Report No: 2012R086

King Edward Mine

Camborne, Cornwall

Conservation Management Plan

March 2013

Historic Environment Projects

King Edward Mine, Camborne, Cornwall

Conservation Management Plan

Status	**This Conservation Management Plan has been adopted by Cornwall Council and King Edward Mine Ltd. See section 8.1 on page 108 for details**
Client	**Cornwall Council Culture Team**
Report Number	**2012R086**
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Acknowledgements

This Conservation Management Plan was commissioned by Jeremy Williams, on behalf of the Cornwall Council Culture Team and produced by Historic Environment Projects, Cornwall Council.

The views and recommendations expressed in this report are those of Historic Environment Projects and those of the other authors and organisations whose reports are summarised here. They are presented in good faith on the basis of professional judgement and on currently available information.

I am grateful for the assistance given me in drawing up this plan by a number of people, including Pete Dudley, Nigel Thomas, Phil Markham, Jeremy Williams (all from Cornwall Council), and especially Tony Brooks from King Edward Mine, who provided much site information and permitted the use of archive photographs currently held by King Edward Mine.

Freedom of Information Act

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

Historic Environment, Cornwall Council is a Registered Organisation with the

Institute for Archaeologists

Front Cover illustration

A 1904 colour tinted postcard of King Edward Mine. This gives a good impression of the peak years of the mine, when above and below ground training for mine students was continuing and the main surface machinery was operational.

Rear Cover illustration

A 2003 photograph of King Edward Mine taken from the same location as the 1904 image (ie from the adjacent Stamps engine house – during conservation works).

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Abbreviations

CC	Cornwall Council
CMP	Conservation Management Plan
CSM	Camborne School of Mines
EH	English Heritage
GFL	Great Flat Lode
HAR	Heritage at Risk
HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
HLF	Heritage Lottery Fund
KEM	King Edward Mine
KDC	Kerrier District Council
LB	Listed Building
NGR	National Grid Reference
NPPF	National Planning Policy Framework
OS	Ordnance Survey
OUV	Outstanding Universal Value
PRN	Primary Record Number in Cornwall HER
SWOT	Strengths, Weaknesses, Opportunities and Threats
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHS	World Heritage Site

Figure 1 An HES aerial photograph (2009) of King Edward Mine with building functions labelled (before the horizontal steam engine winder and compressor house was rebuilt).

1 Executive Summary

Following the establishment of Camborne Mining School in the late 1880s, the eastern section of South Condurrow Mine (1864-1896) was leased from the Pendarves Estate and renamed King Edward Mine (KEM) in 1901. Three years later after the mine was equipped with new surface machinery, buildings and a new Mill, it was successfully operating as a training facility (above and below ground) for students of Camborne School of Mines, the main practical mine training school in the country.

King Edward Mine is now the oldest complete mine site left in Cornwall. The entire site contains a number of buildings (see Figure 14), many grouped into larger complexes; for example the Count House, Assay Office and Carpenters' Shop complexes (all these are unoccupied and deteriorating), and the hugely significant Mill complex. All of the main buildings on the site are Grade II* Listed due to their individual or group value, with the exception of South Condurrow Stamps Engine House (Site 44), which is Grade II. Of special significance to this site is the rare survival of collections of original mine machinery, rare milling equipment and smaller steam engines. It is also a museum for the Trevithick Society's collection of mining machinery, some of which are the only remaining examples in the world. The entire CMP area is within the Cornish Mining World Heritage Site (WHS). KEM has Outstanding Universal Value as the best preserved mine head complex within the WHS for the 1700 – 1914 period for which the WHS was inscribed by UNESCO. The museum receives an annual grant from Cornwall Council.

In December 2010 Cornwall Council commissioned Purcell Miller Tritton and Parkin Heritage & Tourism to undertake a Condition Survey, Options Appraisal and Outline Business Plan to understand these buildings and how they could be utilised to develop the site and make it viable. This was subsequently extended to develop a Master Plan and Business Plan for the whole site, which was produced in December 2011. Grant applications are underway to fund the restoration and adaptive re-use of presently underused buildings in order to generate income to make the site's continued operation more sustainable, improve the condition of some of the Listed Buildings, and reinforce recognition of KEM's standing within the Cornish Mining World Heritage Site.

The overall aim of the Conservation Management Plan (CMP) is to ensure that the significance and special importance of King Edward Mine is retained and enhanced through future maintenance, conservation and development works. It will also facilitate on behalf of KEM, its preservation group, directors and volunteer staff, their aim to continue to respect the significance and value of the site, to enable it to be more publicly accessible, to provide an exciting and informative experience for visitors, and above all to ensure financial sustainability for its continual operation. The vision for King Edward Mine should be:

King Edward Mine is a thriving Cornish mining visitor attraction enjoyed by 'one and all', and previously redundant buildings are restored and sustainably reused, thereby securing the long term preservation and enhancement of the best preserved pre-1915 mine site within the Cornish Mining World Heritage Site.

King Edward Mine is sited at the western end of the Great Flat Lode, an area demonstrating key authentic aspects of the 19th and early 20th century Cornish mining industry. The overall complex has Outstanding Universal Value as the best preserved mine head complex within the WHS for the relevant 1700-1914 period, and as a prominent mine site in the best preserved mining landscape within the WHS.

This KEM CMP informs, guides and influences management decisions for the foreseeable future; reinforcing heritage and conservation philosophies to achieve long term sustainability.

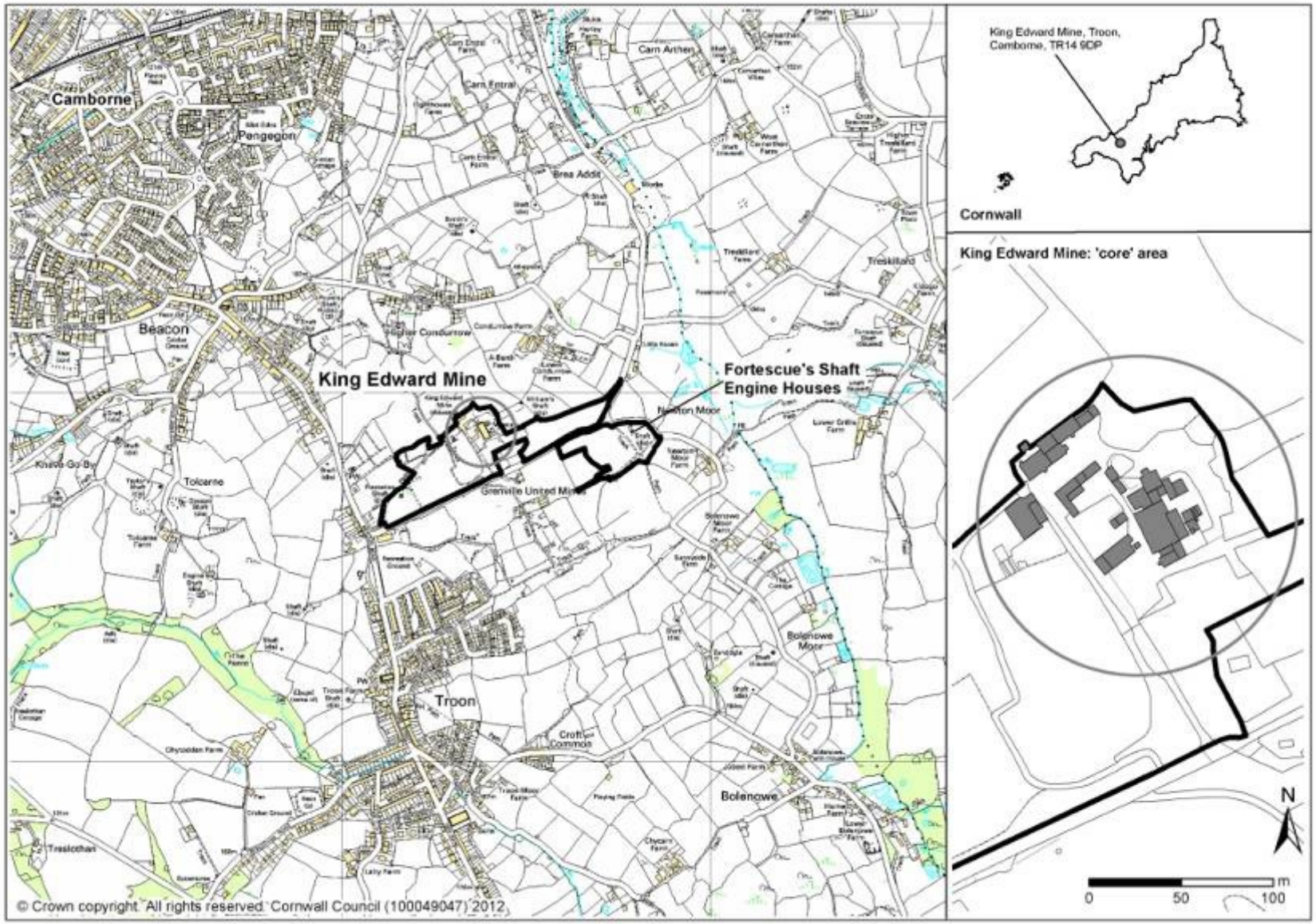


Figure 2 Location map of King Edward Mine and surrounding area

2 Introduction

This Conservation Management Plan is intended to provide an easily understandable introduction to King Edward Mine which will enable all readers to understand the site, its significance, as well as the natural, historic and technological processes that have created it. It also sets out the issues which currently affect it, the philosophy underlying proposals for its future management and the ways in which the management vision can be realised.

2.1 CMP background

King Edward Mine was developed within a part of the former South Condurrow sett which worked from 1864 to 1896. It was taken over by the Camborne School of Mines (CSM) in 1896 and reorganised as a training mine to enable its students to gain practical experience in all fields of their discipline. Part of the site, which included the mill complex and its associated buildings, became redundant in 1974 when CSM relocated from Camborne to Pool. A volunteer group was set up in 1987 to try to preserve these now redundant structures, to restore the mill and in time to open it as a museum. This was achieved and the museum opened in 2001. CSM finally terminated their lease for the whole KEM site in 2005, when responsibility for the operation and development of the museum passed to King Edward Mine Ltd. (a not for profit company). In 2009 Cornwall Council acquired the freehold of the site from the Pendarves Estate. The King Edward Mine site area is entirely in the ownership of CC, and in 2012 KEM Ltd obtained a 30 year lease from CC for the entire CMP area. The Wheal Grenville site (Fortescue engine houses) is leased by CC (see Fig 3).

The complex of structures making up the core area of the King Edward Mine site are unique in that they were almost all constructed during a single development phase (1897 – 1907), each for a specific function. It is extremely rare that most of the original buildings have survived without significant modification. For this reason, many have been accorded designation as Grade II* Listed Buildings (the associated South Condurrow stamps engine house is Listed at Grade II, and the nearby Fortescue's Shaft pumping and winding engine houses on Grenville United Mine are Scheduled Monuments). The site is also a key element of the Cornish Mining World Heritage Site in recognition of the very important role it played in the development of the Cornish mining industry.

However, some elements of the site, in particular the Carpenters' Shop, Assay Office, and Count House complexes are not appropriately utilised, and in 2011, proposals were put forward for their adaptive re-use. A master plan and business plan for the site was prepared in 2011, and ERDF and HLF grant bids are currently being prepared by Cornwall Council to achieve these works and the possibility of other schemes to improve the visitor experience, their engagement with the heritage of the site and area, and to increase the number of visitors with the overall aim of making the site more financially sustainable. This Conservation Management Plan will guide these specific proposals and the wider management and future development of the site.

Following production of a Conservation Management Plan Statement of Requirements by Cornwall Council (Culture Team) in July 2012, Historic Environment (Projects) were successful in tendering for production of this document, adapting existing surveys for the main core buildings and undertaking a consultation workshop.

2.2 Aims and purpose

The overall aim of the plan is to ensure that the significance and special importance of King Edward Mine are retained and enhanced through future maintenance, conservation and development works on site. The broad aim of this Plan is:

- To undertake a thorough assessment of the physical resource presented by the wider King Edward Mine study area (see Figs 2 and 3).
- To identify significant building phases and original features within each building.

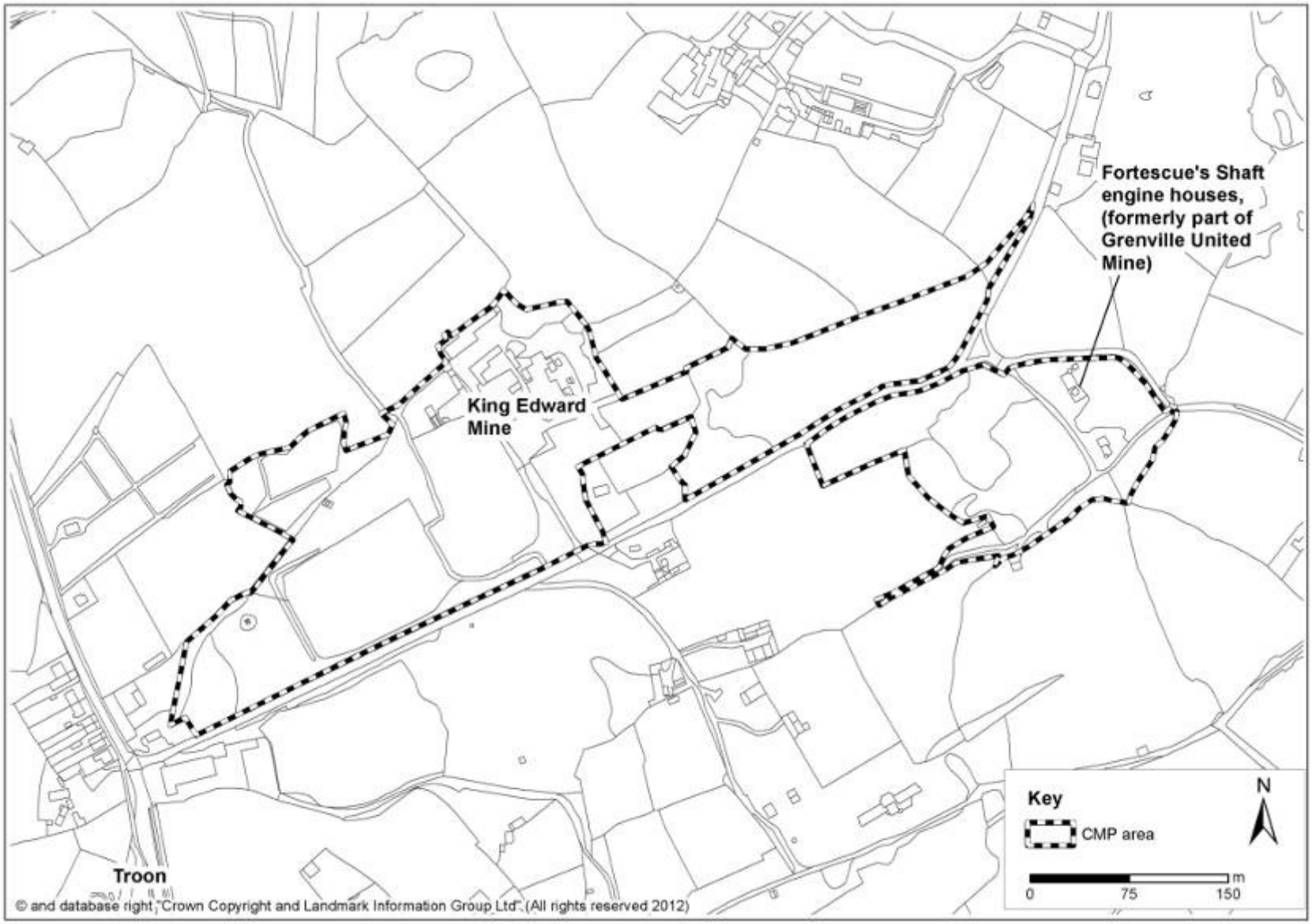


Figure 3 Plan showing the CMP area

- Devise a conservation philosophy for the site as a whole as well as a range of specific policies which will ensure that the site is protected, promoted, understood and assimilated into future decision-making processes.
- To inform the design process for conservation, repair and adaption for reuse of the three remaining significant sites of the Counthouse, the Assay Office and the Carpenters' Shop complexes.
- To provide an impact assessment for the proposed alteration works with an agreed mitigation strategy.
- To support planning and listed building applications for the adaption and re-use of significant parts of the site.
- To support grant applications to the Heritage Lottery Fund and EH for the continued enhancement of the site to create a sustainable visitor centre.
- To inform the long-term management of the site.

2.3 Conservation Management Plan methodology

The format and contents of this document follow the sequence as recommended in the Heritage Lottery Fund Guidance, Conservation Management Planning (April 2008), starting with the historic analysis of the site and concluding with policies for its future management. A gazetteer and detailed block plan of KEM buildings is given within this document as well as an overall site inventory plan within the CMP area. Detailed assessment record sheets have been compiled for those significant buildings with original fitments and features that will be impacted by proposals given in the 2011 master and business plan proposals.

This plan has been prepared by members of Cornwall Council Historic Environment Projects; specifically Colin Buck, Nigel Thomas, and Peter Dudley. Colin Buck (and Adam Sharpe who produced the project design), have specialised in all aspects of industrial archaeology during the past twenty years, and have both produced Conservation Management Plans. Specialised inputs for this project have also been made by an experienced local ecological sub-contractor (Cornwall Environmental Consultants), and considerable historical advice and archive photographs from Tony Brooks – KEM director and author of the book on King Edward Mine (Brooks 2002).

The first two stages of the plan were produced in draft for review by KEM stakeholders, during a workshop session held on 26th September 2012. The nature and form of Stages 3 and 5 were also discussed at the same time. The stakeholders included personnel from KEM (directors), the County Council (including Property, Planning Advice, Culture Team and Conservation Officers), with Town Council representatives. A list of the invitees (main stakeholders) is included in Appendix 10.6. Key stakeholders have been consulted on a Consultation Draft of the full document.

3 King Edward Mine: Understanding the site (Stage 1)

3.1 Introduction

This first section of this Conservation Management Plan seeks to describe and analyse a number of different important aspects in order to increase our understanding of the site, the CMP area and its hinterland. It should enable the reader to have a clear picture of King Edward Mine and the factors that combine to make it the oldest and most significant complete mine site in Cornwall.

The historical, archaeological and industrial heritage of the mine and CMP area will be described in detail, as well as annotated phased interpretative floor plans showing the development of each core building. The geological origins of the site will be described, as well as the natural biodiversity of the CMP area (a summary of an ecological report is given in Section 3.8). A summary of the significant collections housed at the site by the Trevithick Trust will also be described. The contextual relationship of the physical and

industrial landscape around the site will be discussed with special reference to the development of the Great Flat Lode and the factors affecting the choice of this site to house the Camborne School of Mines.

A detailed inventory of all archaeological sites within the CMP area will be given in tabular form with a summary description of the significant sites. In addition a site inventory and block plan of all the King Edward Mine buildings has been produced, with detailed recording sheets produced for the significant core buildings that still retain original building form, original equipment and fitments. These sheets will also describe existing condition and possible impacts (see also Section 10.5, Table 3), if present proposals for adaptive change of use proceed.

Lastly, the management of the site will be described both in terms of background, structure and other factors acting as site management constraints (i.e. statutory designations and other policies; locally, county wide and nationally).

3.2 Area context

3.2.1 Location

King Edward Mine is located to the south of Camborne between the villages of Beacon and Troon, grid reference SW 6645 3890. The CMP area is 8.5 hectares (including the Fortescue's engine site). The core of the site is a number of former mining buildings, accessible via a driveway from the lane running between Newton Road and Treskillard.

The CMP area extends eastwards to include the Scheduled Fortescue's pumping and winding engine houses (formerly of Grenville United Mine), and ends south east of Lower Condurrow Farm. The site also extends to the west and ends just short of Newton Road. Much of the wider CMP area still shows signs of former mining-related activity, although nature has reclaimed some parts (see Fig 3).

3.2.2 Landscape setting and character

3.2.2.1 Landscape setting

King Edward Mine lies towards the western end of the shallow Great Flat Lode (GFL) valley, an area dominated by a 20th century tin mining revival, on the south-facing valley side (opposite Grenville United Mine), north-east of the village of Troon, 2 km south of Camborne. The setting of King Edward mine in this GFL industrial canvas is one of a tightly concentrated island of buildings within a landscape interspersed with mining related earthworks and occasional extant engine house complexes. This 4km section of highly significant industrial archaeology has resulted in it being described as the most important surviving mining landscape remains in the Cornish Mining WHS.

The visual impact of King Edward Mine is one of a clean tidy collection of buildings, both from a distance and close-up. The tall buildings are the two engine houses; the Winding engine house (Site 24) and the nearby tall Stamps engine house (Site 44), have both been conserved (albeit using cement mortar), whilst the Mill complex walls were partly re-clad in 2001. This contrasts with (for example to the south east), the Grenville United Mine buildings of the New Stamps and Fortescue engine houses, not all of which have been conserved, with related earthwork features and landscape overgrown. The distinctive character of KEM remains its turn of the 20th century architecture (wooden buildings and corrugated sheet roofs etc), both from a distance and close–up, is a rarity in its existing rural landscape setting. Even the large visible Trevithick Society items left around the site for storage seem to accord with the visual landscape of a working mine.

With the exception of the core site of King Edward Mine, the study area boundaries of the site are a mixture of Cornish hedges (sections of which have collapsed; the boundaries repaired by post and wire fences), and fields. The Great Flat Lode Trail runs through the site. King Edward Mine has a gentle, southerly aspect and is within an agricultural landscape dominated by post medieval fields of semi-improved pasture.

The setting of this site gives magnificent views west, east (covering most of the Great Flat Lode mines), but predominantly south towards Troon.

3.2.2.2 Character

Historic Landscape Characterisation (HLC) is a tool used to gain a more holistic and integrated understanding of the ways in which our modern landscape has developed, identifying its values, potential and vulnerabilities. HLC is increasingly recognised as a valuable aid to landscape management.

Defining attributes

The HLC Type for the CMP area is predominantly Ancient Enclosed Land in the Landscape Character Area of Carnmenellis. *'The area is an elevated undulating granite plateau with outcrops in places and incised by stream valleys towards the edge. It is boggy in places and the soils are impoverished and humic. The area is open and exposed with few trees on the tops although there are some limited broadleaved plantations in the valley heads and bottoms. The field pattern varies from small fields within a medieval landscape of Anciently Enclosed Land around the fringes of the upland, bounded by sinuous Cornish hedges or hedgerows, to more recent enclosure of former rough ground into strongly rectilinear field patterns. Some areas of rough ground survive. The land is mainly down to permanent pasture with some rough grazing. The heath and wetland habitats are small and fragmented but most link along the stream valleys to form valuable ecological corridors. Some fields are being invaded by scrub. The settlement pattern is of dispersed farmsteads and small clusters of modest cottages, single or in terraces, in former industrial areas. There are also some larger industrial settlements such as Troon, Beacon and Pengegon, based primarily on terraces. Mining (tin and copper) and quarrying have been of major importance in the area in the past'* (CC HE Landscape Area Character Description 2005-7).

Evidence of this intense industrial use is visible in the form of engine houses and tips, and the monument at Carn Brea to the east. The northern part of this Landscape Character Area abuts the urban areas of Camborne and Redruth.

3.2.3 Geology/mineral lodes

Cornwall derived its wealth from its geology. Its granite uplands extend westwards from Dartmoor to West Penwith, creating a spine of outcrops, each surrounded by Devonian shales, locally known as killas. Mineralisation is the contact areas between the granite intrusions and the shales. This has created rich lodes, or deposits of tin, copper, zinc, lead and iron. This mineral wealth has been exploited since prehistoric times, giving Cornwall early importance as a supplier of metals to northern Europe.

The plateau of Carn Brea in the Carnmenellis area is formed by a large igneous intrusion (granite boss), which has given this area its distinctive topography and landscape character. The main bedrock within the study area is *'granite overlain by a strip of metamorphosed killas about ¼ mile wide, trending east-north-east, separates the granite outcrop of Carn Brea on the north, from that of Carnmenellis to the south'* (Dines 1956, 337). The chief lode is the Great Flat Lode which outcrops about 50m to the north of the western boundary road and about 80m to the north in the east. It trends about E.40°N in the west and E.30°N in the east, dipping 30 to 35°to the south. There are also five or more vertical lodes, some of which intersected the Great Flat Lode, none of which were encountered until the 1850's (particularly William's and King's Lode). Engine Shaft (Site 34) worked William's Lode (or Middle Lode) which courses E. 35° N. and underlies steeply north. Vivian's Shaft (Site 58) and New Shaft (Site 77) both worked King's Lode which courses E. 28°N. and underlies 8° to the 40 fm. level. It passes through the granite-killas junction at about 30 fathoms depth and through Great Flat Lode below the 61 fm. level (Dines, 1956, 338-9). Figure 4 shows the lodes at surface and underground as consisting of tin and copper trending north

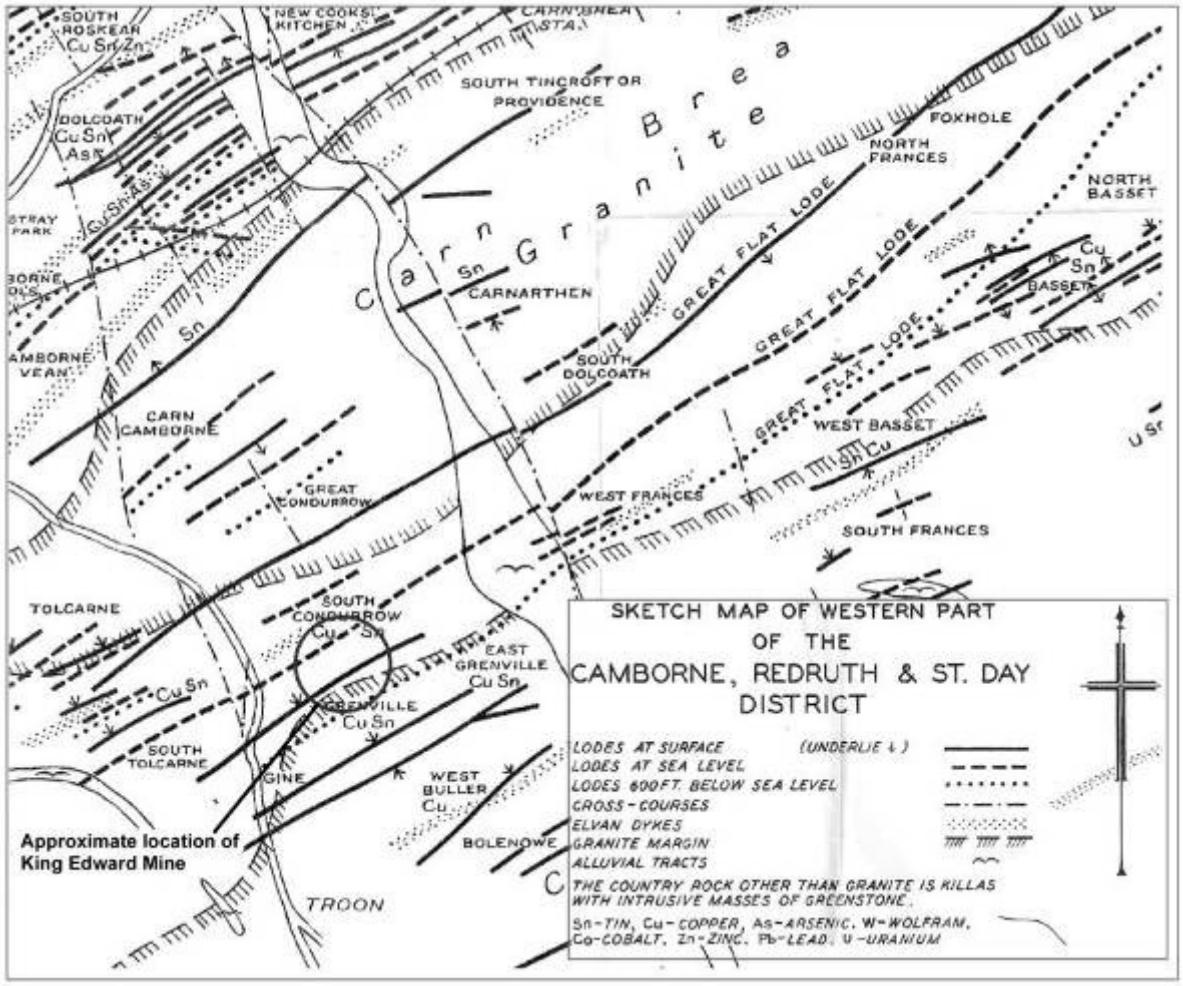


Figure 4. A map showing the mineral lodes in the surrounding area (Dines 1956, Map VIa). The CMP area is shown circled.

east to south west. King Edward Mine can be seen at the western end of the Great Flat (tin) Lode, sited in the northern side of the valley south of Carn Brea.

3.2.4 Site designations

International

All of the CMP area is included in Area A5i (Camborne and Redruth Mining District) of the **Cornwall and West Devon Mining Landscape World Heritage Site**, inscribed by UNESCO in July 2006.

National

There are no Scheduled buildings within King Edward Mine. However, at the east end of the CMP area both of the Grenville United engine houses are nationally protected **Scheduled Monuments (SM)**: Fortescue's Shaft pumping engine house (SW 66787 38894) is SM 873b (formerly a Listed Building No. 1159809), and the nearby winding engine house (SW 66809 38854) is SM 873a (formerly a Listed Building No. 1328144). Record sheets reproduced in Appendix 10.3 of this report describe these sites in detail (R15 for the pumping engine house and R16 for the winding engine house).

Most of the King Edward Mine buildings are Grade II* **Listed Buildings (LB)**. There are too many to list here, however all of the sites are listed in Section 3.5.1 (Table 2), including their relative Historic Buildings Sites and Monuments Record numbers, and whether they are on the English Heritage at Risk list (2012).

Regional/County

The CMP area is wholly within an **Area of Great Historic Value** (AGHV) for the Carn Brea/Great Flat Lode area. There are no designated sites of nature conservation importance within the CMP area (refer to the ecological context summary reproduced in Section 3.8).

3.3 Historic context

This chapter provides an outline history of South Condurrow Mine, its subsequent occupation and use by Camborne School of Mines through the 20th century and beyond. This will be described within the context of the historic development of mining in Cornwall, and in particular the development of the Great Flat Lode in the late 19th and early 20th century. In recent years there has been much written about the history of tin and copper mining in Cornwall. Although this has been summarised within the World Heritage Site nomination document (2005, revised 2013), and may be familiar territory for many, it is important to understand the historical significance, context and importance of the King Edward Mine (KEM) site.

Given the amount of historic information readily available for this site (particularly research reproduced in previous reports), numerous site survey plans produced by previous Camborne School of Mine students, and a publication by Tony Brooks (Brooks 2002 - Director and historian of KEM), no additional research has been undertaken.

3.3.1 Pre-industrial history of the area

Within the CMP area, there are no pre-industrial sites recorded on the Cornwall and Isles of Scilly Sites and Monuments Record. However, many former areas of Upland Rough Ground (now mostly Recently Enclosed Land), include earlier prehistoric ritual monuments including the stone circle at Nine Maidens, standing stones and numerous hilltop cairns and barrows. The summit of Carn Brea is of high importance, with a Neolithic tor enclosure, an Iron Age hillfort, a medieval hunting lodge and deer park. These upland sites often have traces of later prehistoric unenclosed settlements and field systems and of Iron Age and Roman-period defended farmsteads (rounds), the latter particularly around the margins of the upland area. There are medieval churches at Constantine, Stithians, Crowan and Wendron.

However, within and in close proximity to the CMP area, it is likely that the dominant pre-industrial history would have been a combination of medieval streamworks along the shallow valley sides of the Great Flat Lode, followed by periods of inactivity when farming prevailed. It would not have been until the mid 18th century onwards when lode back and shaft mining spread across the landscape; the long lines of shafts (see Fig 7), testament to the mineral lode riches that lay beneath the fields.

3.3.2 Industrial historic context

By the medieval period tin streaming was being undertaken on an industrial scale across Cornwall. In the 12th century legal control of Cornwall's tin mining industry was granted to Richard, Earl of Cornwall and the stannary system conceived. However, half a millennium later, copper mines in the west of Cornwall were, in many regions, of greater significance in terms of the sheer quantity of ore produced and their impact on the Cornish landscape and economy than were the tin mines. By the 19th century the greatest copper mining district was around St Day and Gwennap, where the Consolidated and United Mines both produced nearly a million tons from 1815 to 1872, at an early stage producing two-thirds of the world's copper production. However, even by 1850 it had been overtaken by competition from Mexico, America and Australia. In Cornwall tin maintained its pre-eminence until the last quarter of the 19th century when it reached its peak of production in the 1870s; the decline thereafter (apart from the discovery of the deep 'Great Flat Lode' – bringing a temporary resurgence of tin mining south of Carn Brea), the result of easily accessible deposits in Malaya, Bolivia and Australia.

The lasting legacy of these different mining operations is the extant evidence of these buildings in their industrial landscape context. Overall, there were at least 3000 engine houses at work in Cornwall, unfortunately only about 200 now remain standing. The iconic remains of a winding or pumping engine house are visible reminders to everyone of Cornwall's historic legacy and contribution to the Industrial Revolution. In particular, the 19th and 20th century mining remains of sites within the Great Flat lode even today still underlines a strong influence on the landscape character of the area and so justifies its status as a key part in Cornwall's World Heritage Site.

South Condurrow Mine

The early history of the site of King Edward mine starts with South Condurrow Mine, its mid 19th century predecessor. The history of this mine is described in more detail in Appendix 10.1. However, a brief summary at this stage will suffice:

What later became (South) Condurrow Mine from the mid 19th Century for at least half a century, was initially in the early 19th century, a couple of much smaller concerns; namely Wheal Polgine in 1825, Polgine and Condurrow in 1837, and prior to 1848, a sett named Old Tye. Although these small companies were unsuccessful and did not last long, mining had reached 30 to 40 fathoms below adit. Figure 5, the 1839 Tithe map unfortunately does not show any mining features, apart from fields and hedges.

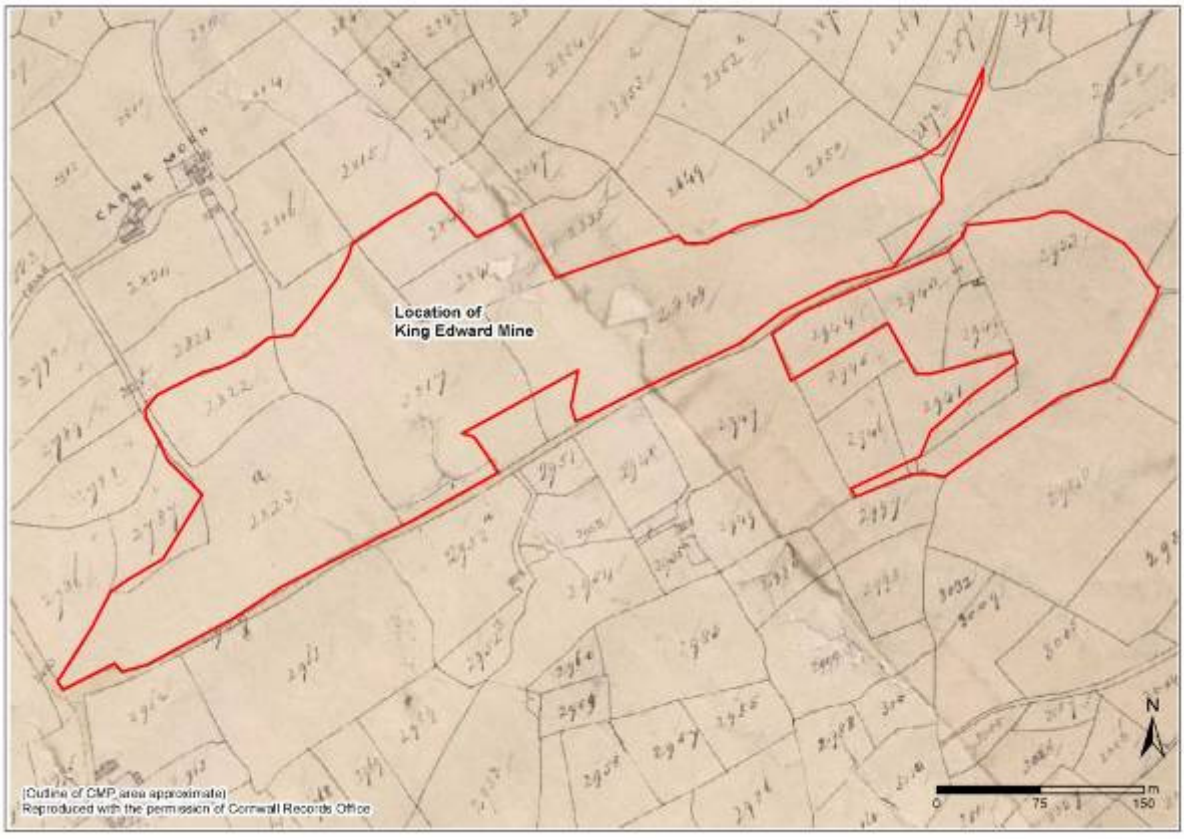


Figure 5 1839 Tithe map of the CMP area (outlined in red) showing the post medieval landscape (unfortunately omitting mining details).

South Condurrow Mine started in the 1850s, but it took nearly fifteen years of exploration before any meaningful lode was encountered. The first recorded production from South Condurrow Mine was in 1864 when 20 tons of copper ore were sold, a direct result of re-siting the pumping engine and shaft to its position next to Engine Shaft (Sites 34 and 35, Fig 14). Figure 6 shows a detailed 1865 South Condurrow mine plan

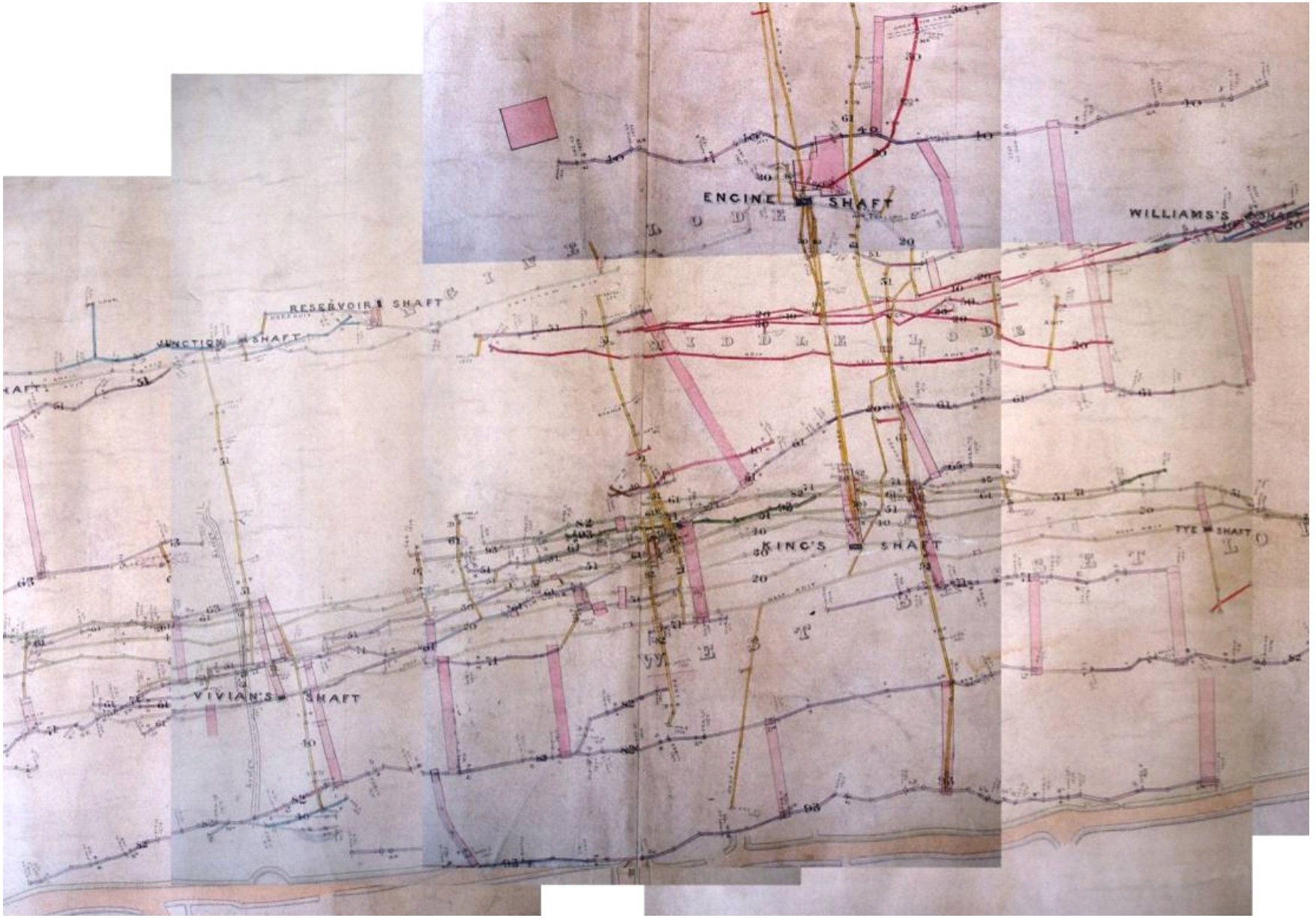


Figure 6 1865 MRO Mine Plan (excerpt) of South Condurrow (HB/D3/1). Reproduced by permission of CC CRO.

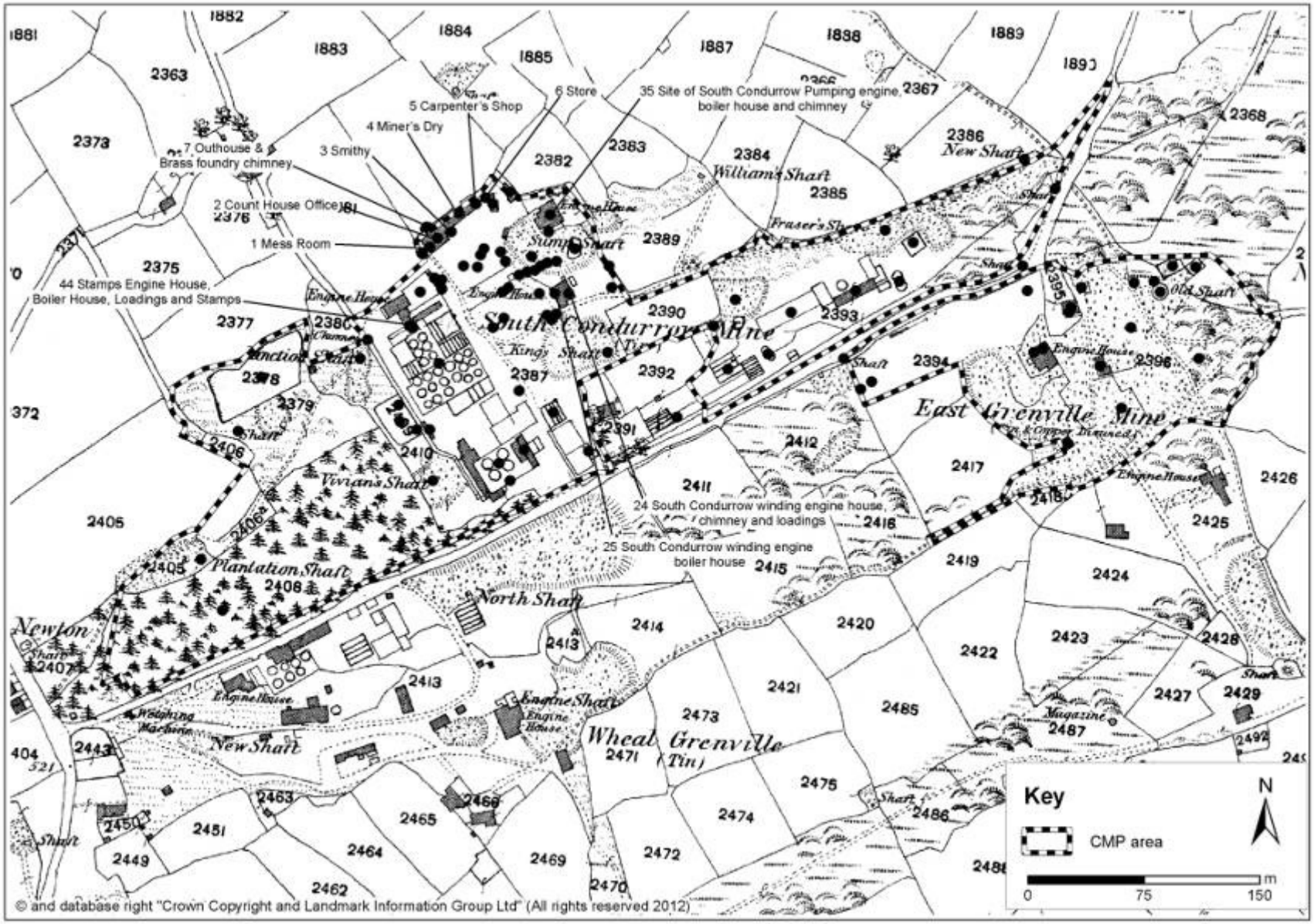


Figure 7 1877 OS First Edition map of the CMP area. Note the annotated buildings that still survive today within the KEM core.

of its underground workings. This helpfully labels the main working shafts, lodes and adits at that time, as well as the main surface buildings. The pumping engine house (Site 35) can be seen next to Engine Shaft (Site 34), and the large rectangular building to the west, which is likely to be the Counthouse (Site 2) before the adjacent buildings were built (Sites 3 to 6). By the date of the mine plan, the shaft had been deepened to 30 fathoms, which by 1868 necessitated the erection of a winding engine (Site 24). Ore production was still increasing, which necessitated a year later, the construction of a Stamps engine (Site 44) and associated stamps. In 1871 South Condurrow declared its first dividends and by the summer was hoisting and stamping 1,200 tons of ore a month at an average grade of 40 lb/ton (Morrison 1983, 171).

Although the 1870s were a time of decreasing tin market values, South Condurrow was compensating by increasing production. Figure 6 (1877 OS map) shows the mine at its heyday. An extensive ore dressing facility can be seen south and east of the engine houses. Site 46, a large dressing floor is south of the Stamps engine house (Site 44). Whilst Site 51 was an arsenic calciner/reverberatory furnace, with an associated flue (Site 52) and chimney stack (Site 53), which also served the nearby Stamps boiler house. There are further dressing floors to the east, parallel to the road (Sites 69 – 75), consisting of settling tanks and buddles (no doubt to process lower grade ore). However, all have now gone, leaving no visible trace of their existence. Figure 13 shows the inventory sites on modern mapping, whilst the inventory table is reproduced in Section 3.5.1 (Table 1).

The 1880s saw further development and shaft sinking primarily in the western part of the sett (to Marshalls Shaft), but the continual decrease of the tin value on the London Metals Exchange made further development work unproductive, and the easily winnable ore had been removed. In addition, it had experienced serious ground stability problems and had a never ending battle against water ingress. A decision was taken to give up the eastern part of the sett, and to reopen the western part of the mine in 1898 around Marshall's Shaft, although this too was short lived and the company was finally wound up in 1903. Part of the eastern section of South Condurrow Mine (including William's and King's Lodes) was leased from the Pendarves Estate in 1897 by Camborne School of Mines, and renamed King Edward VII Mine in 1901. However, South Condurrow retained the use of the Counthouse and Assay Office complex until these too were given up in 1903.

King Edward Mine

Following the establishment of Camborne School of Mines in 1888, it had finally found a training site in 1897 from which to operate at surface and underground. The Camborne School of Mines (CSM) evolved from attempts in the 1850s to improve the technical education of miners. In 1863, the Miners' Association of Cornwall and Devon adopted the Science and Art Department schemes so that students could obtain nationally recognised certificates. In 1882, work was started on building the Camborne Science and Art School. In 1888 the building was extended to accommodate the newly formed Camborne Mining School. At this time the local mining industry was in deep decline and the majority of the students came from outside Cornwall. On graduation most students went to work abroad. In the 1870's it was said that at the bottom of every mine you would find a Cornishman (in the 20th century you would find a CSM graduate in the management of every mine). Figure 8 shows the KEM mine site plan (surface and underground) in 1899, as drawn by a CSM trainee.

By 1907, after the mine had been equipped with new surface machinery, buildings and a new Mill, the site was successfully operating as a training mine for students. The Mill equipment demonstrated the most up to date technology at that time. The Californian Stamp battery had been exhibited at the Paris Exposition of 1900, the tables and vanners were automatic and the plant also incorporated hydraulic classifiers and closed circuit regrinding of middlings using a pulveriser - the first mine in Cornwall to do this. KEM was only the third mine in Cornwall to erect a truly modern integrated mill. For the next eighteen years the mine trained students underground and on the surface (as part

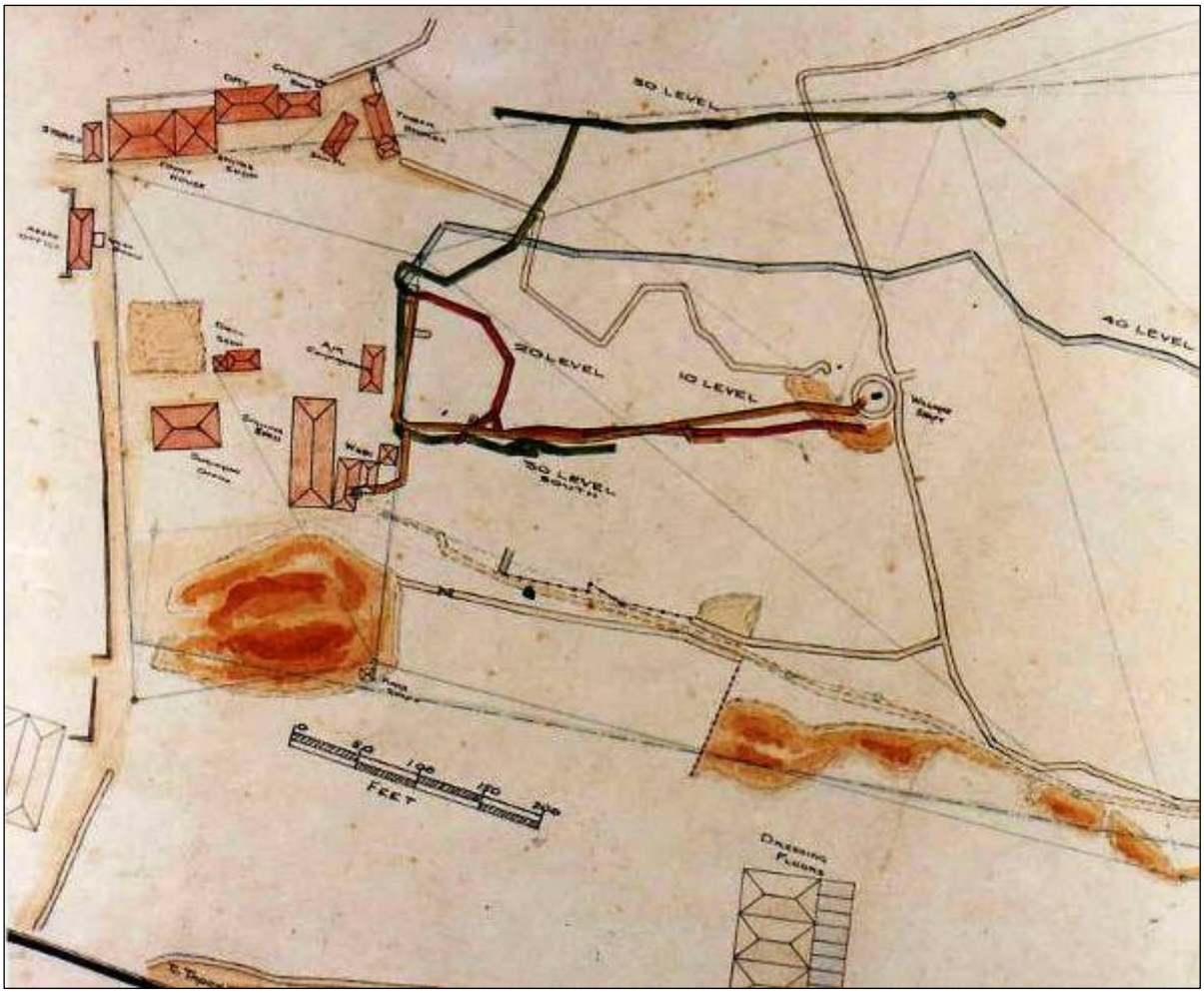


Figure 8 Reproduction of an 1899 survey plan of the mine (produced by a student). This plan shows the mine after CSM took over the lease, illustrating the new Drill House (Site 18), the new Survey Office (Site 19), and the new Compressor house (Site 29).

of an operational mine), until 1921 when Great Condurrow Mine closed, its pumps ceased working and so flooded the adjoining KEM workings.

Figure 11 shows the later earthwork remnants of mining related features shown on Figure 9, the earlier 1908 OS map, after the final closure of the Great Flat Lode mines in the 1920s. Throughout the following decades, some new buildings were added, until in 1975 most lectures were held at the new Camborne School of Mines building at Pool. However, KEM continued to be partly used for mining tuition until 2005. In 1987, volunteers decided to turn the redundant mill complex into a museum. The project was supported by the School of Mines. The volunteers, since that inception have lovingly restored and remarkably, brought back to working order much of the entire mine complex.

King Edward Mine Museum initially opened under the auspices of the Trevithick Trust in 2002, and subsequently became incorporated in 2005 as King Edward Mine Ltd, a not for profit company limited by guarantee and a registered charity. It formally opened as a visitor attraction in the same year under an informal arrangement with the Pendarves Estate. In early 2007 the Friends of King Edward Mine was formed with the aim of supporting the mine museum. The Pendarves family, whose family seat was only a mile or so from King Edward Mine, supported Camborne School of Mines from its formation and owned the land with mineral rights until 2009.

In order to secure the site's future, Kerrier District Council negotiated its purchase from the Pendarves Estate, although this was not concluded until May 2009, by which time Cornwall Council had become a Unitary Authority. Today King Edward Mine Ltd has a 30

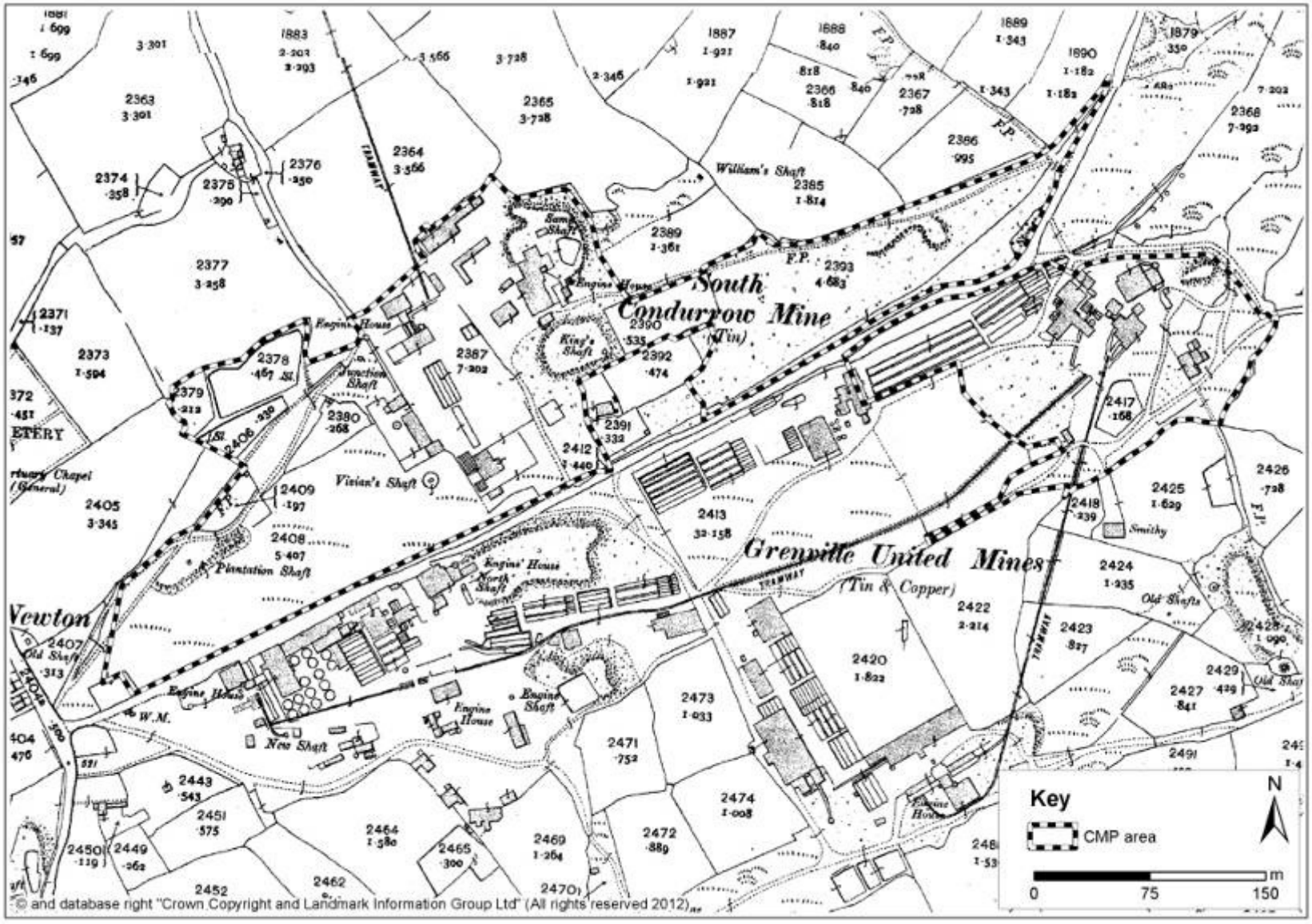


Figure 9 1908 OS Second Edition map of the CMP area. Comparisons with the earlier 1877 OS map (Fig 7) show how the South Condurrow Mine dressing floors had diminished whilst those at Grenville United had expanded (due to the Great Flat Lode tin expansion)

year lease from Cornwall Council (who also leases the adjacent Wheal Grenville site – Fortescue engine houses from the Boconnoc Estate), and manages the site as a mining heritage centre which currently attracts around 5,500 visitors per annum (including free entry and volunteers). The collections on the site are largely owned by the Trevithick Society. Camborne School of Mines, now part of Exeter University, relocated to Cornwall's university campus in Penryn and still flourishes today. The account given above is a broad summary of historical events (see Brooks 2002).

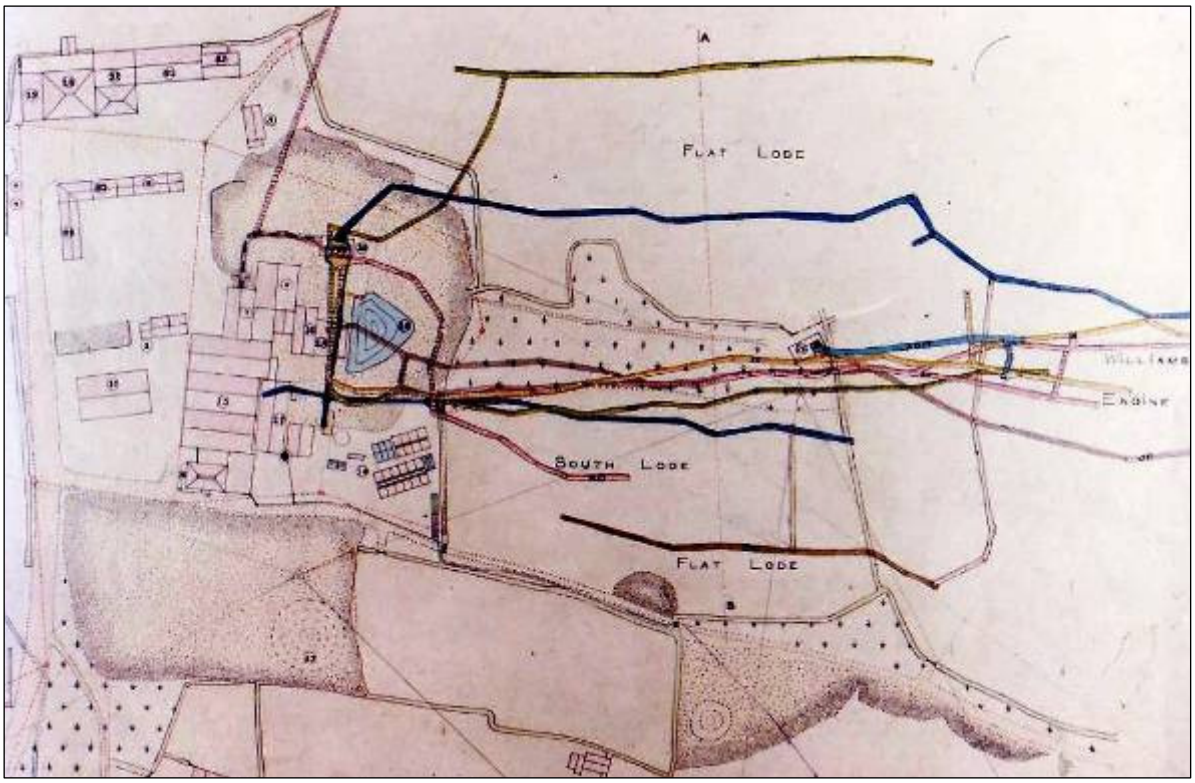


Figure 10 Reproduction of a 1912 survey plan of the mine (produced by a student).This map shows that many of the new buildings had been erected by this date

Figure 11 Reproduction of a 1946 Royal Air Force aerial photograph of the CMP area

3.4 King Edward Mine: Site context

3.4.1 History

King Edward Mine is sited at the western end of the Great Flat Lode. It is the ideal starting point from which one could discover this incredible testament to industrial archaeology (by walking or cycling). Along the Great Flat Lode is to be found the finest surviving assemblage of engine houses along a single mineralised structure anywhere in the world. For 4 km the landscape between and beyond the high hills of Carn Brea and Carnkie Hill is characterised by 24 engine houses (demonstrating a range of pumping, winding and stamping), tin dressing floors, extensive tramway sheds, mining settlements and the site of the largest remaining tin smelter in Cornwall.

At the west end of the Great Flat Lode and King Edward Mine is the Marshall's site (previously part of South Condurrow Mine), consisting of a pumping engine and winding engine (conserved in 2008 as part of the Mineral Tramways project), to the north is Great Condurrow Mine (its pumping engine house also recently conserved), and to the south is Grenville United Mine. All of these sites (even in this small localised area), place King Edward Mine in an entirely appropriate industrial landscape context of high significance, even without taking into account its position on the Great Flat Lode.

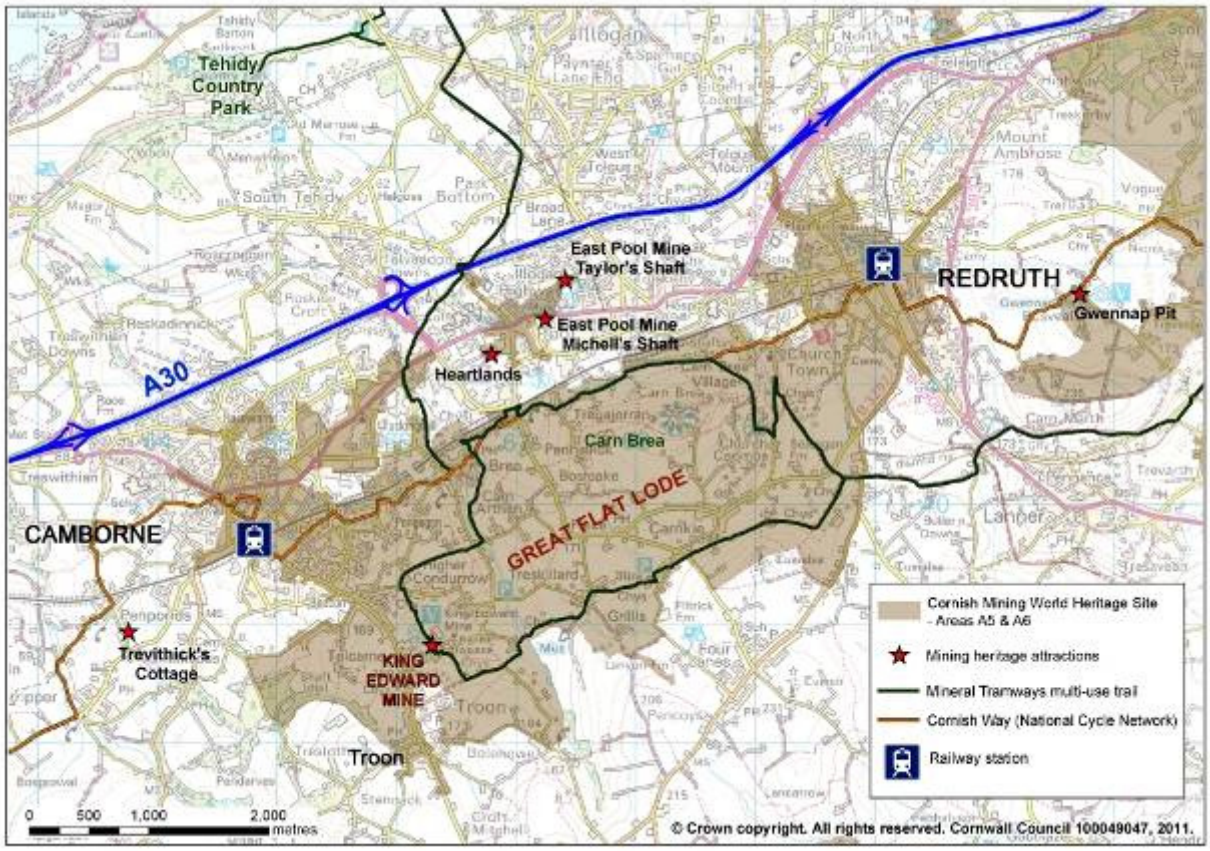


Figure 12 A map showing the geographical and industrial heritage context of King Edward Mine in 2011

South of Carn Brea, the centre point of mining activity was at the Basset Mines, the Marriott's Shaft complex (1900) and Wheal Basset. These are virtually all Scheduled Monuments, of outstanding quality of survival. They include a pumping engine house which contained an inverted vertical beam engine (unique to Cornwall), the houses for winding, crushing, compressor and a large Miners' Dry. On the south side of the valley is Wheal Basset: The stamps engine house (1868) was unusual in that it contained two separate beam engines side by side, and stands above a prominent Frue Vanner house (1908) and Brunton Calciner (1897). At West Bassett the Stamps engine house stands above one of the finest surviving nineteenth century tin dressing floors in the world.

Figure 12 shows the Mineral Tramways multi-use trail which has offered King Edward Mine the opportunity to be a base for visitors to discover this amazing part of the World Heritage Site.

3.4.2 Technology

At the time when King Edward Mine was investing in new dressing floor and machinery there were a number of technological innovations around the turn of the 20th century. One of these was Californian Tin Stamps, exhibited by Frazer & Chalmers at the Paris Exhibition of 1900. Dolcoath Mine, Camborne, a relatively affluent mine for its time often invested in new technology (usually because it was more efficient). A second example being the design of the Frue Vanner, which also was first introduced into Cornwall at Dolcoath Mine in 1898. This was an important technology for the Great Flat Lode mines as it was most effective on fine tin material and worked well where mines were stamping down to a very fine size. Large impressive structures that housed Frue Vanners can be seen at mines such as Wheal Basset. Figure 17 shows a number of archive photographs of significant items that have been at King Edward Mine or can be seen in rebuilt form, graphically illustrating (and demonstrating in the 21st century), the technological context of the site with innovative technologies of the period.

The tin-dressing machinery now at KEM is a mix of original in situ equipment and rescued equipment from other Cornish sites. Many of these have been designed, built and used in Cornwall and represent changes in dressing floor technology over centuries. These have been rebuilt and re-erected in their original positions. The original mill machinery (with the exception of the stamps), was gradually replaced after World War II with pilot plant laboratory sized equipment. This was removed in 1974 when the transfer of CSM teaching operations moved from Camborne to Trevenson in Pool. The mill became redundant leaving KEM to focus on teaching underground and surface surveying, a role it had fulfilled almost since the School's inception, making KEM one of the most surveyed mines on earth!

This site is also significant and appropriately sited in terms of WHS interpretation and education as a visitor orientation and interpretation site for the Great Flat Lode (GFL). The archaeology and quality of extant remains of tin-dressing (processing) along the GFL is exceptional and is testimony to an important period of technological improvements in the industry, much of which can be interpreted by machinery and the Mineral Tramways exhibition at KEM (in Site 21). For example, a more basic form of dressing floor technological design can be seen at Sites 94 and 95 (see Fig 13: Site inventory map), where there are substantial earthwork remnants of the Grenville United square frames, hundreds of which were aligned parallel to the road. The detail record sheets also describe different technologies relevant to each site (see Section 3.6).

3.4.3 Community

In this instance, the community could be defined as Cornwall as well as Camborne. Within the close community, Camborne School of Mines has trained thousands of men to become mining engineers and mine surveyors. It has been a world renowned training facility, sending engineers to all corners of the world. Its importance, significance and reputation to the close community is therefore paramount. For those interested in industrial mine technology, KEM has a die-hard group of local volunteers that re-build, re-erect and maintain working equipment all year round. If these volunteers stopped giving their time free of charge, the site would be closed. It is testament to their generosity that the site is one of the most complete, interesting and accessible 19th/early 20th century mine sites in the Cornish Mining World Heritage Site, if not the world.

KEM is highly valued by the local community in the Troon, Beacon and Camborne areas, and the annual open day at KEM is very well attended by local people.

In the wider community of Cornwall, recognition of the site's significance both locally and nationally, and the need to provide financial assistance through grants has been realised. During the past two decades, finance has been available to conserve, repair and maintain some of its buildings (first provided in 1990). In 2001 some core buildings (Mill walls etc) were restored by Kerrier District Council as part of the European Regional Development Fund grant aided Mineral Tramways Project. Having opened informally in 2002, the volunteers were constituted in January 2005 as King Edward Mine Ltd, and the museum formally opened to the general public that spring. The Mineral Tramways exhibition in the entrance room was grant funded by HLF in 2008. The museum receives an annual grant from Cornwall Council, and obtained a grant under the *Discover the Extraordinary* project during 2010 to rebuild the Winder/Compressor House and introduce additional interpretation.

3.5 Site assessment

Methodology

During the desktop assessment historical databases and archives were consulted in order to obtain known information from a variety of sources about the history of the site, its existing structures and former features that were known to have existed. The main sources located and consulted are summarised as follows (refer to Section 9.0 for a detailed list). In addition, primary historical documents, maps, plans and other published material held by statutory and non statutory agencies (see Section 9.0):

- Copies of Historical documents, maps, plans and other published material held by Cornwall Records Office (see Section 9.1) and reproduced in other reports.
- Published histories of local industrial archaeology (see Section 9.2): primarily Cornwall Archaeological Unit reports from the 1990s.
- Cornwall Council Historic Environment Records and Events record for the CMP area.
- Report to Kerrier District Council: King Edward Mine Options Appraisal by Roger Tym & Partners, Nov. 2007.
- Condition Survey for Count House, Carpenters' Shop and Assay Office complexes, King Edward Mine by Purcell Miller Tritton, September 2011.
- King Edward Mine: Master and Business Plan *'The Way Forward'* by Purcell Miller Tritton, December 2011.
- Mineral Tramways Conservation Management Plan, HES, CC 2004.
- The principal published source is *'King Edward Mine: An illustrated account of underground and surface operations 1897-2001'*, 2002, by Tony Brooks and John Watton.

Documentary research and fieldwork have been slanted towards the industrial development of the site. Nevertheless, sufficient background research has been undertaken to be able to summarise the pre-industrial history of the landscape within the CMP area. This research was undertaken in late July 2012.

Fieldwork

Detailed maps for use in the field were produced from the Ordnance Survey Landline Digital Mapping and amalgamated with information derived from historic maps (including the 1st, 2nd edition 1:2500 Ordnance Survey maps), and other documentary sources. Site fieldwork within King Edward Mine was undertaken on 2/8/2012 (by the author, with N Thomas and Tony Brooks), with additional fieldwork by the author within the overall CMP area on 8/8/2012.

These images were also used as part of the fieldwork map base during the field survey component of the project. Field recording was based on a mixture of photography (digital), and site notes.

3.5.1 CMP area

Figure 13 shows the overall CMP area site inventory map. The CMP area boundary includes a combination of land owned by Cornwall Council (and leased to KEM), and land leased by Cornwall Council (parts of Grenville United Mine). The site numbers given on the map are reproduced in a site inventory table (Table 1), which gives the site name, national grid reference (NGR), comments relating to approximate date, the site's significance rating, together with a reference to the appropriate detail record sheet description for significant sites.

CMP area summary description

The core of KEM is shown within the circle on Figure 13, and reproduced in detail in Figure 14. The remainder of the CMP area extends east and west of the core site. Immediately to the west, in an area now completely devoid of archaeological features, is a field of grass that once sited the mine's dressing floor. It was located below the Stamps (Site 44), for the numerous water-fed settling tanks and buddles by the late 19th century (see Fig 7). Below this a furnace or calciner complex was located, its flue vented by a chimney stack (Site 53), also used for the Stamps boiler house (Site 44). Further to the north west are two well preserved reservoir ponds (Sites 60 and 61), all bounded by high walls of stone, and to the south the site of a former tramway. The water for these were fed by a leat with additional water pumped up from depth by the Stamps engine via a shaft sited in the loadings (see Detail Record Sheet 14 in Appendix 10.3). The remainder of the ground to the west seems to have been wooded or agricultural (except for the two mine shafts (Sites 62 and 63). Many of the known mine shafts have been capped by Kerrier District Council in the mid to late 1990s.

To the east of the CMP core area, in a landscape now enclosed as small fields, in the 19th century were sited more settling tanks and dressing floors (for copper ore dressing). Older mine (air) shafts also run along two parallel lodes running east/west in this area. Some of these shafts are visible as high collared hedges, but there is no visual evidence of the former dressing floors.

The contextual relationship of the east and west parts of the CMP area to the core of King Edward Mine cannot be understated. This overall site (north of the road), formerly South Condurrow Mine, still retains its 19th century relationship between processing/dressing the ore, and underground access via visible (capped) shafts to excavate, develop and pump the workings.

Cornwall Council has also leased the former site of East Grenville Mine (see Fig 7). This was amalgamated in the late 19th century into Grenville United Mine (see Appendix 10.2). Both of the extant (Fortescue's) engine houses are Scheduled Monuments (see Appendix 10.3, R15 and R16). The remainder of the site has very little visible surface archaeology. The only exception is Site 94, the well accentuated linear earthworks; remnants of hundreds of square frames used to separate out fine small quantities of tin. Vegetation clearance of this site would reveal these substantial earthworks.

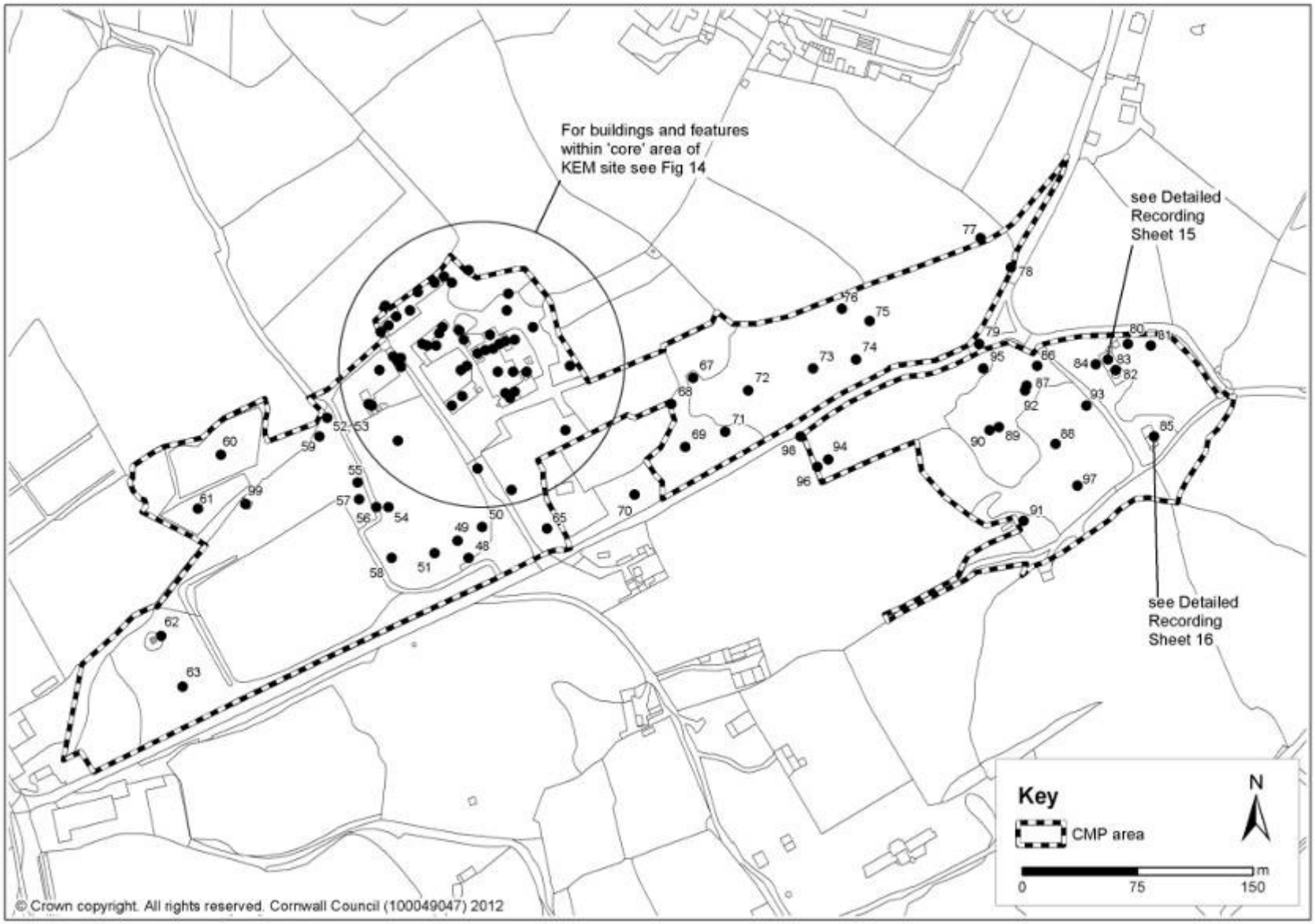


Figure 13 A map showing all archaeological sites as point data within the CMP area. Refer to the Table 1 for site description

Table 1 CMP area site inventory table

Site No.	Feature	NGR (SW)	Comments	S (Rating)
1	Count House Complex: Mess Room	66314 38925	Shown on 1878 elevation (MRO R80/3). Labelled on 1905 plan.	H **(R1)**
2	Count House Complex: Count House Office	66319 38931	Shown on 1865 mine plan (labelled on 1899 plan)	H **(R1/R2)**
3	Count House Complex: Smithy	66328 38935	Shown on 1877 map (labelled on 1899 plan)	H **(R1)**
4	Count House Complex: Miners' Dry	66333 38947	Shown on 1877 map (labelled on 1899 plan)	H **(R1/R3)**
5	Count House Complex: Carpenters' Shop	66344 38953	Shown on 1877 map (labelled on 1899 plan)	M **(R1)**
6	Count House Complex: Store	66350 38957	Shown on 3rd edit OS survey	L **(R1)**
7	Count House Complex: Outhouse & Brass foundry chimney	66312 38938	Smaller site shown on 1877 map. Brass foundry chimney shown on 1904 photo	M **(R1)**
8	Assay Office Complex: Sample House	66317 38905	Shown on 1877 map (labelled on 1912 plan)	H **(R4)**
9	Assay Office Complex: Wash/Assay House	66320 38902	Shown on 1877 map (labelled on 1912 plan)	H **(R4)**
10	Assay Office Complex: Cycle House	66322 38898	Shown on 1877 map (labelled on 1912 plan)	H **(R4)**
11	Carpenters' Shop Complex: (Offices/Carpenters Shop/Machining room)	66336 38913	Built c1903. Shown on 1907 map as Count House 1912) and Vanning Office (1905)	H **(R5)**
12	Carpenters' Shop Complex: Carpenters' Shop extension for saw machine	66339 38912	Built c1950s	M **(R5)**
13	Carpenters' Shop Complex: (Assay Office)	66347 38920	Built c1903. Shown on 1907 map (labelled as Assay Office on 1912 plan)	H **(R5)**
14	Carpenters' Shop Complex: (Stores/Dark Room)	66349 38924	Built c 1903. Shown on 1907 map (labelled as Stores 1905, Dark Room 1912 plan)	M **(R5)**
15	Welding Shop	66360 38922	1960s	L
16	Machinery workshop	66363 38916	1960s	L
17	Toilet block	66361 38896	Shown on 1899 site plan, labelled on 1912 site plan	M
18	Drill/Fitting Shop	66365 38899	Drill Shop labelled on 1899 plan, Fitting Shop 1905 plan.	M
19	Survey office	66362 38879	Shown and labelled on 1899 plan	H **(R6)**
20	Lecture/AV Room	66355 38873	Extended from earlier Survey building in 1967	M **(R6)**
21	Calciner and chimney	66393 38878	Built 1904. Shown on 1907 OS map and 1912 survey. Conserved 1990s	H **(R7)**
22	Buddle House/laboratory	66396 38882	Built after 1907, shown on 1912 survey.	M
23	Infill site	66390 38881	Infilled c1950s	M

Site No.	Feature	NGR (SW)	Comments	S (Rating)
24	South Condurrow winding engine house, chimney and loadings	66404 38895	Built c1868, shown on 1877 OS map. Conserved 1990s	H **(R8)**
25	South Condurrow winding engine boiler house	66395 38895	Built c 1868, shown on 1877 OS map. Replaced 1904.	H **(R9)**
26	Mill House	66385 38895	Built c 1903-6. Shown on 1907 map (on site of former Spalling Shed).	H **(R10)**
27	Californian Stamps Building	66377 38909	Contains Fraser & Chalmers Stamps built c1903. Shown on 1907 map.	H **(R11)**
28	Mill Engine Room	66380 38919	90 HP compound engine, built c1903. Shown on 1907 map (labelled on 1912 plan)	H **(R12)**
29	Site of Compressor House	66390 38915	Shown and labelled on 1899 plan. Burnt down 1957, rebuilt 2009 as display unit.	M **(R13)**
30	Horizontal steam engine winder and house	66396 38916	Twin drum winder (erected 1907, sold 1942). Burnt down 1957, rebuilt 2009 with original steam winder.	H **(R13)**
31	Infill building (Porch/AV Room)	66386 38913	Built c 1903-6. Shown on 1907 map.	M
32	Infill building (Maintenance Workshop)	66382 38910	Built c 1903-6. Shown on 1907 map.	M
33	Sulzer Generator Room	66372 38907	Built 1993 to site a Sulzer diesel engine.	M
34	Sump/Engine Shaft	66391 38935	Shaft sunk 1865. Shown on 1865 abandoned mine plan. Shaft collapsed and capped in 1997 (CC Rep. 1999R011)	H
35	Site of South Condurrow Pumping engine, boiler house and chimney	66392 38946	Built 1864. Shown on 1865 abandoned mine plan and 1877 OS map. Remnants revealed during shaft works.	M
36	Site of timber store	66366 38961	Shown on 1877 map (labelled on 1899 plan)	L
37	Site of (roofed) Saw Pit	66355 38953	Shown on 1877 map (labelled on 1899 plan)	L
38	Site of Reservoir pond	66408 38924	Formed mid 1860s, shown on 1877 map infilled c 1940s	L
39	Site of slimes dressing floor	66432 38899	Settling tanks shown and labelled on 1912 plan	L
40	Cobble floor area	66345 38912	Possibly dating for mid 1860s (S. Condurrow Mine)	H
41	Site of Weighbridge	66322 38904	Shown/labelled on 1899 plan	H
42	Site of timber store/Brass foundry	66309 38921	Shown on 1877 map (as outhouse). Labelled on 1905 plan as Foundry).	L
43	Walled Yard (Stamps Engine House)	66308 38896	Shown on 1877/1907 OS maps	M
44	South Condurrow Mine Stamps Engine House, Boiler House and Loadings	66301 38874	Built 1869. Shown on 1877 OS and later maps. Engine house conserved in 2000.	H **(R14)**

Site No.	Feature	NGR (SW)	Comments	S (Rating)
45	Reservoir Shaft	66303 38873	Sump Shaft in engine house loadings. Grilled 1997.	H
46	Site of South Condurrow Mine Dressing floor	66320 38850	Buddles and settling tanks shown on 1877 OS map. Landscaped 1960s.	M
47	Unnamed Shaft	66372 38832	Not shown on OS maps, plugged 1999.	L
48	Site of possible Shafts	66366 38774	Shafts not shown on OS maps, not located for treatment (1999)	M
49	Site of four large buddles	66359 38785	Part of walled complex with calciners/furnaces etc. Shown on 1877 OS map.	L
50	Site of calcined ore dressing floor building near furnaces/calciners.	66375 38794	Shown on 1877 OS map. Part of walled complex (sites 49-51).	L
51	Site of furnaces/calciners (1877 map). Site of later dressing floor building and settling tanks (1907 map)	66344 38777	Shown on 1877 OS map. Part of walled complex (sites 49-51) which connects to sites 52-54). Calcined ore dressing building shown on same site on 1907 map.	L
52	Site of Arsenic/sulphide flue	66274 38865 66346 38763	Fully shown on 1877 OS, partly on 1907 OS.	L
53	Site of Arsenic/sulphide flue/stamps engine house (Site 44) chimney	66274 38865	Shown on 1877/1907 OS maps.	L
54	Site of labyrinth	66314 38807	Shown on 1877 OS, gone by 1907 OS.	L
55	Site of Brunton arsenic calciner (1907 map). Site of dressing floor building (1907 map)	66294 38823	Shown on 1907 OS map. Part of (another) walled complex (sites 55-56) for dressing the calcined ore. Connects to sites 52-54.	L
56	Site of calcined ore dressing floor building and buddle near calciner (1907 map)	66306 38807	Shown on 1907 OS map. Part of walled complex (sites 55, 56) which connects to sites 52, 53). Calcined ore dressing floor building shown on same site on 1907 map.	L
57	Site of dressing floor reservoir pond	66295 38812	Shown on 1877 OS map. Gone by 1907.	L
58	Vivian's Shaft	66316 38774	Shown on 1865 Mine plan. Shaft capped prior to 1999 site investigation.	H
59	Junction Shaft	66269 38853	Shown on 1865 Mine plan. Shaft capped 1995.	M
60	Site of reservoir pond	66205 38841	Shown on 1877 and 1907 OS	L
61	Mine shaft and site of later reservoir pond	66190 38806	Mine shaft shown on 1877 OS map, pond on 1907 map.	H
62	Plantation Shaft	66166 38723	Shown on 1865 Mine plan. Shaft capped 1995.	M
63	Mine Shaft	66180 38690	Not shown on OS maps. Shaft capped 1995.	M

Site No.	Feature	NGR (SW)	Comments	S (Rating)
64	Site of settling tanks	66394 38818	Shown on 1877 OS map.	L
65	Site of unroofed mine building and adjacent yard	66417 38793	Shown on 1877 OS map.	L
66	Kings Shaft	66429 38857	Shown on 1865 Mine plan and later OS maps.	H
67	Tye Shaft	66512 38891	Shown on 1865 Mine plan.	H
68	Site of mine building	66498 38874	Shown on 1877/1907 OS maps.	L
69	Site of dressing floor settling tanks	66507 38846 66522 38847	Shown on 1877 OS map.	L
70	Site of linear settling pond	66474 38815 66520 38842	Shown on 1877 OS map.	L
71	Site of pair of buddles	66533 38856	Shown on 1877 OS map.	L
72	Site of dressing floor building and settling tanks	66548 38883	Shown on 1877 OS map.	L
73	Site of roofed dressing floor building/settling tanks	66590 38897	Shown on 1877 OS map.	L
74	Site of pair of buddles	66618 38903	Shown on 1877 OS map.	L
75	Site of dressing floor reservoir pond	66627 38928	Shown on 1877 OS map.	L
76	Fraser's Shaft	66609 38936	Shown on 1865 Mine plan and later OS maps.	M
77	New Shaft	66699 38982	Shown on 1865 Mine plan and later OS maps. Shaft plugged 1999.	L
78	Mine shaft	66719 38963	Shown on 1877 OS map.	H
79	Mine shaft	66698 38913	Shown on 1877 OS map.	H
80	Wheal Grenville: Reservoir pond	66795 38913	Shown on 1877 OS map.	L
81	Wheal Grenville: Reservoir pond	66810 38912	Shown on 1877 OS map.	L
82	Wheal Grenville: Fortescue Shaft	66787 38896	Shown on all OS maps. Possibly re-cut in 1891.	H **(SH)**
83	Wheal Grenville: Fortescue Pumping Engine House and chimney	66782 38903	Built 1891. Shown on 1907 OS map.	H **(SH) (R15)**
84	Wheal Grenville: Fortescue Boiler House	66774 38900	Shown on 1907 OS map.	H **(SH)**
85	Wheal Grenville: Winding Engine House, boiler house, loadings	66812 38853	Built 1891. Shown on 1907 OS map.	H **(SH) (R16)**
86	Wheal Grenville: Site of mine building/yard	66736 38899	Shown on 1877 OS map.	L
87	Wheal Grenville: Site of mine building	66729 38886	Shown on 1877 OS map.	L
88	Wheal Grenville: Site of mine building	66748 38848	Shown on 1877 OS map.	L
89	Wheal Grenville: Site of engine house, boiler house and chimney	66711 38859	Shown on 1877 OS map.	L
90	Wheal Grenville: Mine Shaft	66705 38857	Shown on 1877 OS map.	L

Site No.	Feature	NGR (SW)	Comments	S (Rating)
91	Wheal Grenville: Site of mine building	66727 38798	Shown on 1877 and 1907 OS maps.	L
92	Grenville United Mine: Site of large roofed dressing floor complex	66728 38883	Shown on 1907 OS maps.	L
93	Grenville United Mine: Site of roofed dressing floor complex	66768 38873	Shown on 1907 OS maps.	L
94	Grenville United Mine: Four long settling tanks	66600 38838 66672 38868	Shown on 1907 OS map (and archive photos)	M
95	Grenville United Mine: Shorter settling tanks	66701 38897	Shown on 1907 OS map (and archive photos)	M
96	Grenville United Mine: (Part) site of roofed dressing floor complex	66593 38833	Shown on 1907 OS map	L
97	Grenville United Mine: Site of dressing floor reservoir pond	66762 38821	Shown on 1907 OS map	L
98	Wheal Grenville: Mine shaft	66582 38853	Shown on 1877 OS map	H
99	King Edward Mine Magazine	66221 38809	Extant (fenced)	M

Note:

The site numbers in this table are mapped in Figure 13 (overall CMP area) and shown in more detail in Figure 14 for the KEM core site.

The '**S**' or Significance rating denotes the relative significance of **L**ow, **M**edium or **H**igh. It is formulated by a combination of factors including the quality and extent of the remains (both within the site and compared to adjacent sites), as well as the importance and understanding of the feature as part of a complex and how it contributes to the overall site character.

R1 (for example) cross-refers the table list with each of the relevant Detail Record Sheets reproduced in Section 3.6 ('Understanding the site'), which describes the significant sites within KEM. **SH** refers to Scheduled Monuments of National importance.

3.5.2 King Edward Mine buildings

The site inventory map for the core King Edward Mine buildings (Sites 1 to 33), is reproduced in Figure 14. This shows site numbering for every building and a cross reference to the appropriate detail record sheet given in the four sections below. The history of the phased development of each site or complex is described in each specific detail record sheet however a general summary is also given. The associated core area site inventory table (Table 2) is a detailed inventory list of all these core sites (Sites 1-33), and also gives the site identification, national grid reference, Cornwall Sites and Monuments No. (MCO No.), whether it is on the EH Buildings at Risk List, the existing and any known proposed function, the detail record sheet number and the site impact rating as a result of any proposed change of function.

Figure 15 is a collection of images of significant buildings across the site, as it is today. The Stage 2 section of this report (Statement of Significance) will be relating to these significance ratings and to Figure 27, a constraint map of the CMP area for both archaeology and ecology.

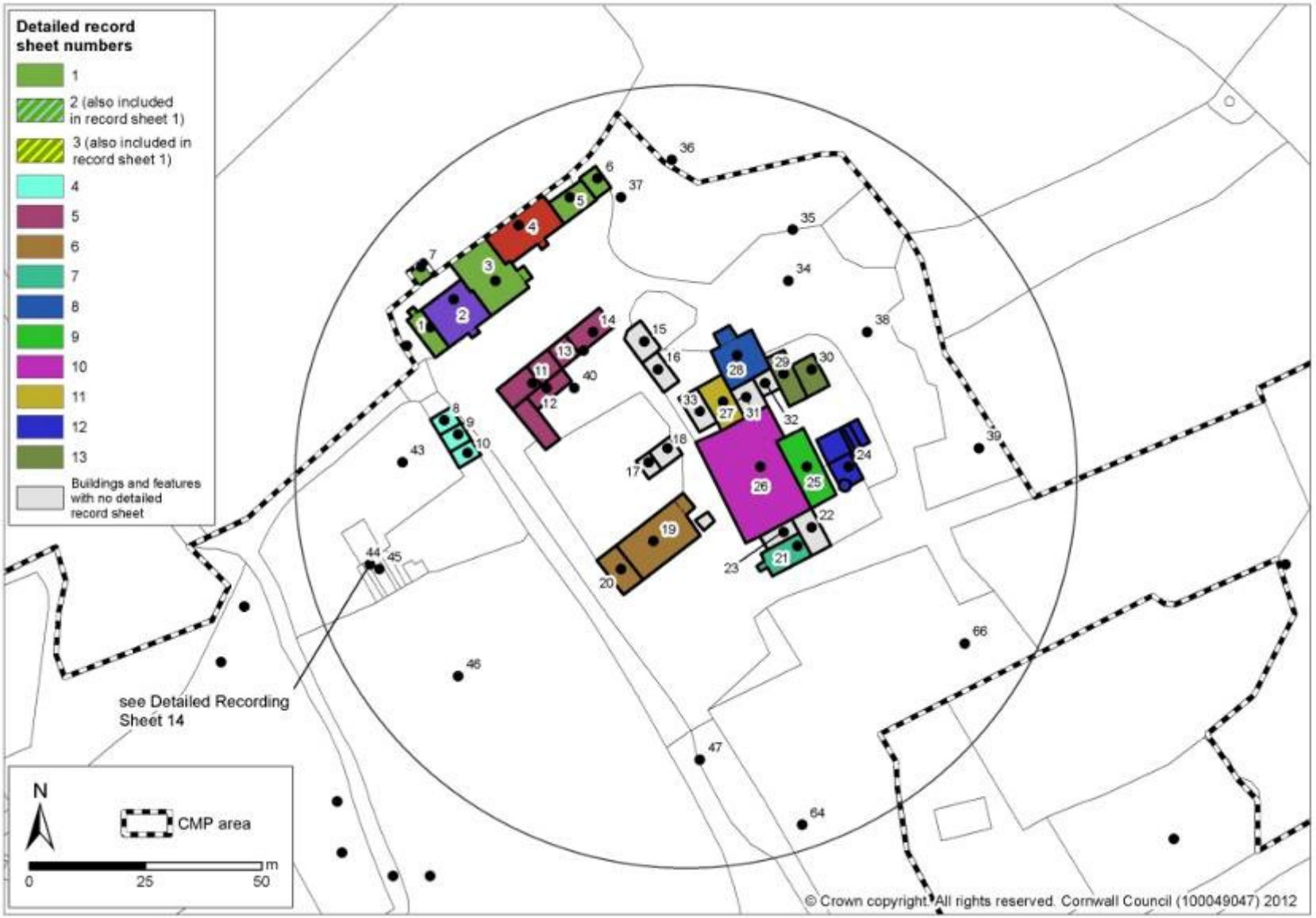


Figure 14 A core plan site inventory map of King Edward mine buildings. Refer to the Table 2 for site number description

Table 2 King Edward mine core plan site inventory table

Site No.	Site	NGR (SW)	MCO No.	LB Ref.	EH HAR Register	Existing function	Assess Sheet No.
1	Count House Complex: Mess Room	66314 38925	56569	1142685	Yes	Unused	R1
2	Count House Complex: Count House Office	66319 38931	56569	1142685	Yes	Unused	R1/R2
3	Count House Complex: Smithy	66328 38935	56569	1142685	Yes	Unused	R1
4	Count House Complex: Miners' Dry	66333 38947	56710	1132883	Yes	Unused	R1/R3
5	Count House Complex: Carpenters' Shop	66344 38953	56710	132883	Yes	Unused	R1
6	Count House Complex: Store	66350 38957	56710	132883	Yes	Store	R1
7	Count House Complex: Outhouse & Chimney	66312 38938	56718	N/A	No	Store	R1
8	Assay Office Complex: Sample House	66317 38905	56570	1142686	Yes	Unused	R4
9	Assay Office Complex: Wash House	66320 38902	56570	1142686	Yes	Unused	R4
10	Assay Office Complex: Cycle House	66322 38898	56570	1142686	Yes	Unused	R4
11	Carpenters' Shop Complex: (Offices/Carpenters Shop/Machining room)	66336 38913	56719	1159182	No	Unused	R5
12	Carpenters' Shop Complex: (Carpenters' Shop extension for saw)	66340 38913	56719	1159182	No	Unused	R5
13	Carpenters' Shop Complex: (Assay Office)	66347 38920	56719	1159182	No	Unused	R5
14	Carpenters' Shop Complex:	66349 38924	56719	1159182	No	Store	R5

Site No.	Site	NGR (SW)	MCO No.	LB Ref.	EH HAR Register	Existing function	Assess Sheet No.
	(Stores/Dark Room)						
15	Welding Shop	66360 38922	56720	N/A	No	Workshop	N/A
16	Machinery workshop	66363 38916	56720	N/A	No	Workshop	N/A
17	Toilet block	66361 38896	56721	N/A	No	Toilets	N/A
18	Drill/Fitting Shop	66365 38899	56721	N/A	No	Blacksmith Shop (site)	N/A
19	Survey office	66362 38879	56722	1311128	No	Lecture room	R6
20	Lecture/AV Room	66355 38873	56722	1311128	No	Lecture room	N/A
21	Calciner and chimney	66393 38878	52506	1159243	No	Exhibition Room	R7
22	Buddle House/laboratory	66396 38882	52506	1159243	No	Entrance kiosk	N/A
23	Infill site	66390 38881			No	Entrance corridor	N/A
24	South Condurrow winding engine house, chimney and loadings	66404 38895	56723	1159235	Yes	Unused	R8
25	South Condurrow winding engine boiler house	66395 38895	56723	1159235	Yes	Unused store	R9
26	Mill House (Dressing floor)	66385 38895	56724	1142687	No	Dressing floor demonstration	R10
27	Californian Stamps and Building	66377 38909	56728	1159218	No	Dressing floor demonstration	R11
28	Mill Engine Room	66380 38919	56728	1159218	No	Exhibition Room	R12
29	Compressor House	66390 38915	56729	N/A	No	Exhibition Room	R13
30	Horizontal steam engine winder house	66396 38916	56730	N/A	No	Exhibition Room	R13
31	Infill building (Porch/AV Room)	66386 38913	N/A	N/A	No	AV resource	N/A

Site No.	Site	NGR (SW)	MCO No.	LB Ref.	EH HAR Register	Existing function	Assess Sheet No.
32	Infill building (Maintenance Workshop)	66382 38910	N/A	N/A	No	Workshop	N/A
33	Sulzer engine room	66372 38907	56725	N/A	No	Working engine room	N/A
34	Sump/Engine Shaft	66391 38935	N/A	N/A	No	Capped mine shaft	N/A
35-39	Various former sites (not visible)		N/A	N/A	No	N/A	N/A
40	Cobble floor area	66345 38912	N/A	N/A	No	Visible resource	N/A
41-42	Various former sites (not visible)		N/A	N/A	No	N/A	N/A
43	Walled Yard (Stamps Engine House)	66308 38896	N/A	N/A	No	Infilled	N/A

Note:

- Site number relates to inventory list and core plan (Fig 14)
- MCO No. is the unique identifier given to each record in the HBSMR.
- LB Ref. is the National List Entry number on the National Heritage List for England
- EH HAR Register: English Heritage at Risk Register 2012
- Assess Sheet No. related to the Detail Record Sheets (No's 14 to 16 are reproduced in Appendix 10.3)
- Many unused buildings are currently used for temporary storage by Trevithick Society/KEM for a variety of items of historical interest

Figure 15 A plan showing existing views of King Edward Mine transposed onto a phase map of site development

General summary of phased development history

Figure 8, an 1899 survey plan of the mine, labels individual buildings two years after Camborne School of Mines took over the site lease from South Condurrow Mine (with the exception of the Counthouse and Assay Complexes: Sites 1 – 10). Apart from the Counthouse and the Assay Office complexes, the main mine buildings that had been used by South Condurrow were some Carpenters buildings (Sites 36 and 37), the Drill Shop (Site 18), the Winding engine house (Site 24), and the Spalling Shed (later to be built over by the Mill: Site 26), see Figure 7 annotations. Interestingly, the square rectangular feature next to the Drill Shop appears to have been a spoil mound, possibly waste remnants from the nearby spalling floor (Site 40 – cobbled floor), only part of which appears to have been exposed.

Figure 8 shows that very little new build had occurred in the intervening two years with the exception of the Survey Office (built c1899, Detail Sheet R6), which appears to be the first new building that was erected, followed by the Compressor House (Site 29). The site could still be used as a working mine, although the site's main pumping engine house (Site 35) had gone by this date. It is probable that the engine house was taken down in the late 1890s when South Condurrow's mine operations were re-focussed at Marshalls Shaft (SW 6638 6538), presumably to build the two engine houses at that site.

The new Stamps and Mill building were built first, followed by the Carpenters' Complex in c1903. As previously mentioned, King Edward Mine had no building for a Counthouse (administrative offices), a Carpenters' Shop, an Assay office or Machine Shop, as South Condurrow retained ownership of the original sites (Sites 1 – 6). It does seem therefore that soon after this new timber shiplap construction, South Condurrow Mine folded (in 1903) and gave up the lease of the (earlier) Counthouse and Assay Complexes (Sites 1 – 10, see Fig 14). All of which was subsequently purchased by KEM in the same year.

The phased development of the Counthouse and Assay Complexes appears to have quickly followed on from c1865, as shown on Fig 6 (apparently showing only the Counthouse), these being possibly the oldest constituent parts of the site.

Figure 16 graphically shows the construction phases of all the King Edward Mine buildings. Construction of buildings from the early 20th century continued after the Carpenters' Shop (Sites 11-16), a Calciner (Site 21), a new Mill (Site 26), and a new Winding engine boiler house (Site 25 - after 35 years of use a more modern efficient boiler was necessary!). Also at this time a new (Californian) Stamps (Site 27), and a new steam Mill engine (Site 28), were installed. In 1907, when it was plain that the cost of renewing the existing winding engine was prohibitive (and the new boiler that had been installed had not really helped the proceedings), a decision was taken to site a new building for the installation of a new twin drum horizontal steam winder (Site 30). This stayed in-situ until the 1940s when it was sold to Castle an Dinas wolfram mine (Buck and Thomas 2012).

This mine complex retained the same building footprint for approximately 60 years until the mid 1960s when a few relatively un-noteworthy buildings were added – mostly of galvanised steel and timber frame construction. Happily, it appears all of the timber buildings that had been erected during the early 1900s have been regularly maintained – no doubt resulting in their excellent general condition in the 21st century. The build quality of reconstruction of the steam engine and compressor houses in 2009, after they had been burnt down in 1957, is perhaps testament to the conservation philosophy of the King Edward Mine volunteers, reflecting the site's significance, character and closely following EH guidance for its conservation philosophy (Section 6.0).

Figure 16 A map of King Edward Mine showing the main construction phases from the late 19th century to the present day

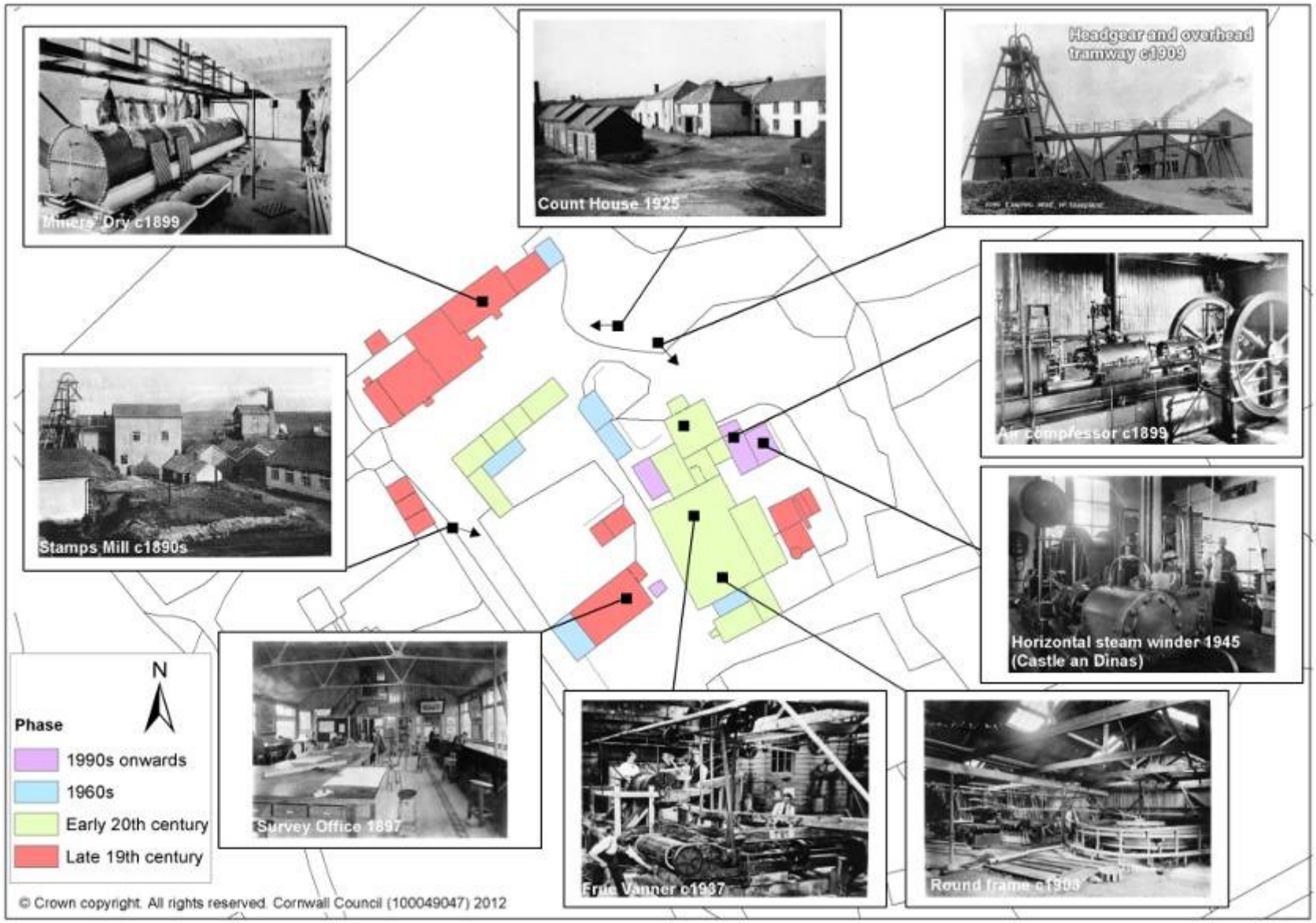


Figure 17 A map showing archive views of different parts of King Edward Mine transposed onto a phase map of site development

Figure 18 A plan showing the existing building functions of King Edward Mine

3.6 Building surveys and detail record sheets

In order to promote the sustainability of King Edward Mine in the future, it is important to understand the site's significant assets, particularly as the site has such high statutory designations and is such a significant part of the World Heritage Site; by analysing in detail all significant buildings, features, fittings etc and in particular those sites that may be impacted by future projects, for example adaptive re-use. This information can then be given to the relevant officers and architects to enable them to mitigate negative impacts, and promote positive specifications.

The methodology of approaching this issue has been to focus on two fronts; firstly, to utilise and adapt existing building surveys of the mine to assess each site's significance, originality and phasing. Secondly, to produce building record sheets (for significant sites only), describing in detail all aspects of the building's history, condition, function, significant features, contents/fittings, machinery, and if appropriate, any known recent site impacts. These sheets are in effect, conservation statements. But they also include information relating to short term proposed impacts, a result of a proposed scheme for adaptive re-use to promote future sustainability (See Appendix 10.5, and Table 3).

The site surveys for the Counthouse Complex, the Assay Office complex, and the Carpenters' Shop complex have been adapted (with permission) from original survey plan drawings produced by Purcell, Miller and Tritton in the 2011 Master and Business Plan (The Way Forward). The other survey plan drawing of the remainder of the site has also been adapted (with permission), from an original survey plan drawing produced by SJH Design Services of Helston in 2000.

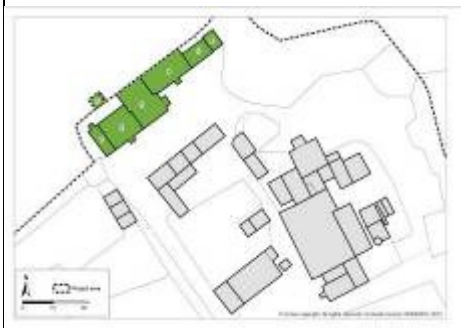
The significant sites chosen for the detail record sheets are given in the project study area site inventory table (Table 1). Site designations are given in the core site inventory table (Table 2). All these sites are listed below:

- **R1** Counthouse Complex (Sites 1-7)
- **R2** Counthouse Complex (Office: Site 2)
- **R3** Counthouse Complex (Miners Dry: Site 4)
- **R4** Assay Office complex (Sites 8-10 but focus on Site 9)
- **R5** Carpenters' Shop complex (Sites 11-14 but focus on Site 11)
- **R6** Survey Office (Site 19)
- **R7** Calciner and chimney (Site 21)
- **R8** South Condurrow winding engine house (Site 24)
- **R9** South Condurrow winding engine boiler house (Site 25)
- **R10** Mill House (Site 26)
- **R11** Stamps building (Site 27)
- **R12** Mill Engine Room (Site 28)
- **R13** Horizontal steam winder house and Compressor house (Sites 29/30)
- **R14** Stamps engine house etc (Site 44)
- **R15** Fortescue Pumping engine house (Site 83)
- **R16** Fortescue Winding engine house (Site 85)

The sites are described within four main sections in this report; The Counthouse Complex, The Assay Office complex, the Carpenters' Shop complex and the main core complex of the Mill and adjacent buildings. Each section will produce the detail record sheets first, followed by the detailed survey drawings. The exceptions to this are for detail record sheets R14, R15 and R16 which are in Appendix 10.3.

3.6.1 Counthouse Complex

Site name:	**KING EDWARD MINE** **Sheet R1**
Building name/identifier:	**Count House Complex (Sites 1 – 7: Overall summary)**
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1142685 - Counthouse and Smith's Shop), Listed Building Grade II* (Ref. 11328113 - Miners' Dry). **This site is on the EH Building at Risk Register 2012.**
Location:	NGR: SW 6632 3892 North side of KEM site. Block Plan Fig 14
Building at Risk:	Yes
Recorder:	C Buck
Survey Plan Ref:	Survey Plan Fig 19 2011 Condition Survey Refs: R01-07, F01-05, G01-24

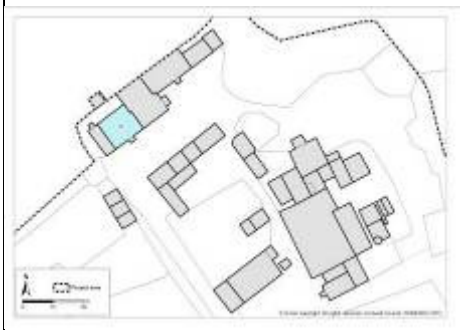
Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* Corrugated asbestos roof sheeting replaced original slate in 1950s. Cementitious pebble dashed render over original granite quoins and stone masonry with earth rab/lime mortar. Only one original window appears to remain (Site 4), the remainder of later different 20th century styles. Many original chimneys removed (including Counthouse, Smithy forge etc).
	Internal: Buildings have been unoccupied leading to damp, floors and walls. Counthouse Office has dry lining of plasterboard and painted woodchip wallpaper on some walls, covering damp lime plaster. Cement plastering in places. Many original plaster ceilings replaced. Floor joists in office collapsing. Smithy building has had major alterations (possibly 1960s). Miners Dry ceiling fully built over, walls faced with granolithic plaster (to create a wet room). Some original doors/floorboards and some dado rails.
Build date:	Mess Room (Site 1) c1870s. Counthouse Office (Site 2) c1864/5. Smithy (Site 3) 1865-1877. Miners' Dry (Site 4) 1865-1877. Carpenters' Shop (Site 5) 1865-1877. Store (Site 6) 1960s. Outhouse/chimney/store (Site 6) 1865-1877.
Modification date:	Complex re-roofed (some rafters replaced with steel) in mid

	1950s. Windows replaced during 20th century, possibly twice. Internal asbestos sheeting added to some walls and some re-plastering at a similar date. Office/Mess room relatively unaltered, but the Smithy buildings have been drastically altered at various times (possibly 1960s onwards). Miners' Dry walls re-plastered and ceiling rebuilt to infill balcony (1960s onwards). Carpenters' Shop internally unrecognisable when transformed into toilets (1960s).
Original function:	South Condurrow Mine: Counthouse, Smithy, Miners' Dry and Carpenters' Shop.
Current function:	Mess Room (Site 1): Unused. Count House Office (Site 2): Unused. Smithy (Site 3): Storage of some Trevithick Society items. Miners' Dry (Site 4): Wet room (unused). Carpenters' Shop (Site 5): Male toilets. Store (Site 6): Used.
Proposed function:	Mess Room (Site 1): Workspace. Count House Office (Site 2): Rented office space. Smithy (Site 3): Workspace. Miners' Dry (Site 4): Workspace. Carpenters' Shop (Site 5): Men's and Women's toilets with shower facilities. Store (Site 6): Unchanged as store.
Significant features/contents:	Mess Room (Site 1): Possibly original wall plaster finish. Count House Office (Site 2): Some original lime wall plaster and original floorboards. Original fireplace in office. Smithy (Site 3): No visible significant original features. Miners' Dry (Site 4): Original roof joists. Carpenters' Shop (Site 5): No visible significant original features. Outhouse/store (Site 7): Possibly original wall footprint.
Original fixtures and fittings:	Mess Room (Site 1): Dado Rails. Count House Office (Site 2): Some original doors/architraves. Original fireplace in office. Miners' Dry (Site 4) and Carpenters' Shop (Site 5): 1960s modifications obscured original details. Most window openings appear to be original dimensions with original brick cills, but windows mostly of later date. Window and frame at south west corner of Miners' dry may be original (small paned).
Machinery:	Not applicable. Smithy building used for temporary storage of Holman's compressors etc for Trevithick Society.
Summary description:	Count House Complex is Listed Grade II* and now on EH Buildings at Risk Register (2012). The Count House was built first, closely followed by the remainder of the buildings in a single connected complex to serve the needs of South Condurrow Mine (1865-1896). From 1903 the buildings were used to serve the training needs and administration of Camborne School of Mines. Externally, it appears the original slate roof of all buildings in this complex was replaced in the 1950/60s, as well as re-rendering the external walls with cementitious pebble dash. It is likely many original windows were also replaced at this time. Internally, there were major alterations to the Smithy and Miners' Dry during the following decade – presumably to suit the training needs of the mining students. In the past, the Count House Office has suffered from damp, the walls being dry lined (twice), re-plastered and floor joists affected by damp rot. However, the Counthouse building is relatively unaltered compared to others in this complex.

Completeness and condition:	This is a rare example of a 19th century Cornish mine complex housing the Count House Office, the Smithy, the Miners' Dry and Carpenters' Shop. Internally, the Office (Site 2) and Mess room (Site 1) are the most unaltered buildings, retaining degrees of original features.
Significance/conservation strategy:	The historic group value of this complex of buildings is highly significant (these are often separate buildings). However, individually, given the extent of the 1950s and later repairs and modifications externally and internally affecting site character, each building is therefore less significant. In any future building conservation/adaptive reuse project, replacement of the asbestos roof with slate, removal of the exterior pebble dash and repointing with an appropriate mortar, and repairing floor joists where appropriate would go a long way to restoring the original character of this complex. The issue of window replacement to an agreed design (reflecting a significant period of the site) will need to be debated with conservation professionals, but a conservation philosophy would relate to minimising impacts and reflecting/mimicking original details where they have been consistently applied, for example drain gutters and downpipe details for the Counthouse (c1860s). For new Counthouse replacement windows again I feel that any decision on window style should reflect basic conservation philosophy (a compromise between the spec that was included in the Listing detail and the original form). The agreed window style should be consistently used throughout the complex. However, it is likely that internal secondary glazing may be required for change of use and to meet current building regulations.
EH at Risk Register 2012:	Count House (Site 2), Blacksmiths Shop (Site 3), and Miners' Dry (Site 4).
Additional requirements for future projects/any other factors affecting reuse/repair etc:	Given the masking of the external walls by a later cementitious pebble dash, a structural assessment of the building after removal may be necessary, to assess if there are structural remediation works that may impact the building. Internal photographic survey should be undertaken before proposed works. Re-use of original internal features (doors, architraves, (unblock fireplace) etc), is recommended. It may be appropriate to rebuild the chimneys that have been removed if funding and consent is given. The use of lime wash as an exterior finish should be considered and maintenance implications discussed.

Site name:	**KING EDWARD MINE** **Sheet R2**
Building name/identifier:	**Count House Complex: Count House Office (Site 2**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1142685 - Counthouse). **This site is on the EH Building at Risk Register 2012.**
Location:	NGR: SW 66319 3829 North side of KEM site. Block Plan Fig 14
Building at Risk:	Yes
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 19 2011 Condition Survey Refs: E02, R02, G01-7

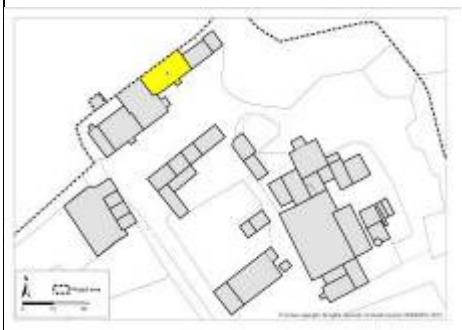
Site map and photograph:		
		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* Corrugated asbestos sheeting replaced slate in 1950s. Cementitious pebble dashed render over original granite quoins and stone masonry with lime mortar. Windows are mostly 1970s replacements and other styles. Original chimneys removed. First floor windows blocked up.
	Internal: This building has been unoccupied leading to damp floors and walls. Office has dry lining of plasterboard and painted woodchip wallpaper on some walls, covering damp lime plaster. Cement plastering in places. Many original plaster ceilings replaced with fibreboard. Floor joists in front office collapsing (dry rot). At rear some modifications to partitions, with original staircase to first floor (storage space) removed. Some original doors/floorboards/architrave and fireplace (removed/blocked up on east side).
Build date:	Counthouse Office constructed c1864/5 as South Condurrow Mine Count House (shown in elevation on 1865 mine plan). The mine retained this complex until 1903 when it ceased operating. The lease was then sold by the Pendarves Estate to Camborne School of Mines.
Modification date:	In approximately the 1930s the interior of the building was dry lined with asbestos/cement sheets, no doubt the dado rails removed at the time. The building was re-roofed (some rafters replaced with steel) in the 1950s with corrugated asbestos sheets. Exterior pebble dash in cement render probably added at a similar time. Possibly at least three

	periods of window replacement (from the 1890s onwards). The earlier internal dry lining was removed in the 1990s and replaced with plasterboard and some new skirtings. The floor was re-laid with lino. Ceilings removed at some date and replaced with fibre board (probably 1960-70s). Staircase to first floor removed at an early date and modifications to timber partitions at rear of building, both at unknown dates.
Original function:	Count House Office for South Condurrow Mine (1864-1903), then Camborne School of Mines admin office up to 1974.
Current function:	Unused.
Proposed function:	To be converted by adaptive reuse for rented office space.
Significant features/contents:	South Condurrow Mine Count House which retains its original plan and design. Some original lime wall plaster, original floorboards, doors and architraves. Original fireplace in south west office. South east fireplace not visible but opening probably blocked up. Some original timber partitions at rear of building are still extant (painted white).
Original fixtures and fittings:	Original window openings. Internally, some original doors/architraves and floorboards. Original fireplace in south west office, but original opening for south east office probably infilled.
Machinery:	Not applicable.
Summary description:	All buildings within the Count House Complex are Listed Grade II* and are on the EH Buildings at Risk Register (2012). The Count House (office) was built first to serve the needs of South Condurrow Mine (1865-1896). It was then used to serve the administration needs of Camborne School of Mines. Externally, it appears the original slate roof of the building was replaced in the 1950s, as well as re-rendering the external walls with cementitious pebble dash. It is likely the windows were also replaced at this time. The Count House Office has suffered from damp, the walls being dry lined and floor joists affected by damp rot. An original fireplace remains, its equivalent on the opposite ground floor side has been removed or infilled. The original lath and plaster ceilings have been replaced with fibreboard, however this building is relatively unaltered – its appearance mainly affected by changes to the external fabric.
Completeness and condition:	This is a rare example of a relatively unaltered (in plan) 19th century Count House Office, retaining a few original fittings and features.
Significance/conservation strategy:	The historic group value of this building within this complex is highly significant. However, individually, given the extent of the 1960s repairs/modifications externally and internally affecting site character, each building is less significant. Replacement of the asbestos roof with slate, removal of the exterior pebble dash and repointing with an appropriate mortar, and repairing floor joists where appropriate would go a long way to restoring the original character of this building. The issue of window replacement will need to be debated with conservation professionals (refer to Record Sheet R1).
EH at Risk Register 2012:	Count House (Site 2)

Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the masking of the external walls by a later cementitious pebble dash, a structural assessment of the building after removal may be necessary, to assess if there are structural remediation works that may impact the building. Internal photographic survey before proposed works. Re-use of original internal features (doors, architraves, (unblock fireplace) etc), is recommended. It may be appropriate to rebuild the chimneys that have been removed if funding and consent is given. The use of lime wash as an exterior finish should be considered and maintenance implications discussed.

Site name:	**KING EDWARD MINE** **Sheet R3**
Building name/identifier:	**Count House Complex: Miners' Dry (Site 4**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 11328113 - Miners' Dry). **This site is on the EH Building at Risk Register 2012.**
Location:	NGR: SW 66335 38947 North side of KEM site. Block Plan Fig 14
Building at Risk:	Yes
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 19. 2011 Condition Survey Refs: E05, R05, G15-18, F02-5.

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* Corrugated asbestos sheeting replaced slate in 1950/60s. Cementitious pebble dashed render over original granite quoins and stone masonry with lime mortar. Only one original window appears to remain, the remaining windows of different styles.
	Internal: An 1899 photograph (Fig 16) shows the internal layout of the Miners' Dry at that time. The walls were lime washed, with a part open ceiling and ground floor boiler. The building now has a full ceiling and first floor with open roof joists. At ground floor the building has been re-plastered with a granolithic finish to provide a 'wet room' with showers, possibly in the 1960s/70s.
Build date:	Original Miners' Dry (Site 4) c1865-1877.

Modification date:	The 1899 Miners' Dry archive photograph shows a central boiler, baths and basins with hooks and wooden slatted seats. Light was provided on the south side by windows on two floors, through the open ceiling with stairway access to a balcony with access to lockers etc. The boiler was removed at an unknown date and the ceiling extended over the entire floor plan to create two rooms above the former boiler/wash room, accessed via a new staircase at the west end of the building. The previously open ceiling joists were boxed in and windows replaced with the present form. At ground floor, it was re-plastered with a granolithic finish and showers installed. All of these works date to the late 1960s/early 1970s. A central doorway opening was blocked.
Original function:	South Condurrow Mine/King Edward Mine Miners' Dry.
Current function:	Unused former CSM 'Wet room' with showers.
Proposed function:	Rented workspace/arts/crafts etc.
Significant features/contents:	Miners' Dry (Site 4): Original walls and (boxed in) roof joists. No visible significant original features at ground floor (masked by later re-plastering etc). It is possible that the original drains survive below ground floor level, and probably the pipes relating to the original boiler.
Original fixtures and fittings:	Most window openings appear to be original dimensions, windows mostly of later date but the window and frame at the south west corner of Miners' Dry may be original (small paned). Original fixtures and fittings appear to have been removed.
Machinery:	Not applicable.
Summary description:	Count House Complex is Listed Grade II* and now on EH Buildings at Risk Register (2012). The Count House was built first, closely followed by the remainder of the buildings in a single connected complex to serve the needs of South Condurrow Mine (1865-1896). This building provided changing facilities following underground mine student training from 1897 – 1923, and possibly later when underground training moved to Great Condurrow Mine (Beacon). An internal 1899 photograph of the Miners' Dry and description is given in Figure 17 and (Brooks 2002, 12). Externally, it appears the original slate roof was replaced in the 1950s, as well as re-rendering the external walls with cementitious pebble dash. Internally substantial changes have occurred to both floors, although the exterior walls and openings appear to have been untouched (apart from the partial blocking of a doorway to form a window).
Completeness and condition:	This is a rare example of a 19th century Cornish mine complex housing the Count House Office, the Smithy, the Miners' Dry and Carpenters' Shop. However, this building has been heavily modified, obscuring or destroying original details/features.
Significance/conservation strategy:	The historic group value of this complex of buildings is highly significant (as these are often separate buildings). However, individually, given the extent of the 1960s repairs, modifications externally and internally that affect site character for each building is less significant. Replacement of

	the existing roof with slate, removal of the exterior pebble dash and repointing with lime mortar would go a long way to restoring the original external character of this complex. The issue of window replacement will need to be debated with conservation professionals (refer to Record Sheet R1). Internally, removal of the later granolithic plastered walls is not necessarily recommended – adaptive re-use of its existing form may be possible (after the washing facilities are removed), and have less impact.
EH at Risk Register 2012:	Miners' Dry (Site 4)
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the masking of the external walls by a later cementitious pebble dash, a structural assessment of the building after removal may be necessary, to assess if there are structural remediation works that may impact the building (including removal of wall pipes etc). The insertion of a first floor in the Miners' Dry has substantially reduced natural light levels in that space, and any decision on insertion of one or more windows in the north side of the Miners' Dry to increase natural light levels should reflect the conservation philosophy and be informed by a natural light assessment. Internal photographic survey should be undertaken before proposed works. The use of lime wash as an exterior finish should be considered and maintenance implications discussed. Internal photographic survey before proposed works should be undertaken. An impact assessment of any proposed ground floor works should be undertaken in order to preserve original pipe work (above/below ground) relating to its original function.

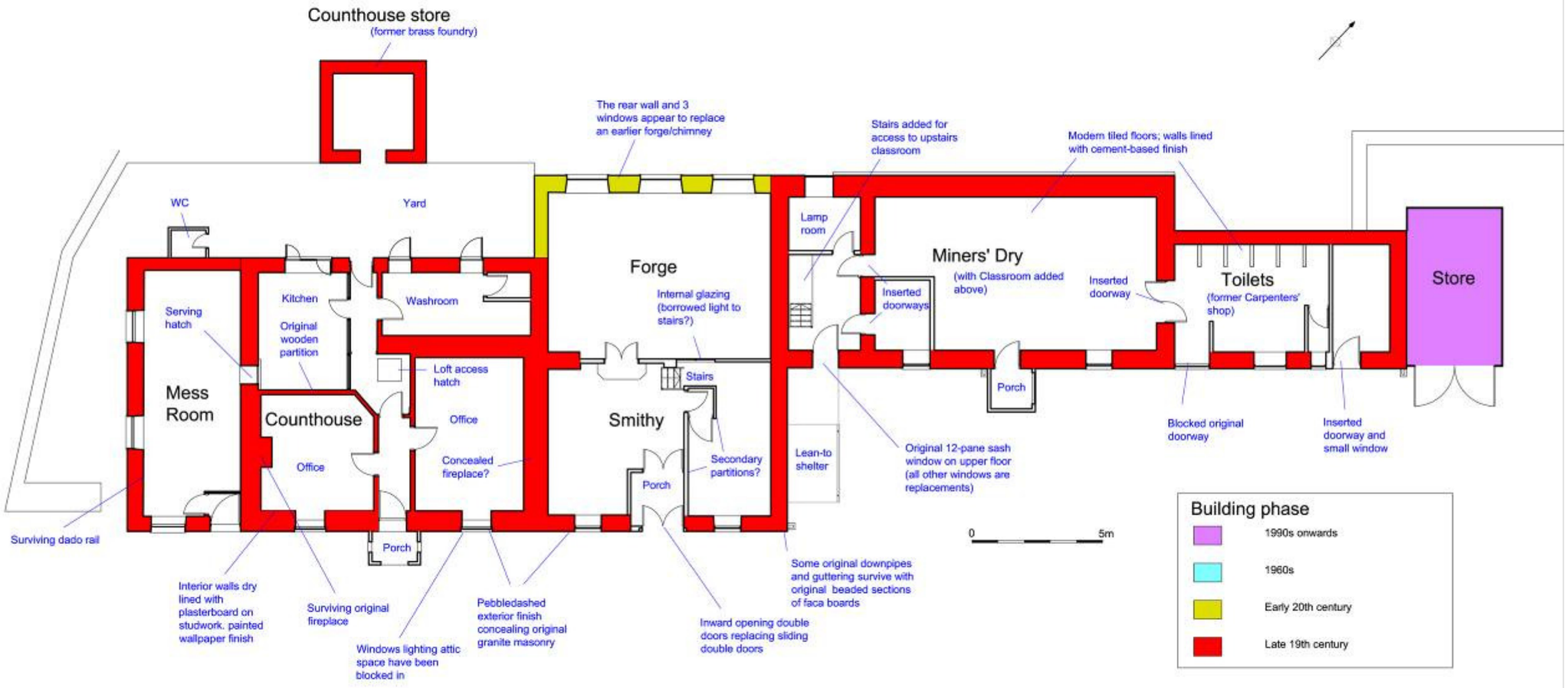
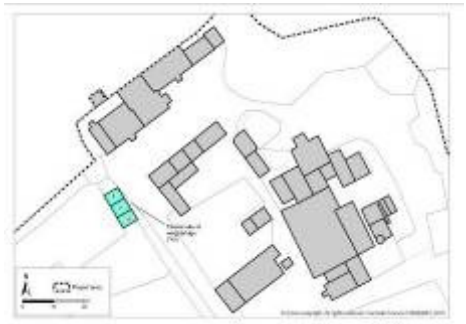


Figure 19 Detail phased site survey of the Counthouse complex

3.6.2 Assay Office Complex

Site name:	**KING EDWARD MINE** **Sheet R4**
Building name/identifier:	**Assay Office Complex (Sites 8-10): Assay House (Site 9**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1142686 – Assay Office). **This site is on the EH Building at Risk Register 2012.**
Location:	NGR: SW 66319 38902 North west side of KEM site. Block Plan Fig 14
Building at Risk:	Yes
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 20. 2011 Condition Survey Refs: R01, G01-03, E01-04.

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* Photographs taken in 2011 by Purcell Miller Tritton show a rusty corrugated iron sheet roof, with various forms of rotted ship lap with tongue and grooved timber repairs. All of these are in a precarious state. Within the past year, a new corrugated iron sheet roof with some new rafters has been added by KEM – providing a degree of interior protection for water ingress. The windows are of different periods and styles, but given their condition, all need to be replaced. The north and south (original) exterior side walls are both timber ship lap on a timber frame.
	Internal: Internally, the complex was divided into three rooms with varying functions through time (see site inventory Fig 14). These are separated by stone/brick lime plastered partitions, the middle section (Site 9), with remnants of a lath and plaster ceiling (possibly the original building of the three). The other two room's ceiling was open to the roof. The same middle section has a stone blocked opening, possibly a low door or window to the yard, the remains of an Assay oven, an assay hearth and adjacent, a Victorian fireplace. The original chimneys from this building have long gone.
Build date:	Original Assay House Complex (Site 9) c1865-1877.
Modification date:	It is possible that the original specification for the roof

	(1865) was timber planking painted with bitumen (remnants were removed during the recent re-roofing), but by 1904 it had corrugated iron sheets (see front cover image). Also at this date the south end wall was partially built of stone and lime. The corrugated sheet roof was probably replaced by CSM a year earlier when it took over the leasehold of the remaining mine buildings. This (or a subsequent version) was then replaced last year by an equivalent, with a northern extension and new supporting timbers to an existing concrete block wall (to provide additional roofed (open fronted) storage space for Trevithick Society Museum items). After 1904 the south end masonry wall was removed and replaced with timber weatherboarding. The existing weatherboarding style varies – a product of its patch replacement during the 20th century. Internally, each of the three rooms appears to have had different functions over time. Internally (no physical access) both Sites 8 and 10 are featureless, with Site 9; the most significant room, retaining the un-modified Assay features. Site 41, immediately outside Site 9 was formerly the mine weighbridge (see Figure 14). Parts of the surface iron plate have been kept by KEM. Early photographs show two chimneys from Site 9, the Assay Office. These are no longer extant (possibly removed when it was re-roofed by 1904).
Original functions:	Variously: South Condurrow Mine Assay sample House/Wash House/Cycle House
Current function:	Unused, derelict and damp.
Proposed function:	Provision of a Café and internal seating area, utilising existing openings and access. It is proposed to provide an option for exterior seating in the adjacent Stamps Engine House Yard (Site 43).
Significant features/contents:	A significant feature is the style of the exterior timber ship lap cladding (replicating similar new buildings at KEM dating from the end of the 19th century). The original footprint of the adjoined buildings appears to be unaltered. The main significant internal features are those within Site 9 (the Assay Office). The original Assay furnace survives on the west side, near an original (blocked opening). On the north side of this small room, another feature (possibly remnants of a small Assay hearth), is visible next to an original Victorian fireplace and iron surround and inset space for shelving. The original lath and plaster ceiling survives, but is in a very poor condition.
Original fixtures and fittings:	There is debris within each of these small buildings – some of which may well obscure original fixtures etc. No other original features were observed (externally) other than those described above.
Machinery:	This is not applicable within each of the three rooms, but there are Trevithick Society Museum items stored in the newly covered area (open fronted), at the north end of the complex.

Summary description:	The Assay House Complex is Listed Grade II* and is now on EH Buildings at Risk Register (2012). This small range of three rooms under a single roof was built to serve the needs of South Condurrow Mine (1865-1896). It appears to have been originally constructed with a masonry rear wall (backing onto the Stamps Engine House Yard: Site 43), and timber frame front and side walls. Although many of KEM's buildings were constructed of ship lap timber, and this site was no exception, it has not been periodically replaced as has other buildings. It has been patched for many years, but not recently, with the exception of a replacement corrugated steel sheet roof within the past year. The old corrugated roof leaked for years, making the interior very damp – negatively affecting the original lath and plaster ceiling.
Completeness and condition:	This is a rare example of a 19th century Cornish mine Assay House Complex. However, this building has been in disuse for many years, virtually all of its timber frame and ship lap is rotten and will need to be replaced. Its existing roof has been temporarily replaced with new corrugated steel sheeting, performing the functional/structural aim of allowing the building to dry out, and to reduce further deterioration until funding is available for its restoration.
Significance/conservation strategy:	The historic group value of this complex of buildings is highly significant. However, given the condition of the structure internally and externally (which negatively affects the site character), its significance and overall site value can be enhanced by rebuilding the external timber frame and (temporary) roof (including new window/door openings) to follow the conservation philosophy of replicating a 1904 specification (a period in time that dominates many of the new adjacent KEM buildings). Given the condition of the external ship lap weatherboarding, it will need to be replaced in a similar style to match the earliest forms on the building and other early forms on the site. The structural condition of the stone partition walls will need to be assessed. The specification for the roof covering, chimney reconstruction and window style will need to be agreed after reference to the conservation philosophy (Section 6.0). However, the conservation strategy could be further informed by research in order to provide evidence of earlier forms of the timber frame fabric style, window openings style and chimney rebuild. Adaptive re-use of its existing form is recommended as long as its significant features (after another site survey), are not compromised.
EH at Risk Register 2012:	Assay Office Complex (Sites 8-10)
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Additional photographic/filmed research could be undertaken in order to provide definite evidence of earlier forms of its timber frame style, and its form of window openings in order to compile conservation specifications for its repair/rebuild for adaptive re-use. Part of this process should also include safe access into each room (after clearance) to investigate any other significant features and site constraints. If funding is in place, justification could be made for reinstatement of the Assay Office chimneys, which would add significantly to the site's original character and group value.

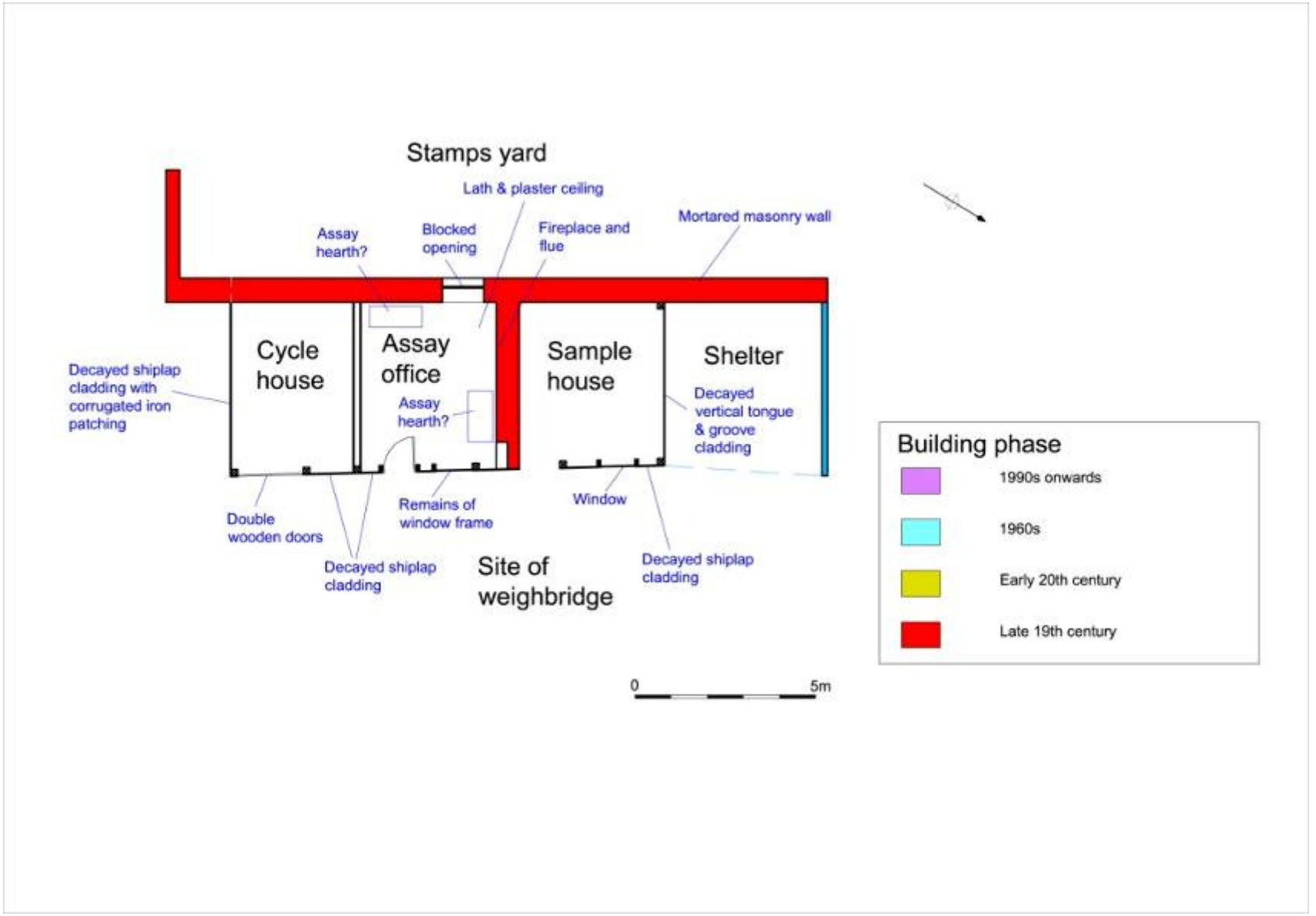
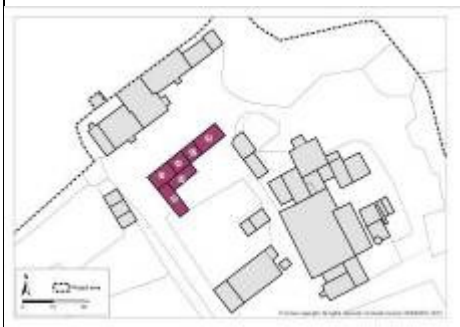


Figure 20 Detail phased site survey of the Assay Office complex

3.6.3 Carpenters' Shop Complex

Site name:	**KING EDWARD MINE** **Sheet R5**
Building name/identifier:	**Carpenters' Shop Complex: Offices/Carpenters' Shop/Machining Room (Sites 11-14**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1159182 – Carpenters' Shop)
Location:	NGR: SW 66339 38917 West of core KEM site. Block Plan Fig 14
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 21. 2011 Condition Survey Refs: R01-R04, G01-08, E01-08.

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* The roof is constructed with scantle slate; the original was replaced in c1990. It appears to be in a good condition. The side and end walls are built of horizontal boarded ship lap (with the exception of the Carpenters' Shop west wall which is constructed of brick), all of which is in dire need of redecoration, and possibly some sections replaced. The rainwater goods are plastic. The external joinery is in a reasonable to poor condition – again, some needs replacing, re-puttying and all re-decorating. Site 12, a new extension was built of concrete block, with external cement render and slate roof.
	Internal: All the original internal partition walls are built of vertical tongue and grooved timber. However the wall between the Machine Shop and the Assay Office was built of stone, lime plastered with an inbuilt chimney flue for the Assay furnace. The ceiling was also boarded out with tongue and grooved timber under the roof joists. In the Carpenters' Shop and the Machining Room (north east end), steel joists were used for machinery support. The ends of these rooms are either stone or brick (to support the drive shafts/belts etc extending from one room to the other. The floor is also constructed of timber floorboards. The windows, for the most part appear to be original, except for those that have been adapted to provide access to the later 1950s saw machine

	building, or blocked doorways with a later window (see Fig 21). Internal modifications since construction can be seen throughout the building, but are minimal. Site 12, was built with a concrete floor and internal cement render.
Build date:	S. Condurrow Mine retained the lease on the Count House and Assay Complexes from 1897 to 1903: The Carpenters Shop/Mine Office/Assay House/Dark Room (Sites 11-13) were built in c1903 (possibly slightly later for Sites 13/14) by CSM. Site 12, the saw machine building was built in the 1950s.
Modification date:	Internally, the original complex form was 'L' shaped and divided into three rooms (the Mine Office/Counthouse, the Carpenters' shop and the Machining room (all Site 11). At a slightly later date Sites 13 (the Assay Office), and 14 (the Stores/Dark Room), were built. In the 1950s building 12 was built to site a new machine saw. It has two external doors, with internal access via the Carpenters' Shop and a doorway formed from a former mine office window. In the office section the position of small stoves can be seen (reference to 1904 photographs of KEM also show these chimneys), and the position of former partitions.
Original functions:	Variously: KEM original Count House/Carpenters' Shop/Machining Room/Assay House and Dark Room. After taking on the lease for the Count House complex, the building was still utilised as Offices, the Carpenters' Shop and Machining Room.
Current function:	Unused. Temporary storage for some Trevithick Society items.
Proposed function:	Workspace of 2 to 6 units.
Significant features/contents:	These timber framed buildings (with the exception of Site 12), are highly significant in terms of their original external timber ship lap design and internal tongue and grooved walls and partitions – replicated in other parts of the mine from 1903 onwards. This complex also retains many original windows and doorway openings.
Original fixtures and fittings:	The Carpenters' Shop (northern part of Site 11), retains original storage shelving, and a shaft drive with flywheel from the adjacent Machining Room (northern eastern part of Site 11). The Machining Room also contains other original shaft drives and fitments at a high level. The Assay building (Site 13) contains the original assay furnace with internal wall flue (except this has been capped at roof level). The Office building contains evidence for siting of the stoves to keep the occupants warm during the winter months.
Machinery:	There are numerous stored Trevithick Society Museum items in the Carpenters' Shop and Machining Room.

Summary description:	The Carpenters' Shop Complex is Listed Grade II*. This range of four rooms under a single slate roof was built to serve the needs of CSM soon after it took over this eastern part of South Condurrow Mine (as at that time the mine retained its lease on the Count House and Assay buildings). The building retains many original internal features, and its external timber frame character and slate roof is still preserved. Internally, original shaft drives and flywheels are extant in both the former Machining Room and the Carpenters Shop. The Assay Office (Site 13) also retains the original assay furnace, with evidence of original shelving and the position where a timber cabinet stood. Given the complex internal timber construction, modifications and signs of original features can still be seen. Site 12, a saw machine room, built with concrete block and rendered in the 1960's, has little character except for its slate roof.
Completeness and condition:	This is another rare example of a relatively untouched early 20th century mine building. It not only demonstrates period construction design, but also reflects a similar style around the mine and unusually retains a number of original features. However, this building has been in disuse for many years, its exterior timber ship lap needs to be redecorated, with some timbers and facias replaced, and guttering repainted or renewed with period equivalents. Its slate roof appears to be in a good condition. Internally, the walls and structures are in a good condition, no doubt a result of ensuring during the past century that the roof was well maintained.
Significance/conservation strategy:	The historic group value of this early 20th century complex of buildings is highly significant, as well as its contextual relationship to other buildings of a similar date and style across the site. Adaptive re-use of its existing form is recommended as long as its significant internal features are not compromised.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of these buildings it is likely to be condition of planning consent that an internal photographic survey is commissioned before any proposed works to enable adaptive re-use. Re-use of original internal features (doors/architraves/skirting boards/fireplace etc), is recommended where possible.

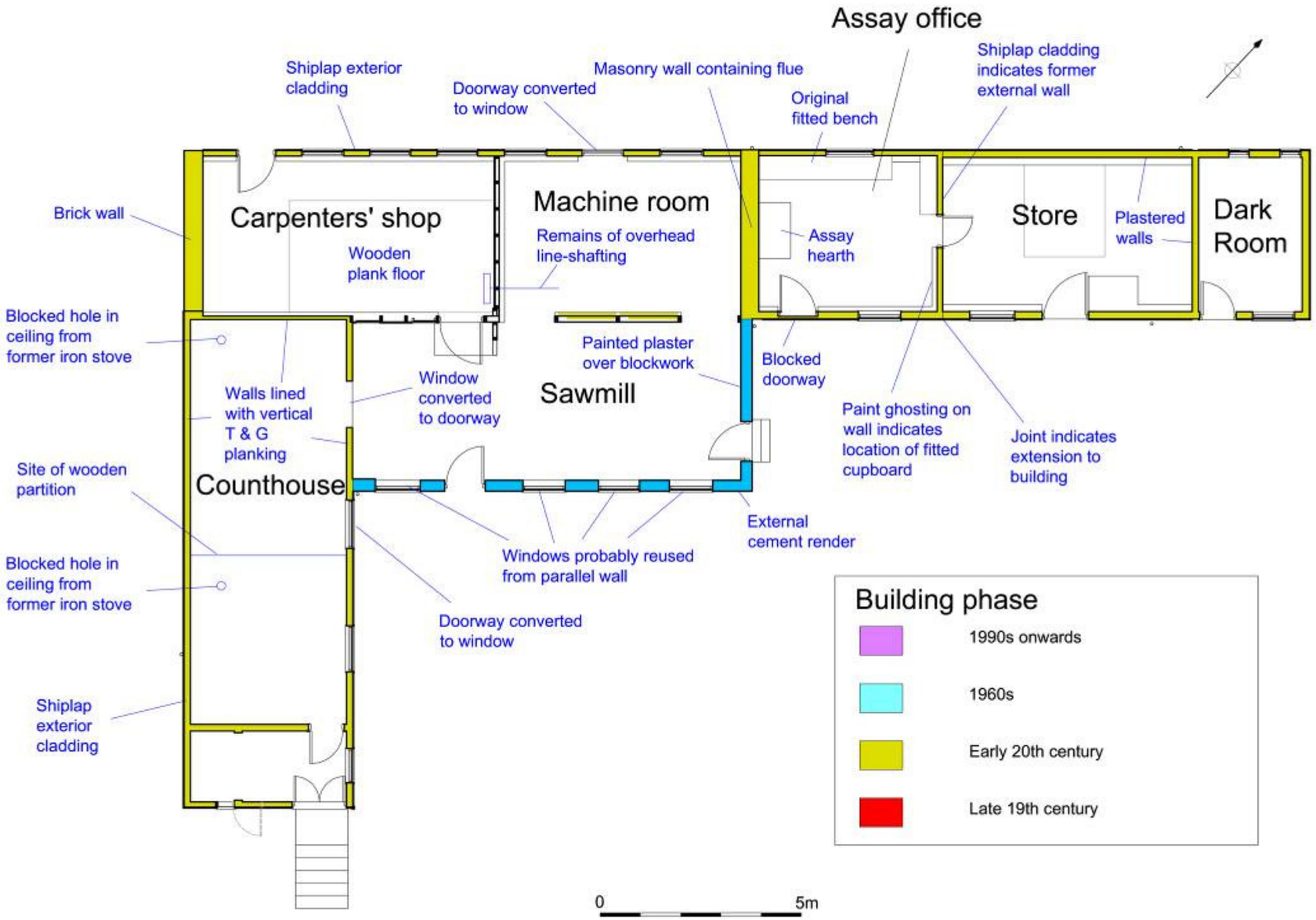
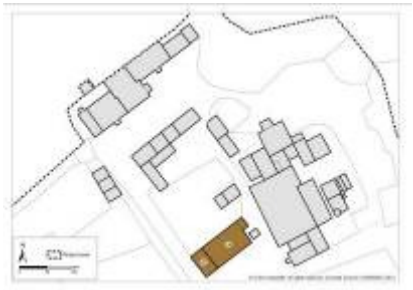


Figure 21 Detail phased site survey of the Carpenters' Shop complex

3.6.4 Mill and other buildings

Site name:	**KING EDWARD MINE** **Sheet R6**
Building name/identifier:	**Survey Office (Site 19**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1311128 – Survey Office)
Location:	NGR: SW 66361 38879 South west of core KEM site. Block Plan Fig 14
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	No survey plans available.

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* The roof is constructed with slate – it is unknown if this is the original construction or a replacement, but it appears to be in a good condition, as are the clay ridge tiles. The top clay air vents have recently been replaced. This building has iron rainwater gutters/downpipes. The side and end walls are built of horizontal boarded ship lap, some of which (north side especially), is in need of redecoration. The external joinery is in a reasonable condition, again some needs replacing and re-decorating. Site 20, an extension to provide a lecture/AV room was built of concrete block, with an external painted cement render and mono-pitch felt roof.
	Internal: All the original internal partition walls are built of vertical tongue and grooved timber. The ceiling is also boarded out with tongue and grooved timber, with visible steel joists below the ceiling. The floor is also constructed of timber parquet. The windows, for the most part appear to be original specification. Internally, the survey office is remarkably unaltered. It consists of a large survey room, with two small rooms on the east end, one a drawing office/store, the other now used for making drinks etc and access to a walk-in safe (a later 1960s addition). Above these rooms is a single room accessed via a timber staircase from the main survey drawing room. A small room by the entrance doorway is used as a map room.

Build date:	CSM built the Survey Office in c1899. The lecture room extension was built in 1967.
Modification date:	In 1967 the original west facing windows to the survey office were removed, and built into the west face of the new lecture room extension. In addition, the new west wall partition (between the survey office and new lecture room), was also built with vertical tongue and groove, replicating the internal specifications of the survey office. At a later date (1990s) the old original warm air pipe channels with iron grating were removed and replaced with timber parquet flooring to match the style of the adjacent floor.
Original functions:	Survey drawing office and ancillary rooms. New lecture/AV room extension built in 1967.
Current function:	KEM meeting room/lecture room and venue for start/finish of KEM guided tours. Drawing/survey walls used for display of survey plans and other mining information.
Proposed function:	Retain existing function. Revamp existing display features as ongoing project.
Significant features/contents:	This is probably the most untouched original building (internally and externally) within KEM, and in an excellent state of preservation. Even the original stools and benches are still in use (photograph taken in 1899 – see Fig 26). These timber framed buildings (with the exception of Site 12), are highly significant in terms of their original external timber ship lap design, and replicated in other parts of the mine from the turn of the 19th century onwards, with original internal tongue and grooved timber partitions. This complex also retains many original windows and doorway openings.
Original fixtures and fittings:	Original benches, stools and shelving in the main survey drawing room. Original drawing office shelving is also still extant. The 1960s walk-in safe is still extant.
Machinery:	Not applicable.
Summary description:	The Survey/drawing room is Listed Grade II*. There are no proposals by KEM to recommend adaptive re-use. This purpose built building has always functioned as a drawing office until CSM moved to its new campus at Pool in 1975. As such it still retains its original features, character, purpose and function. This is amplified by the degree of preservation of its internal timber tongue and grooved décor. It is still used for its original purpose, meetings and education about the mine, although survey drawings are not drawn up anymore. Externally, especially on the north side, the timber ship-lap needs complete re-decoration.
Completeness and condition:	This is possibly the best example of an late 19th century timber frame mine building at the KEM site. It must be the best preserved student drawing offices in Cornwall, and not only demonstrates period construction design, but also reflects a similar construction style around the mine and unusually retains a number of original features. Internally, very little needs to be done. This building is still in use over a century later although its exterior timber ship lap needs to be redecorated and possibly some timbers and facias replaced. Its slate roof appears to be in a good condition. Internally,

	the walls and structures are in a good condition, no doubt a result of ensuring during the past century that the roof has always been well maintained.
Significance/conservation strategy:	The historic group value of this late 19th century building is highly significant, as well as its contextual relationship to other buildings of a similar date and style across the site. Internally, the quality of its fixtures and fittings is breathtaking, when compared to an internal photograph of the building in 1899. The conservation strategy is to preserve the building in its present state.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of these buildings it is likely to be condition of planning consent that an internal photographic survey is commissioned before any proposed works are undertaken.

ite name:	**KING EDWARD MINE** **Sheet R7**
Building name/identifier:	**Calciner (Site 21**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1159243 – Calciner with chimney)
Location:	NGR: SW 66393 38878 South end of core KEM site. Block Plan Fig 14
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 22

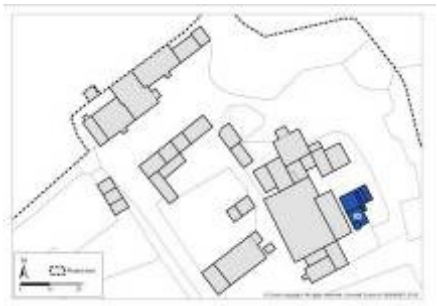
Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* The hipped roof is constructed of slate. Its former slurried roof was re-roofed in slate in 2001. The walls are constructed of un-coursed granite rubble with granite quoins. The wall finish is a combination of flush and recessed pointing. The recessed pointing was probably undertaken when the roof was replaced. The flush pointing is probably the original finish (then lime washed). This building has original iron rainwater gutters/downpipes, and timber facias. The walls appear in a good condition and do not appear to need repointing. However, the external joinery is in a reasonable to poor condition – again, some needs replacing,

	and all re-painting. The square profiled red brick quoined chimney at the centre of the west end is in a good condition, and appears to have been entirely repointed. A large recessed window is centrally located in the south elevation, with a doorway in the north elevation (via Site 23 – an infill building used as a site entrance).
	Internal: There are no internal partitions or walls to this single storied building. All of the original features/fixtures have been removed. The floor is constructed of timber floorboards. The main southern window appears to be original specification. A doorway has been cut into the north and east elevations for access/exit. The walls are painted white, and used to site exhibition boards – access through the building to main reception entrance.
Build date:	KEM built the reverberatory furnace Calciner with drying hearths in 1904, with associated recovery slime tanks to the west (Site 39).
Modification date:	By the mid 1980s (after training had been moved to the new campus in 1975), part of the site which included the calciner, had been stripped of equipment, leaving the building empty. The building was repointed in 1992.
Original functions:	The reverberatory furnace calcined copper ore which allowing the product to be soluble in dilute acid, then precipitated.
Current function:	Calciner walls are used for various exhibition displays (currently of the WHS and Great Flat Lode), and entrance to KEM reception kiosk. New display features in 2009.
Proposed function:	Retain existing function.
Significant features/contents:	Externally, this building retains its original character and design. Its recent external overhaul and re-slating has enhanced its appearance, especially with the imposing attached square chimney. However, internally it presents as a shell of its former function, although this has been adapted for re-use for much needed exhibition space.
Original fixtures and fittings:	Not applicable.
Machinery:	Not applicable.
Summary description:	This building is Listed Grade II*. Externally It retains its distinctive character of an early 20th century calciner; it's relatively recent external overhaul improving and conserving the building. There are no proposals by KEM to recommend adaptive re-use. Presumably it will continue to function as an exhibition resource.
Completeness and condition:	This building reflects a similar construction style (granite uncoursed stone with granite quoins), to some other buildings within the core of the site but unfortunately retains no internal original features. Its exterior design (see Fig 16) is still original. But externally – as with other sites, timber joinery needs replacement and complete re-decoration. Internally, the walls appear to be in a good condition, no doubt a result of ensuring during the past century that the roof has always been maintained.
Significance/conservation	The historic group value of this early 20th century building is

strategy:	highly significant, as well as its contextual relationship to other buildings of a similar date and style across the site. But internally, the building is featureless and lacks original function character. The conservation strategy is to keep the building in its present condition and continue to use it as an exhibition resource.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of this building it is likely to be condition of planning consent that an internal photographic survey is commissioned before any proposed non-reversible impact works are undertaken.

Site name:	**KING EDWARD MINE** **Sheet R8**
Building name/identifier:	**Winding Engine House, chimney and loadings (Site 24**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1159235 – Winding engine house). **This site is on the EH Building at Risk Register 2012.**
Location:	NGR: SW 66404 38895 South east corner of core KEM site. Figure 14 for location
Building at Risk:	Yes
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 22

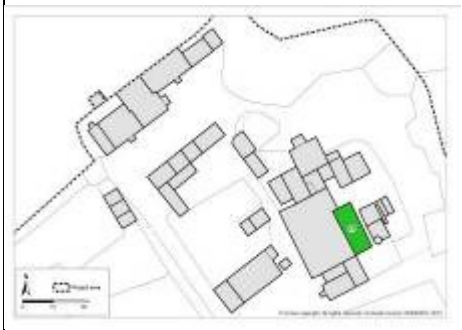
Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* The walls are constructed of un-coursed granite rubble with granite quoins. The roof is no longer extant, presumably either collapsed through neglect or removed when the steam engine was sold after 1908 when the new horizontal steam winder was installed (Ref: Site 30, Detail Record Sheet 13). The walls were repointed in c1992 with cement but appear to be in a relatively good condition, although vegetation is now growing out of the top of the attached chimney, the tops of the exposed wing walls and a few other parts of the building. There are two windows in each of the east and south elevations, and one window in the west side. The upper brick section of the chimney is missing. The loadings are overgrown with vegetation and could not be

	assessed due to the encircling fence.
	Internal: Due to the fence internal features of this building could not be assessed. However, it is likely that the internal walls were also repointed when the building was scaffolded for the exterior face. The cataract pit is extant as well as the granite cylinder bedstone.
Build date:	This building dates back to 1869 and was built by South Condurrow Mine to wind from Engine/Sump Shaft (Site 34). However, the location of Kings Shaft (Site 66) to the south makes it also a prime candidate for being wound from this engine. The engine was working until 1908, when the horizontal steam winder was erected and working (Site 30).
Modification date:	There are no known modifications to the building.
Original functions:	Winding engine house, winding from Engine/Sump Shaft.
Current function:	Building not in use since the new horizontal steam winder was operational (1908).
Proposed function:	KEM have a long term aim to place a steam engine back into this building. The National Trust have many parts of a former china clay steam engine (from Restowrack) stored on site that could be suitable for re-erection into this building.
Significant features/contents:	Both externally and internally, this building retains its original character and design. Its repointing a decade ago has enabled the structure to retain structural integrity and enhanced its appearance.
Original fixtures and fittings:	Not applicable.
Machinery:	No original machinery remains, but another engine could be constructed within its walls.
Summary description:	This building is Listed Grade II*. It retains its distinctive character of a mid/late 19th century Cornish steam winding engine, and it's relatively recent external conservation overhaul (unfortunately using a cement based mortar), structurally improved and conserved the building. There are no firm proposals by KEM to recommend adaptive re-use, apart from a long term objective to install another steam engine (for which substantial funds will need to be raised). Presumably it will continue to function as a visual resource of a bygone technology.
Completeness and condition:	This building reflects a similar construction style (granite uncoursed stone with granite quoins), to some of the older buildings within the core of the site. It still retains its main structural features of the (unsupported) wing walls, but unfortunately retains no internal original fittings/features. The building appears to be in a good structural condition, no doubt a result of masonry conservation a decade ago.
Significance/conservation strategy:	The historic group value of this mid/late 19th century building is highly significant, as well as its contextual and working relationship to other adjacent mine buildings. It is one of a few buildings that date back to South Condurrow Mine (1864-1897), the primary mine for this site. In the short term, the conservation strategy is to keep the building in its present condition to provide options for longer term projects,

	and to repoint the building with a lime based mortar – after its cement mortar has been removed.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	If, in the long term serious consideration for reinstatement of another steam engine is likely, it will be necessary to produce a detailed impact assessment of the proposals (which may necessitate construction of new cylinder foundations and certainly the loadings), as well as rebuilding the brick section of the chimney etc (given the statutory designation of this building). Construction of a typical roof in the short term would aid structural stability of the unsupported wing walls.

Site name:	**KING EDWARD MINE** **Sheet R9**
Building name/identifier:	**Winding Engine Boiler House (Site 25**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1159235 – included with Winding engine house). **This site is on the EH Building at Risk Register 2012.**
Location:	NGR: SW 66395 38895 South east corner of core KEM site. Figure 14 site plan
Building at Risk:	Yes
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 22

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* This long and high building is constructed of un-coursed granite rubble with granite quoins. The building has a slurried slate pitched roof which is in a poor condition (patched to stabilise it last year). There is a brick edged window opening in the top section of each gable and a central window in the west side. There is a double door opening with timber doors in the south elevation – the main entrance/exit. The external walls were repointed in c1992 at the same time as the adjacent engine house, and as a result appear to be in a relatively good structural condition.
	Internal: Internally, there is evidence in places of the original lime plaster wall render. The floor was presumably infilled

	when the boiler was removed, but still retains original clay floor tiles in places. The roof is visible with its open 'A' frame trusses, purlins and rafters. Cement from the slurried roof is also visible from the underside. All of the floor area is full of stored Trevithick Society items of an industrial nature.
Build date:	The original shorter mono-pitch building dates back to 1869, with both ends extending either side of the engine house with a hipped roof. It was built by South Condurrow Mine at the same time as the winding engine house (Site 24). However, in 1904 the building was demolished and a new longer, higher, pitched building constructed to take a longer Cornish boiler (to increase steam pressure).
Modification date:	The entire building was rebuilt in 1904. Although the winding engine no longer consistently operated, the boiler remained in use up until approximately 1920 (*pers comm* Tony Brooks). The exterior masonry walls were repointed with a lime mortar in c1992, and the scantle slate roof patched in places last year.
Original functions:	Boiler house for winding from Engine/Sump Shaft.
Current function:	Storage for Trevithick Society and KEM items.
Proposed function:	KEM have a medium term aim to reuse and adapt this building to create a 'hands on' educational resource for children and adults.
Significant features/contents:	Both externally and internally, this building retains its original character and design. Its repointing a decade ago has enabled the structure to retain structural integrity and enhanced its appearance. There are no significant internal features – apart from extant openings related to its previous function.
Original fixtures and fittings:	Not applicable.
Machinery:	No boiler remains.
Summary description:	This building is Listed Grade II* (as part of the adjacent Winding engine house. It retains its distinctive character of an extant and well preserved late 19th century Cornish steam engine boiler house. It's relatively recent external conservation overhaul structurally improved and conserved the building's walls but the roof needs to be re-slated. There are proposals by KEM to recommend adaptive re-use – although this would not affect the external character of the building. Externally it will continue to function as a visual resource of a bygone technology.
Completeness and condition:	This building reflects a similar construction style (granite uncoursed stone with granite quoins), as some of the older buildings within the core of the site. With the exception of the roof and facias, it is well preserved, but unfortunately retains no internal original fittings/features (apart from a rotted window, and steam pipe openings). The building's walls appear to be in a good structural condition, no doubt a result of masonry conservation two decades ago.
Significance/conservation strategy:	The historic group value of this early 20th century building is highly significant, as well as its contextual and working

	relationship to the adjacent winding engine house. The conservation strategy is to reroof the building and restore it to good condition.
EH at Risk Register 2012:	Winding Engine Boiler House (Site 25)
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of this building it is likely to be condition of planning consent that an internal photographic survey is commissioned before any proposed non-reversible impact works are undertaken.

Site name:	**KING EDWARD MINE** **Sheet R10**
Building name/identifier:	**Mill (Dressing) House (Site 26**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1142687 – included with Stamps-Site 27)
Location:	NGR: SW 66385 38895 Centre of core KEM site. See Figure 14 for site location
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 22

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* This large single storey tin dressing plant building is constructed of corrugated sheet cladding to walls supported by a timber frame and a cement fibre corrugated roof. It is rectangular in plan with a three span roof on an east-west axis, triple gabled to west and east. There is a door between the first and second gables, and internally to the south, with roof skylights.
	Internal: The floor is mostly concrete, to site tin dressing machinery: This includes a Dipper wheel, a Frue Vanner, a Cornish Round Frame, A Buddle, Rag Frames, Slime Tables, Kieve Tossing and packing gear, Flotation Cell, and Sand Table. Internally, the building is open on its north side where it adjoins the stamps, creating a far larger building than it appears externally.
Build date:	The dressing floor was erected 1902–1904 on the former site

	of the South Condurrow spalling sheds (see Fig 8).
Modification date:	It was extended in 1905 to include the third gable to the south. The walls of the building have been sporadically re-clad with corrugated iron sheeting throughout its lifetime, the most recent episode being in 2001 (in part). The roof had its corrugated iron sheeting replaced in the 1960s with a cement fibre roof asbestos equivalent, which still remains (albeit in a poor condition).
Original functions:	Tin concentration dressing plant.
Current function:	Individual machinery demonstrations of the tin concentration dressing plant as part of the KEM guided tour and open days.
Proposed function:	Unchanged from current function.
Significant features/contents:	Taken as a whole – this is the most complete working collection of tin dressing plant in Europe, and one of the most significant sites at KEM. Individual items have been rescued by KEM volunteers from other sites in Cornwall – all are rare (some unique), but all have been rebuilt and are in working order for use in regular demonstrations as part of the KEM experience: **Cornish Round Frame** (rescued 1974) and reinstated on original site; a very rare survival one of only two surviving working examples. **Kieve Tossing and Packing gear** (rescued 1989) and reinstated on original site; a unique survival of this equipment. **Dipper Wheel** (rescued 1989 from the former Tolgus Tin site) and reinstated on original site; another unique survival of equipment. **Sand and Slime Tables** (rescued 1989 from Geevor and Tolgus), and reinstated on original site; more examples of unique survival of tin dressing equipment. **Buddle** sited on original concrete base (typical examples can still be seen across the great Flat Lode mines. **Frue Vanner** (reconstructed from other sites) and reinstated on original site; an example of equipment used since the turn of the 20th century for tin dressing. **Rag Frames** (newly built of timber) and reinstated on original site; a working example of equipment commonly used since the 1860s for tin dressing. In the south west corner is the **Tin Store**, a safe, lockable (ship lap timber walled), site to store the tin ready for export. A **Flotation Cell** (rescued in 1989 from Geevor) is also present (a rare survival of this equipment dating from the 1930s), although it was not originally used in the Mill.
Original fixtures and fittings:	The description above describes the equipment that has been brought into the Mill – which replicates its original contents that were disposed of in the mid 1970s. There are original fittings in the concrete floor where items have been reinstalled and in the roof space (ie shaft drives etc).
Machinery:	No original machinery remains, with the exception of the Californian Stamps.
Summary description:	This building is Listed Grade II* (as well as the adjacent Stamps (Site 27). Now its equipment has been restored and rebuilt and is in working order, this site retains its distinctive character of a working and well preserved late 19th/early 20th century tin dressing floor. Taken as a whole, it represents survival of the only working tin concentration dressing plant in Europe. There are no proposals by KEM to recommend any

	other changes internally or externally, and it is hoped it will continue to function as a visual and working resource of a bygone technology.
Completeness and condition:	This site now has all of the main working tin dressing equipment that would have been used from the early years of the 20th century, demonstrating the localised resurgence of tin mining of the Great Flat Lode. All the equipment has been rebuilt from either second hand sources, or new timber items, carefully replicating the original design and specifications. Although the side walls were partially re-clad in 2001, the 1960s cement fibre corrugated roof and timber facias are in a poor condition.
Significance/conservation strategy:	The historic group value of the contents of this working tin mill, and its contextual and working relationship to other adjacent mine buildings cannot be understated. It is highly significant, and is the only example of a complete working tin concentration plant in Europe. Without this site and its working machinery, KEM could not survive or be perceived as a complete example of a Cornish mine.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Presumably when items break down they will be repaired by KEM volunteers. Funding should be kept in reserve for such occasions.

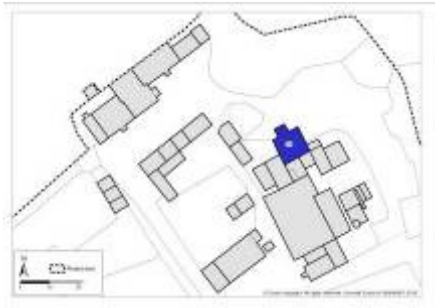
Site name:	**KING EDWARD MINE** **Sheet R11**
Building name/identifier:	**Stamps (Site 27**)
Survey date:	2/8/2012
Designations:	Listed Building Grade II* (Ref. 1142687 – included with Mill building-Site 26)
Location:	NGR: SW 66377 38909 Centre of core KEM site. See Figure 14 for site location
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 22

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* This tall double storey building to site the Californian Stamps is constructed of corrugated sheet cladding to walls supported by a timber frame and a cement fibre corrugated roof. It is rectangular in plan with a single pitched roof. There are two windows on the west side, one on the south side and one on the east side. The north side opening is blocked with timber, formerly the opening for the overhead tramway from Engine Shaft headgear.
	Internal: The building is built around the massive timber frame to support the five head of stamps. The book on King Edward Mine (Brooks & Watton 2002, Plate 44), shows a photograph of the stamps building being erected around the already constructed stamps. To allow safe public access from the Mill Engine Room (Site 28), timber stairs have been constructed down to the Mill floor.
Build date:	These Stamps, built by Fraser & Chalmers were erected in 1901, purchased after display in the Paris Exposition a year earlier (presumably at a discounted price !).
Modification date:	The stamps themselves have never been modified, but they have occasionally been repaired. The building has been sporadically re-clad with corrugated iron sheeting throughout its lifetime, the most recent episode being in 2001. The roof had its corrugated iron sheeting replaced in the 1960s with a cement fibre roof.
Original functions:	Californian design Tin Stamps.
Current function:	Still operational as Tin Stamps.
Proposed function:	Unchanged from current function. Operates occasionally on special occasions.
Significant features/contents:	These tin stamps are complete and the only full size working set in Europe, a highly significant feature. They also include a small jaw size crusher. The first stamps of this Californian design were installed at Dolcoath Mine in 1893.
Original fixtures and fittings:	KEM retains this original equipment which at the time was at the forefront of a new technological design, and amazingly is still in good working order.
Machinery:	Californian Stamps.
Summary description:	This building (and presumably the contents) is Listed Grade II* (as well as the adjacent Mill House (Site 26). Taken as a whole, the Stamps and Mill House represents survival of the only working tin concentration dressing plant in Europe. There are no proposals by KEM to recommend any other changes internally or externally, and it is hoped it will continue to function on special occasions as a visual and working resource of a bygone technology.
Completeness and condition:	This site now has all of the main working tin dressing equipment that would have been used from the early years of the 20th century as part of the localised resurgence of tin mining in the Great Flat Lode. This is a highly significant massive piece of machinery, which is now over a century old, and the only one in Europe that is still functioning.
Significance/conservation	The significance of the stamps and the historic group value of the contents of this working tin mill, together with its

strategy:	contextual and working relationship to other adjacent mine buildings cannot be underestimated. It is highly significant to the site and is the only example of a complete working tin concentration plant in Europe.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	In case of Stamps breakdown, it may be prudent to keep a sum of money available for repair.

Site name:	**KING EDWARD MINE** **Sheet R12**
Building name/identifier:	**Mill Engine Room (Site 28**)
Survey date:	2/8/2012
Designations:	None
Location:	NGR: SW 66385 38895 Centre of core KEM site. See Figure 14 for site location
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 22

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceilings, windows, doors):**	*External:* This single storey timber building was built to house the steam engine which powered (via a belt drive), both the main Stamps (Site 27, Detail record R11) and the Mill dressing floor machinery (Site 26, Detail record R10). The building is rectangular in plan with a single pitch roof of slate. It is unknown if this is the original construction or a replacement, but it appears to be in a good condition. The walls are built of horizontal boarded ship lap, all of which is in need of a coat of paint. The rainwater goods are of original cast iron profile. The external joinery is in reasonable to poor condition, again some needs replacing and re-decorating.

	Internal: All the original internal walls are built of vertical tongue and grooved timber. The ceiling is also boarded out with tongue and grooved timber, under the roof joists. The floor is also constructed of timber floorboards, with newer floorboards used to infill the former site of the steam engine (see Fig 16). The windows mostly appear to be original.
Build date:	The 90HP compound steam engine from Holman's of Camborne was erected in 1902.
Modification date:	The roof slates were replaced in 1993. This room has been used to site an exhibition of photographs and site history information, both on the walls and standing displays and cabinets.
Original functions:	Mill engine room with belt drive to Stamps/mill below floor level.
Current function:	Exhibition room and access to AV room (Site 31).
Proposed function:	Unchanged from current function.
Significant features/contents:	Unfortunately the steam engine was removed long ago (and has not been replaced). These timber framed buildings are highly significant in terms of their original external timber ship lap design – replicated in other parts of the mine from 1903 onwards, with original internal tongue and grooved timber walls. This complex also retains original windows and doorway openings.
Original fixtures and fittings:	There are original fittings in the ceiling for ventilation and structural roof support. The original position of the steam engine can be seen in the wooden floorboards.
Machinery:	No original machinery remains.
Summary description:	Externally, this building retains its original character. However, removal of its main focus, the steam engine to power the Stamps and mill machinery, has left it devoid of its 'raison d'etre'. However, its internal wall finish is still preserved, as it is in many of KEM's early 20th century buildings. Its light and rectangular open plan provides an excellent setting for a detailed exhibition of KEM.
Completeness and condition:	This is another rare example of a relatively untouched early 20th century mine building. It not only demonstrates period construction design, but also reflects a similar style around the mine and unusually retains a number of original architectural features. However, its exterior timber ship lap needs to be redecorated, as well as the timber facias. Its slate roof is also in a poor condition, and has previously been patch repaired. Internally, the walls and structures are in a good condition.
Significance/conservation strategy:	The historic group value of this early 20th century complex of buildings is highly significant, as well as its contextual relationship to other buildings of a similar date and style across the site. Adaptive re-use of its existing form has not compromised or impacted existing features. Future conservation work should reflect, not impact the building's character.
EH at Risk Register 2012:	Not applicable

Additional requirements for proposed work/any other factors affecting reuse/repair etc:	It may be prudent to keep (or raise) a sum of money to fund purchase/repair and installation of another steam engine to power the mill as a long term objective.

Site name:	**KING EDWARD MINE** **Sheet R13**
Building name/identifier:	**Horizontal Winding Engine House (Site 30) and Compressor House (Site 29)**
Survey date:	2/8/2012
Designations:	None
Location:	NGR: SW 66396 38916 North of centre core KEM site. Figure 14 for location
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	Survey Plan Fig 22

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceiling, windows, doors):**	*External:* These single storey timber buildings (on the exact site of the original winding engine house and compressor house buildings - which burnt down in 1957), were recently rebuilt (2010) on the same footprint. The winding engine house now sites the same Holman's horizontal steam winding engine used in this building over 60 years ago. Given the large amount of survey and photographic evidence for these buildings, the specification for the rebuild was very similar to the original (built in 1907). The building is rectangular in plan with a single pitch roof of slate. Given its recent new build, it is in a good condition. The walls are built of horizontal boarded ship lap, and the rainwater goods also mimic the original cast iron profile. The external joinery is also in a good condition.
	Internal: All the original internal walls have been rebuilt using the original specification of vertical tongue and grooved pine timber. The ceiling is also boarded out with tongue and grooved timber using a similar specification wood stain. The floor is also constructed of timber floorboards. The window design also replicates the original 1907 design. The Compressor House - Site 29, was of earlier construction (built in 1899), but this building also burnt down in 1957.

	This was also rebuilt at the same time, but the original dividing walls of both buildings were not replaced – combining the area of both buildings to create a larger internal floor space (for exhibition material and displays).
Build date:	Site 29 (the original compressor house) was built in 1899, and sited a small engine and compressed air tank – to supply compressed air to power the rock drills via Engine Shaft (Site 34). This building was burnt down in 1957, but rebuilt in 2010. Site 30 (the original horizontal winding engine house) and its *in situ* machinery dates to 1907, when a decision was taken to purchase a more efficient winding engine for Engine Shaft. It was a 10 inch by 15 inch couple geared twin drum steam hoist supplied by Holman Bros. It worked until 1942 when it was sold to Castle an Dinas wolfram mine (Buck and Thomas 2012). KEM now has this original engine back in-situ in the newly rebuilt winding house and is currently being rebuilt to run on compressed air.
Modification date:	Both of these timber ship-lap buildings were rebuilt in 2009 (as the originals burnt down in 1957), on the same foundation footprints. This was recorded by Exeter University (2010), prior to the site rebuild. The original steam winder engine is also being rebuilt. The east timber wall of the compressor house and west timber wall of the winder house was removed between 1942 (when the winder engine was sold), and 1957. This was not replaced, combining the floor space of both buildings. The former compressor building now sites a Holman's of Camborne exhibition.
Original functions:	Compressor house and Horizontal winding engine and house, winding from Engine/Sump Shaft.
Current function:	Building in use to allow viewing of the original horizontal steam winder, exhibition panels and the Holman's display in the former Compressor building.
Proposed function:	It is not known if the KEM volunteers have a long term aim of installing a steam compressor back into its original position although an 1870s Harvey compressor is on display. However, KEM certainly intends to rebuild the steam winder for operational use.
Significant features/contents:	Both externally and internally, the quality of the 2009 rebuild and close attention to detail has created a new building that mirrors the exact specification of the original, and so complements the character of this building with the rest of this highly significant site.
Original fixtures/fittings:	None.
Machinery:	The horizontal twin drum steam winder is re-sited.
Summary description:	Externally and internally, this building's recent rebuild retains its original specification and certainly its character as being representative of an early 20th century construction, on the same basis as many other buildings on this mine site. Reinstating the original steam winder engine provides the focus for its use as an important part of the guided tour, and part of the story of a working Cornish mine.

Completeness and condition:	Although it is only three years old, many people would be hard put to recognise this fact, it exactly mirrors the character and design of adjacent timber frame buildings, a conservation philosophy followed by KEM.
Significance/conservation strategy:	The northern extension used as a store dates from 1902, and is highly significant because of historic group value with the Mill complex. The remainder of the building was rebuilt in 2010, but only the original foundations are significant. The rebuild has not compromised or impacted adjacent original buildings, rather complimented them.
EH at Risk Register 2012:	Not applicable
Long term requirements, any other factors affecting reuse/repair	Presumably putting the steam engine back to operational use will not impact upon existing planning/building control regulations. The steam compressor is partly rebuilt.

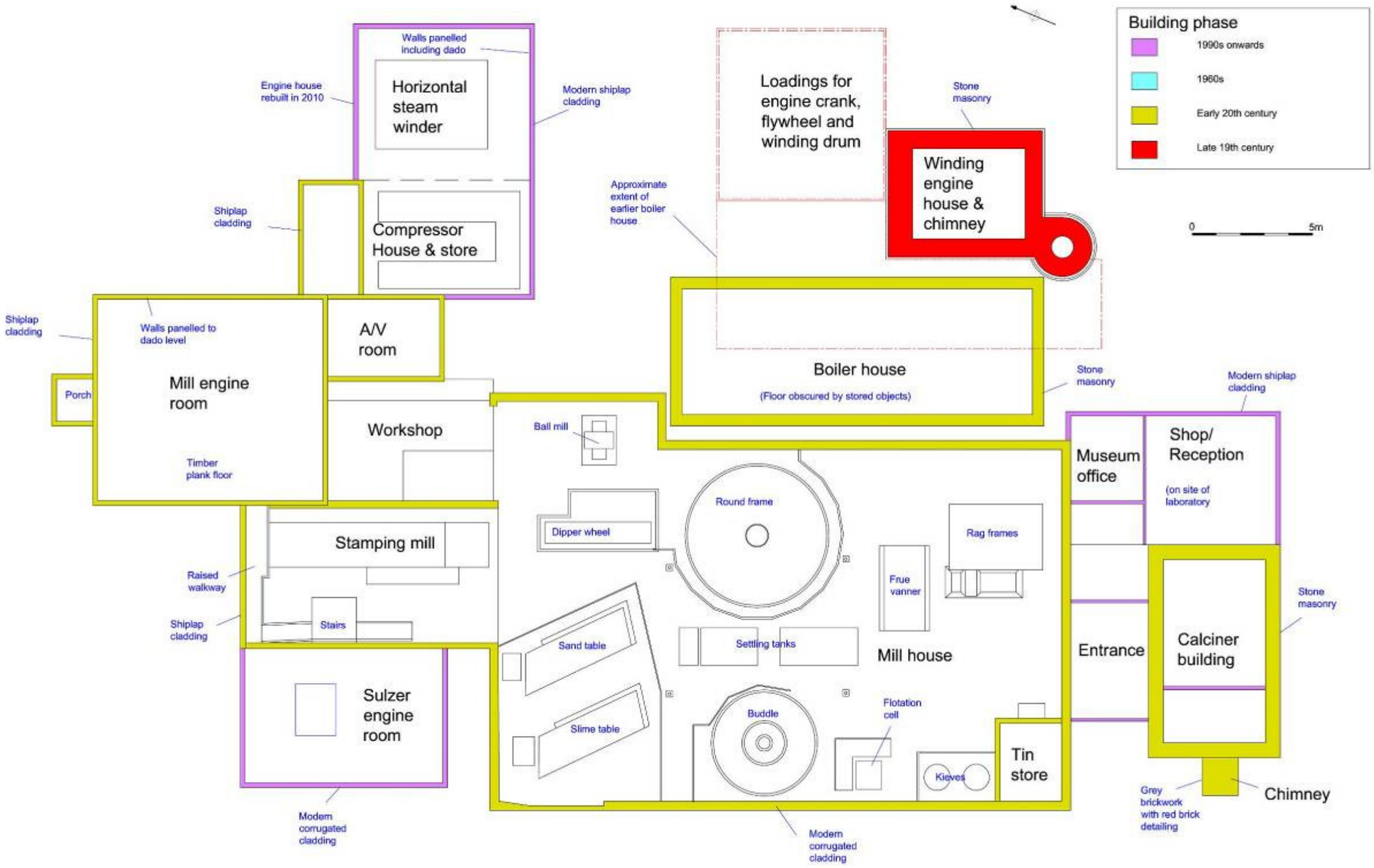


Figure 22 Detail phased site survey of the Mill complex

3.7 Site management

King Edward Mine Ltd. was incorporated as a not-for-profit company limited by guarantee on 14th January 2005, and is a registered charity. The site was originally owned by the Pendarves Estate until Kerrier District Council sought its purchase in 2008/9. It was eventually acquired by Cornwall Council in May 2009. KEM Ltd. currently has a 30 year lease, and an annual grant from Cornwall Council of £14,000 towards its running cost.

The museum is managed by five Directors (Tony Brooks (Chairman), Kevin Baker, Kingsley Rickard, David Blight and Nigel MacDonald), with the additional support of some 25 volunteers who are involved in all aspects of the site. There is one part time Guide/Keyholder, whilst a local freelance education officer provides the opportunity for all day educational school activity programmes. The museum attracted 5,500 visits in 2011 (an increase of 7% on 2010) of which around 2000 were paying visitors; 1000 came free to the annual Open Day and 2500 were free entry (including volunteers). However, King Edward Mine obtained a European Union and Defra funded grant as part of the *Discover the Extraordinary* project during 2010 to rebuild the Winder/Compressor House and introduce additional interpretation.

3.8 Ecological context

An ecological assessment report for King Edward Mine was produced by Cornwall Environmental Consultants (CEC) Ltd (Report Ref. CEC2039) for the entire CMP area, on 4th September 2012, with further bat surveys undertaken in July and August 2012. This work was undertaken in advance of proposed renovation work on three buildings and to inform and enhance longer term ecological site management.

Figure 23 Historic Environment aerial photograph of the CMP area (CC F71-015) shows the extent of fields, hedges, gorse and rough ground obscuring spoil heaps and possibly mine shafts.

The CMP area consists of old mining sites with many of the habitats usually associated with mines, for example heathland, ephemeral/short perennial, bracken and scrub. The site also has large areas of semi-improved grassland, some of which are relatively species rich. The surrounding area is dominated by pasture fields bounded by Cornish hedges, most of which support shrub species. The acid grassland, species-rich neutral grassland, hedges and heathland are the habitats of greatest nature conservation importance. However the site supports a good mosaic of habitats which provide a much more diverse species mix than would normally be expected from the sum of such habitats.

The Carpenters' Shop supports a small common pipistrelle roost and renovation work will need to taken place after further consultation with a bat ecologist. Of the species present it is the small bat roost which is of greatest significance as common pipstrelle is a legally protected species. A method statement or a Natural England European Protected Species (bats) Licence will need to be in place before the renovation work starts on this building.

There are Schedule 9 plants (Japanese knotweed, montbretia, variegated yellow archangel) present on the site. A management programme will need to be put in place to eradicate them from the site. The presence on site of these non-native invasive species detracts from an otherwise very rich site. If left unmanaged these species have the potential to seriously impact upon the nature conservation value of the site.

There is the opportunity to enhance the site for ecology by:

- Controlling the scrub in and around the main area of heathland.
- Controlling the scrub and bracken in and around the acid grassland.
- Clearing/opening up the large areas of scrub in the west of the site and on the area south of the lane. This will encourage heathland, grassland and provide habitat for metalliferous bryophytes.
- Enlarge the two small ponds on site.

Figure 24 is an archaeological and ecological constraint map showing significant features of both specialisms. The map is key coded and self explanatory.

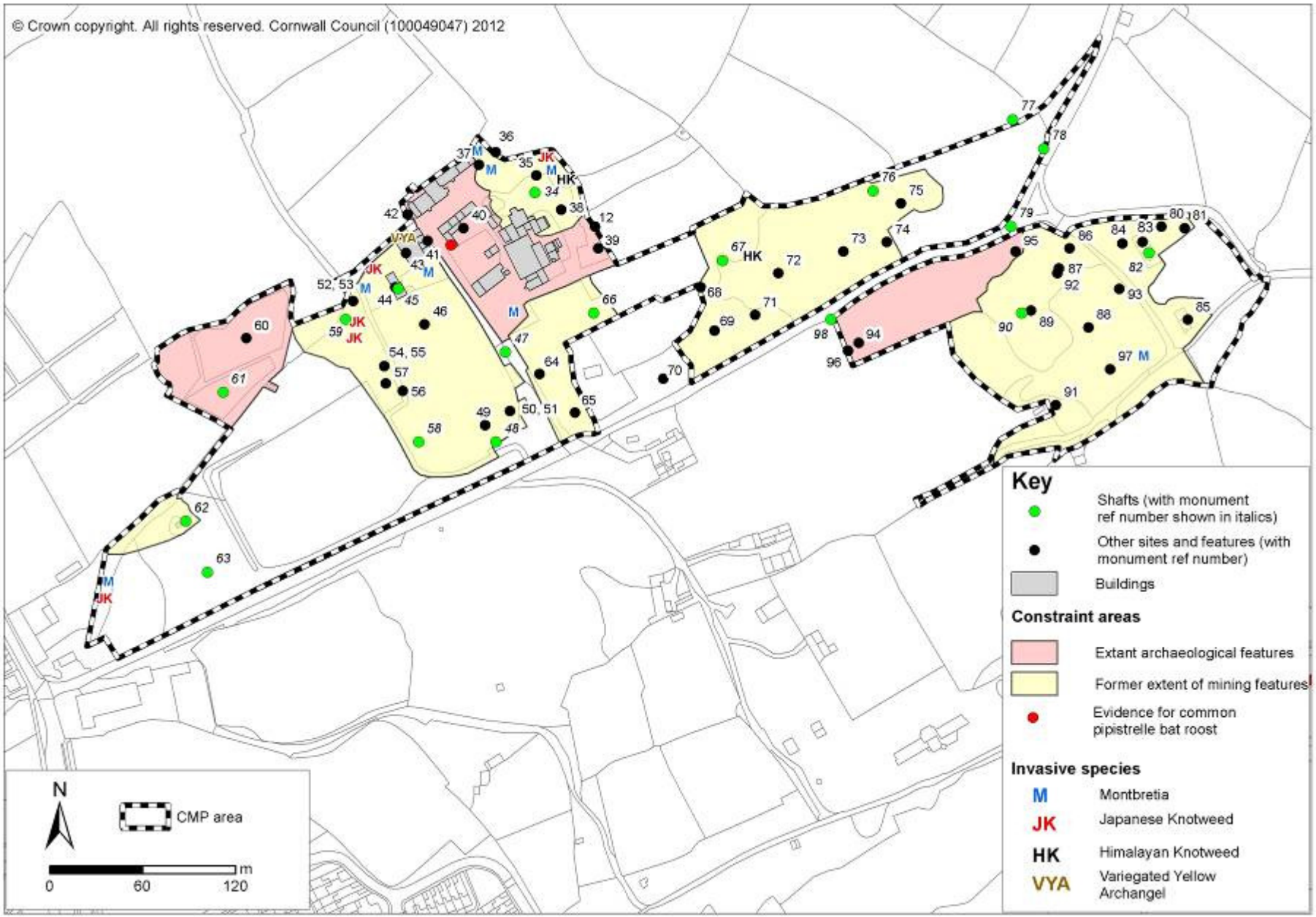


Figure 24 CMP area archaeological/ecological constraint map

4 King Edward Mine: Site Significance (Stage 2)

This section examines and assesses the significance of King Edward Mine. It considers not only the relative significance of all remaining structures on site but also its wider relationship with the Cornish Mining World Heritage Site mining landscape. It is intended that this information will help inform proposals for the future conservation and possible conversion of under-used buildings, to create a higher public profile and interest, in an attempt to promote a sustainable income for the future.

4.1 Methodology

This assessment of significance has been prepared as a result of going through the process of undertaking a detailed understanding of the site following research and analysis of its main significant components. This has included research of existing reports and documents relating to a number of different proposals and schemes that have been underway during the past two decades. Perhaps the most important methodology is to simply visit the site and to understand its function, raison d'être, and the way it evolved through time.

Within the parameters of this report, the assessment of significance has been generated by following the methodology of assessing the relative merits and significance of every building, analysing historical site phasing and recording the location of original features, fixtures, fittings and original equipment. A working knowledge of other adjacent industrial mine sites within the World Heritage Site (particularly the Camborne/Redruth area (Area 5i), has provided additional comparative criteria from which to base significance comments.

The significance criteria have been prepared by members of Cornwall Council Historic Environment Projects; specifically Colin Buck, Nigel Thomas (surveys) and Peter Dudley (graphics). Colin Buck has specialized in all aspects of industrial archaeology for the past twenty years, and has produced the Mineral Tramways Conservation Management Plan. At the half way stage the draft results and implications of the Stage 1 and Stage sections of this Conservation Management Plan were reviewed by a key stakeholder group, as part of a consultation event. The group invited to attend included: the five Directors of King Edward Mine, a member of the commissioning section of Cornwall Council (the Culture Team), the Historic Environment officers (Planning Advice Officer–on behalf of the WHS, the Planning Advice Officer Team Leader: Conservation Officer), and representatives of the Cornish Mining World Heritage Site Office, English Heritage, the project architect (2012), and of course the report author (See Appendix 10.6 for event summary).

4.2 Statement of Significance

International significance

Significance of the Site to the World Heritage Site/Outstanding Universal Value

King Edward Mine is a central pillar within the Cornish Mining World Heritage Site (WHS). The overall complex has Outstanding Universal Value as the best preserved mine head complex within the WHS for the 1700 – 1914 period for which the WHS was inscribed by UNESCO. Outstanding Universal Value is a central theme of the World Heritage Convention, and it means exceptional international significance. It is only used for heritage which meets the World Heritage Convention relevant criteria and conditions of integrity, authenticity and management for the particular WHS.

King Edward Mine, sited at the western end of the Great Flat Lode is the oldest complete 19th/early 20th century mine site and the most significant example left in Cornwall, demonstrating key authentic aspects of the Cornish mining industry. In addition, it is virtually a complete example of a late 19th and early 20th century mine training school (by Camborne School of Mines to learn practical mining, mineral processing and surveying). As such it was of international importance for training mining professionals. Camborne graduates are known and respected throughout the international mining

industry maintaining the influence that Cornwall has had on the mining world over the past two centuries.

Of special significance is the nature and extent of working examples of 19th and 20th century tin dressing equipment and mine machinery at KEM, many of which are unique or rare survivals in the world. Stored within the site is an extensive collection of Trevithick Society artefacts, many of which are internationally rare examples.

There are only five mine sites in the World Heritage Site that are left with substantial elements of their original equipment; there will not be any more. Three are in close proximity in the former Camborne/Redruth Mining District, where tin mining continued through much of the twentieth century. They collectively and predominantly represent exceptional survivals from the first quarter of the twentieth century and all contribute to the best preserved mining landscape in the Cornish Mining WHS.

KEM lies within the Camborne and Redruth Mining District (WHS Area A5), amidst one of the densest concentrations of significant industrial sites anywhere within the WHS. It lies within the south-western sector of the Area and at the western end of the Great Flat Lode; a landscape renowned particularly, for its tin mining and dressing (mineral processing) archaeology.

The Great Flat Lode Area was unusual in that its geological riches, together with its mine engineering technology, enabled it to weather the catastrophic fall in international copper prices through the mid 19th century. New tin discoveries at the end of the 19th century to the south of Carn Brea saw the development of important mining ventures along the Great Flat Lode outcrop. Jointly, these allowed the economy of the area to continue to thrive into the early decades of the 20th century. The pattern of post-industrial land use followed that of other rural areas of Cornwall, after the cessation of mining. Whilst some peripheral areas of mine sites were reclaimed to agriculture, the significant buildings in this area became fossilised, and as a result, the 21st century survival of evidence for industrial activity here is exceptional. KEM and the Fortescue engine houses are very prominent features of this mining landscape, and make a major contribution to its OUV.

The **Outstanding Universal Value** statement for WHS Area A5i is: *'The mid-west Central Mining District, the richest non-ferrous metal mining district of the late C18th and first half of the C19th, the most populated, most urbanised, the most innovative in the Site, an internationally significant centre for safety-fuse and rock-drill manufacture and an epicentre of migration … **King Edward Mine**, the former practical training base for students at the world-famous Camborne School of Mines, is one of Cornwall's two complete mine sites and contains a unique collection of restored historical machinery'.*

National significance

Individual aspects of natural and cultural heritage have differing levels of significance; some may be of an international level, and others of national, regional or local significance. The reasons why a site is significant also vary.

King Edward Mine individual buildings

The entire KEM site contains over thirty nationally significant buildings, many part of larger complexes; namely the Counthouse complex, the Carpenters' Shop complex, the Assay Office complex and the Mill complex – all of which are Grade II* Listed, with the exception of the nearby South Condurrow Stamps Engine House which is Grade II. Within the CMP area to the east, the Fortescue pumping and winding engine houses are also Scheduled Monuments of National importance.

Significance of individual buildings to group value

All the major buildings on the site are Grade II* Listed because of their group value, with the exception of South Condurrow Stamps Engine House. The KEM complex is of the highest integrity with exceptional group value that represents key authentic aspects of the Cornish mining industry and a training school site (Camborne School of Mines) of international significance. Figure 25 is a plan showing the significant sites within the core complex. The significance variables are divided from Highly Significant to Neutral.

Figure 25 King Edward Mine core plan of comparative significant sites

The highly significant sites are those that retain high degrees of originality and character (although this may be masked externally). Some of the significant sites are either rebuilt or lack degrees of originality etc.

Significance of original in-situ machinery and the Trevithick Society's collection

A key element of the site, as it exists today, is the extensive collection of machinery, artefacts, photographs and documents which are displayed or stored at the site. This collection now owned by the Trevithick Society, a central partner in the King Edward Mine project, has been collected across Cornwall and many internationally or nationally significant items have been brought to this site over the last 25 years, some of which have been expertly restored to working order. The Californian Stamps, and the other machinery on the processing floor (refer to Detail Record Sheet R10), illustrate tin processing, and are regularly brought to life by the guide and volunteers. They are a remarkable testimony to the people who have voluntarily given a large proportion of their spare time to create this facility.

The Society has a huge collection of some 70,000 items comprising machinery, artefacts, minerals, documents, film and photographs some of which is on loan to various sites across the county with the most important documents lodged at Cornwall Record Office. The Society has obtained funding to document the collection to national museum standards with the long term objective of bringing most of the collection together in one location… ideally King Edward Mine.

A museum professional has been commissioned by the Trevithick Society to undertake an independent assessment of the entire collection, which will include a detailed assessment of its significance; and to prepare a Collections Management Plan. These documents will be completed in 2013, and will cover all the items in the Trevithick Society's collection at KEM.

Figure 26 is a core plan map showing images of King Edward Mine/Trevithick Society significant artefacts. It should be noted that much of the tin-dressing equipment shown in these images is of international significance, as is the group value of such a collection - all of which is in working order.

Significance to Cornwall

King Edward Mine Museum now performs a role as a visitor and educational gateway centre to provide interpretation and orientation for the Camborne and Redruth Mining District of the WHS. It also features relevant WHS interpretation strategy themes for Mining the Resource: the Great Flat Lode; Cornish tin dressing (with steam stamping); Camborne: Engineering Town of the West, including in particular Holman's and the 'Widow Maker' Holmans rock drills, including the Mineral Tramways multi-use trails that have been created within the past decade.

Other local and popular mining heritage attractions in this WHS Mining District include Heartlands and East Pool Mine. KEM will further develop joint co-operation and help to promote their combined industrial heritage relationship, which will be of great potential significance in the future.

Significance to the local community

The importance of the site was recognized firstly at a local level when in 1987 it was decided to turn the redundant mill complex into a museum and visitor attraction by volunteer mining enthusiasts to bring back, rebuild and restore original machinery. This work is still being undertaken, and if this support had not been instigated and was unsustainable, the site would not operate as it does today. The support of the local community is absolutely paramount to the success of operating and maintaining the site. King Edward Mine holds an annual open day on the day after Trevithick Day, which is particularly popular with local people from Camborne Parish.

If current proposals for improving the long term sustainability of the site go forward (adaption and re-use of vacant buildings), King Edward Mine will interact far more with

Figure 26 King Edward Mine core plan of images of significant KEM/Trevithick Society artefacts and their location

the local community than has occurred in the last century (since South Condurrow Mine stopped employing local miners in 1897).

Ecological significance

There are no designated sites of nature conservation importance within the CMP area. The acid grassland, species-rich neutral grassland, hedges and heathland are the habitats of greatest nature conservation importance, and are at least of local significance. The site supports a good mosaic of habitats, which provide a much more diverse species mix than would normally be expected from the sum of such habitats.

Of the species present it is the small pipistrelle bat roost (in the Carpenter' Shop complex) which is of greatest significance as common pipistrelle is a legally protected species.

The presence on site of a number of non-native invasive species (Montbretia, Japanese knotweed, Himalayan knotweed and Variegated yellow archangel) detracts from an otherwise very rich site. If left unmanaged these species have the potential to seriously impact upon the nature conservation value of the site. These significant ecological sites are shown on Figure 24, together with the archaeological constraint areas for significant archaeological features.

5 Issues and vulnerabilities (Stage 3)

Having considered the significance of the site (as a whole and its parts), it is appropriate now to review the risks and issues affecting its conservation and significance. The aim of this section is to take the main tenets of the WHS Management Plan and apply it to KEM, but also to explore issues which are specific to this site and debates about its future. Other more positive defining issues have been included so that policies arising from this section can include enhancement of the significance of the site as well as risk avoidance.

The sections below are cross-referenced to the Conservation Management Policies in Stage 5 (Section 7), with both the issues and vulnerabilities divided into three sections; Generic, Short term and Long term. The issues and vulnerabilities relating to future aspirations are given in Appendix 10.5, with a site plan of proposed changes of functional use and provisional future projects (Figure 27 and Table 3).

5.1 Generic issues and vulnerabilities

5.1.1 Non-Statutory designations

Policies: Section 7.2.2

World Heritage Site Management Plan Policies
The WHS Management Plan sets out the mechanisms for the protection, conservation and enhancement of the Outstanding Universal Value of the WHS and its constituent parts, of which KEM makes a significant contribution. Part 4 of the World Heritage Site Management Plan (WHS 2005, revised 2013), discusses a range of issues and opportunities relevant to the management of the WHS, many of which need to be taken into account when thinking about the future of KEM, however they are generic and do not specify issues affecting specific sites.

By applying policies, a positive outcome is achieved in response to both opportunities and threats. For example relevant issues and vulnerabilities may well be: *'Unsympathetic conversion of historic buildings', 'Lack of maintenance and neglect of historic fabric', 'Inappropriate alterations to historic built fabric', 'Visitor pressures', 'Fire', 'Theft, disposal or damage to buildings, artefacts etc'*. However, given the number of statutory designations within the KEM core site itself, some of these issues may not be relevant. Although the issue of lack of regular maintenance funding from CC may be both an issue

and vulnerability, it could create neglect of historic fabric. In the past, volunteers have maintained the site free of charge, materials being the only cost.

Conversely, the opportunities could include heritage led regeneration *'The reuse of historic buildings can be more environmentally sustainable, and their environmental performance can be as good as new-build projects. Sympathetic re-use of historic buildings can help to fill in needs …'* (WHS 2005, 116). For KEM, this could provide long term financial sustainability, and amplify its close relationship to the community. Other opportunities listed in the WHS Management Plan and relevant to KEM include: Heritage and Culture tourism, Geodiversity (a long term aim to identify the ecological resource and understand the relationship between geology/ecology and mineralogy with the development of Cornish mining). This would introduce visitor access of a varying focus and nature, again increasing footfall and income. Education is also an important opportunity, a recent project funded by the WHS, *Discover the Extraordinary*, funded rebuilding of the timber steam winder and compressor house (Sites 29 and 30) including new interpretation displays and fitting out of the AV Room (Site 31) in 2011.

5.1.2 Statutory designations

Policies: Section 7.2.1 (County and Local Policies)

Section 3.5.2 (Table 2) lists the statutory designations for KEM. The presence of numerous Listed Grade II* buildings, group value significance and the site's inclusion within the Cornwall WHS mean that any proposals to alter or redevelop the site or its buildings will be subject to additional scrutiny beyond normal planning controls.

Listed building consent must be gained from the local planning authority before any works are carried out involving the alteration, extension or demolition of any listed building, or alteration of its setting or character. To achieve this, the proposals must demonstrate that they meet the criteria laid out in current statutory guidance for historic buildings, the National Planning Policy Framework. World Heritage site status does not carry any additional statutory protection for the site, however it should be a material consideration in determination of any planning application by the local planning authority.

5.1.3 Potential hazards

Policies: 7.4.6 and 7.5.1

Potential hazards can take a variety of forms, and a former working mine site has many. An obvious hazard is mine shafts. These are noted in the site inventory table (Table 1), and mapped on Figure 13. Figure 26, the project study area archaeological and ecological constraint map identifies documented shafts as green sites that can be seen to be distributed across the entire CMP area. It should be noted that given the long history of mining in the area, it is likely that more (undocumented) shafts are located within the CMP area.

Other hazards may include made-ground relating to former mining activities (ie spoil heaps), naturally occurring radon gas, hydrocarbons relating to any fuel or oil storage, asbestos within current buildings and methane and carbon dioxide associated with neighbouring mine landfill.

A report prepared in 2007 for Kerrier District Council for an options appraisal included a preliminary risk assessment with respect to ground contamination to help determine any site constraints for potential development options for King Edward Mine (Tym & Partners 2007, 39). The summary of the risk assessment stated:

'Overall this assessment of ground conditions suggests that there are low to moderate risks associated with re-use of King Edward Mine and that these risks can be reduced by further exploration and if necessary, some mitigation. The ground condition work undertaken as part of this study has not revealed any factors that clearly preclude careful reuse of King Edward Mine'…. The site is located within an area considered to be at high risk from the effects of radon gas. Building designers should reference BRE document BR211: Radon: guidance on protective measures for new building'.

However the report also states; *'Based on the anticipated ground conditions, the nature of the likely development, and the above risk assessment, issues that need to be resolved with respect to contamination sources include the following:*

- The extent and nature of contamination associated with the general Made Ground
- The extent of the Japanese Knotweed across the site
- The location, status and extent of any associated contamination of any above ground heating oil/fuel storage tanks
- The presence of any landfill gas migrating on site from the adjacent former landfill site
- The locations, type and quantity of any asbestos present on site
- Natural background contamination relating to the geological characteristics of the area

Issues that need to be resolved for geotechnical purposes include the following:

- The locations and size of all mine shafts within the proposed development area
- The suitability of the underlying ground for construction purposes

5.1.4 SWOT Analysis

SWOT analysis is a strategic planning method used to evaluate the **S**trengths, **W**eaknesses/Limitations, **O**pportunities, and **T**hreats involved in a project or in a business venture. For example for this CMP, KEM Ltd and Cornwall Council are planning a number of short and long term projects in order to achieve the objectives of creating a sustainable Cornish mining visitor attraction and the restoration and reuse of previously redundant buildings. The aim of any SWOT analysis is to identify the key internal and external factors that are important to achieving the objectives. SWOT analysis groups key pieces of information into two main categories:

- Internal factors – The *strengths* and *weaknesses* internal to the organisation/site.
- External factors – The *opportunities* and *threats* presented by the external environment to the organisation/site.

It involves specifying the objectives of the venture or project and identifying the internal and external factors that are favourable and unfavourable to achieve those objectives. Finalising the objectives should be done after the SWOT analysis has been performed. This allows achievable goals or objectives to be set for the organisation/site.

- **S**trengths: characteristics of the business, or project team that give it an *advantage* over others
- **W**eaknesses (or Limitations): are characteristics that place the KEM team/site at a *disadvantage* relative to other similar mining heritage sites
- **O**pportunities: *external* chances to improve financial and environmental sustainability
- **T**hreats: *external* elements in the environment that could cause issues/vulnerabilities for the business or project

Identification of SWOTs is essential because subsequent steps in the process of planning for achievement of the selected objectives may be derived from the SWOTs. A summary SWOT Analysis has been produced (see Appendix 10.4).

5.2 King Edward Mine: Issues

Short term

1. Cornwall Council owns the core site and land to the east and west (see Fig 3), and leased by KEM Ltd under a 30 year lease. Cornwall Council provides an annual grant to KEM Ltd, which in 2012/13 was £14,000; although there is no annual maintenance budget set aside by Cornwall Council. This is perhaps an issue (or perhaps vulnerability), that other similar CC owned sites have an annual maintenance budget (eg Geevor Tin Mine). Many of KEM's buildings are timber framed – this will be a constant maintenance issue (short and long term). It is accepted however, that CC has the ultimate liability for the site and recently funded the cost of materials to provide a temporary roof on the Assay Office complex and the cost of other materials for maintenance works.

2. Land to the south of King Edward Mine (Wheal Grenville Mine) is privately owned, although it is leased at present by Cornwall Council (currently re-negotiating the lease for a longer term). This is an important asset for King Edward Mine.

3. The identification and amelioration of risks as described in this CMP should achieve the successful outcome of the CMP.

4. Building condition: The Counthouse complex, the Assay Office complex and the Boiler House are all on English Heritage's Buildings at Risk Register. Other buildings needing major attention include the roof of the Mill complex. However, grant funding is being sought to restore all the main buildings to a good condition within 3 years, but this will depend upon the outcome of the funding bids.

5. A Health & Safety plan should be adhered to by KEM Ltd. Changing legislation in relation to Health & Safety, Risk Assessments (public access), disabled public access etc could all impact upon the requirements for visitor access and therefore the future sustainability of the site.

6. Proposed grant aided schemes to adapt existing underused buildings (all of which are Grade II* Listed), will necessitate detailed Listed Building applications. This, in turn, will need justification using evidence of changes to existing building specifications (exterior wall finishes/roof finishes/window designs etc), by researching older specifications (often by the medium of archived photographs – fortuitously KEM has perhaps the best in the World Heritage Site, since 1899). The process of justification may be an issue, as well as further impact issues of integrating modern day building regulations into older buildings and possible conflicts between proposed and existing uses.

7. It is likely an Impact Assessment will be required to be submitted with any Listed Building consent application for adaptive re-use proposals – which should also discuss any possible conflicts between proposed and existing uses.

8. The Trevithick Society are ultimately responsible for their collection (which is distributed within and around KEM). However, they have commissioned a Collections Management Plan for all their collection including all their items currently in store at KEM. This Collections Management Plan will guide its short and long term management and provide relevant policies for all items.

9. Given the current use of vacant buildings to store a wide range of Trevithick Society items (large and small), these will have to be temporarily stored somewhere else to gain vacant buildings for any successful adaptive reuse projects. Again, this will need a funding source for secure, temporary accommodation.

10. Different significant buildings have varied significant and original features. All may be impacted by alteration or adaption in the future. The replication of original significant features as part of a large scale alteration will need to be carefully considered by Conservation Officers and English Heritage.

11. Within the core buildings area of KEM the only identified ecological issue is at the Carpenters' Shop, the roof space of which supports a small common pipistrelle roost. Consultation with a bat ecologist will need to taken place for the proposed renovation

work. The common pipistrelle is the species of greatest significance within the CMP area as common pipistrelle is a legally protected species. A method statement or a Natural England European Protected Species (bats) Licence will need to be in place before the renovation work starts on this building.

Long term

1. The impact of increasing numbers of visitors (and rental occupiers) if KEM is successful in obtaining Listed Building consent and grant funds to enable adaption of under-used buildings to rent office and workspace units.

2. Cornwall Council, as landowner should undertake a quinquennial condition survey of the site, and ameliorate high risk issues that are identified, within time frames identified in the condition survey report. KEM Ltd should address those high risk issues that are identified which are their responsibility.

3. There are Schedule 9 plants (Japanese knotweed, Montbretia, Variegated yellow archangel) present on the site (see Figure 24). Himalayan knotweed is also present. A management programme will need to be funded and put in place to eradicate them from the site. The presence on site of these non-native invasive species detracts from an otherwise very rich site. If left unmanaged these species have the potential to seriously impact upon the nature conservation value of the site.

5.3 King Edward Mine: Vulnerabilities

Short term

1. Cornwall Council owns the core site and land to the east and west (see Fig 3), and leased by KEM Ltd under a 30 year lease. Cornwall Council provides an annual grant to KEM Ltd, which in 2012/13 was £14,000, although there is no annual maintenance budget set aside by Cornwall Council. This is perhaps an issue, in that other similar CC owned sites have an annual maintenance budget (eg Geevor Tin Mine). It is accepted however, that CC has the ultimate liability for the site and continues to support its aims and objectives.

2. Cornwall Council is presently leasing parts of Wheal Grenville from the landowner (Boconnoc Estate). It is currently negotiating a 30 year lease. Successful re-negotiation of the lease is important as this site is an added attraction for KEM and provides an opportunity for a short walk (and provision of site interpretation) to what was an important and iconic mid/late 19th century Great Flat Lode mine.

3. A Collection Management Plan has been commissioned by the Trevithick Society for their collection, including all the many items currently at KEM. This will identify specific issues and vulnerabilities for their collection. It should be noted that the working and static collections of items at KEM are perhaps one of its most significant heritage assets.

4. KEM, although the prime site for the surface dressing floor workings of a Cornish Mine, could be vulnerable to competition from other industrial heritage sites (for example those with underground experiences, and working steam engines) within the World Heritage Site. Thus, levels of publicity should be focussed and maintained to promote the site.

Long term

1. The economic viability of KEM Museum depends upon visitor income and the annual grant from CC, but these are vulnerable respectively to economic trends and CC funding cutbacks. So KEM's future financial sustainability needs to be safeguarded by implementing the business plan to increase site income.

2. The impact of vandalism (and theft) to the site (and for new rental occupiers), if KEM is successful in obtaining Listed Building consent and grant funds to enable adaption of under-used buildings for commercial office and workspace units.

3. It would be appropriate to undertake a detailed mine survey in advance of development proposals given the industrial archaeological history of the site, and the lode mineralisation crossing from east to west.

4. Advisory preparation for risk preparedness and disaster management protocols (flood/fire/mine shaft underground workings collapse) etc.

5. Sufficient time and resources need to be allocated to the process of obtaining statutory consents as this is a demanding process due to the site's significance. Any substantial repair works will need grant aid – an economic reality for this site.

6. The impact of proposed new development at KEM should be carefully considered to ensure that the heritage significance is retained and where possible enhanced, and that new development is sympathetic with the special qualities of the site.

7. A number of significant buildings are timber framed and have interior and exterior timber facings (Sites 8-10, 11, 13 – 14, 19 – 20, 26, and Sites 27 – 33). These are especially vulnerable to fire. It may be prudent when re-painting to use a fire retardant paint to partially ameliorate this vulnerability. The last major incident on this mine occurred in 1957 when the original steam winder engine house and compressor house burnt down (Sites 29 and 30).

8. Site security and theft has been an issue for some time, with a few reported break-ins to the northern part of the site. The site is closed to visitors in the winter (from October to April) except on Sundays. It is likely that occupation of the vacant buildings (Counthouse complex and Carpenters' Shop complex) for office and workspace may well provoke further burglaries (and theft of high value items for example lead flashing), unless the security of these buildings is improved.

9. KEM is sustained by volunteers – to provide public guides and to maintain, repair and rebuild its existing and rebuilt machinery. This is perhaps a declining resource, linked to specific generations interested in industrial archaeology. If this resource dwindles through time, the sustainability of the whole site is brought into question. There needs to be an ongoing programme to attract younger volunteers, which may require new approaches and new activities relevant to this mining heritage site.

10. It would be advantageous (as a long term aspiration) for KEM to have a full time funded Site Manager.

11. A large majority of the working machinery is over a century old. If there is a significant breakage (to the Stamps for example), there may not be sufficient immediate funds or manpower to repair the machinery, thus fundraising would be needed.

6 Conservation Philosophy (Stage 4)

Conservation is defined as *'The process of managing change to a significant place in its setting in ways that will best sustain its heritage values, while recognising opportunities to reveal or reinforce those values for present and future generations'* (Conservation Principles, Policies and Guidance, EH 2008).

General conservation philosophy

A site's importance may relate to its historic heritage, its ecological or mineralogical heritage, or more usually, to a combination of two or more of these factors. Statutory designations (Scheduled Monuments and Listed Buildings etc) and non-statutory designations (World Heritage Site), may well affect or constrain the scope of a proposed project and detailed consultation with relevant statutory agencies will need to take place both prior to and during a project, with a marked emphasis on a continual dialogue with consultants, focussing on the preservation of the historic character of the mining landscape and buildings.

Conservation work usually involves more than just the consolidation of a building or structure. The work carried out must respect its character and should take into account

future access and interpretation, as well as the integrity of its surroundings. It is particularly important that all of these aspects are considered from the outset to avoid situations where consolidation or safety works compromise future plans for the site. Thus the process of professional dialogue and assessments needs to be co-ordinated, often by a conservation accredited architect, and broadly follow the pattern of Assessment, Evaluation (excavation or Impact Assessment), and Mitigation (the results of an agreed Mitigation Strategy). If the project manager is not a conservation accredited architect then the assistance and close liaison of a Historic Buildings Consultant is very important before, during and after works have finished to ensure communication protocol with the respective statutory agencies and to ensure that the works are undertaken to the required standard.

The proposals should be specified in the schedule of works and specifications (through consultation with the appropriate statutory and non-statutory bodies), that result in the conservation, protection and enhancement of the historical authenticity, biodiversity and mineralogical heritage potential of the site. Therefore disturbance to a site should be kept to the minimum required to achieve the aims of the schedule of works and impact assessment mitigation strategy (all of which should have been designed in close consultation with appropriate statutory agencies i.e. EH, EN, CC (HE Advice), etc. Thus the site should be (as far as possible) left in an enhanced or similar condition as when work started.

Building Conservation

The conservation of a structure is likely to include a combination of one or more of the following approaches: Stabilisation, Partial or full Repair, Selective or full Demolition and adaptive Re-use. Schedules of work should incorporate some flexibility of approach and be tailored to specific site conditions and problems. The particular options selected are likely to be influenced as much by immediate objectives (e.g. stopgap measures to prevent further deterioration) as long term aims intended to serve for many decades, but should always take into consideration the intended long-term use of both the structures and the sites within which they stand.

The preferred conservation approach for buildings which are ruins and not to be reused is based on retaining the essential appearance of a structure, whilst tackling the effects of time, weather and previous destructive interventions, with the aim of undertaking the minimum of work necessary to produce a stabilised ruin in the medium term. Demolition and reconstruction interventions however, should be kept to a minimum in order to maintain the integrity of the structure, and all wall capping and masonry reconstruction should be to profiles existing at the commencement of the works.

Wherever possible, conservation approaches should be based on carrying out repairs rather than rebuilding, other options being resorted to only where absolutely necessary. Other structural remediation works are likely to necessitate operations such as masonry removal and re-setting, masonry replacement, re-installation of lintels and other structural timber or stonework, pointing and weatherproofing of areas of exposed walls, cores and wall heads, installation of strengthening features such as hidden steel rods or 'beams', treatment of chemical hazards, removal or control of vegetation, clearance of rubble or rubbish, and perhaps reinstatement or replacement of roof structures and coverings.

The conservation philosophy should be based on principles of replication of existing specifications, perhaps adopting an appropriate period style (if large scale refurbishment is necessary), and following a basic principle of impact reversibility.

Specifications

- Traditional building materials (e.g.: brick, stone, or appropriate timber) can be used when consolidating historic buildings. Where material is to be site won, advice must be taken from the archaeologist and ecologist on the project team to ensure that the sites where this is to take place are appropriate.

- Traditional lime mortar mixes should generally be used (specifications can be supplied by HES/EH), using locally sourced aggregates to match the original mortar composition or locally sourced rab. Mortar test panels should be made to permit the selection of appropriate aggregate mixes/colour and finish before the pointing work is undertaken.

- Cement and modern materials should be used very rarely and only when the need for their use can be demonstrated.

- Where possible the original form and specification of windows, gutters, downpipes, timber weatherboarding etc should be researched by viewing archive information and reference on site, to replicate and compliment the existing style found at KEM, if replacement is warranted.

For public access and interpretation, additional works may be required, including hazard treatment, safety barriers or hazard warnings, site access arrangements – paths, parking, perhaps steps or ramps to enable public access, including arrangements for those with restricted mobility. There may also be a need to restrict access to the structure, or to parts of it, using railings or other barriers. Signs or interpretive features may also be installed.

Whatever approach is taken, the need for flexibility, sensitivity and above all, authenticity must be recognised from the outset, and, where possible incorporated into the design brief. Work to Listed Buildings or Scheduled Monuments will almost certainly need specific and detailed written consent from the appropriate statutory authority. Any existing consents, permissions and approvals should always be checked, and attached conditions strictly adhered to.

Mitigation strategy

The project briefs for the site assessments, any follow on evaluation and impact assessments should be specified by the appropriate statutory or non-statutory authorities.

As part of the mitigation strategy, Historic Building Consultants could be utilised to ensure that English Heritage principles of conservation practice are adhered to both in terms of the design of appropriate schemes, to ensure that consolidation works are carried out to acceptable (EH) standards and to ensure close liaison between statutory agencies and the project works. In addition it is important that the nature, extent and development of the site conservation works should be guided by the relevant short and long term management plan policies (statutory, archaeological, conservation, ecological, mineralogical and WHS etc), which are an important part of any mitigation strategy of the site.

The following Conservation Principles (Policies and Guidance, EH 2008, 7), provide a comprehensive framework for the sustainable management of the historic environment (and particularly King Edward Mine):

Principle 1 *– The historic environment is a shared resource*

Principle 2 *- Participation in sustaining the historic environment*

Principle 3 *– Understanding the significance of places is vital*

Principle 4 *– Significant places should be managed to sustain their values*

Principle 5 *– Decisions about change must be reasonable, transparent and consistent*

Principle 6 *– Documenting and learning from decisions is essential*

This same document describes aspects of *'Understanding the value of the site'*, *'Assessing heritage significance'*, *'Managing change to significant places' and 'Conservation policies and Guidance',* all of which are discussed within this CMP. Future projects to **repair buildings** necessary to sustain the heritage values of a significant place are normally desirable if (Section 11): *'there is sufficient information comprehensively to understand the impact of the proposals on the significance of the place'.* It is recommended that for any proposed works to Listed Buildings at KEM, that

an Impact Assessment report be produced for any proposed heritage impacts, which will cross–refer to this CMP and include appropriate mitigation strategies.

Section 14 is also very appropriate: *'**New work or alteration** to a significant place should normally be acceptable if: 'the proposal would not materially harm the values of the place, which, where appropriate, would be reinforced or further revealed; the proposals aspire to a quality of design and execution which may be valued now and in the future; the long-term consequences of the proposals can, from experience, be demonstrated to be benign, or the proposals are designed not to prejudice alternative solutions in the future'.*

Any proposals, for example for adaptive re-use of significant (statutorily protected) buildings, need to demonstrate the basic conservation principles described above, the policies described in Section 7 (Stage 5), and to meet the justification criteria for repair or alteration. This process can be undertaken after detailed consideration of the CMP, careful analysis of the relevant significance, following a policy of reversibility and a policy of retaining (or reinstating) its significant features then mitigating impacts as far as possible. The choice of particular styles and specifications for adaptive re-use projects should be determined by reference to appropriate research and analysis of nearby dominant period architecture. Conservation philosophies such as reversibility and integrating adaption or alteration policies to match in with the group context and site character/setting etc should also be demonstrated, as should the justification for rebuilding chimneys, now removed.

7 Conservation management policies (Stage 5)

The purpose of the conservation policies below is to provide a guide to the future care and development of King Edward Mine and its CC owned environs so as to retain and enhance significance. The policies and management guidelines in this chapter arise directly from the issues and vulnerabilities discussed in Section 5.0.

7.1 Methodology

The production of conservation management policies were generated in partnership with CC, KEM Ltd and the wider group of stakeholders (using the consultation event as an initial draft medium - see Section 2.3), and thereafter by comments from the final draft version. Production of the policies have been made by reference to a number of documents including: NPPF (2012), Draft HE White Paper (2012), EH Conservation Principles, Policies and Guidance (2008), WHS Management Plan Policies (2013 – 18), County and Local Policies, Mineral Tramways CMP Policies (2004), and Ecological Policies prepared by Cornwall Environmental Consultants Ltd.

The policies are designed to respond to the needs of both the assets and those who value them, and take into account management issues and the various ways that assets are valued. Generic policies cover all the study area assets while specific policies have been developed for KEM.

7.2 Conservation management policies

Statutory, non-statutory specific KEM policies, specific CMP area policies and ecological policies are discussed in turn. These refer to heritage designations, and the specific heritage designations for the CMP area are described in Section 3.2.4.

7.2.1 Statutory

The Cornwall County Structure Plan, Local Plans, and English Heritage policies (which will be applied as conditional consent for proposed works to Listed Buildings), all contain a range of relevant policies for the protection of the historic environment from the detailed level of an archaeological feature to county policies for the protection of the historic heritage of mine sites in Cornwall. The following abstracts relevant policies from this range of documents.

Cornwall Structure Plan

The latest Structure Plan was adopted in August 2004, replacing the 1997 Plan. Landscape Character Assessment has been introduced in the new Plan and key phrases on character included in Policy 2 provide scope for Historic Landscape Characterisation to be used in the implementation of a more sensitive approach to development in Cornwall. As this new characterisation approach is adopted, the county designated Areas of Great Historic Value and Historic Settlements have been removed from the Plan. In addition, the World Heritage Site has been recognised as a 'designation' of international importance in Policy 2.

Policy 2 – Character areas, Design and 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.*

Local Plans should define Character Areas to inform planning decisions taking into account Regional and County-wide landscape assessments. 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 World Heritage Site, should be given priority in the consideration of development proposals.

Within Areas of Great Landscape Value and other areas or sites of county-wide significance for their biodiversity, geodiversity or historic interest, development proposals will be required to respect those interests.'

Cornwall Local Plan 2010 – 2030

The Cornwall Structure Plan is to be superseded by the Cornwall Local Plan 2010-2030, which is programmed to be published as a consultation draft in March 2013 and adopted in early 2014 (text excerpt from Cornwall and West Devon Mining Landscape World Heritage Site Management Plan 2013 – 2018, 82):

The emerging draft of the Local Plan for the submission to the Secretary of State seeks to address all aspects of land use planning including policies on minerals and waste developments. This draft contains a policy on the protection of the historic environment that applies to all development proposals:

Development proposals will need to retain Cornwall's local distinctiveness and character and protect and enhance Cornwall's historic environment and assets according to their international, national and local significance through the following measures;

- Protect, conserve and enhance the historic environment of designated and undesignated heritage assets and their settings, including historic landscapes, settlements, Conservation Areas, marine environments, archaeological sites, parks and gardens and historic buildings
- Enhance and promote the outstanding universal value of the World Heritage Site and its setting; supporting the adopted management plan.

Kerrier Local Plan (pre-unitary form: revised deposit draft 2002)

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.EN5: Historic Heritage – conservation and enhancement of mining remains
Development for the conservation, interpretation and display of industrial archaeological sites and buildings will be permitted where:

- *there is no significant harm to the character and appearance of the landscape, built environment or the quality of the natural environment;*
- *there is no significant harm to the character, appearance, historic, cultural and heritage value of the buildings and remains themselves, their setting or to other nearby heritage features;*
- *there is safe parking in accordance with the council's guidelines and the access and approach roads can provide safely for the level and type of traffic likely to be generated.*

National Planning Policy Framework
The National Planning Policy Framework (NPPF) was published on 27 March 2012, replacing all the previous Planning Policy Statements, including PPS 5, as well as other planning guidance. Its central theme is the *'presumption in favour of sustainable development'*, set out in twelve core land-use planning principles which underpin both plan-making and decision-taking.

Although matters relevant to the historic environment are scattered throughout these principles, particularly design, urban and countryside policies, it is the section on Conserving and Enhancing the Historic Environment which supersedes PPS 5, whilst following that document's significance-led approach to decision-taking. NPPF 126 to 141 are core historic environment policies in Chapter 12 of the NPPF. These have not been reproduced in detail in this CMP.

English Heritage policies:
The document Conservation Principles, Policies and Guidance (2008) sets out fundamental propositions that serve as a foundation for the way English Heritage engages with every aspect of the historic environment, and should be a tool to be used by all who are involved in managing change in the historic environment. If (sustainable) change to the historic buildings is necessary at KEM it is likely to involve Listed Building consent applications. EH are likely to request conditions based on policies reproduced within this published document. Relevant policies relating to KEM are given below:

In '**Managing change to Significant Places**' (2008, 41): *'Conservation involves people managing change to a significant place in its setting, in ways that sustain, reveal or reinforce its cultural and natural heritage values (Policy 4.2). Conservation is not limited to physical intervention, for it includes such activities as the interpretation and sustainable use of places'* (2008, 43). In 'Take account of sustainability' *'Significant places should be used and managed in ways that will, wherever possible, ensure that their significance can be appreciated by generations to come, an established aspect of stewardship. Sustaining the value of the historic environment as a whole depends also on creating in the present the heritage of the future, through changes that enhance and enrich the values of places'* (2008, 46).

In '**English Heritage Conservation Policies and Guidance**' (2008, 49), the following policies are most appropriate for KEM:

1. *The conservation of significant places is founded on appropriate routine management and maintenance*

2. *Repair necessary to sustain the heritage values of a significant place is normally desirable if:*
- There is sufficient information comprehensively to understand the impacts of the proposals on the significance of the place; and
- The long term consequences of the proposals can, from experience, be demonstrated to be benign, or the proposals are designed not to prejudice alternative solutions in the future…

3. *Restoration to a significant place should normally be acceptable if:*
- The work proposed is justified by compelling evidence of the evolution of the place, and is executed in accordance with that evidence;
- The form in which the place currently exists is not the result of an historically-significant event;
- The work proposed respects previous forms of the place;
- The maintenance implications of the proposed restoration are considered to be sustainable

4. *New work or alteration to a significant place should normally be acceptable if:*
- (see two bullet points under the Repair section)
- The proposal would not materially harm the values of the place, which where appropriate, would be reinforced or further revealed;
- The proposals aspire to a quality of design and execution which may be valued now and in the future…

7.2.2 Non-statutory

World Heritage Site Management Plan (2013 – 2018)

The revised 2013–2018 World Heritage Site Management Plan policies remain unchanged from the original management plan (2005 – 2010), but have been re-ordered to refer back to the four core areas of activity set out in the World Heritage Convention; these are detailed below:

Protection:
Policies within this section are the basis for robust, long term protection for the WHS. Their implementation by all partner planning authorities and integration into strategic planning documents is essential to preservation of the Outstanding Universal Value and integrity of the site. This section includes the former Issues 4 *Strategic framework*, Issue 5 *Increasing protection*, and Issue 6 *Protecting the setting*..

Conservation & Enhancement:
Policies within this section relates to positive actions for improving the site's condition and distinctive character, and the integration of WHS priorities into wider regeneration agendas. The policies cover a wide range of aspects involved in conserving the cultural landscape assets, including conservation and enhancement, and improvement to presentation within the site. This section includes the former Issues 7 *Sustainable development*, Issue 8 *Conservation of key components*, and Issue 9 *Curation of archives and collections*.

Presentation:
Policies within this section are designed to ensure that access to and enjoyment of the site is sustainable and equitable. This is the shared responsibility of public, private and third sector organisations. Policies focus on ensuring that the unique qualities of the mining landscape and its World Heritage values are at the core of all presentation activity. This section includes the former Issues 10 *Sustainable physical access*, Issue 11 *Increasing* intellectual access, Issue 12 Coordinated marketing, Issue 13 Measuring economic outputs, and Issue 14 *Community involvement*.

Transmit:
This section sets out policies aimed at increasing the understanding of the WHS and its OUV. Understanding underpins appreciation and, ultimately motivation for conservation. Policies and strategic actions within this section focus on learning, research and

intellectual access through immersive interpretation, such as cultural events and 'hands-on' experiences. This section includes the former Issues 11, 15 *Research and advocacy*, Issue 16 *Cultural distinctiveness*, and Issue 17 *International links*.

All four groups of policies generally relate to KEM (and the Trevithick Trust), and its relationship to the World Heritage Site. However, the Conservation and Enhancement group (namely: ***Issue 7*** *Sustainable development,* ***Issue 8*** *Conservation of key components, and* ***Issue 9*** *Curation of archives & collections*), is specifically relevant to KEM both at present and for future development proposals. The following policies relate to the revised 2013-18 WHS Management Plan:

Conservation and Enhancement
Sustainable development

Policy C1: Sustainable heritage-led regeneration should be promoted.

Policy C2: New development should add to the quality and distinctiveness of the site by being of high quality design and respectful of setting.

Policy C3: There should be a presumption in favour of retaining and re-using historic buildings which are important components of the World Heritage Site

Policy C5: Landscape, nature conservation and Countryside management regimes should have regard for the authenticity and values of the site.

Conservation and maintenance of key components

Policy C6: 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 C7: The historic character and distinctiveness of the Cornwall and West Devon mining landscape should be maintained.

Policy C8: Traditional materials and skills should be encouraged in the maintenance of the authentic historic fabric within the site.

Policy C9: Where the historic fabric within the site has been lost or compromised through non-authentic materials, inappropriate details and poor workmanship, historic character and detail will be reintroduced wherever and whenever possible.

Archives, collections and data

Policy C13: Archives, collections and data concerning the World Heritage Site should be curated, catalogued and conserved and made accessible to all.

7.3 King Edward Mine site policies

These policies essentially focus on the core site and buildings, but the following guiding principles are cross-cutting themes applicable to all policies:

Guiding principles

- *Understand the significance and character of the 'place' which should guide and inform management decisions.*
- *Assess all proposed interventions thoroughly (and in a logical order):*
    - *Do they impact upon significance and character ?*
    - *Do they accord with the Conservation Philosophy for the site ?*
    - *Are they necessary and have all the options been considered ?*
- *Make and keep thorough records before, during and after works*
- *Management should give pre-eminence to maintenance (for buildings or working exhibits)*
- *Ensure compliance with statutory obligations*

7.3.1 Vision Policy

King Edward Mine is a thriving Cornish mining visitor attraction enjoyed by 'one and all', and previously redundant buildings are restored and sustainably reused, thereby securing the long term preservation and enhancement of the best preserved pre-1915 mine site within the Cornish Mining World Heritage Site.

7.3.2 Legislative and policy framework

All works that affect the special architectural and historic interest of significant buildings and site should be planned in accordance with statutory and local authority guidance, and in accordance with the World Heritage Site Management Plan.

7.3.3 Achieving sustainable regeneration

The sustainable regeneration of the site should seek to conserve and promote its significant aspects whilst permitting an appropriate degree of change and new development.

7.3.4 Constraints arising from the Statement of Significance

Any works to buildings and structures on the site should take full account of the assessment of group significance, its individual significance (see Figure 25), and the conservation philosophy given in this CMP. Buildings classified as significant may be altered, especially where such alterations would have the effect of enhancing their significance.

7.3.5 Building Conservation philosophy

All building works should use appropriate specifications and materials that reflect the character and period style of its original form, unless structural or health and safety factors require otherwise. All proposed works should refer to (and be guided by), the appropriate statutory authority.

New development or alterations should not be allowed to obscure the significance, character and understanding of its original form.

7.3.6 Maintenance and management of buildings

CC own the site, which is leased to KEM Ltd. CC's property department should undertake regular (quinquennial) surveys which may result in a costed, phased programme of maintenance and repairs. This would avoid loss of historic fabric, escalating repair costs and the necessity of emergency works. It would be appropriate to also undertake a 10 year maintenance plan of the site which will describe the necessary repairs/maintenance over a 10 year period, taking account of the significance of the buildings, structures and machinery.

Consideration could be given to whether any elements of inspection and maintenance might be undertaken by volunteers, and the establishment of a reporting and monitoring system.

Appropriate fire safety and security systems may need to be introduced and subject to a cyclical inspection and testing regime (especially if parts of the site may be rented for alternative uses).

Maintenance and management of the existing buildings are an important function and priority of KEM Ltd, who act as site curators, and enable short and long term pro-active schemes to protect the site's main assets.

KEM Ltd need to have a working knowledge of their compliance with legal obligations and conservation principles, given the high degree of statutory designations to KEM.

7.3.7 Machinery, equipment and artefacts

A separate collections management plan should be undertaken to assess significance and policies etc. Machinery, equipment and artefacts that have been assessed as significant should be kept in situ. However, there may be conflicts with the proposed adaptive re-

use of buildings and those spaces currently used to store Trevithick Society items. Temporary storage space may need to be created before funds are raised for erection of the Engineerium.

7.3.8 Environmental sustainability

Measures to promote environmental sustainability and energy saving should be followed where this does not conflict with the historic significance of the buildings and group value of the site.

A programme of short and long term projects should be drawn up to promote the environmental sustainability of the site over the long term. Guidance from grant facilitators could be sought.

7.3.9 Interpretation and Education

Interpretation and Education of the history of KEM and its contents is a core function for visitors. But the site should not be regarded as solely a museum or visitor attraction. Themed links and marketing of the setting of the site within the Great Flat Lode, its significant contribution to the Cornish World Heritage Site, and to other industrial heritage sites in Camborne and Pool should be enhanced.

KEM should widen its information and communication techniques to provide not just static displays and views of the operation of the Mill, but 'hands-on' facilities to appeal to younger generations (especially for school trips etc as part of their local history curriculum).

7.3.10 Management and ownership

CC has management responsibilities as site owner and KEM Ltd as the long term leaseholder. CC and KEM Ltd will be jointly responsible for ensuring the policies in this plan are adhered to, and that any CC produced maintenance plan is duly implemented. Both CC and KEM Ltd hold responsibilities for maintaining the site's significance and character, the health and safety of visitors, and enabling the long term sustainability of the site.

7.3.11 Volunteer staffing

KEM is managed and maintained by volunteers, many of retirement age. In order to promote a sustainable management and volunteer structure, it would be prudent to initiate a well planned recruitment programme.

7.3.12 Policies towards visitors, the local community and public access

The sustainability of the site depends on a combination of attracting a wider resource of funding (for example adaptive re-use of under-used buildings for workspaces or offices), and attracting a younger generation of visitor (especially from schools). Widening and varying the visitor experience should enable higher visitor numbers, especially if long term objectives for an Engineerium, an underground experience and reconstruction of a steam winding engine are brought to fruition.

However, management responsibilities for visitor health and safety, disabled access, maintaining a Health and Safety Plan, whilst perhaps having additional local community open days, may well create extra responsibilities for the existing management structure.

7.3.13 Adoption and management of the Conservation Management Plan

The future conservation and development of KEM will be undertaken in accordance with the guiding principles and vision policy above.

CC and KEM Ltd. accept the statements of significance and conservation philosophy in this CMP as the basis of future planning and works at the site.

Arrangements should be made for CC and KEM Ltd. to manage, update, and review this plan as need arises. The CMP review should be no later than five years after its completion.

7.4 CMP area policies

These policies relate to the overall CMP area (focussing outside the KEM core area).

Environmental Policies

7.4.1 Landscape

Site works (outside the core KEM area) should not adversely affect the wider landscape, to the detriment of character, setting and WHS status. However, enhancement of archaeological features to enable pro-active conservation and enablement of enhanced site interpretation is to be commended.

7.4.2 **Heritage** (above and below ground)

The historical resource should be fully understood and managed to national standards. Proposed heritage impacts should be subject to consultation (and resulting mitigation) with the appropriate statutory/historic environment advice body.

- Where above or below ground remediation or development works are necessary, the significant built (above ground) or archaeological (below ground) site should be adequately surveyed, and archaeological supervision/recording undertaken where appropriate as part of archaeological mitigation. Appropriate site works/recording could be undertaken by volunteers under archaeological supervision.

An assessment of the significance and condition of the heritage resource should be used to establish if any remedial works and ongoing management regimes are required to appropriately restore and conserve the resource.

Resources for site conservation should be prioritised appropriately to restore and conserve to the highest standard the heritage resource, and then develop a programme of works accordingly.

Ensure other non-heritage driven works (for example ecological, mineralogical or geotechnical), avoid or minimise damage to heritage assets.

7.4.3 Policies ensuring works do not compromise other environmental interests

Specialist environmental works (heritage, ecological, mineralogical etc) should not unnecessarily compromise other relevant environmental interests

Public access and interpretation policies

7.4.4 Additional public access and interpretation

Establish a prioritised list of adjacent sites for new public access and heritage interpretation, as part of a programme of appropriate conservation/vegetation and access works. These sites could be accessible from KEM (ie Grenville United Mine including the Fortescue Engine Houses).

Community involvement policies

7.4.5 Community involvement policy for new access/interpretation works

Fully involve local landowners and the local community in the Project and ensure that it contributes to the economic and social regeneration of local communities

Public health and safety policies

7.4.6 Health and safety

Comply with legal obligations in terms of health and safety on all sites and trails under management

The treatment of mine shafts will be carefully designed, with each shaft considered individually on its own merits, and the public safety aspects of each shaft carefully weighed against other reasonable interests, including heritage, ecology, amenity and landscape.

Management, maintenance and monitoring policies

7.4.7 Management, maintenance and monitoring

Utilise an existing management structure to ensure good management of the CMP area into the future. The two scheduled sites of the Fortescue Engine houses are owned by the Boconnoc Estate. CC currently leases this site.

Ensure the survival of the heritage value of the sites and trails in the CMP area, and to optimise their future condition in close liaison with the Mineral Tramways Heritage Project.

Cross cutting policies

7.4.8 Cross cutting themes

The KEM Conservation Management Plan policies should be implemented in conjunction with other relevant strategic plans and programmes, particularly the NPPF, EH policies, County and local planning policies, and the World Heritage Site Management Plan policies (2013 – 2018).

7.5 Ecological policies for the CMP area

7.5.1 Statutory

National Planning Policy Framework (NPPF)

National planning policy is set out in the National Planning Policy Framework (NPPF) (2012). This document supersedes Planning Policy Statement 9 (PPS9), although Government Circular 06/05, which accompanied PPS9, is still in use and is to be used in conjunction with the NPPF. Chapter 11 relates to conserving and enhancing the natural environment. The most relevant policies relating to planning decisions are (summarised):

- *Recognising the wider benefits of ecosystem services*
- *Minimising impacts to biodiversity and providing net gains in biodiversity where possible*

Cornwall Structure Plan

This document is also to be superseded by the Cornwall Local Plan 2010 – 2030 which is programmed to be published as a consultation draft in March 2013 and adopted in early 2014. There is one policy in the existing Cornwall Structure Plan which focuses entirely on the natural environment:

Policy 2. The relevant parts of the policy are as follows:

- *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 historic features that add to its distinctiveness.*
- *Contribute to the regeneration, restoration, enhancement or conservation of the area*.
- *The conservation and enhancement of sites, areas, or interests of recognised international or national importance for their landscape, nature conservation, archaeological or historic importance, including the proposed World Heritage Site, should be given priority in the consideration of development proposals.*
- *Within Areas of Great Landscape Value and other areas or sites of countywide significance for biodiversity, geodiversity or historic interest, development proposals will be required to respect those interests*.

Policy ENV 12 states:

- *In the reclamation of derelict land, priority should be given to proposals which will deal effectively with safety hazards, facilitate appropriate development or enhance the historic, landscape or nature conservation value of the land.*

Kerrier Local Plan (Revised deposit draft 2002)

The Kerrier Local Plan will be replaced by the Cornwall Local Plan which is programmed to be adopted in early 2014:

Policy ENV23: Derelict land reclamation. Proposals for development for the reclamation of derelict land will be permitted where:

- *the character and appearance of the area is enhanced*;
- *the quality of the natural environment is conserved, including significant features of interest for plant life and wildlife habitat;*
- *there is a scheme of landscaping and planting where it would not significantly harm the character of the landscape or the quality of the natural environment.*

Within the core CMP area there is evidence of a roosting common pipistrelle bat (in Site 11). A method statement or a Natural England European Protected Species (bats) Licence will need to be in place before the renovation work starts on this building. Statutory guidelines will need to be followed to mitigate this issue (Cornwall Environmental Consultants (CEC) Ltd, Report Ref. CEC2039).

7.5.2 Non-Statutory

- *The assessment of the significance and condition of the ecological resource should be used to establish what remedial works and ongoing management regimes are required to appropriately restore and conserve the resource*
- *Resources for site conservation should be prioritised appropriately to restore and conserve to the highest standard the ecological resource and then develop a programme of works accordingly*
- *Management and conservation works within the KEM CMP area (and trails) must avoid or minimise damage to ecological assets*
- *Ensure legal framework and statutory consents protecting ecological resources is fully understood and adhered to by all people working on site*
- *Invasive plants (Schedule 9) from the CMP area should be eradicated where possible. Such plants include Japanese knotweed, Montbretia, and Variegated yellow archangel (see Figure 24).*

8 Use of the Conservation Management Plan

8.1 Adoption and responsibility

This Conservation Management Plan has been adopted by Cornwall Council and King Edward Mine Ltd. as a document to which both parties have regard in the submission and determination of applications for planning permission and Listed Building consent. The adoption decisions were by King Edward Mine Ltd's Directors/Trustees on 22 February 2013; and on 22 March 2013 by Mark Kaczmarek, Cornwall Council's Portfolio Holder for Housing and Planning.

8.2 Use of the plan

Capital works and other site works will necessitate very close detailed use of the management plan policies by the KEM management, project developers, architects etc. (especially when producing specifications/method statements), and of course site contractors when undertaking the work. However, over the longer term the CMP will also

provide a consistent policy framework for any works affecting any of the site assets, and the CMP should be consulted at the earliest stage in developing all relevant proposals, including for maintenance programmes.

The World Heritage Site Management Plan forms the foundation upon which this Plan rests. They closely relate to each other and offer the relevant Cornwall Council managers a package of policies from the specific to the general.

8.3 Monitoring and review

8.3.1 Monitoring

Monitoring of the implementation of the CMP policies is a key responsibility of Cornwall Council and KEM Ltd management, and monitoring information may need to be reported to statutory agencies (EH/Conservation Officers/Planning advice etc).

8.3.2 Review

This Conservation Management Plan should be reviewed every 5 years, with the next review due to be completed in 2018. Cornwall Council and KEM Ltd will be jointly responsible for its review, which will include further consultation with key stakeholders. The revised CMP will need to be endorsed by both parties.

9 Bibliography

9.1 Primary sources

Cornwall Record Office:

Abandoned Mine Plan (Henderson Bull: MRO HB/D3/1)

Symons 1846 Mining Map of Camborne Parish (CRO MRO A4)

CRO MRO R80 2/8

King Edward Mine:

Various maps/plans held at King Edward Mine (1899 and 1912 survey plans): On display or held in map drawers

Archive photographs held by Tony Brooks

Cornwall Council:

Aerial photographs (overhead and oblique) of King Edward Mine

Camborne Tithe Apportion Map, 1839 (digital copy)

Ordnance Survey, *c*1877. *25 Inch Map* Second Edition (licensed digital copy at HE)

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Survey drawings:

Counthouse/Assay House/Carpenters' Shop Complexes (Purcell Miller Tritton 2011 Reports)

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9.2 Secondary sources (published)

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WHS, 2007. *The Outstanding Universal Value of the Cornwall and West Devon Mining Landscape*, WHS

WHS, 2013. *Cornwall and West Devon Mining Landscape - World Heritage Site Management Plan 2013-2018*

Note: The Cornwall Historic Environment Record lists 33 separate reports (or 'events' by internal and external contractors) that have taken place within the CMP area. A substantial number of these were undertaken by CC archaeological projects team (12 by the report author).

9.3 Websites

http://lbonline.english-heritage.org.uk The Listed building database of English Heritage and the Department of Culture, Media and Sport

http://www.cornish-mining.org.uk The Cornwall and West Devon Mining Landscape World Heritage Site website

http://www.stastier.co.uk A particularly useful website by the manufacturers of St. Astier brand lime products detailing methodologies for their application.

http://www.cornishlime.com The website of the Cornish Lime Company

http://www.matchingbrick.co.uk A useful website for those seeking matching brick for the repair of historic structures

9.4 Project archive

The HE project number is **146165** (King Edward Mine: Conservation Management Plan)

The project's documentary and photographic archive is housed at the offices of Historic Environment, Cornwall Council, Kennall Building, Old County Hall, Station Road, Truro, TR1 3AY. A copy of the report will be deposited in Devon's Sites and Monuments Archive as well as a copy of all digital images. A copy of the Project administration and black and white images will be archived with Plymouth Museum (following the agreed guidelines produced in the WSI).

The contents of this archive are as listed below:

1. A project file containing site records and notes, project correspondence and administration (File No. **146165**).
2. Digital photographs are archived in Cornwall's Sites and Monuments Archive (R:/Images/HES Images/Sites K-L/King Edward Mine CMP 146165).
3. This report is held in digital form at HE CC as: G:\Historic Environment (Documents)\HE Projects\Sites\Sites K\King Edward Mine CMP 2012\REPORT\King Edward Mine CMP Report 2012086
4. EH OASIS No. cornwall2-138559

10 Appendices

10.1 Historical background of South Condurrow Mine

South Condurrow Mine was formerly known as **Wheal Polgine** in 1825, when sales reached 821 tons of high grade ore. A year later production increased to 1,146 tons but ceased in 1830. By 1837 there was a company named **Polgine and Condurrow Consols Mining Company**, the mine at that time having reached 30 to 40 fathoms below adit. Polgine was abandoned in 1839 as presumably at the same time, was Condurrow (Morrison 1983, 165). Symons 1846 Mining Map of Camborne Parish (CRO MRO A4), shows a line of shafts along William's Lode, which were actively being worked (the later mine site is labelled). A mine map (MRO R80 2/8) held at the County Records Office (which appears to date to the 1840's), shows many more shafts accessing this lode during this period. These early workings were on the vertical lodes, but it was not until the 1860's (discovery of the Great Flat Lode), that the mine saw any real profits.

The Mining Journal of 24th August 1850 states: *'Immediately between Wheal Grenville and Condurrow is a sett formerly known as Old Tye, but now christened South Condurrow'* (Morrison 1983, 165). The lease was granted before Condurrow reopened in 1844, but it was fourteen years before production was obtained and twenty five years before dividends were paid regularly. A deep adit was cut through the sett at 38-40 fathoms from surface with six lodes cut but provided no workable ore. An engine shaft (with a 45" pumping engine) was sunk from 1859 to 1863 reaching a depth of 64 fathoms but barren ground met and the pitwork raised (Morrison 1983, 166).

The first recorded production from South Condurrow was in 1864 when 20 tons of copper ore were sold, a direct result of re-siting the pumping engine and shaft at its present position in 1864. Copper ore sales reached a maximum of 340 tons in 1866 (and totalled only 1,071 tons from 1864-9 and 1877-82; Morrison 1983, 167). Figure 6 an 1865 South Condurrow Mine plan shows the intensive development work that had been undertaken by this date. Shaft sinking continued with Engine Shaft reaching the 30 fathom level in 1865. In July 1868 the new winding engine house south of Engine/Sump Shaft was working. A year later a new steam stamping engine had been constructed and was working. In 1871 South Condurrow declared its first dividends and by the summer was hoisting and stamping 1,200 tons of ore a month at an average grade of 40 lb/ton (Morrison 1983, 171).

By 1873 seven shafts had been sunk by this date for copper and tin ores. The 1870's were a time of decreasing tin prices but for South Condurrow increasing production, as the 55" engine at Engine Shaft struggled to pump out the deepening and lengthening mine. Figure 7 (the 1877 OS map) shows the mine in its heyday. Sump/Engine Shaft is shown south of the pumping engine house and north of the winding engine house, this and William's Shaft working the Great Flat Lode at shallow depths, whilst Kings and Vivian's Shafts worked the Great Flat Lode at deeper depths (the 60 to 80 fathom levels). A large spoil heap is shown west of Sump/Engine Shaft and extending north-eastwards to William's Shaft (approximately 100m away). A well developed dressing floor and calciner complex is shown west of Engine Shaft.

The 1880's saw further development and shaft sinking in the western part of the sett necessitating the construction of a new pumping engine house (with a second hand 60"engine) in 1888 at Marshall's Shaft. This reached 168.5 fathoms in early 1895, but the decreasing price of tin made further development work unproductive.

Part of the South Condurrow section of the mine around William's Shaft (including William's and King's Lodes) was taken over in 1897, by **Camborne School of Mines** and renamed '**King Edward VII Mine**'. In 1906 the old cost-book system was abandoned at the adjacent Wheal Grenville in favour of a limited company. Figure 4 (1907 OS map) shows the mine towards the end of its life as an ore producer.

The turn of the century saw large changes to the surface layout of the mine, after its purchase in 1897 for **Camborne School of Mines**. *'A new headframe was erected over Engine Shaft, which had been re-collared and re-timbered to bedrock. The western end of the shaft had to be cut down in order to replace the old skip roads by two new cage roads'* (Brooks 1986, 58). New timber frame buildings were constructed east of Engine Shaft winding engine/boiler house and south-east of the shaft. These included a new material house, a vanning room and timber cutting room with classrooms. The main addition was a new automated mineral dressing plant which included a set of Fraser and Chalmers Californian Stamps and 90 H.P. compound steam engine to drive the stamps and mill machinery (construction completed by 1903). Water for the dressing floor was supplied by a nearby reservoir to the west and a water skip in Engine Shaft which was designed to hoist water from the 40 fathom level (lessening the load on the Wheal Grenville pumps), Brooks 1986, 58. The mines were amalgamated as **Grenville United Mines** in 1912, but ceased production in 1921. From 1864 to 1902 South Condurrow produced 11,430 tons of black tin, 1,060 tons of 10% copper ore and 4 tons of arsenic (Dines 1956, 340).

Excerpt from Buck (1999a) *Contract 9B (Additional shafts)*, Assessment report, CAU Report No 1999R002.

10.2 Historical background of Wheal Grenville

Wheal Grenville came into being at the end of 1845, with Engine Shaft (New Engine Shaft on Polgine Lode) cut to the 70 fm. level seven years later. Operations for the ten months ending 30th April 1852 cost £2,227, with copper ore sales contributing only £428. The mine was taken over by John Taylor and Sons in 1851 but sold in 1855. At this date there were two engines on the mine, a 30" and 36", one on Engine Shaft and the other on Newton Shaft (sunk to 28 fm. from surface). New shafts were cut, existing shafts deepened all without success. In 1859 a subdivision of **Wheal Grenville** named **East Wheal Grenville** was formed to work the ground between Newton Shaft and the South Wheal Frances boundary. This was an independent (unsuccessful) mine separate from Wheal Grenville until 1877, when it was amalgamated with **Wheal Grenville**.

The 30" engine was moved from old Wheal Grenville Engine Shaft to East Wheal Grenville, and placed near Watson's Engine Shaft, a recently sunk shaft. A horse whim was erected nearby and water wheel powered stamps were working in 1862 when 19 tons of black tin were sold. A second hand 60" engine replaced the 30" as the shaft deepened to the 85 fm. level in 1865. By this time copper ore and tin were being produced (its peak production year of 575 tons of copper and 53 tons of black tin realising nearly £5,000), and the mine employed seventy men, thirty-eight women and ten boys. By 1869 the 120 fm. level was being driven and copper ore sales increased to 1,184 tons in 1871. At this date a 22" steam whim, crusher and skips were installed. However during the next five years, failure of pumps, boilers and seasonal flooding at the bottom of the mine (130 fm.) caused by heavy rain, reduced ore output. The continuing depression of tin prices resulted in the abandonment of the mine in 1876. The Great Flat Lode in this sett became a major source of ore in later years when the shafts were deepened. The overall production figures were 6,429 tons of copper ore and 315 tons of black tin between 1859 and 1876.

By the late 1870's **Wheal Grenville** was a viable proposition (after a large cash injection of a new 80" engine (Goold's) and engine house at North Shaft. At surface the stamps engine was enlarged (from the 24" to a 30" cylinder) and the head of stamps increased to seventy two). The Great Flat Lode was now being developed at the 162 fm. level. **South Wheal Grenville** had been abandoned in 1869, and **East Wheal Grenville** closed in 1876, both at shallower depths than **Wheal Grenville**. Accordingly all of these setts were amalgamated in 1877.

In 1880 four large slime pits were added to the dressing plant and a hundred slime frames built, which could treat 2000 tons of ore per month. Costs were cut three years

later by the company importing its own coal, as shafts were deepened (Goold's to the 200 fm. level) and stopes lengthened. The dressing floor now included a calciner, rock crusher, forty four buddles and 288 slime frames. An extra thirty two head of stamps were also erected with its own engine to treat poorer grade ore. Ore revenue reached nearly £30,000 in 1885 and two years later 639 tons of black tin realised £41,882.

Figure 7 (1877 OS 1:2500 map) labels this eastern part of the mine ***'East Grenville Mine'*** *(Tin and Copper, Disused*). An engine house is shown south west of the later site of the Fortescue engine house and another to the south-east (a winding engine). Two buildings (both possibly related to the dressing floors) are shown east of the later site of the pumping engine house. The shaft labelled as *'Old Shaft'* (possibly Watson's Engine Shaft) was later re-cut as **Wheal Grenville's** main pumping and hauling shaft in its latter stages.

Development in the eastern part of the sett had created long tramming distances to the stamps in the west. In 1891 the company was obliged to raise £15,000 for the sinking of a new shaft for pumping and winding, naming it Fortescue, the name of the mineral Lords (from the Boconnoc Estate). £3,600 was paid for a third hand 90" pumping engine from Tresavean (previously from South Wales). The steam winder was purchased second hand from South Roskear. Fortescue Shaft was equipped with a double skip road and the engine house foundations built in July 1891. In 1894 Goold's Shaft was sinking below the 232 and Fortescue Shaft below the 225 fm. level. ... *'Wheal Grenville was one of the few mines in Cornwall, if not the only one, to declare dividends in 1894, a year of wreck and ruin for the Cornish mines'* (Morrison 1983, 210).

The new stamps and new pumping capacity kept the mine going through the mid 1890's when many in Cornwall folded. Fortescue Shaft was deepened to the 262 fm. level in 1896. A year later it was recorded that since 1890 the company had spent nearly £37,000 on construction and development which included £15,000 from shareholders and £17,389 from operating profits. Dividends up to 1895 amounted to £82,546 so that a further £44,813 was divided in the years 1898-1906. In 1906 **Grenville United Mines** was formed which included the additional adjacent setts and plant of South Condurrow and part of West Wheal Francis. Production averaged 800 tons of black tin per year. In 1910 five shafts were in use, West Frances to the 150 fm. level, Fortescue's to the 360 fm. level, Goold's to the 310, Pease's to the 276 and Marshall's to the 125 fm. level.

Figure 9 (1908 OS 1:2500 map) labels the mine ***'Grenville United Mines'*** *(Tin and Copper)*. The former site of the engine house south west of the Fortescue buildings have gone, and been replaced nearby by a dressing floor complex and long complex series of slimes settling tanks, oriented parallel to road. Two tramways lead from the crushing plant, one to the new stamps uphill (south west of this eastern end of the mine), and the second to another dressing floor complex. Fortescue Pumping and Winding Engines can be clearly seen, as can the location and extent of the pumping engine boiler house.

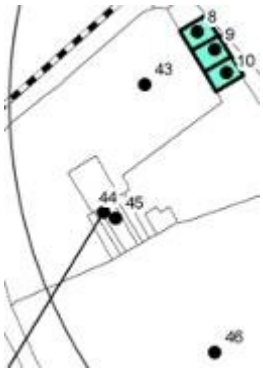
By 1916 Fortescue's Shaft was down to the 395 fm. level, 270 fathoms from surface, but although the price of tin had been high, a collapse of the price in 1920-1 and the lack of skilled miners (due to the First World War) and lack of investing capital caused the pumps to stop in 1920, and the mine to close a year later. The 90" engine was removed to New Cook's Kitchen Shaft in 1922 and remained working until the end of 1950 when the beam broke, wrecking the engine. 2,329 tons of copper ore was produced between 1860 and 1895, nearly 25,000 tons of black tin from 1860 to 1913 (over half during the previous seventeen years from the Great Flat Lode).

During the 1960's Camborne Tin attempted to un-water the shaft, presumably to provide water, or to lower the water level at another site. This caused drainage problems at other mines in the area, and the work was soon stopped. The shaft in later years was used to pump out water by SWW for emergency back up, although the electric power supply to the pump (previously housed in the condenser pit) has been disconnected.

Excerpt from Buck (1999b) *Wheal Grenville (Fortescue Boiler House)*, Evaluation report, CAU Report No 1999R020.

10.3 Detail Record sheets for Sites R14 to R16

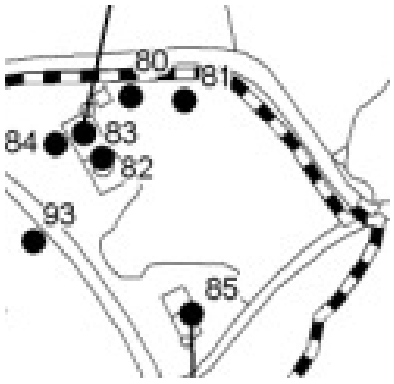
Site name:	**South Condurrow Mine** **Sheet R14**
Building name/identifier:	**Stamps Engine House, and loadings (Site 44**)
Survey date:	8/8/2012
Designations:	Listed Building Grade II (Ref. 1328114 – Stamps engine house).
Location:	NGR: SW 66301 38874 North west part of core KEM site. Figure 14 for location
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	N/A

Site map and photograph:		

Construction materials: **(walls, roof, floor, ceilings, windows etc):**	*External:* The walls are constructed of un-coursed granite rubble with granite quoins. The roof is no longer extant, presumably either collapsed through neglect or removed when the steam engine was sold after 1903 when the mine ceased operating. Part of the rear (gable) and east wing wall has collapsed between this date and 2000, when the remaining walls were consolidated with new mortar (possibly cement based). However, before this in 1997, the auxiliary pumping shaft (located in the loadings) was grilled, as a Health & Safety measure by KDC (Buck 1999c). The walls appear to be in a relatively good condition, although vegetation is now growing out of parts of the building, with ivy spreading up the walls. There are three windows in the west wing wall, one in the east side and the plug door. The earthwork remnants of the stamps platform are overgrown with vegetation, although the front retaining wall is extant. The loadings were fenced in 1997 when the shaft was grilled.
	Internal: The interior is overgrown, and cataract pit infilled.
Build date:	This building dates back to 1869 to house a double acting engine to drive the stamps. The stamps were located to the south east of the engine house, the boiler house to the north west and a yard to the east (see Fig 7 and Site 43). The dressing floor buddles and rag frames were sited downslope to the south. This engine had a dual function to power an

	auxiliary bob from the crankshaft to pump water from underground for use on the dressing floors.
Modification date:	There are no known modifications to the building.
Original functions:	Stamps engine house.
Current function:	Conserved Listed building.
Proposed function:	KEM have a short term aim of adapting the nearby Assay Complex (Sites 8-10) for reuse as a café, and utilising the former yard area for outside seating. Clearing the surface of the yard to any buried hard standing for the café seating will be undertaken, but it would also be preferable if the vegetation over the stamps platform and engine house interior could be cleared to give public access – which will surely be a focus for interesting wandering. In addition, perhaps thought should also be given to removing the fence around the loadings, and grilling the remaining loading slots – to allow the platform to be used as a viewing point for seeing this section of the GFL.
Significant features/contents:	Both externally and internally, this building retains some of its original character and design. Its repointing over a decade ago has enabled the structure to retain structural integrity and enhanced its appearance.
Original fixtures/fittings:	Not applicable.
Machinery:	No original machinery remains.
Summary description:	This building is Listed Grade II. It retains its distinctive character of a late 19th century Cornish steam stamps engine house, and it's relatively recent external conservation overhaul structurally improved and conserved the building. Presumably it will continue to function as a visual resource of a bygone technology, and perhaps its loadings as a viewing platform to view this section of the GFL.
Completeness and condition:	This building reflects a similar construction style (granite uncoursed stone with granite quoins), for some of the older buildings within the core of the site. It still retains some of its main structural features of the (unsupported) wing walls, but unfortunately retains no internal original fittings/features. The building appears to be in a good structural condition, no doubt a result of masonry conservation a decade ago.
Significance/conservation strategy:	The historic group value of this mid/late 19th century building as part of South Condurrow Mine is highly significant, as well as its contextual and working relationship to other adjacent mine buildings. It is one of only a few buildings that date back to the original South Condurrow Mine (1864-1897), the primary mine for this site. The conservation strategy is to keep the building in its present condition for preservation (remove vegetation) and public enjoyment, although it would be advantageous to remove any cement repointing.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Vegetation management is necessary in the short term, with ongoing regular management thereafter (especially if the adjacent yard area is to have regular public use).

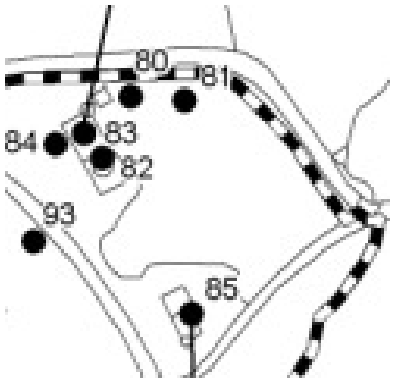
Site name:	**Wheal Grenville** **Sheet R15**
Building name/identifier:	**Fortescue's Pumping Engine House and chimney (Site 83**)
Survey date:	8/8/2012
Designations:	Listed Building Grade II* (Ref. 1159809) and Scheduled Mon. No. 1003117
Location:	NGR: SW 66782 38903 East end of CMP area. Figure 13 for location
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	N/A

Site map and photograph:		
		

Construction materials: **(walls, roof, floor, ceilings, windows etc):**	*External:* The walls are constructed of un-coursed granite rubble with granite quoins. The roof is no longer extant, presumably either collapsed through neglect or removed when the steam engine was sold in 1922. (See Appendix 10.2). The walls were partially repointed in 1993, but its mainly granite and coursed granite construction with arched windows have also preserved this building and kept it in a relatively good condition. However, vegetation is now growing out of its top and sides, with ivy growing up the attached chimney. There are two windows in each of the east and west elevations, and the main girder opening. The boiler house doorway is on the west side – the boiler house has gone, although there are extant remains below ground level (Buck 1999b). The upper brick section of the chimney is missing (and may be crumbling and distorting – it was hit by lightning not long after it was built). Fortescue's Shaft, since closure has been used by South West Water as an emergency reservoir – but its use has been discontinued. The shaft is now fenced and internally obscured by vegetation.
	Internal: This site was not assessed internally as access could not be gained.
Build date:	This building dates back to 1891 to house a (third hand) 90" engine from Tresavean, when underground development focussed in the east of the sett, necessitating the sinking of a new shaft and related pumping and winding engines (to reduce tramming distances). The shaft had a double skip

	road installed. The collapse of the tin price in 1920 (and lack of skilled miners), caused (the later) Grenville United Mine company to close. The engine was removed to New Cook's Kitchen Shaft (South Crofty) in 1922 and remained working until 1950 when the beam broke, destroying the engine.
Modification date:	There are no known modifications to the building although in the 1960s Camborne Tin attempted to un-water the shaft.
Original functions:	Pumping from Fortescue Shaft (Site 82).
Current function:	Building not in use.
Proposed function:	Grenville United Mines, with its three Scheduled Monuments (all the extant engine houses), are accessed via the Mineral Tramways Trail and public rights of way. Other engine houses in the locality have been conserved; these buildings deserve the same long term treatment and increased (informed) public access. This could generate additional interest/use of King Edward Mine for parking/other facilities.
Significant features/contents:	This building retains its original character and design, a product of its robust construction.
Original fixtures and fittings:	Unusually, the balance bob pivot bearings are intact and still *in situ* on top of the bob wall.
Machinery:	No original machinery remains.
Summary description:	This building is Listed Grade II* and is a Scheduled Monument. It retains its distinctive character of a late, robustly built 19th century Cornish steam engine house. Presumably it will continue to function as a visual resource of a bygone technology. However it has much potential in terms of informative visitor access, and should be subject to a programme of vegetation removal.
Completeness and condition:	This building reflects a similar construction style (granite coursed stone with granite quoins), as the nearby contemporary winding house (Site 85), and the more distant Stamps Engine House (out of the CMP area), all part of the later Grenville United Mines. It still retains its main structural features of the (unsupported) wing walls, but unfortunately retains little internal original fittings/features. The building appears to be in a good structural condition, with the exception of the brick section of the chimney.
Significance/conservation strategy:	The historic group value of this late 19th century building is highly significant, as well as its contextual and working relationship to the other adjacent mine building of Wheal Grenville. It was of large and quite late construction, and one of a few examples of buildings constructed during the Great Flat Lode bonanza of the late 19th century. In the short term, the conservation strategy should be to keep the building in its present condition to provide options for longer term projects. The site is owned by the Boconnoc Estate.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of this building, any works impacting upon the site will require Scheduled Monument Consent.

Site name:	**Wheal Grenville** **Sheet R16**
Building name/identifier:	**Fortescue's Winding Engine House, loadings and chimney (Site 85**)
Survey date:	8/8/2012
Designations:	Listed Building Grade II* (Ref. 1328144) and Scheduled Mon. No. 1003117
Location:	NGR: SW 66812 38853 East end of CMP area. Figure 13 for location.
Building at Risk:	No
Recorder:	C Buck
Plan Ref:	N/A

Site map and photograph:		
		

Construction materials: **(walls, roof, floor, ceilings, windows etc):**	*External:* The walls are constructed of un-coursed granite rubble with granite quoins. The roof is no longer extant, presumably either collapsed through neglect or removed when the steam engine was sold in 1922. (See Appendix 10.2). The walls were partially repointed in 1993, but it's mainly granite and coursed granite construction with arched windows have also preserved this building and kept it in a relatively good condition. However, vegetation is now growing out of its top and sides, with ivy growing up walls. There is one window in each of the east and west elevations, and the main girder opening is bricked up externally. The boiler house doorway is on the west side – the boiler house has gone, although there are likely to be remains below ground level. The upper brick section of the chimney is partly missing (and now crumbling and distorting).
	Internal: This site was not assessed internally as access could not be gained.
Build date:	This building dates back to 1891 to house a (second hand) 28" engine from South Roskear (Buck 1999b), when underground development work was focussed in the east of the sett, necessitating the sinking of a new shaft and related pumping and winding engines (to reduce tramming distances). The collapse of the tin price in 1920 (and lack of skilled miners), caused Grenville United Mines to close. The engine was sold in 1922. This building would have functioned to wind from Fortescue's Shaft (which had a double skip road installed).

Modification date:	There are no known modifications to the building.
Original functions:	Winding engine house, winding from Fortescue Shaft (Site 82).
Current function:	Building not in use.
Proposed function:	Grenville United Mines, with its three Scheduled Monuments (all the extant engine houses), are accessed via the Mineral Tramways Trail and public rights of way. Other engine houses in the locality have been conserved; these buildings deserve the same long term treatment and increased (informed) public access. This could generate additional interest or use of King Edward Mine for parking and other site facilities.
Significant features/contents:	Both externally (and internally), this building retains its original character and design, a product of its robust construction.
Original fixtures and fittings:	The original wrought iron fixing/strengthening plates remain (made by Tavistock Iron Works).
Machinery:	No original machinery remains.
Summary description:	This building is Listed Grade II* and is a Scheduled Monument. It retains its distinctive character of a late, robustly built 19th century Cornish steam engine house. Presumably it will continue to function as a visual resource of a bygone technology. However it has much potential in terms of informative visitor access, subject to a programme of building conservation.
Completeness and condition:	This building reflects a similar construction style (granite coursed stone with granite quoins), as the nearby contemporary pumping house (Site 83), and the more distant Stamps Engine House (out of the CMP area), all part of Grenville United Mines. It still retains its main structural features of the (unsupported) wing walls, but unfortunately retains little internal original fittings/features. The building appears to be in a good structural condition, with the exception of the brick section of the chimney.
Significance/conservation strategy:	The historic group value of this late 19th century building is highly significant, as well as its contextual and working relationship to other adjacent mine buildings of Wheal Grenville. It was of quite late construction, and one of a few examples of buildings constructed during the Great Flat Lode bonanza of the late 19th century. In the short term, the conservation strategy should be to keep the building in its present condition to provide options for longer term projects. The site is owned by the Boconnoc Estate.
EH at Risk Register 2012:	Not applicable
Additional requirements for proposed work/any other factors affecting reuse/repair etc:	Given the statutory designation of this building, any works impacting upon the site will require Scheduled Monument Consent.

10.4 SWOT Analysis

Helpful to achieving the vision objective	Harmful to achieving the vision objective
Strengths (an *advantage* over others)	**Weaknesses** (a *disadvantage* over others)
KEM is an important central pillar of the Cornwall WHS (and sited within the GFL). Many of KEM buildings are Listed Grade II* This site has the best preserved and most significant dressing mill complex in the country. This site has the best preserved grouping of intact early 20th century mine buildings in Cornwall. This site also contains the Trevithick Society's collection of industrial artifacts; the most significant amalgamation of industrial heritage in Cornwall. KEM has an excellent resource of interested volunteers who repair, rebuild and maintain the site and its industrial machines. The success and operational capacity of the site depends on this resource. Cornwall Council owns the site which is leased to KEM Ltd. CC has previously funded the cost of materials for emergency repairs and an annual grant. Cornwall Council has funded officer time to prepare grant applications to enable the site to be more sustainable in the future.	Statutory designation to most buildings. There is a long and expensive lead-in time to gain consent for proposed works. Many of the site's early 20th century mine buildings are built of timber – an obvious fire hazard (the last fire in 1957 destroyed the winder house). The network of volunteers, so critical to the operational success of the site, will always be a diminishing resource - it needs to be periodically replenished from perhaps a younger generation. Weak links to this site from other industrial heritage sites in the vicinity. A slight constraining factor relating to full public access (Health & Safety) may be the uncertainty relating to shallow workings and mine shaft collapse. The nature of the site's former use as a mine would have created contaminated ground (with heavy metal concentrations), in some places. The suitability of underlying ground for the erection of new buildings therefore needs to be investigated. There is a risk to the working machinery in terms of long-term maintenance and fundraising for major repairs.
Opportunities (*external* chances to improve)	**Threats** (*external* elements)
Utilise grants from HLF, European and other sources to enable a more sustainable future (by adaptive reuse of underused buildings). Improve links to the site with other nearby industrial heritage facilities (Heartlands etc) and improved signage to KEM from major routes into Cornwall (A30). Use the CMP effectively as an aid to secure further funding to meet the short/long term aims of KEM. Widen the public perception of the site, by diversifying its product. Utilise the Mineral Tramways/Great Flat Lode public interest.	Occasional theft has occurred in the past – adaptive reuse may provide an incentive for more vandalism/theft. A long term aspiration is to promote the surrounding mining landscape around the core site. But, the ecological survey (see Appendix 10.4) describes the extent of invasive species (Japanese knotweed, Himalayan knotweed etc). If future grant aid (short term from CC and long term to promote sustainability), is not forthcoming, the site may close if visitor spend is not increased. Cornwall Council may not provide a grant to offset insufficient income.

10.5 King Edward Mine: Future aspirations

Policies: Section 7.3.8 and 7.3.9

The management of King Edward Mine have long term aspirations to enable the site to be financially sustainable, to create a high quality visitor attraction and to enhance the visitor experience. These include an Engineerium, a camping site, re-instatement of the steam winding engine in the winding engine house, an underground experience, erection of a headframe around Engine Shaft, and erection of an overhead tramway to the Stamps from the headframe. These sites are shown in Figure 27 and described in more detail in the Purcell, Miller, Tritton (2011) report. At present these are all long term objectives which will need substantial funds and may not be started before this CMP is reviewed in five years time. However, it is important to outline future long term goals.

Engineerium

There is a strong case for the Trevithick Society to bring much of its objects, machinery and archive collection into one place; to curate and manage it to professional standards. King Edward Mine is an obvious location for the collection to be located if a building of appropriate size and capacity could be developed. KEM Ltd identified the former Vospers building, which was located on the Heartlands site, as an opportunity to obtain a building that could become the shell of the Engineerium. They successfully applied for outline planning permission to erect this building on the KEM site (on the area to the west of the entrance road and core complex) and sought and obtained a grant from Cornwall Council to relocate it to the site. It has now been dismantled and relocated to KEM. The building is around 5,000 sq ft in size.

Issues:

- Detailed planning permission will be necessary.
- Short term funds will need to be sought for erection of this building.
- Long term funds necessary for maintenance/running costs of this building.
- There is the possibility of mine shafts being close to the site (investigated (but not located by KDC in 1999, Buck 1999).
- Proposed site is overlying the site of former archaeological features (Sites 48 – 51): archaeological impacts possible.

Vulnerabilities:

- Fire/theft etc close to the road.
- Long term sustainability of project.

Camp site

Given KEM's site within the Great Flat Lode and especially being an important part of the Mineral Tramways Route, there is a strong case for locating a camp site in the presently unused area south of the Stamps engine (Site 44), and north of the proposed site for the Engineerium (Figure 27). This would increase knowledge, publicity and use of the site, so accentuating the possibility of sustainability. Many thousands of people use the Mineral Tramways paths and visit the area; locating a campsite within the Great Flat Lode should have a positive outcome.

Issues:

- Detailed planning permission will be necessary.
- Short term funds will need to meet current regulations for creating a camp site.
- Long term funds necessary for maintenance/running costs of a camp site.
- Proposed site is overlying the site of former archaeological features (Site 46): archaeological impacts possible.

Vulnerabilities:

- Theft etc from camp site.
- Long term sustainability of project should be funded by camp site profits.

Underground experience

The KEM Directors strongly believe that what is lacking in the WHS is an underground experience which tells the story of metal mining from beginning to end including the earliest mining together with the modern story with artefacts along the way to create as authentic an experience as possible.

When people visit a mine they normally expect to be able to go underground. Currently visitors can go underground at Geevor Tin Mine and at Poldark Mine. Underground access at Geevor, although an excellent visitor experience, does not take people into the 20th century workings for which it is famous. Nowhere in southern Britain can the general public see how metalliferous underground mine workings would have looked in the 20th century. Nor are there underground workings in the KEM site, or down the Great Flat Lode that are accessible.

The site of the proposed underground experience is shown on Figure 27. It is proposed that a 'cut and fill' excavation would have minimal impact and effect on archaeological features.

Issues:

- Detailed planning permission may be necessary.
- Short term funds for site excavation and site interpretation proposals.
- Long term funds necessary for maintenance/running costs.

Vulnerabilities:

- Long term sustainability of project should visitor numbers drop.

Overhead Tramway and Headgear erection

The epicentre of a working mine is its main shaft for access and pumping/winding etc. There is no doubt that the headgear at Robinson's Shaft is an important iconic and visual feature of the site. For KEM, a headframe erection would demonstrate the practical and functional working relationship of the shaft to the winding mechanism, the underground experience and the link (for the ore transport) via the overhead tramway to the Stamps for processing.

Issues:

- Detailed planning permission may be necessary.
- Short term funds for headframe construction and erection.

Vulnerabilities:

(Limited) long term funds necessary for low maintenance/running costs.

Installation of steam engine into the winding engine house

KEM Ltd would like to install the Restowrack beam engine held by the Trevithick Trust (at KEM) into the existing winding engine house (which has been derelict since 1905, Site 24 - one of the few remaining in Cornwall), and restore it to be operational, enabling a key part of the story of the surface operations of a Cornish mine to be told. At the time of writing, it is proposed that the boiler house (Site 25) is to be re-used as a 'hands on' educational resource and exhibition of the human story of KEM, as there is no likelihood in the foreseeable future of funding the installation of the steam engine into the winding engine house. In addition, a steam boiler would need to be found and installed (probably a modern steam generating boiler). Thus the whole project would 'fill a gap' in the story of the site by establishing a working single active rotary 24" cylinder 1852 beam engine made by William West.

Issues:

- Detailed Listed Building consent (and possibly planning permission), will be necessary.
- Production of detailed survey of the building with a related impact assessment report as part of the Listed Building application.
- This project will need a substantial amount of funds for modifications to the engine house cylinder bedstones, a new roof, new loadings, and upper chimney rebuild. The engine will need to be rebuilt and possibly some missing parts sourced or re-made.
- Impact on a Grade II* Listed Building to provide the necessary modifications to install a steam engine which was never originally designed to be in this building.

Vulnerabilities:

- Long term funds necessary for high maintenance/running costs.

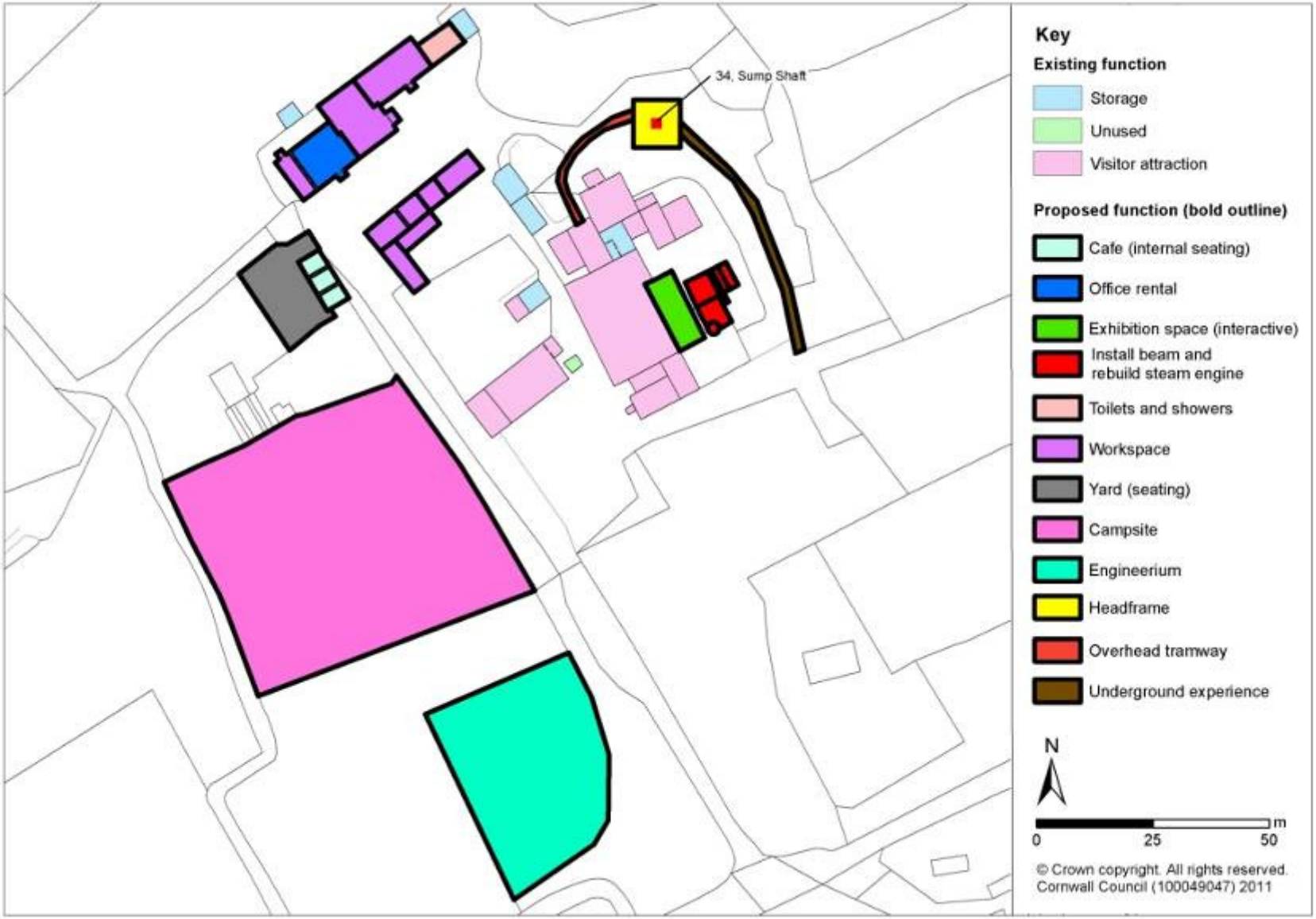


Figure 27 King Edward Mine plan of proposed changes of functional use and provisional future projects (2012)

Table 3 King Edward mine core plan site inventory table with proposed changes and impacts

Site No.	Site	NGR (SW)	MCO No.	LB Ref.	EH HAR Register	Existing function	Proposed function	Assess Sheet No.	Site Impact (Rating)
1	Count House Complex: Mess Room	66314 38925	56569	1142685	Yes	Unused	Workspace	R1	M
2	Count House Complex: Count House Office	66319 38931	56569	1142685	Yes	Unused	Offices	R1/R2	H
3	Count House Complex: Smithy	66328 38935	56569	1142685	Yes	Unused	Workspace	R1	H
4	Count House Complex: Miners' Dry	66333 38947	56710	1132883	Yes	Unused	Workspace	R1/R3	H
5	Count House Complex: Carpenters' Shop	66344 38953	56710	132883	Yes	Unused	Male/Female toilets	R1	M
6	Count House Complex: Store	66350 38957	56710	132883	Yes	Store	Store	R1	L
7	Count House Complex: Outhouse & Chimney	66312 38938	56718	N/A	No	Store	Store	R1	L
8	Assay Office Complex: Sample House	66317 38905	56570	1142686	Yes	Unused	Café	R4	H
9	Assay Office Complex: Wash House	66320 38902	56570	1142686	Yes	Unused	Café	R4	H
10	Assay Office Complex: Cycle House	66322 38898	56570	1142686	Yes	Unused	Café	R4	H
11	Carpenters' Shop Complex: (Offices/Carpenters Shop/Machining room)	66336 38913	56719	1159182	No	Unused	Workspace	R5	M
12	Carpenters' Shop Complex: (Carpenters' Shop extension for saw)	66340 38913	56719	1159182	No	Unused	Workspace	R5	M
13	Carpenters' Shop Complex: (Assay Office)	66347 38920	56719	1159182	No	Unused	Workspace	R5	M
14	Carpenters' Shop Complex:	66349 38924	56719	1159182	No	Store	Store	R5	L

Site No.	Site	NGR (SW)	MCO No.	LB Ref.	EH HAR Register	Existing function	Proposed function	Assess Sheet No.	Site Impact (Rating)
	(Stores/Dark Room)								
15	Welding Shop	66360 38922	56720	N/A	No	Workshop	Workshop	N/A	L
16	Machinery workshop	66363 38916	56720	N/A	No	Workshop	Workshop	N/A	L
17	Toilet block	66361 38896	56721	N/A	No	Toilets	Toilets	N/A	L
18	Drill/Fitting Shop	66365 38899	56721	N/A	No	Blacksmith Shop (site)	Blacksmith Shop (site)	N/A	L
19	Survey office	66362 38879	56722	1311128	No	Lecture room	Lecture room	R6	L
20	Lecture/AV Room	66355 38873	56722	1311128	No	Lecture room	Lecture room	N/A	L
21	Calciner and chimney	66393 38878	52506	1159243	No	Exhibition Room	Exhibition Room	R7	L
22	Buddle House/laboratory	66396 38882	52506	1159243	No	Entrance kiosk	Entrance kiosk	N/A	L
23	Infill site	66390 38881			No	Entrance corridor	Entrance corridor	N/A	L
24	South Condurrow winding engine house, chimney and loadings	66404 38895	56723	1159235	Yes	Unused	Reinstall steam engine	R8	H
25	South Condurrow winding engine boiler house	66395 38895	56723	1159235	Yes	Unused store	Interactive display resource	R9	M
26	Mill House (Dressing floor)	66385 38895	56724	1142687	No	Dressing floor demonstration	Dressing floor demonstration	R10	L
27	Californian Stamps and Building	66377 38909	56728	1159218	No	Dressing floor demonstration	Dressing floor demonstration	R11	L
28	Mill Engine Room	66380 38919	56728	1159218	No	Exhibition Room	Exhibition Room	R12	L
29	Compressor House	66390 38915	56729	N/A	No	Exhibition Room	Exhibition Room	R13	L
30	Horizontal steam engine winder house	66396 38916	56730	N/A	No	Exhibition Room	Exhibition Room	R13	L

Site No.	**Site**	**NGR (SW)**	**MCO No.**	**LB Ref.**	**EH HAR Register**	**Existing function**	**Proposed function**	**Assess Sheet No.**	**Site Impact** (Rating)
31	Infill building (Porch/AV Room)	66386 38913	N/A	N/A	No	AV resource	AV resource	N/A	L
32	Infill building (Maintenance Workshop)	66382 38910	N/A	N/A	No	Workshop	Workshop	N/A	L
33	Sulzer engine room	66372 38907	56725	N/A	No	Working engine room	Working engine room	N/A	L
34	Sump/Engine Shaft	66391 38935	N/A	N/A	No	Capped mine shaft	Erect headgear. Shaft collar tunnel exit	N/A	H
35-39	Various former sites (not visible)		N/A	N/A	No	N/A	N/A	N/A	N/A
40	Cobble floor area	66345 38912	N/A	N/A	No	Visible resource	Visible resource	N/A	N/A
41-42	Various former sites (not visible)		N/A	N/A	No	N/A	N/A	N/A	N/A
43	Walled Yard (Stamps Engine House)	66308 38896	N/A	N/A	No	Infilled	Uncover	N/A	H

Note:

- Site number relates to inventory list and core plan (Fig 14)
- MCO No. is the unique identifier given to each record in the HBSMR.
- LB Ref. is the National List Entry number on the National Heritage List for England
- EH HAR Register: English Heritage at Risk Register 2012
- Assess Sheet No. related to the Detail Record Sheets (No's 14 to 16 are reproduced in Appendix 10.3)
- Many unused buildings are currently used for temporary storage by Trevithick Society/KEM for a variety of items of historical interest

10.6 Consultation event summary

KEM Key Stakeholders Consultation Event held at KEM

26th September 2012 (10.0 – 1.0)

Attendance

Name	Representing
Colin Buck (Chairing)	Historic Environment Service, CC
Morwenna Williams	CC
Andrew Richards	Historic Environment Service, CC
Tamsin Daniel	CC Culture team
Ainsley Cocks	Cornish Mining WHS Office
Phil Markham	CC HE Planning Advice
Colin Benney	CC Area Valuer
Tony Brooks	Chairman KEM
David Blight	KEM
Kevin Baker	KEM
Kingsley Rickard	KEM/Trevithick Trust
Jean Charman	Camborne Town Council

Apologies

Name	Representing
Jeremy Williams	Cornish Mining WHS Office
Francis Kelly	English Heritage
Adam Sharpe	Historic Environment Service, CC
Deborah Boden	Cornish Mining WHS Office
Paul Perry	Project architect
Nigel MacDonald	KEM

Agenda

Welcome and Apologies

Introduction to KEM CMP:

- KEM CMP background reason for meeting (Discuss 1& 2, inform stages 2, 3 and 5)
- CMP background (refer to KEM CMP summary form content sheet; Stages 1-6)

Review KEM Consultation Draft CMP Report (Stages 1 & 2):

- General comments (by me: report layout etc)
- General comments (by others: one by one CB make notes)

Tea/Coffee break

Discussion to inform KEM CMP Report (Stages 3 and 5):

- General comments Stage 3 (Issues and Vulnerabilities)

- General comments Stage 5 (Conservation Management Policies: refer to Min Trams Policies)

Any other business:

- Discussion
- Opportunity for brief explanatory tour of sites that may be impacted (?)

Finished by 12.40

Meeting agreed that comments and discussions would not be minuted but notes would be taken by C Buck and individual detailed comments sent to C Buck to integrate into the CMP.

C Buck 27/9/2012

10.7 Glossary of mining terms

Cornish mining terms, taken abroad by the miners who left Cornwall in their thousands in the nineteenth and early twentieth centuries, have been adopted across the world and remain a significant reminder of the impact this small part of southwest Britain had on the world of non-ferrous mining.

Adit	A horizontal level taken up at the foot of a hill, and either driven on the lode, or to intersect it, for dewatering or draining the mine at that level; and also occasionally used for bringing out the ores.
Adventurers	The individuals who have parts or shares in a mine.
Anker	Small barrel containing drinking water
Arch	A piece of ground that is left un-worked near a shaft.
Assay House	The house in which the ores are assayed.
Attle	Waste from mine workings.
Back	The back of a lode is the part of it nearest the surface; the back of a level is that portion of the lode extending above it to within a short distance of the level.
Bal	A Cornish miner's term for a mine; miner's shovel.
Bal maiden	A female surface worker employed mainly in dressing the ores prior to smelting.
Bargain	A miner's contract negotiated with the Mine Captain to perform certain work for a certain price.
Beu-heyl	Live stream; rich for tin
Binder	Timberman
Bit	The steeled end of a borer
Bob	The engine beam that transfers the power from the engine to the pitwork. The bob wall of the engine house supports this beam.
Black-jack	Blende
Black tin	Tin ore ready for smelting
Blasting	Forcing off portions of rock by means of gunpowder or other high explosive.

Bonney	A distinct bed of ore that communicates with no vein of ore
Borer, augur, or drill	A round piece of iron, the one end steeled
Bottoms	The lowest workings either in a stope, level, or elsewhere
Bounds	The proprietary of tin ore over a given tract
Bounder	Denouncer of mining claims
Brace (to lay down at the)	If a person wished to relinquish his dole (claim) in a tin mine, he declined his 'dole at the brace' by placing his hand on the axletree and declaring he would no longer be involved with the mine
Branch	A small vein which separates from the lode, and frequently again unites with it, or a string of ore falling into the lode
Bryle	The traces of the presence of a lode, found in the loose matter, on or near the surface
Bucket	The piston of the lifting pump.
Bucking	The final hand reduction of ore for the separation of waste. A *bucker* performs this task using a bucking iron (short handled, flat faced hammer) on a buck stone.
Bunch or squat of ore	A quantity of ore of small extent; more than a stone, and not so much as a course.
Bunchy	Said of a mine which is sometimes rich but at other times poor
Buddle	An apparatus in which stamped tin is washed from its impurities.
Burning House	The furnace in which ore is calcined to sublime the sulphur from pyrites; being more decomposed, pyrites are then more readily removed by washing.
Burrow	A mound of waste rock or attle.
Cal	Wolfram
Calcination	The roasting of ore to remove impurities, particularly arsenic, performed in a calciner.
Capel or carrack	A stone composed of quartz, schorl and hornblende, usually occurring on one or both walls of a lode, and more frequently accompanying tin than ores.
Capstan	A machine consisting of an axle and several long arms, by which pumps and other equipment is lowered or raised from a shaft by manual force.
Captain or Agent	A superintendent in charge of the running of a mine. There were also subordinate captains who attended exclusively to underground or surface operations.
Carbonas	Irregular offshoots of minerals from lodes
Catch-pit	Area where slimes are retained for dressing
Caunter	When two lodes intersect, one is said to be caunter to the other diagonal lode

Chimming	A process similar to tossing but performed on much smaller quantities of ore; the kieve is supported on the verge of its bottom
Cistern	A large box at the bottom of each lift in the engine shaft
Clack	The valve of a pump
Clapper	An implement erected at the top of a shaft to sound from the mine to the engineman
Claying	Lining the hole (in which gunpowder is to be placed) with clay, to prevent the powder becoming damp.
Cobbing	The intermediate stage of the hand reduction of ore when the valuable parts are chipped away from the gangue prior to bucking.
Cockle	Schorl
Cofer	A case containing a set of stampers or lifters from 3 to 6 in number
Coffen, coffin, koffen	Open working, resembling a quarry without shafts, where tin stuff was excavated by digging and casting up from one stage of boards to another
Combed ore	Veins made up of layers of different materials parallel to the walls
Conglomerate	Consolidated gravel, pebbles, and boulders in a cementing fine-grained matrix
Core	Division of time, shift. Cores were usually 8 hours long, 3 per day, except in difficult working conditions (foul air, water), where 4 six-hour cores were usual.
Costean	Shallow pits to trace or find tin
Cost Book Company	A form of extended partnership that evolved in the Stannaries in which a group of adventurers came together to initiate a mining venture by opening a cost book that recorded their names, addresses, and all subsequent transfers of shares and costs of the undertaking. 'Adventurers,' who held shares in almost any fraction of the capital, put up enough cash in proportion to their share to finance operations, or paid 'calls' (demands for money) to enable operations to continue, or received their share of the divided profits at regular meetings.
Count House	Mine account house; mine captain's residence or office.
Country rock	The rock containing the lode fissure
Courses of ore	Deposits of ore having small vertical but considerable lateral extent
Creazes	Work of dressing tin in the middle part of the buddle
Cross course	A lode or vein that intersects or crosses a lode at various angles, and generally throws the lode out of its regular course.
Crop	Ore of tin dressed and cleaned for smelting; finest black tin
Cross cut	A level driven at right angles to the direction of the lode.

Country	The strata or rock through which the vein or lode traverses
Crusher	A pulverising machine for reducing the ores; worked either by steam or water.
Cylinder	The circular case of iron in which the piston receives the steam to give the engine motion.
Dead ground	Ground without mineral values
Derrick	A digger or miner
Dialler	An underground surveyor.
Dileuing	Washing ore, supported on a hair-bottom sieve in water
Dip	The angle of inclination of beds or strata measured in relation to a horizontal line
Dippa	A pit or a hole sunk in the lode to collect water to be drawn out by small barrels; a pit sunk in a bunch of ore
Dish	A portion of the produce of a mine payable to the mineral owner, also known as a due or royalty
Dol, dole	Any part or share of the adventure of tin ore; a small heap of ore
Draught engine	Engine used for pumping
Dressers	Cleaners of the ore.
Dressing Floor	Surface area of a mine where ores are separated from their matrix ready for smelting.
Drill	A machine invented for boring blasting holes using steam and later compressed air.
Driving	Cutting and blasting horizontally.
Druse	Cavity in a vein
Dry	A room fitted with steam pipes where the miners' underground clothes were dried.
Dun-mwyn	A hill of minerals
Durns	A frame of timber with boards placed behind it to keep open the found in shafts and levels
Dyke	A vertical or highly dipping injected sheet or eruptive origin. Igneous rock injected into fissures in older rocks.
Elvan	Porphyry - clay-stone.
Engine house	The masonry structure built to accommodate the steam engine, complete with chimney or stack, and which has come to internationally symbolise Cornish industrial genius and technical innovation.
Engine man or driver	Man who attends to and works the engine.
Fathom	Six feet in height, depth or length; measurement of stoping, driving, and sinking
Fault	An intersection of the strata
Fissures	Open cracks

Flang	A two pointed pick
Flat rods	Rods for communicating motion from an engine horizontally.
Floran	Small-grained tin, scarcely visible in stone but extremely rich. Any tin stamped extremely finely is known as floran tin (flower tin)
Flookan, fluccan	A soft clay-like substance
Fluorspar	Fluoride of calcium used as flux by copper-ore smelters
Flue	The connection between a boiler and chimney; also chambers in which arsenic soot is collected
Fluke	The head of a charger; an instrument used for cleaning the hole prior to blasting
Foge	Forge or blowing house for smelting tin
Footwall	The wall under the lode; also referred to as the underlying wall.
Footway	The ladders by which the workers ascend and descend.
Fork	A mine 'in fork' has all the water drawn out; the bottom of the engine shaft.
Frames	A type of buddle
Fuggan	Miner's lunch made of pastry containing meat
Fuze or fuse	Straws or hollow briars, reeds, etc., filled with powder.
Gad	A pointed wedge of a peculiar form having its sides of a parabolic figure.
Galena	Sulphide of lead
Gangue	Waste matrix of ore.
Glist	Mica
Gozzan	Oxide of iron and quartz, generally occurring in lodes at shallow depths.
Grass	The surface of a mine. A grass captain was therefore one in charge of surface operations.
Griddle	A sieve.
Growan, grouan	Rough pebbles, granitic gravel
Guag	Emptiness, void; ground previously worked for tin
Gulph	Large quantities of ore that continue at depth
Gunnies	Breadth or width. Single gunnies are 3 feet wide. Former vaults or cavities dug in nay mine are termed 'the old gunnies'. If full of water they are referred to as gunnies or houses of water
Gurt	A gutter or channel for water
Hanging wall	The wall or side over the lode.
Halvans, halvaner	The ores not sufficiently rich to be offered for sale; man responsible for dressing the halvans.
Heave	The horizontal dislocation that occurs when one lode is

	intersected by another having a different direction.
Helling stone	Slate
Hoggan	Miner's lunch consisting of baked pastry containing figs or currants
Horse	Portion of dead ground in a lode
Huel, wheal	A hole, or mine pit. A prefix to the names of most Cornish mines
Hulk, dzhu	To excavate a portion of rock on one side of an end to render the blast more efficient
Jigging	A method of separating larger pieces of mixed ore and waste rock by agitating the mixture under water: the heavier pieces of ore sink to the bottom of a sieve or container and the lighter pieces of waste rise to the top.
Keenly	Ground that looks favourable for ore.
Kerned	Mundic ore hardened by exposure to the sun
Kibble	A bucket usually made of iron, in which ore etc. are drawn to the surface.
Kieve	A large circular vat used in tin dressing
Killas (call-ys, cales, callys)	Clay-slate (sedimentary rock).
Kindly ground	Those rocks in which lodes become productive of mineral of value
Knockers	Benign spirits believed to inhabit the mines
Lander	Man who attends at the shaft mouth to receive the kibble in which ores, etc., are brought to the surface.
Lappior	The dresser of the leavings
Launder	A tube or gutter for the conveyance of water.
Learys, learies	Old men's workings; emptiness
Leat	A water-course.
Leavings	The ores that are left after the crop is taken out
Levels	Galleries driven on the lode usually at 10, 20, 30, etc., fathoms below adit level.
Limp	A semi-circular scraper to collect the skimpings in copper ore dressing
Lobby	Open drain
Lock-piece	A piece of timber used in supporting workings
Lode	A regular vein, producing or affording any kind of metal.
Loobs	Slime containing ore
Looby	To toss the ore
Lost-slovan	Either beginning or tail of an adit
Moor	Quantity of ore in a particular part of the lode
Moorstone	Surface as opposed to quarried granite

Mun	Any mineral
Mundic	Iron Pyrites
Nogs, nays	Support for the roof of a mine
Old men's workings	Ancient workings usually on the backs of lodes
Outcrop	The emergence of a rock or lode at ground surface
Pack	To facilitate the speedy subsidence or settlement of ore in the process of tossing by beating the kieve with a wooden hammer
Parcel	Pile or heap of dressed copper ore ready for sale
Pare	A gang or party of men.
Pasty	Miner's lunch consisting of a pastry case containing meat and vegetables
Peach	Chlorite
Pednan	Head of a buddle, where tin is dressed
Pedn cairn	A bunch of ore at a distance from the lode
Pillar	A support for the roof, of timber, stone, or other material
Pitch	Limits of the ground set to tributers who agree with the Mine Captain to work it at a pre-negotiated price
Pitman	One employed to look after the lifts of pumps and the drainage of the engine shaft.
Pitwork	The pumps and other apparatus of the engine shaft.
Planchun	A platform
Plat	A flat area used for the storage of ore or deads; whim plat is the level area whereupon a horse whim is erected
Poder	Rotten, corrupt; the former name for copper ore.
Pol-rôz	Water-wheel pit
Prian	Kaolin; a favourable sign when found in a lode
Prill	Lump of solid virgin metal, or the button from an assay
Purser	The cashier or paymaster at the mines; the financial officer of a cost book company
Queres or Quears	Crevices in the lode.
Racking	A process of separating small ore from the earthly particles by means of an inclined wooden frame; the impurities being lighter are washed off, the ore remaining near the head of the rack which will be removed to undergo tossing
Raffain	Poor ore of no value
Rake or rabb	True vein or lode
Red-rabb	Red killas
Reverse faults	Faults due to thrust, the hanging wall saide of the fault being forced upwards on the footwall
Riddar, riddle	Sieve

Rising	Digging upwards - a man working above his head in the roof is said to be rising.
Rôz	A wheel
Run	When excavations fall together.
Run of a lode	Its direction
Safety Fuse	Invented in 1830 and patented in 1831 by William Bickford of Tuckingmill. A stream of gunpowder was inserted into the core of twisted flax yarns, bound with twine and sealed with a waterproof varnish of tar. The fuse burnt at a regular 30 seconds per foot.
Saller	A floor at the bottom of the ladder to rest on; ground room; an empty passage or chamber
Sampling	The taking of a portion of ore for the assayer.
Scal, scale	A shale or portion of earth or rock which separates and falls from the main body
Scorran	St Just mining term for an iron-like quartz vein
Scovan	A tin lode
Scove	Very rich tin ore
Scrowl	When a metallic lode is interrupted by a cross gozzan, it may sometimes be picked up again by the presence of some loose stones of the true lode in the body of gozzan, known as the scrowl
Seem	Pack-horse load
Sett	A mine or number of mines taken on lease; the ground granted to a company of adventurers.
Shaft	A pit - the perpendicular opening to a mine. A shaft worked by horse engine or whim is called a whim shaft. Where the water is drawn, it is known as an engine shaft and an access shaft is a footway shaft
Shammel	A stage of boards used in coffins before shafts were in common use
Shoots	Deposits of ore in lodes which have a limited lateral extent, but considerable extent in depth; they generally dip at varying angles between horizontal and vertical
Skimpings	Skimmings of the light ore in the dressing process
Slimes	Mud containing metallic ores; muddy or earthy particles mixed with the ore.
Sollar	A small platform at the end of a ladder; also the covering of a shaft
Spal, spalling	Reduction of the ore into smaller fragments with long handled hammers after which it is cobbed; one's wages could be spalled (deducted) for absence from work or some other misdemeanour
Spaliard	A pickman
Spar	Crystalline white mineral: quartz, lime or feldspar

Squat	A large lode or heap of the lode in one place
Stamps	Machinery for crushing ores
Stannaries	An area of customary mining law in Devon and Cornwall
Stem, stemmyn	A day's work.
Stent	Rubble – loose dead earth
Stockwork	Rock that is traversed by numerous metallic veins rendering the whole deposit of sufficient value for treatment.
Strake	A launder or wooden box without ends, in which the process of washing or tying is performed.
Stope	A horizontal lode. To stope - to excavate horizontally layer after layer.
Stream tin	Tin ore found in the form of pebbles in valleys
Stream works	A place where detrital tin is washed
Strîk	To lower a man into a mine by windlass
Strike	A horizontal line upon the floor of a bed or footwall of a lode
Stull	Timber placed in the backs of levels and covered with boards to support rubbish.
Sturt or start	A pitch taken by a tributer at high tribute and which subsequently proves very rich.
Sump, sumph	A pit sunk in the engine shaft below the lowest workings. The sumpmen assist the pitmen and attend to the machinery in the bottom of the engine shaft.
Syncline	Strata bent in the form of a trough
Tackle	Windlass, rope and kibble.
Tailings	Refuse from the previous dressing operations.
Tamping	Process of inserting clay into a charge hole prior to blasting to confine the force that could often pass up the hole
Team	To lade water in bowls
Tide	A smelter's working for 12 hours
Tods	To shake and toss the wet tin to and fro in a kieve; to cleanse and dress it
Tol	A bounder's portion of tin stuff
Toller, tollur	A man who inspects or superintends tin bounds
Tossing, tozing	A process by which ores are suspended in water and violently agitated; the ore subsides aided by packing, leaving the lighter worthless parts on top
Trawn	A cross course (common in the St Just mining area only)
Treloobing	Working slimy tin earth in a pit allowing the mud to wash off with water and the ore to settle at the bottom
Tributers	Men whose pay is a certain proportion of the ore, or value

	of the ores they raise.
Trunk	A long, narrow cistern or pit, in which mixed ore and slimes are separated by the subsidence of the former
Trunking	Process of separating ores from the slimes prior to racking and tossing
Tutwork	Work in which the labourer earns in proportion to his labour, paid for driving at a certain price per fathom.
Tye	A long trough to separate roughs from slimes by washing. Tying therefore refers to the washing of minerals.
Umber	Oxide of iron and manganese
Underlie shaft	A diagonal shaft on the course of the lode
Van	The tin ore washed and cleaned on a shovel.
Vein	Any substance different from the rock; a rake vein is perpendicular, or nearly so; a pipe vein, nearly horizontal.
Vooga	A cave or cavern
Vou hole, vug	A natural cavity in the mine
Wey	Measure of coal
Wheal	A hole, or mine pit. A prefix to the names of most Cornish mines
Whim	A machine worked by horse, steam, or water, for raising ores etc.
Winze	A sinking on the lode communicating one level with another for proving the lode, or ventilating such workings.
Wits	The undressed tin nearest the stamps after reduction; the 'crop' of the stuff
Zawn	Sea cave
Zighyr	A small underground stream