depot.

See Fig 31 for locations.

1. Winding engine house SW 66297 41354

A winding engine house is shown at this location (in the south-western corner of the WPD depot) on the 1st Edition OS 25" scale mapping dating to 1877 (Fig 11), the building appearing to be aligned so as to be able to wind from Sump Shaft on the western side of Tolvaddon Road some 65m away. It may well also have wound other shafts at North Crofty, as it appears to be the only steam whim on the mine at that date. The engine house was not depicted on the 1840 Tithe Map (Fig 8) or the Symons map dating to *circa* 1850 (Fig 9), and had been completely demolished by 1907 (Fig

12). In 1877, despite the closure of the mine, the engine house and its adjoining boiler house were both shown as roofed. The chimney associated with this engine house seems to have been set into the eastern gable of the boiler house.

There are no traces of the engine house at this location, which straddles the safety fence between the depot and the recently widened Tolvaddon Road (Figs 21, 27), though some of its foundations courses may survive below ground.

2. Shaft at SW 66295 41360

The Ordnance Survey 1st Edition 25" mapping dating to 1877 (Fig 11) shows a mine shaft immediately to the north of the winding engine house at this location. The shaft seems to have become redundant by 1907 (Fig 12), and was not shown at that date by the OS on their 2nd Edition 25" mapping. The shaft is likely to be one of those sunk during the excavation of the Pool Adit, and is therefore of early 18th century date. No trace of the shaft can be seen on the 1946 AP (Fig 13).

There is no trace of a shaft at this location, which is occupied by a tarmac surface. The means by which the shaft was made safe is unknown, and there is the potential at this location for the survival of sub-surface features.

The shaft was located through probe drilling by Cornwall Mining Services in late May 2011 and found to be loosely backfilled; the shaft was at the documented location adjacent to the western fenceline of the yard.

3. Praed's Shaft at SW 66330 41360

A second shaft was shown on the East Wheal Crofty plan of 1833 (GHW/P/45, Fig 7) at this location, depicted by Symons *circa* 1860 (GHW/P/14, Fig 9) and mapped by the OS in 1877 (Fig 11). It is again likely to be one of those originally ventilating the Pool Adit, and therefore of early 18th century date. The shaft was mapped by the OS in 1907 (Fig 12), when it was shown surrounded by a safety hedge. It seems to have been capped over by 1946 (Fig 13).

A square of tarmac 7.0m x 6.5m in plan at this location has been replaced (Fig 26), suggesting that the shaft may have been re-capped in recent decades. Dependant on what works took place here, there may remain some potential for the survival of sub-surface features associated with the shaft. Steve Kingstone and Tony Bennett (pers. comm.) both independently reported the existence of a large (2.5m wide, 2.0m high) shallow tunnel only 1.5m below ground surface located during the enlargement of Tolvaddon Road and heading towards Praed's Shaft from the west. This ought to run under the southern part of the yard at an equivalent depth. The tunnel was reported as being lined and supported with timber setts, though was stone-arched beneath the highway.

The shaft was located through probe drilling by Cornwall Mining Services in late May 2011 and found to be concrete capped about 2.5m below surface at this location. CMS reported that the cap or slab did not fully cover the shaft cone on the western side. The tunnel was not detected during the drilling programme.

4. Possible shaft at SW 66327 41369

B3 Architects plan 1640 G0 LY-101 A marks a shaft at this location, possibly an alternative site for Praed's Shaft [3] (above). The source for this mapping is unknown and no features are visible in the tarmac surface at this location.

5. Possible shaft at SW 66348 41366

B3 Architects plan 1640 G0 LY-101 A marks a shaft at this location, possibly an alternative site for Praed's Shaft [3] (above). The source for this mapping is unknown and no features are visible in the tarmac surface at this location.

6. Area of mine spoil centred SW 66313 41386

The operations of Trevenon Mine, East Wheal Crofty and North Wheal Crofty over the course of nearly two centuries evidently produced substantial spoil dumps on both sides of Tolvaddon Road, as can be seen on the 1st and 2nd Editions of the OS 25" mapping (Figs 11 and 12). To the east, the spoil occupied a roughly rectangular area 120m east to west and 85m north-south with a substantial height along its northern edge; the dump further extended along the outcrop of the lode for a further area 75m east-west and 30m north-south. This extended dump had been landscaped by 1907 and partly occupied by the tramway depot and by gardens backing onto the nearby cottages.

The principal dump area survived as a landscape feature until at least 1946 (Fig 13), but it is likely that it was either landscaped or removed for reprocessing shortly thereafter, and has left no traces on the modern site beyond slightly elevated ground levels in some areas of the site. It is probable that this landscaping activity would have removed any surviving traces of horse whim platforms or other relatively ephemeral structures which would have been associated with the operation of the mine.

Trenching by Cornwall Mining Services in late May 2011 revealed the remnants of this mine waste to be between 0.1 and 0.6m deep and to consist of greenstone and quartz lode material in a soil matrix. It was evident that the majority of the spoil had been removed using mechanical means, a process which would also have resulted in the removal of all above-ground traces of any mine structures which would have been on this part of the site.

7. Revetting wall and granite -faced tanks centred at SW 66372 41387

An elevated area currently occupied by live transformers on the southern edge of the depot is defined along its northern face by a section of 1.6m high granite walling, this originally probably being small earth-laid granite pieces, though at its western end these have been cement pointed (Fig 25). The south-heading return of this wall is constructed of rendered concrete which may date to the 1950s or 1960s. Further sections of the granite walling are exposed further to the east, where they again revet an elevated area.

These features appear from comparison between the OS 1st and 2nd Edition mapping to have been constructed between 1877 and 1907 (Fig 12) and to originally have formed the northern boundary of the nearby tramway depot. The function of the three tanks or yards which were revetted by the western section of walling is uncertain. This elevated area, although considerably altered to accommodate the transformers, appears likely to preserve the original tanks as infilled features.

8. Roofed structure mapped in 1907 at SW 66429 41401

A roofed rectangular building measuring 15.5m x 7.05m was constructed at this location between 1877 and 1908 (Fig 12) almost certainly as part of the complex of structures making up the tramway depot. Its function is unknown and it had been demolished by 1946 (Fig 13).

9. Site of building at SW 66378 41390

The 1946 RAF aerial photograph (Fig 13) shows a 40m x 7.5m single storey shed at this location, this having as its rear wall the revetted granite facing surviving as feature [7] (Fig 25). The function of the building is unknown, though it probably served a light industrial use. The building has been demolished and has left no traces.

10. Site of building at SW 66305 41393

The 1946 RAF aerial photograph (Fig 13) shows a gabled roofed shed approximately 25m long and 8m wide at this location. Again, like [9] above, this probably had a light industrial use and has been demolished, leaving no trace.

11. Probable allotments SW 66411 41439 to SW 66301 41504

The 1946 RAF aerial photograph (Fig 13) shows what appear to be lines of individual allotment plots flanking a trackway leading down the eastern boundary of the depot site. These were probably created as part of the *Dig For Victory* campaign during WWII and would have been associated with the nearby cottages in the western end of Pool.

The area within which they were created has been tarmaced over and is used for materials storage and recycling points within the depot.

12. Farmstead centred at SW 66257 41516

A small complex of buildings, probably a farmstead established on the Trevenson Estate, was created between 1870 and 1877 (Fig 10, Fig 11) in the north-eastern corner of the northern plot now occupied by the Pool WPD depot.

The house, at the south-western end of a complex of small enclosures, seems originally to have been rectangular in plan, though by 1877 had been extended to the north-east (Fig 11). To its north, and flanking Trevenson Lane was an elongated outbuilding with small extensions to both the north-east and the south-west. A further elongated shed was shown along the western boundary of the field, adjacent to the screening plantation [13] at this date. This last building had been demolished by 1907 (Fig 12), though four further small structures (probably animal houses) were shown by the OS at this date scattered around the complex.

The farmstead survived until at least 1946 (Fig 13) with the addition of some further extensions to the cottage, though must have been demolished shortly thereafter with the construction of the SWEB depot (Fig 14, Fig 28). Test pitting revealed a jumble of demolition rubble at this location.

The only remains of this complex now consists of the northern wall of the larger original outbuilding, this forming the frontage to Trevenson Lane (Fig 29). The remains are of bag-rubbed mine waste and poor quality shillet rubble, and incorporate a blocked in brick quoined window opening (Fig 30). A gateway into the complex seems to have adjoined the eastern end of the building and is still preserved as a gap in the Cornish hedge which forms the southern boundary of the remainder of Trevenson Lane.

13. Plantation screen between Trevenson House and North Wheal Crofty SW 66404 41396 to SW 66254 41537

A mixed coniferous and deciduous linear plantation measuring 50m wide at its southern end and 5.5m wide at its northern end had been deliberately planted by 1877 but after 1840 (Figs 11 and 8) to screen mining operations at North Wheal Crofty from the genteel occupants of Trevenson House, who, whilst profiting from these operations, had no wish to see them every day from the windows and grounds of the house. A similar linear plantation 15m wide had been planted along the southern edge of the estate to screen mining operations further along the outcrop of the lode to the east and the grounds immediately surrounding Trevenson House were thickly planted with trees, no doubt with a similar end in mind. By 1907 all of these shelter belt trees had been felled and the area formerly occupied by the plantation along the eastern boundary of the WPD site had been returned to agriculture (Fig 12).

Some re-planting subsequently took place within the broader grounds surrounding Trevenson House, and the eastern boundary of the WPD depot is now screened from the Cornwall College campus by a linear shelter belt formed of a mixture of 7m high elms, ash and some conifers (Fig 28), these last possibly being the remnants of the original screening belt.

14. Agricultural boundaries making up the former site boundary

a) SW 66429 41421 to SW 66256 41545 (eastern boundary)

b) SW 66385 41392 to SW 66252 41534 (western boundary of plantation belt)

c) SW 66343 41379 to SW 66236 41502 (internal north-south boundary)

d) SW 66283 41321 to SW 66198 41449 (boundary with Tolvaddon Road)

e) SW 66198 41449 to SW 66255 41547 (boundary with Trevenson Lane)

f) SW 66243 41384 to SW 66322 41421 (boundary between northern and southern plots on western part of site)

William Doidge's 1737 map of the Manor of Tehidy (Fig 3) shows the WPD depot site to occupy the majority of two plots marked as 'di' to the south and 'dk' to the north, shaft dumps on the route of the Pool Adit being shown traversing the southernmost plot from west to east.

Two of the boundaries shown on this mapping survive to the present day. The first, boundary **a** to the east is a low Cornish hedge just to the east of the security fence; whilst boundary **e** to the north is a Cornish hedge flanking most of the southern edge of Trevenson Lane. Until recently, the eastern edge of Tolvaddon Road followed the line of boundary **d**, though road improvements have now moved the edge of the road several metres to the east. The southern boundary of these plots formed the northern side of Trevenson Road through Pool, whilst the east-west boundary between the two plots, boundary **f**, can be seen to have provided the northern boundary of mining operations at surface for North Wheal Crofty, this forming the edge of its spoil dumps to the east of Tolvaddon Road; by 1877 the eastern extension of this hedgeline had been removed.

By the late 19th century, the plots had been further subdivided from north to south by the western boundary of the plantation [14], boundary **b**, and by a roughly parallel boundary to its west, boundary **c**. With the exception of the removal of the plantation and its western boundary, boundary **b**, this arrangement of fields remained unchanged in 1907.

By 1946 (RAF AP), the internal north-south boundary, boundary **c**, had also been removed, except to the south, where it continued to revet the then still surviving area of mine spoil dumps. All internal boundaries have now (2011) been removed.

The surviving boundaries, boundaries **a** and **e** date from at least 1837, and are therefore considered important under the 1997 Hedgerow Regulations. Under these regulations, owners wishing to remove all or part of a hedgerow considered to be historically important must notify the Local Planning Authority (LPA). Criteria determining importance include whether the hedge marks a pre-1850 boundary, and whether it incorporates an archaeological feature. The LPA may issue a 'hedgerow retention notice' prohibiting removal.

10 Significance

Pool Adit Mine and its successor, Trevenson Mine, were amongst the earliest and most important copper mines anywhere in Cornwall, their lodes being worked under these names and as parts of East Wheal Crofty, North Wheal Crofty and eventually South Wheal Crofty between 1710 and 1999. Although almost all surface evidence for their operations has by 2011 been cleared away, the potential for the survival of associated sub-surface archaeological features should not be discounted. Should features survive they may have considerable potential to throw light on a poorly-documented yet very important phase in the development of Cornish mining technology.

11 Impacts and recommendations for mitigation

Two general types of archaeological impact associated with developments of this type have been identified: those during the construction phase and those during the operational phase.

11.1 Scale and duration of impact

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

positive/substantial

positive/moderate

positive/minor

neutral

negative/minor

negative/moderate

negative/ substantial

Additionally **negative/unknown** is used where an adverse impact is predicted but where, at the present state of knowledge, its degree cannot be evaluated satisfactorily (this is usually applied to sub-surface archaeological features, or to documented features which have not been previously evaluated by trenching and/or geophysical survey techniques).

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

11.2 Potential and residual impacts

Potential adverse impacts may be capable of mitigation through archaeological recording or other interventions. Where appropriate, both 'potential' and 'residual' impacts are given; that is, expected impacts 'before' and 'after' such work. A proposed mitigation strategy is outlined below.

11.3 Assessment of impacts during construction

Site preparation works may include the re-capping of mine shafts within the site and groundworks associated with the installation of new roadways, services and foundation works for structures on the site.

Given that the known mine shafts on this site have, in the past, been covered over or capped, operations to stabilise them and ensure that they are safe are likely to extend beyond the footprint of their original openings; these have the potential to result in damage to or the complete destruction of any surviving remains of engine houses or other associated surface structures. There are known to have been at least one engine house constructed within the WPD site, though it is possible that there were also much earlier, undocumented examples. No remains of the whim engine house documented by the Ordnance Survey in 1877 (Fig 11) survives at surface, though its location is mapped on this source.

The impacts on the surface remains directly associated with the mine shafts are judged to be **negative/unknown/permanent** without mitigation (see below) and **negative/minor/permanent** should appropriate mitigation be carried out.

The landscaping and other associated works proposed for the site are likely to result in the loss of stratified archaeological deposits, together with any surviving sub-surface remains of documented and undocumented structures such as tramways, leats, ponds, horse whims, dressing floors and other mine buildings.

The impacts on these other buried remains within the development site are judged to be **negative/unknown/permanent** without mitigation (see below) and **negative/minor/permanent** should appropriate mitigation be carried out.

Operations affecting surviving stretches of historic boundaries are unlikely, but if proposed would fall under the 1997 Hedgerow Regulations and would require consent from the LPA. Given the relative antiquity of these hedges, the impacts of any such operations would be judged to be **negative/moderate/permanent**.

11.4 Assessment of potential impacts during operation

The nearest points on the boundary of the Cornwall and West Devon Mining Landscape World Heritage Site are 65m to the south-west of the site, 250m to its south-east and 400m to its north-east (Fig 19). It is inevitable that the development at Pool will have some impact on this significant landscape, inscribed in 2005. The closest distance between the Tuckingmill Conservation Area (Fig 20) and the WPD site is 168m, this being to the south-west of the site. In both these cases the impacts will be predominantly visual in character, though are likely to be partial due to masking by intervening structures, both existing and proposed.

The visual impacts on both the Tuckingmill Conservation Area and the World Heritage Site are likely to be limited by topography (given the location of the development area), already-existing changes to the local landscape and the proposed screening around the periphery of the development site. The existing storage yard and associated structures are notably utilitarian, and the proposed redevelopment of the site provides an opportunity for the construction of high quality, sensitively designed buildings in an improved setting. The impacts on the landscape character of East Hill, Pool and Tuckingmill, together with the WHS are therefore considered to be potentially **positive/moderate and semi-permanent**.

11.5 Suggested mitigation measures

Given that it is known that this area at Pool proposed for redevelopment sited one of Cornwall's earliest and richest copper mines, it is recommended that an archaeological watching brief is undertaken during any shaft capping or major groundworks on site. The redevelopment of the WPD depot, Pool, provides a rare opportunity to increase our understanding of the development of steam technology on Cornish mines as well as for early copper mining in Cornwall.

The following mitigation measures are proposed:

- An archaeological watching brief should be allowed for in relation to any works to or adjacent to mine shafts at the WPD site together with any other significant groundworks on the site. Due allowance should be made for the recording of any buried structures which may be revealed within these areas.
- Operations which might affect the remaining historic boundaries to the north and east of the site should be avoided if at all possible.
- Careful consideration should be given to the design, massing and selection of materials and finishes for new buildings on the WPD site, as well as to any boundary and screening features in order to reduce or remove any potential negative impacts on the nearby historic settlements of Pool and Tuckingmill, and on the adjacent World Heritage Site.

11.6 Residual impacts

Evolving changes to the Historic Landscape Character of this area are described above. It is recognised that the particular characteristics of this part of the Pool-Tuckingmill area which reflect its former HLC and still contribute to its current character have been significantly affected by recent developments. It is also recognised that the redevelopment of the WPD site presents an opportunity for positive enhancement of the local area.

The significance and value provided by the built environment at Pool and Tuckingmill rely not only on the retention of elements which underpin their historic landscape

character, but also the degree to which new build or the redevelopment of adjoining sites respect and thus enhance that character. Equally, the Cornish Mining World Heritage Site in turn relies for its continuing integrity, authenticity and the retention of its Outstanding Universal Value (OUV) through the appropriate management not only of key structures, sites and landscapes within its boundaries, but also those which form its landscape context. As mentioned above, there is the potential for positive residual impacts as a result of the redevelopment of the WPD site on both the neighbouring historic settlements and on the World Heritage Site (of which they form important elements).

Given the scale and type of the groundworks which will be required to redevelop the WPD site, any surviving near-surface archaeology within the site is likely to be damaged or destroyed. It is unlikely, however, that the archaeological watching briefs proposed during these works would be able to record all significant evidence for the development of the site. A permanent loss of archaeological information relating to early copper mining activity in Cornwall, and on this site in particular, is therefore inevitable as a residual impact.

12 Conclusions

The Western Power Distribution depot at East Hill crossroads, Pool occupies a site which was part of that worked by one of the first and most important copper mines in Cornwall, and one which witnessed active mining from 1711 until 1874, though the exploitation of these lodes at depth continued for over a century more until the closure of South Crofty in 1999.

At surface, nothing now survives to indicate this long and important history of mining, in particular the significant role played by Pool Adit and Trevenson Mine in the development of an industry which would place Cornwall at the centre of worldwide technological development and which would underpin the World Heritage Site status inscribed by UNESCO in 2005. Not far beneath the tarmac surface of this currently unprepossessing site, there may still survive the evidence for some of the important first steps taken in that process.

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14 Project archive

The HE project number is **2011047**

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

1. A project file containing site records and notes, project correspondence and administration.
2. Digital photographs stored in the directory R:\Historic Environment (images)\Sites\Sites.W\WPD depot Pool assessment 2011047
3. English Heritage/ADS OASIS online reference: cornwall2-101109
4. This report text is held in digital form as: G:\Historic Environment (data)\HE Projects\Sites\Sites W\WPD depot Pool assessment 2011047\WPD depot assessment report.doc

15 Appendix: summary results of a watching brief carried out during geotechnical test trenching and test pitting

See Fig 32.

A programme of geotechnical trenching and pitting was undertaken between 23 and the 26 May 2011 by Cornwall Mining Services Ltd, HE Projects undertaking an archaeological watching brief during this work.

Five trenches and six test pits were excavated. In each case, the tarmac surface was cut out with a road saw, following which a JCB equipped with a 1.0m toothed bucket excavated the fill material in spits. In the case of the test pits, soil compression testing was carried out at the stages when the topsoil and subsoil were exposed. Once this had

been undertaken the test pit was deepened to the point where structural bedrock was exposed. In the case of some pits around the periphery of the site (Pits 1-3), water permeability tests were also carried out. Structured bedrock was found at about 1.8m from surface in all cases but that of Pit 6, where firm bedrock was found at about 1.25m from surface.

Test pits

Test pits P1 and P2, 2.8m deep and 3.3m deep respectively, like the other test pits, measured approximately 1.5m x 1.0m in plan and showed natural profiles from topsoil through subsoil to bedrock with almost no evidence for mine waste beneath the modern tarmac and sub-base gravel. Some mica spotting was found within the fractured metamorphosed Mylor Series slates forming the bedrock, together with a degree of Psilomelane (hydrous manganese oxide) or Pyrolusite (manganese dioxide) coating on fracture planes, resulting from the movement of mineralised water through rock which had been squeezed and baked by the emplacement of the underlying granite.

In Trench P3, which was 2.8m deep, this profile was overlain by 600mm of demolition rubble, including granite quoins and a cast iron drainpipe, which are assumed to have derived from the cottage which occupied a site near this location (inventory Section 9, site 12).

The ground immediately below the tarmac in Trench P4 was occupied by a sand-bound levelled greenstone cobbled surface with its surface 400mm from the top of the tarmac, over which a deposit of coal dust and fine cinder had built up, suggesting that this area had been a deliberately-surfaced area of North Crofty mine, perhaps a coal yard serving the nearby whim engine house. The underlying ground showed a natural profile, despite its proximity to the lode outcrop running across the site on which the nearby shafts had been sunk. The trench was excavated to a final depth of 2.8m from surface.

The ground beneath the tarmac in Trench P5 was occupied by mixed rubble to 300m below surface, this material incorporating some engineering bricks, indicating a generalised build up and levelling of the original ground surface prior to the creation of the modern yard. Bedrock was found at 1.9m from surface, the base of the trench being at 2.7m from surface.

Trench P6 was set adjacent to the boundary fence near the vehicle maintenance workshops. Beneath the tarmac surface the upper 350mm of ground was made up of mixed rubble, cut through by a redundant pitch fibre soil drain.

Trenches

The test trenches were also opened up in spits, though given their lengths and the limited reach of the JCB back arm, this was undertaken in a series of 3.0m sections. Again, the trenches were excavated down to structured bedrock.

Trench T1 was L-shaped, each arm being approximately 20m long and 2.5m wide. A thin spread of mine waste down to a maximum of 600mm from surface was revealed beneath the tarmac cover, this directly overlying a natural profile topped by a very compressed topsoil. A decayed greenstone lode trending at 258 degrees magnetic was found traversing the NW-SE aligned arm of the trench. This was excavated to a maximum depth of 4.5m from surface, but was found not to have been worked at this depth.

Trench T2, 9.5m long, was trenched to an average of 1.5m depth. Again, a thin band of remnant greenstone and quartzite mine waste underlaid the tarmac surface having been laid down directly onto the topsoil, which was very compressed as a result. The underlying metamorphosed slates were very fractured and displayed mica spotting and manganese oxide coatings.

Trench T3, the longest on the site (40m), contained almost no mine waste beneath the tarmac, being sited within what appears to have always been an agricultural enclosure

prior to the development of the forerunner of the SWEB depot during the 1950s. The profile was natural throughout, with no indications of any lodes.

Trench T4, 25m long, was expected to reveal signs of the lode picked up in Trench T1, but this was not seen, and had perhaps been faulted. The profile was similar to that seen in the other trenches. No evidence for site 10 was found in this trench.

Trench T5, 27m long, was the last to be excavated. At its south-eastern end a narrow band of decayed greenstone marked the position of an unworked lode. A second, slightly wider lode of similar form was exposed in the trench section about 5.0m to the north-west. Two thirds of the way along the trench towards the north-west, a backfilled hollowed area 400mm deep containing hydrocarbon residues (possibly an area where waste oil had been disposed of) mixed with undecayed vegetation fragments abutted a 300mm wide, 125mm deep concrete slab of unknown function. Just to its south-east, a 1.0m wide surface made up of large greenstone blocks was found, this overlying the contaminated hollowed area. Resuming the excavation to the north-west of the concrete slab, the ground near surface again consisted of a thin skim of mine waste over a compressed topsoil overlying a yellowish slate-derived subsoil which became increasingly stony in depth. At 1.5m from surface, however, where bedrock had been expected to be encountered, the ground became abruptly less stony and far more free-cutting, its colour becoming notably darker in colour. The archaeologist instructed the excavator driver to deepen the trench from this point onwards to pick up bedrock, the eventual depth of this section of the trench being 2.4m, where structural bedrock was finally exposed. It became clear that the ground here had been considerably altered by metamorphism associated with a series of parallel lodes, much of the bedrock being very soft and having lost almost all structural cohesion. The influence of this lode structure (probably Reeve's Lode, see Fig 9) was found to extend almost all of the way to the north-western end of the trench, a length of 5.0m. No indications of any working of this lode were found at this depth.

Summary

The underlying geology exposed within these trenches and pits is complex and clearly considerably affected by metamorphism, a number of greenstone lodes and the circulation of mineralised groundwater. However, the upper 1.5m of the natural profile appeared to consist of un-metamorphosed small blocks of angular slate within a clay matrix. A small number of partially abraded pieces of greenstone were found within this material, together with a couple of quartz pebbles and also isolated pieces of lode quartz, suggesting that this is a geologically redeposited material which has been transported from another location, and may represent head material moved by solifluction during an inter-glacial period.

The trenching and test pitting also revealed that the majority of the mine waste documented on archive maps has been removed, leaving only a thin remnant skim; the most likely mechanism for this is bulk removal using mechanical excavators, given the consistent thinness of the deposit. In one location (P4), however, part of an intact cobbled surface associated with mining activity was found beneath the remains of the mine waste, suggesting that some early surface mine features which had been overdumped during the later operations of North Crofty may well survive. The evidence also suggests that the cottage complex formerly sited in the northern corner of the WPD depot has been substantially demolished, and that little may now remain except its foundation courses.



Fig 5. An extract from the OS 1809 1st Edition 1" to the mile mapping. No indications of Trevenson Mine are shown on this source.

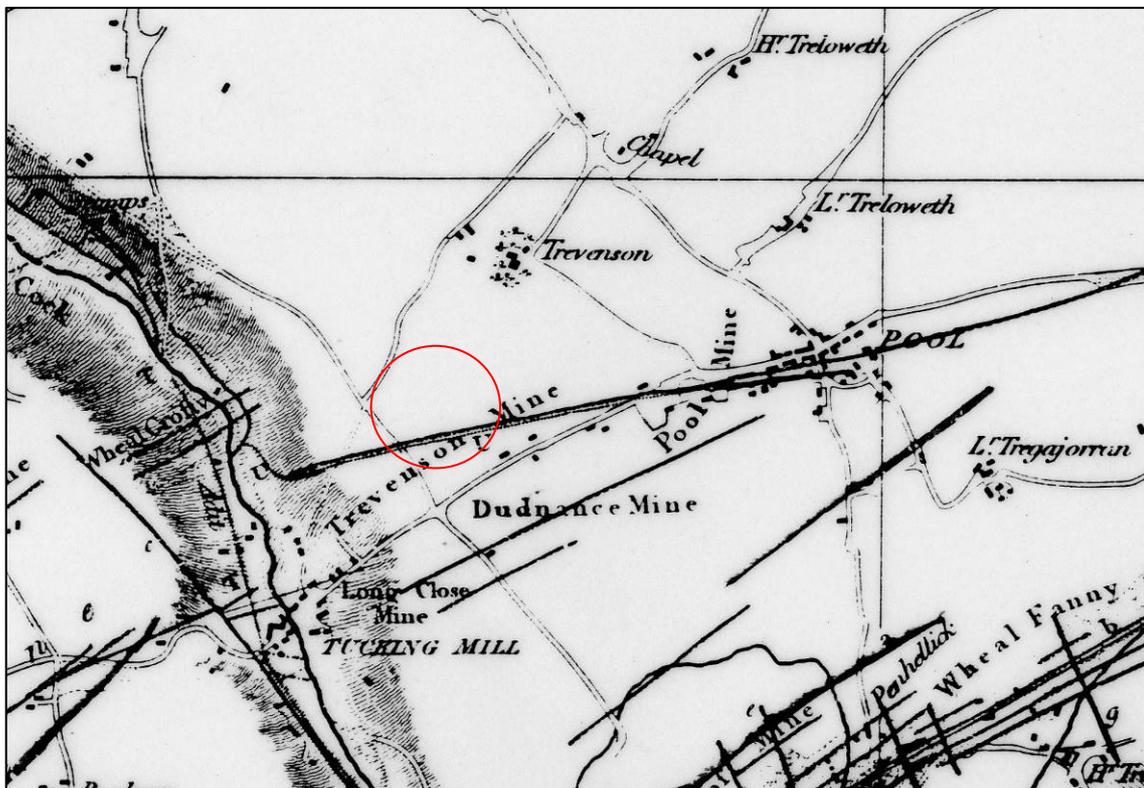


Fig 6. An extract from Thomas' 1819 Geological map of Camborne and Chasewater, showing, the settlements of Pool and Tuckingmill, and the sett of Trevenson Mine amongst others. The red circle indicates the project area.

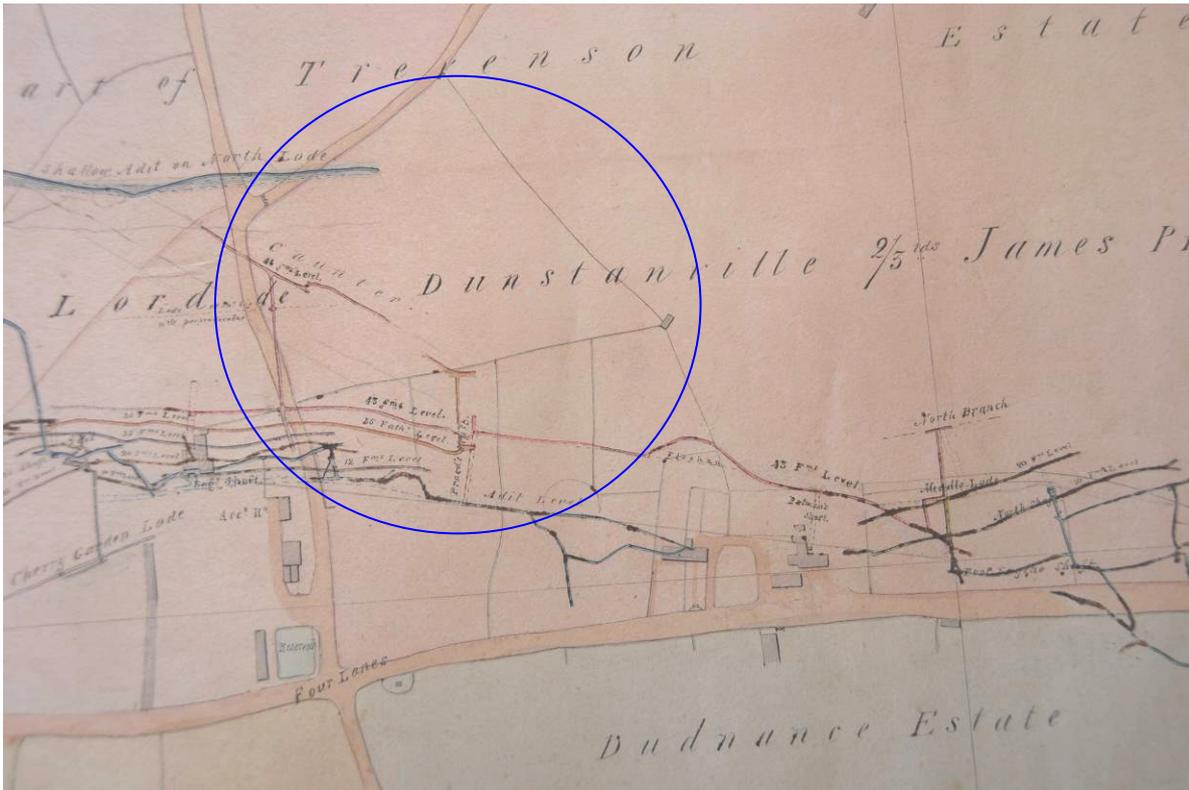


Fig 7. An extract from an 1833 Plan of East Wheal Crofty (CRO GHW/P/45); the project area consists of the fields immediately to the east of 'Four Lanes' crossroads circled in blue.



Fig 8. An extract from the 1840 Illogan Tithe Map, showing the southern part of the project area lying within the surface part of East Wheal Crofty.

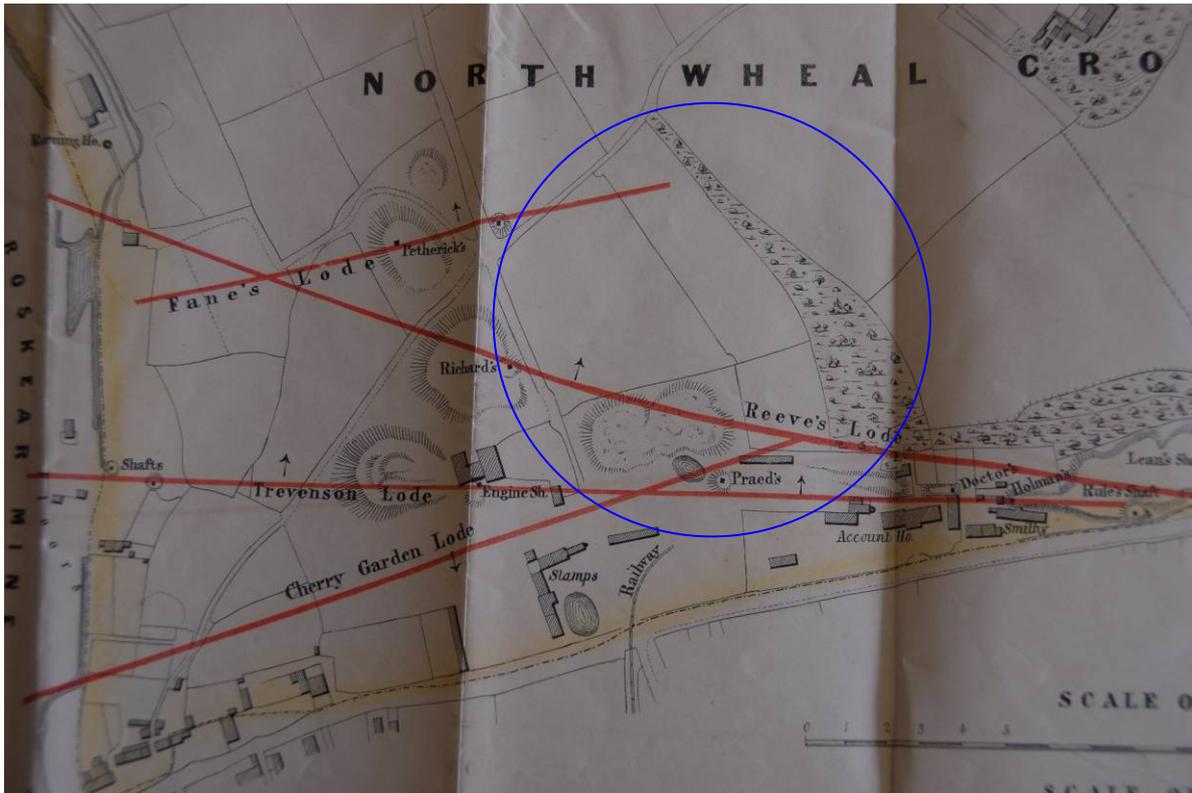


Fig 9. A circa 1850 Symons' plan of North Wheal Croft (CRO GHW/P/14). The WPD site occupies the ground to the north east of the crossroads, extending eastwards to Praed's Shaft. The plantation shelter belt was in existence by this date. The blue circle indicates the project area.

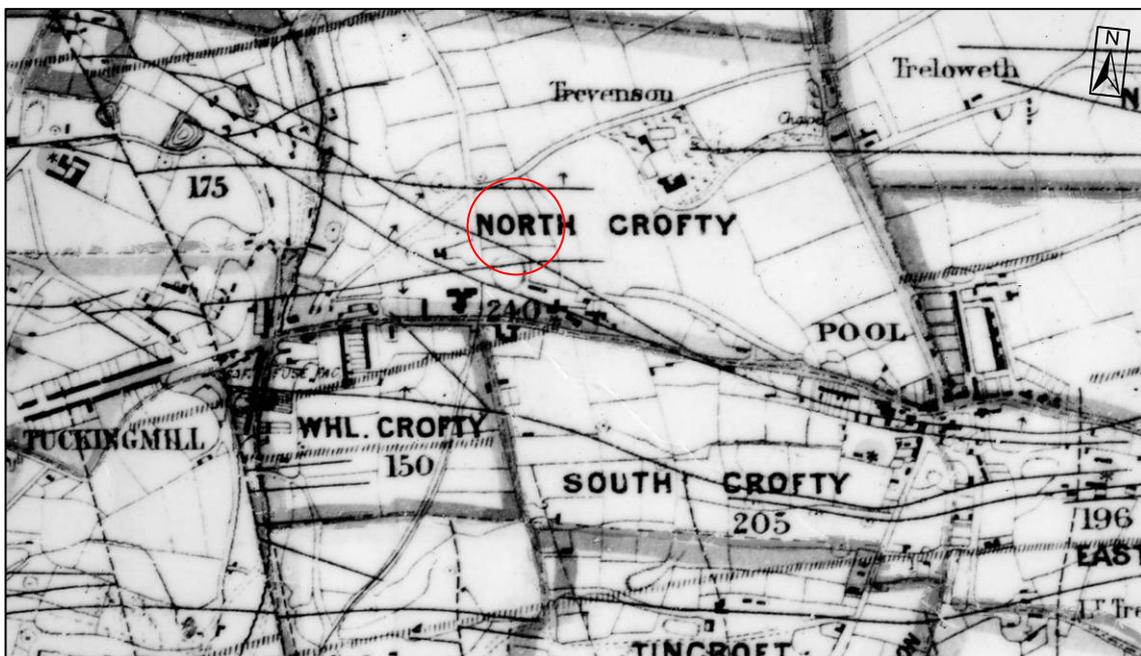


Fig 10. An extract from Symons and Son's c1870 Map of Camborne, Illogan, Redruth and Gwennap Mining District showing the sett of North Wheal Croft amongst the others in the area (CRO 147/3). The red circle indicates the project area.

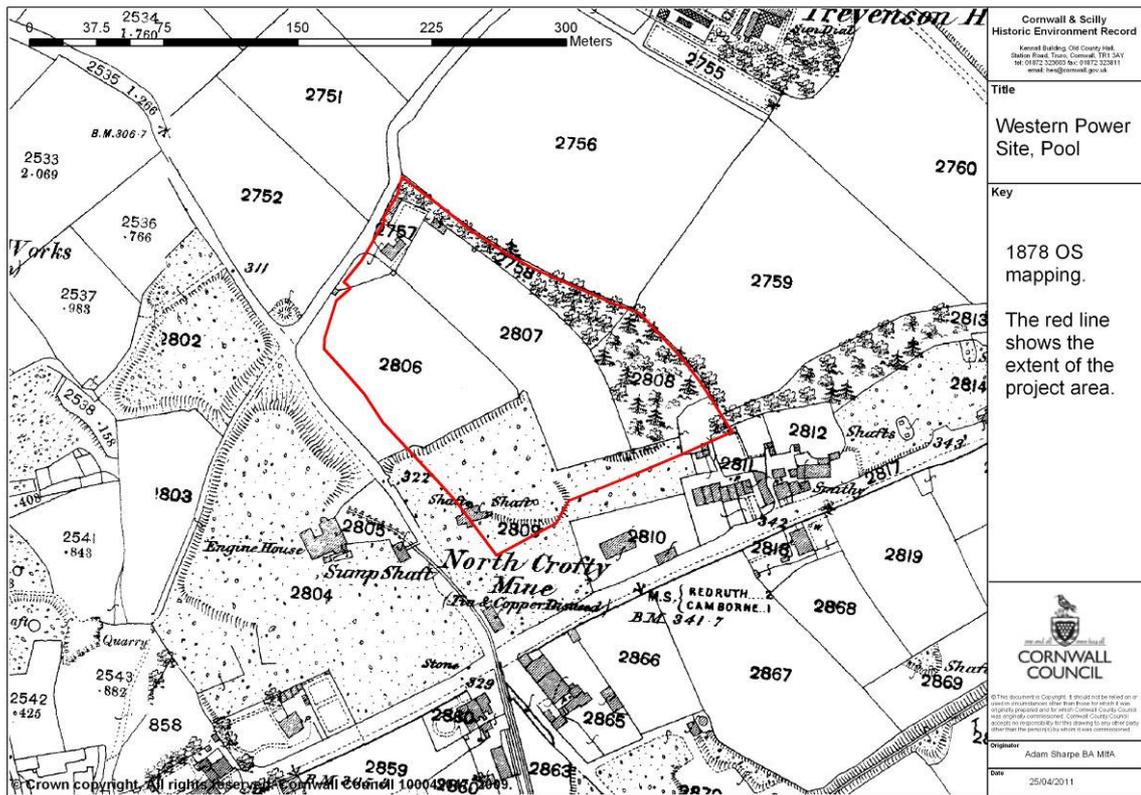


Fig 11. An extract from the 1877 OS 1st Edition 25" mapping. This provides much useful detail of the surface arrangements of North Wheal Crofty, including the whim engine house and shafts in the south-western corner of the project area.

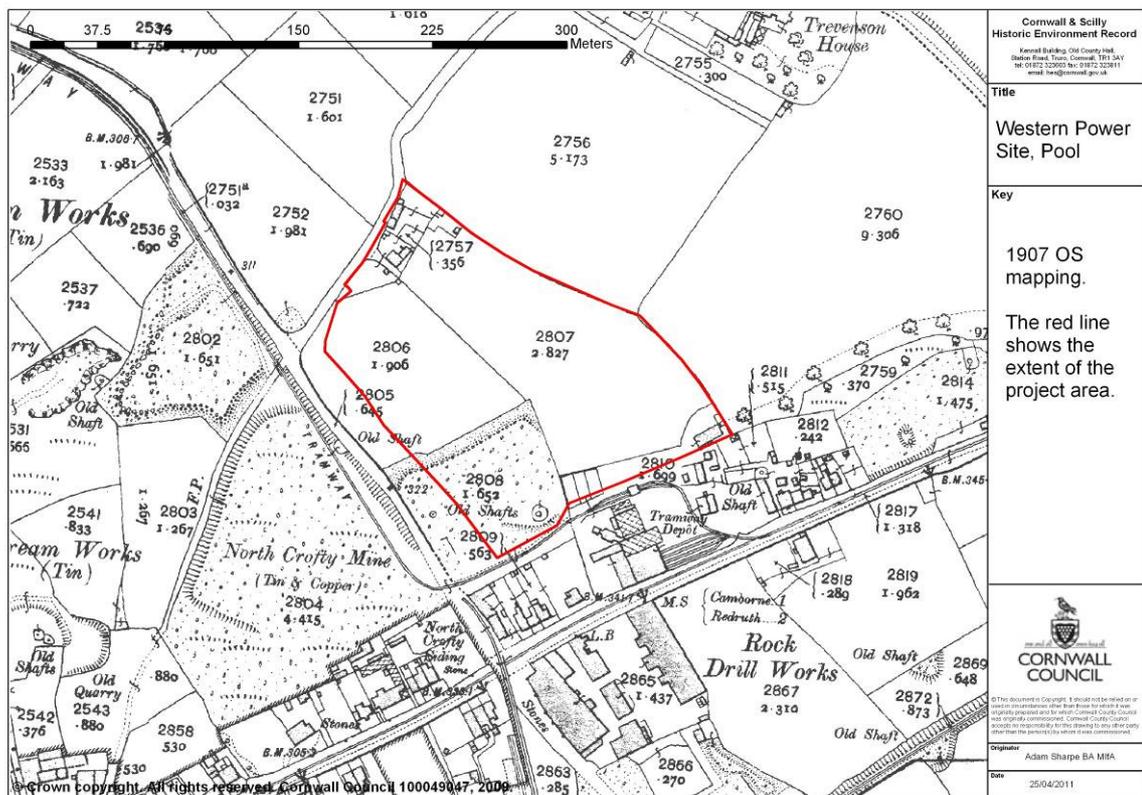
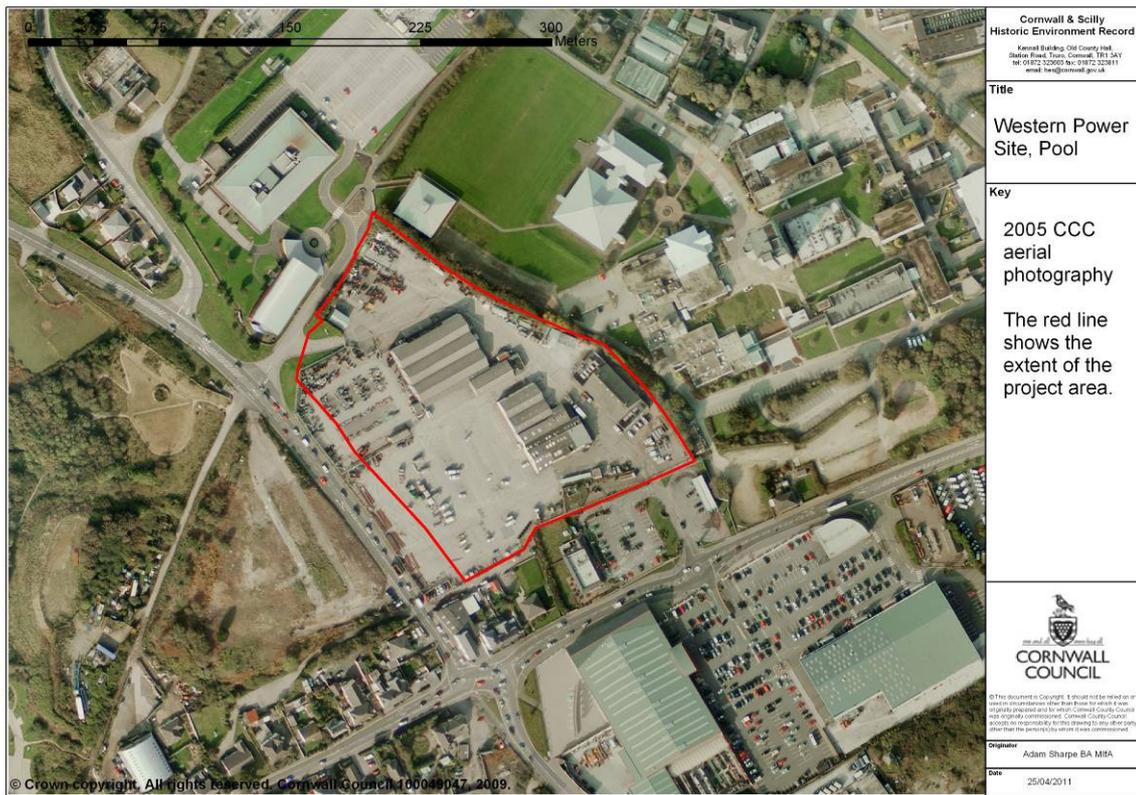


Fig 12. In contrast to Fig 11 the 1907 2nd Edition of the OS 25" mapping shows that almost all North Crofty surface structures had been demolished by this date.



Fig 13. An extract from 1946 RAF B&W aerial photograph A8 50041 (© Cornwall County Council) showing how the site remained undeveloped at this date. The red circle indicates the project area.



Cornwall & Scilly Historic Environment Record Kennel Building, Old County Hall, Station Road, Truro, Cornwall, TR1 3AY tel: 01872 32200 fax: 01872 322111 email: her@cornwall.gov.uk	
Title	Western Power Site, Pool
Key	2005 CCC aerial photography The red line shows the extent of the project area.
CORNWALL COUNCIL	
Original	Adrian Sharpe BA MBA
Date	25/04/2011

Fig 14. The project area at East Hill as shown on a 2005 Cornwall County Council vertical aerial photograph.

WPD depot, Pool, Cornwall: Archaeological Assessment



Fig 15. A version of the proposed layout of the WPD site at Pool (source B3 Architects). In this case the south-eastern area proposed for sale is shown as set aside for pole storage.

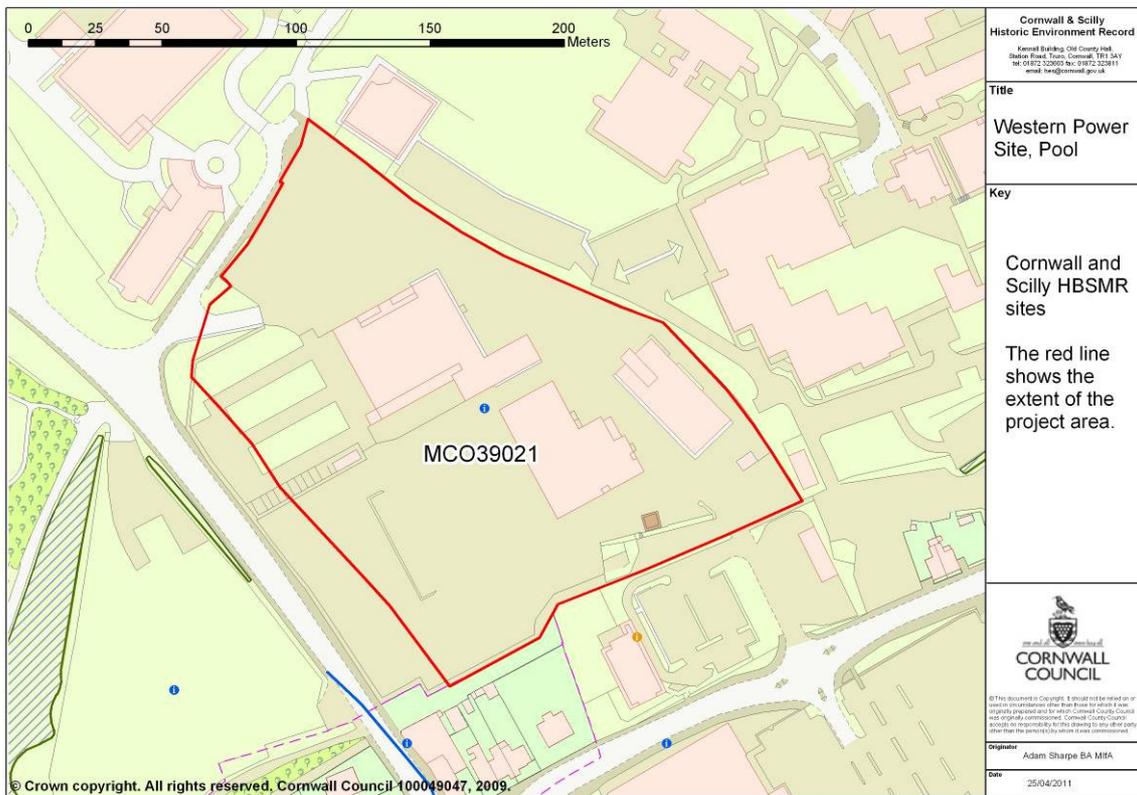


Fig 16. Sites shown on the Cornwall and Scilly HBSMR. MCO39021 relates to North Crofty Mine.

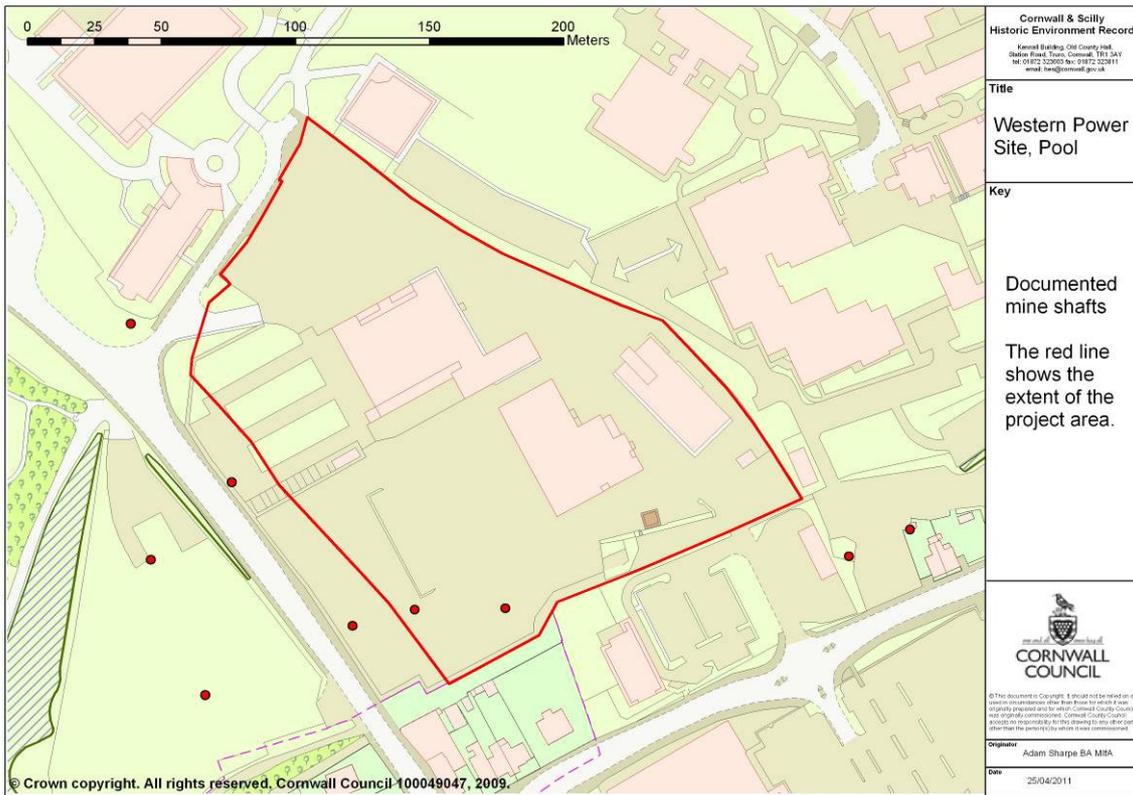


Fig 17. The location of known mine shafts (red dots) shown in relation to the project area.

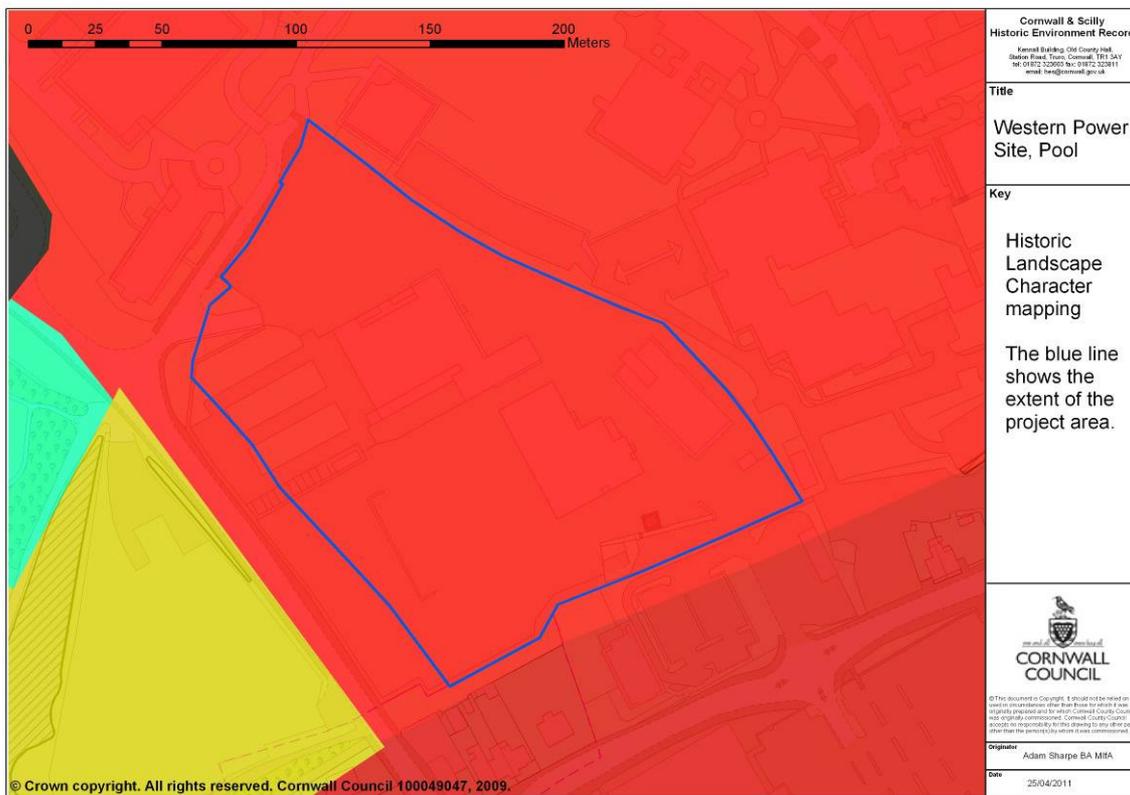


Fig 18. Historic landscape character mapping shown in relation to the project area. The brighter red indicates predominantly 19th century urban development.

WPD depot, Pool, Cornwall: Archaeological Assessment

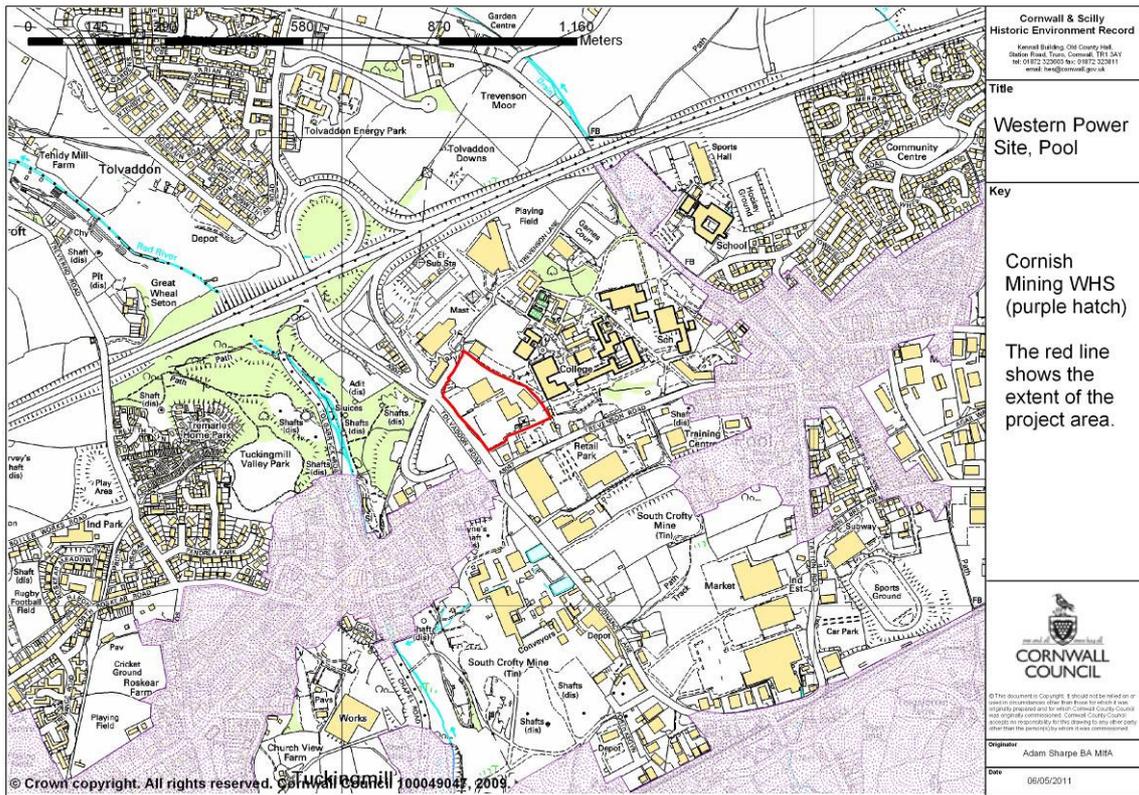


Fig 19. The spatial relationships between the project area (red line) and the Cornish Mining World Heritage Site (purple hatch).

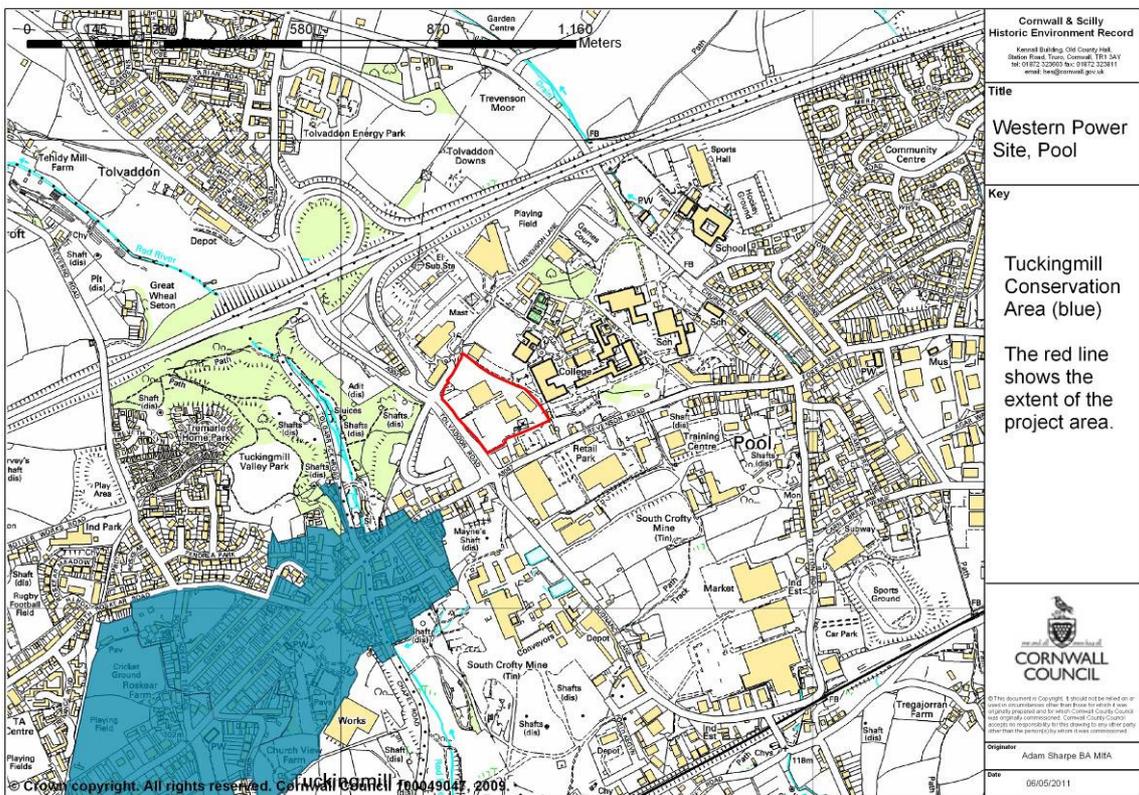


Fig 20. The spatial relationship between the project area (red line) and the Tuckingmill Conservation Area (Blue).



Fig 21. Looking south across the pole storage area on the western side of the depot towards the site of the North Crofty whim engine house at the far end of the yard.



Fig 22. The office/workshop/stores complex at the centre of the site, seen from the south-east.



Fig 23. The vehicle workshop on the eastern side of the site, probably the earliest surviving building within the depot.



Fig 24. The eastern elevation of the vehicle workshop at the WPD depot at Pool.



Fig 25. The granite wall facing of the tanks within the yard associated with the former tramway depot just to the south of the WPD depot at Pool.



Fig 26. A portable generator unit located on an area of fresh tarmac which coincides with the location of Praed's Shaft [3].



Fig 27. A view of the depot looking south along the newly-widened Tolvaddon Road. The site of the North Wheal Crofty whim engine straddled the fenceline near the far road sign, whilst one of its shafts was more or less under the silver car.

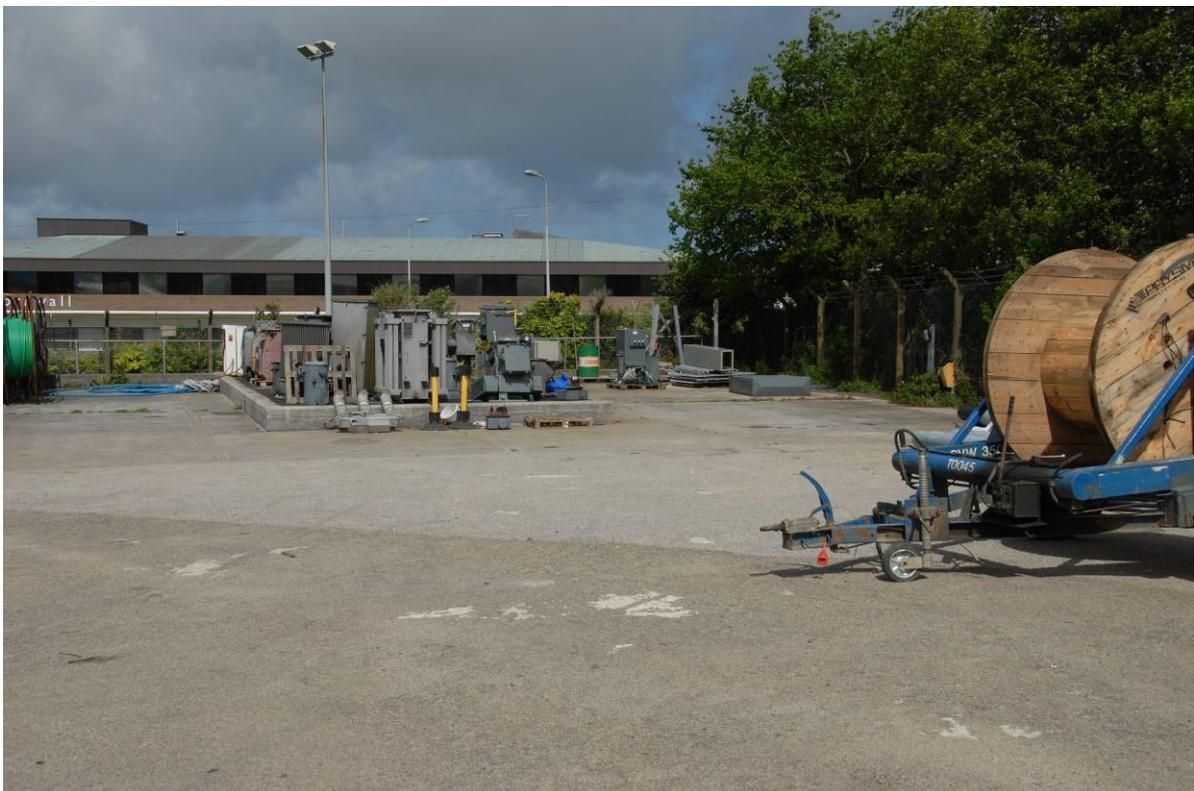


Fig 28. This transformer drain-down area in the north-eastern corner of the depot occupies part of the site of the former cottage and outbuildings.



Fig 29. The southern side of Trevenson Lane at this point is defined by the truncated remains of one of the outbuildings associated with the cottage complex.



Fig 30. A detail of the walling of the remains of the outbuilding, showing the poor quality of the bag-rubbed shillet, and the brick-quoined blocked window opening.

WPD depot, Pool, Cornwall: Archaeological Assessment

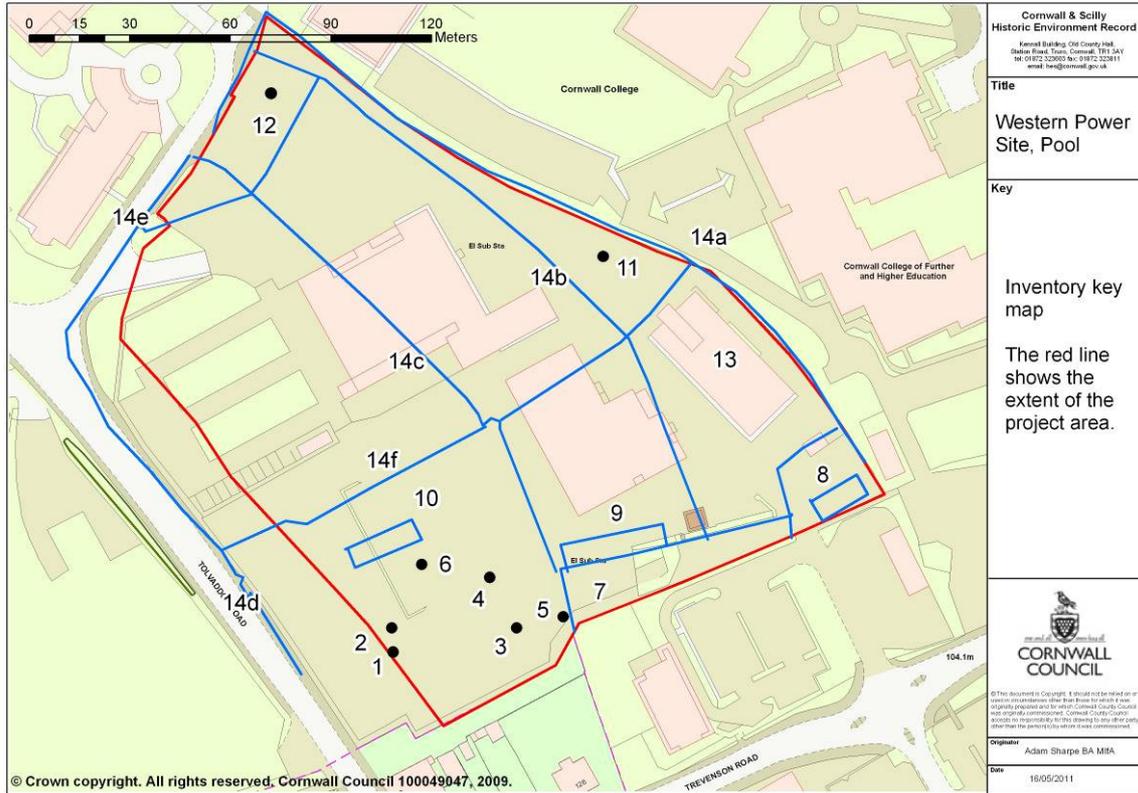


Fig 31. Inventory key map (see Section 9). The blue lines indicate former field boundaries and the locations of three now-demolished buildings.

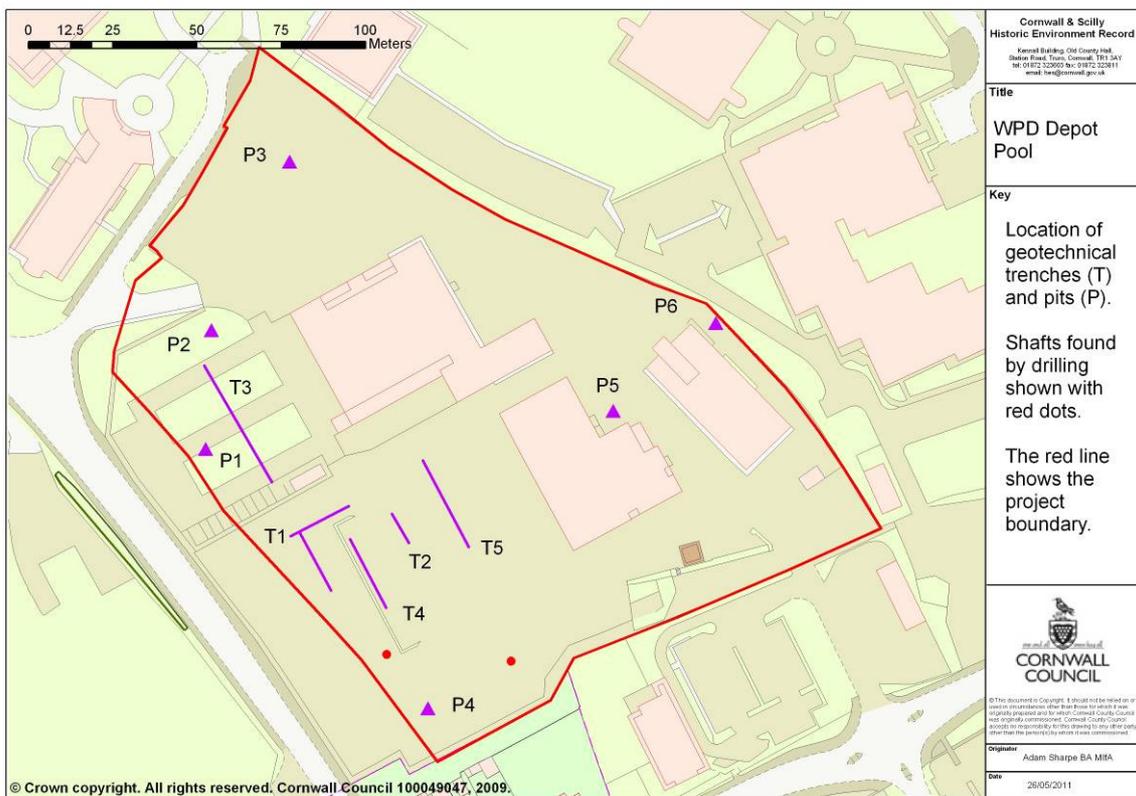


Fig 32. The locations of the geotechnical test pits and trenches excavated by Cornwall Mining Services, as well as the locations of the shafts located by drilling.