

# Bilberry Dry

Roche, Cornwall

## Historic Building Recording

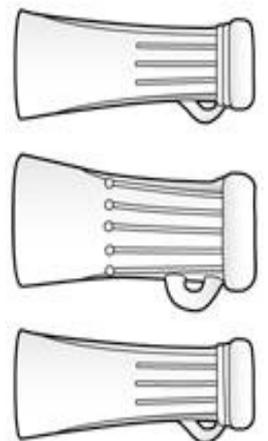
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Report Date February 2012



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## **Acknowledgements**

This study was commissioned by David Easterbrook and carried out by Archaeological Consultancy Ltd.

We are very grateful for help with the historical research provided by the staff at Cornwall Records Office; Truro Library; Ivor Bowditch (China Clay History Society); Mining Searches UK and Jane Powning at the Historic Environment Service, Cornwall Council.

The project manager was Matt Mossop, the project officer was Hayley Goacher whilst the fieldwork was undertaken by Matt Mossop and Hayley Goacher assisted by Graham Hill.

The views and recommendations expressed in this report are those of Archaeological Consultancy Ltd and are presented in good faith on the basis of professional judgement and on information currently available.

## **Cover illustration**

Southern end of linhay and chimney, looking southwest.



# **Bilberry Dry**

**Roche, Cornwall.**

## **Historic Building Recording**

**Authors:** Hayley Goacher BA (Hons) PlfA and  
Matt Mossop MA (Hons) MGSDip MIAI

**Report Date:** February 2012

**Client:** David Easterbrook

**Proposal:** Proposed erection of a 4 bedroom  
bungalow

**Planning Reference:** C2/10/00678

**Statutory Protection:** Grade II Listed Chimney (LBS 70952)

**Project No:** AC11001E

**Civil Parish:** Roche

**District:** Central 2

**Postal Address:** Bilberry Dry, Bilberry, Bugle, Cornwall

**Postcode:** PL26 8QU

**National Grid Reference:** SX 02010 59920

**Fieldwork Dates:** January 2011

**Accession No:** Forthcoming

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## Abbreviations

AC	Archaeological Consultancy Ltd
BGS	British Geological Survey
CC	Cornwall Council
CRO	Cornwall Record Office
DBA	Desk Based Assessment
EH	English Heritage
HER	Cornwall and the Isles of Scilly Historic Environment Record
HES	Historic Environment Service, Cornwall County Council

LBS	Listed Building Search number
NGR	National Grid Reference
NMR	National Monuments Record, Swindon
OASIS	Online Access to the Index of Archaeological Investigations
OS	Ordnance Survey
SMR	Sites and Monuments Record

## 1 Summary

Archaeological Consultancy Ltd was commissioned by David Easterbrook to undertake historic building recording on works associated with the construction of a four bedroom bungalow. The historic building recording was required as a condition of planning permission for the proposed bungalow. The china clay dry chimney is designated as Grade II Listed (LBS 70952). Previous work has included a visit and description by Cornwall Archaeological Unit in 1990 as part of the China Clay Survey.

The site is located at SX 02010 59920 (NGR).

This fieldwork was undertaken on 25<sup>th</sup>-28<sup>th</sup> January 2011, it recorded:

- Three principle phases incorporating a drying floor, furnaces, chimney and settling tanks dating to the first half of the 20<sup>th</sup> Century.

## 2 Introduction

### 2.1 Project Background

Planning permission (application no. C2/10/00678) was granted for a proposed 4 bedroom Bungalow on site, subject to a number of planning conditions, including Condition 10, which states:

*“No development shall take place within the site until the applicant has secured and implemented a programme of archaeological work in accordance with a written scheme of investigation to be submitted by the applicant and approved in writing by the Local Planning Authority”*

and Condition 11:

*“No development shall take place within the site until the applicant has secured and implemented, the retention and any necessary repairs or alterations to the remaining walling of the clay dry in accordance with a written scheme to be submitted by the applicant and approved in writing by the Local Planning Authority.”*

The Historic Environment Planning Advice Officer (Cornwall Council) has provided a brief for descriptive historic building recording to guide the archaeological program (Ratcliffe 2010). Subsequent correspondence with the Historic Environment Planning Advice Officer has clarified that the written scheme required by Condition 11 should:

*“be approved prior to development but that the implementation could take place at or during commencement of works according to the approved written scheme.”*

AC was commissioned to undertake the historic building recording in line with an approved written scheme of investigation (Mossop 2010).

### 2.2 Site Location

The site is located immediately to the south of the hamlet of Bilberry, approximately one kilometre north-northeast of Bugle and eight kilometres north of St Austell at OS grid reference SX 02010 59920.

### 2.3 Topography

The south facing site gently slopes down to a china clay pit drain, which joins a tributary of the Par River, which itself issues at Par approximately 10 kilometres to the southeast.

### 2.4 Geology

The bedrock is recorded as St Austell Intrusion Granite (British Geological Survey), which formed about 300 million years ago, with three main minerals, feldspar, quartz and mica (Thurlow, 2005; 4). The client confirmed the presence of granite bedrock exposed in a number of trial pits, service trenches and soakaways excavated prior to archaeological monitoring and the majority of the surviving dry is built of presumably locally sourced granite. The decomposition

of the white feldspar within the granite, formed a very fine mineral called kaolinite the main constituent of China Clay (Thurlow, 2005; 4) on some of the granite uplands of Devon and Cornwall. These areas include parts of western Dartmoor, Bodmin Moor, the Hensbarrow Moors north of St Austell of which the study area is a part, Tregonning Hill and West Penwith (Smith, 1992; 2).

Above the granite, superficial deposits of alluvium (clay, silt, sand and gravel) are recorded, typically laid down in the Quaternary; that is from 1.8 million years ago until the present day (British Geological Survey).

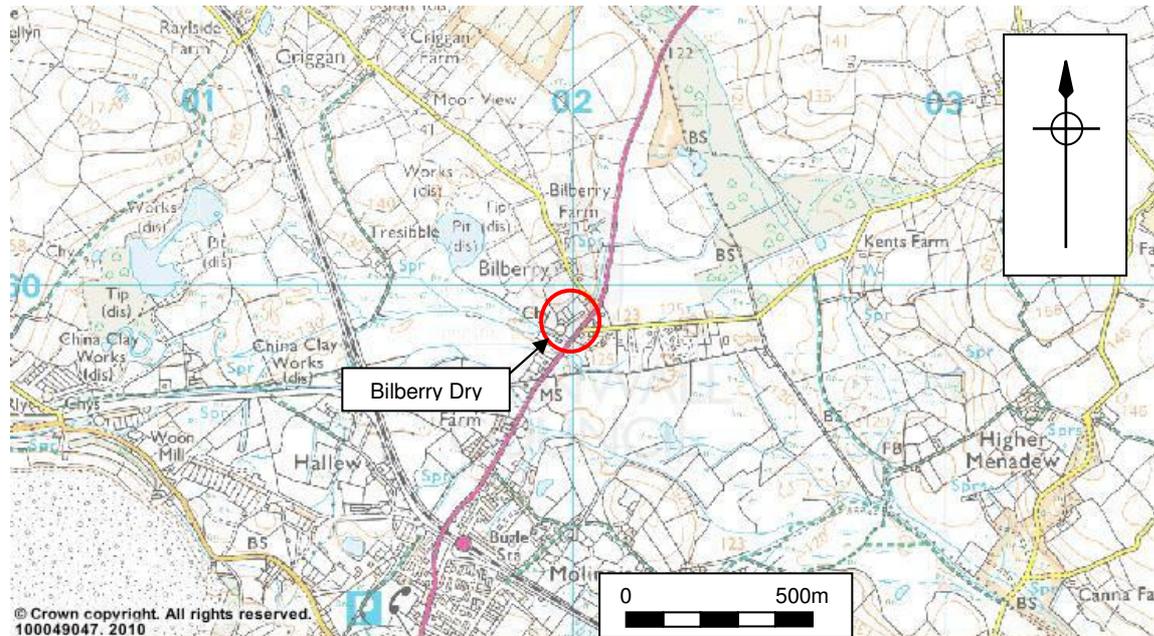


Figure 1 Site location, courtesy of Cornwall Council



Figure 2 Bilberry Dry location of recording area, courtesy of Cornwall Council

## 2.5 Archaeological and Historical Background

China clay extracted in Cornwall has become world renowned for its quality since its potential was first recognised by William Cookworthy in c.1745. A specific set of conditions is required for china clay to form, a process called kaolinisation. It is the partial decomposition of the granite mass where the feldspar element is converted to aluminium silicate, china clay. Where partial kaolinisation occurs china stone is formed and this is also extracted in Cornwall. Both forms are required to make hard paste porcelain comparable to that which the Chinese had been producing for centuries. The realisation of this in the 18<sup>th</sup> Century led to the growth of the industry in Cornwall (Herring and Smith, 1991; 45).

Hand digging and washing was the earliest method of extraction (Thurlow, 2005; 5). The process was extremely labour intensive and inefficient, taking four to eight months, depending on the season, to dry the clay sufficiently in air dries. Realistically, each producer could only deliver two consignments in a year (Herring and Smith, 1991; 46). China clay has always had a low intrinsic value and investment in more efficient technology, as was occurring in Cornish hard rock mining, was not possible. In addition, competition with mining for the work force, transportation difficulties and control of the industry by the Staffordshire potteries meant a low output was almost inevitable. The potteries did not move into Cornwall because of the cost of importing coal.

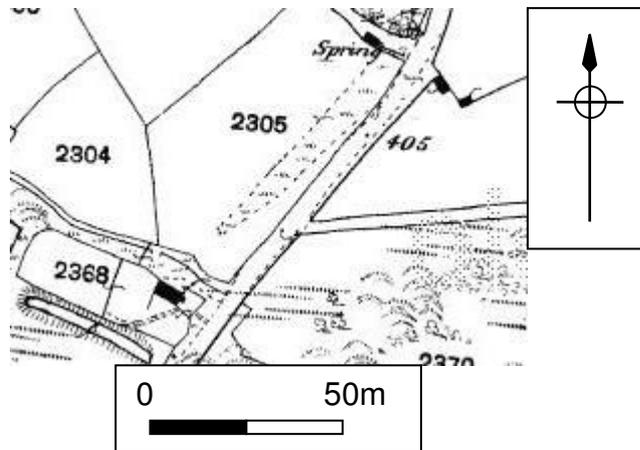
By the 19<sup>th</sup> Century the potteries were relinquishing their control to local entrepreneurs. This, and a gradual increase in demand, seems to have encouraged investment in infrastructure. Sir Charles Rashleigh had initiated work on a new harbour at Charlestown in 1791. This was followed by Sir Charles Hawkins building Pentewan harbour with a horse tramway to extraction districts in 1817-26 and J.T. Treffrey constructing Par harbour with a canal between 1829 and 1840. Horse tramways were built through the Luxulyan Valley into the clay district around Bugle in 1842 and from Hendra to Newquay in 1849. Though these tramways were dedicated to transporting clay, their capacity and speed was often little better than the wagons.

Perhaps the greatest development in the processing of the clay was the introduction of the coal fired pan kiln in the 1850s. The first kilns were pioneered at Greensplat and Parkandillack in 1845 and although small, were very successful; able to dry the clay in only three days. Prior to the introduction of the kilns, output for 1838 was approximately 13,440 tons but by 1858 had increased to 65,600 tons. The design looked similar to a Roman hypercaust with porous floor tiles forming the pan for the clay to sit upon; a furnace was placed at one end and a chimney at the other with the flues running under the pan drawing the moisture through the tiles (Cole, 2005; 17). The pan kiln developed and spread quickly throughout the 1860-70s, becoming 'familiar and integral' (Smith, 1992; 10) with few amendments to the design except for size and local conditions until the 1960s (Herring and Smith, 1991; 48).

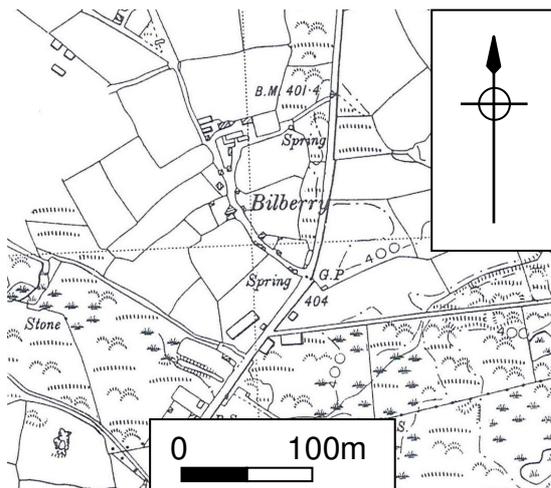
The massive increase in production put further pressure on the transport infrastructure forcing a series of railways to be built across the clay district from 1859 (Herring and Smith, 1991; 47). In 1872 work began on the rebuilding and conversion to steam power of the Treffry Tramway through the Luxulyan Valley

from Par to Fowey with branches to major clay works. This form of development ceased with the take-over of the routes by Great Western Railways and their final construction of the Bugle to Gunheath line in 1893 (Smith, 1992; 14).

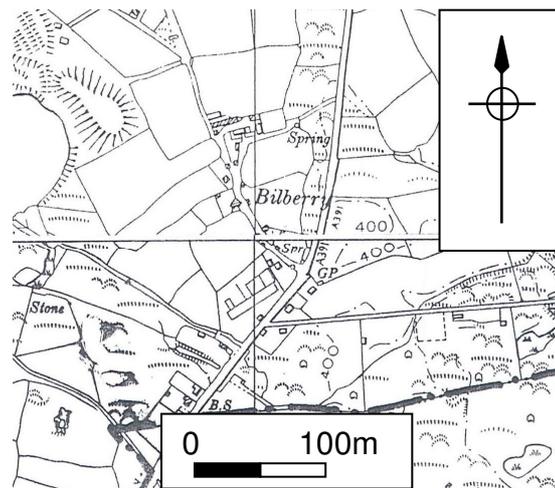
In the early 20<sup>th</sup> Century electricity, filter presses and high speed pumps were introduced. Filter presses removed much of the excess water before the kiln stage, reducing drying time, saving expenditure on coal. Manpower shortages and reduced markets during the two World Wars and the 1930s Depression led to reduced production and stimulated changes in the industry. A series of amalgamations of the many operating companies throughout the 1920-30s, eventually formed English China Clays International (Hudson, 1969; 51). After World War II power was provided by electricity, Par and Fowey dominated exports and the principle market became the paper industry. Most importantly coal pan kilns were replaced by oil fired rotary driers (Herring and Smith, 1991; 48; Smith, 1992; 20, 21).



*Figure 3 1881 Ordnance Survey Map*



*Figure 4 1938 Ordnance Survey Map*



*Figure 5 1963 Ordnance Survey Map*

The 1801 Ordnance Survey map shows the study area to the southeast of Biberry; within enclosed farmland at the edge of marsh surrounding tributaries of the River Par. The Roche parish Tithe map is fragmentary and was not available for viewing. The 1881 Ordnance Survey map (*Figure 3*) shows a linear anomaly on the site, perhaps related to earlier china clay streamworks, though there is nothing shown on the 1907 Ordnance Survey map. Bilberry China Clay works were apparently active from 1908-1932, with Jack Gilbert mine captain for much of this period and his son taking over latterly for a short spell (Ivor Bowditch *pers com.*).

The first confirmation for the construction of Bilberry Dry is on the 1938 OS map (*Figure 4*) where a rectangular building in the same position and alignment is depicted. No chimney or settling pits are recorded. Interestingly, to the north west of the dry location there are breaks in field boundaries forming a sub-circular void that is not present on earlier maps and becomes an extraction pit on later maps. The simplistic portrayal could be due to the scale of the map.

Kelly's Directories of 1910, 1930, 1935 and 1939 do not record a china clay dry in the Bilberry area. The 1939 Directory lists only the Goonvean and Rostowrack China Clay Company for the parish of Roche. There are many companies registered to the St. Austell area and it is probable that one of them operated Bilberry Dry but as they were not based there, the relevant company is not listed under Bilberry. It is not until 1938 (*Figure 4*) that a small rectangular building is depicted. The Ordnance Survey map of 1963 (*Figure 5*) indicates that the building has doubled in length to the northeast. This map also shows settling tanks in the area of B7 and B1 as well as one of the longer walls of B10 (see below). The more detailed 1971 Ordnance Survey map clearly shows the current layout including the chimney, though notably much of B1 is no longer depicted and scrub is illustrated within the building. The simplified layout in the 1985-92 Ordnance Survey map omits the chimney but it is still standing today and was listed in 1987 (LBS 70952). A photograph of the chimney taken in 1987 (Beveridge 1987) clearly shows the site heavily overgrown, perhaps explaining why the listing states that the rest of the dry no longer exists. Herring and Smith (1991; 142) have categorised dries into four classes:

There are no surviving examples of the earliest (phase 1 kilns), which included Truscott's Kiln at Parkandillack, St. Dennis.

Phase two pan-kiln complexes are those dated to between 1855-1880. Of granite construction, these tended to comprise short kilns, with the length of the structure constrained by the need to spread the wet clay along the pan by hand. They usually had a single tank to the rear, which was often subdivided into two, and a small linhay. It was also common for the stack to be remote from the kiln. During this phase, kilns were often improved with the addition of extra settling tanks or pits to the rear. The eastern pan-kiln at Wheal Rashleigh is one of the best-surviving examples of a phase two kiln.

In phase three, dating between 1880 and 1920, there was an increased sophistication to the design of the dries which was further reflected in their great size. With the development of the travelling bridge, the kilns grew in length. To the rear, there was also a greater network of tanks and pits.

These normally comprised a series of conjoined rectangular tanks immediately to the rear of the pan-kiln and settling pits on higher ground for an earlier stage of dewatering with a set of mica drags.

Pan-kilns from the final phase, dating between 1920 and 1940, are distinguished by their large size and concrete block/mass concrete construction. All previous phases were of granite build. The addition of a filter press meant that tanks could be sub-divided to form a grid-iron at the rear of the kiln. The furnace rooms and coal stores were also greater in size and often incorporated complex coal hoists (description from Cole, 2007; 15)

## **2.6 Project Aims and Objectives**

The principal aims were to:

- Provide a basic written, measured/drawn and photographic record of the structure at an appropriate scale and level of detail to permit a proper understanding of its present state.
- Identify and record any evidence for a travelling bridge, filter presses and coal hoists.
- Identify both the significance and conservation requirements of individual elements of the structure within the application area.
- Make recommendations for any priority works required to secure the longer term conservation of these elements.
- Make recommendations for the management and care of the structure for its present and future owners.
- Provide appropriate information to update the listing.

## **2.7 Methodology**

### **2.7.1 Desk based assessment, walk over and standing building survey**

An initial desk based assessment concentrated on Sites and Monuments Records (SMR), records held at the Cornwall Record Office, including the trade directories, archaeological reports and a map regression exercise. No photographic records were found at the Cornwall Studies Library, though an image of the chimney was included on the Images of England website (Beveridge 1987).

A walk over and comprehensive photographic survey recorded extant visible remains on the site, concentrating on aspects most likely to be affected by the conversion works, especially the surviving floor of the settling tanks, the wall and its associated openings dividing the settling tanks from the dry and the furnaces.

The scaled monochrome 35mm photographic survey documented the structure in advance of conversion works and included: general views of the building in its wider setting where possible, oblique views of all external elevations, floors and features of the dry, with perpendicular shots for complex elevations and

additional details. Scaled digital colour photography augmented this to provide general and detailed shots to be used within the report. All negatives and contact prints will be included in the archive accompanied by a photographic register detailing as a minimum, feature number, location and direction of shot.

Existing 1:200 plans were checked for accuracy and annotated with archaeological detail and the southwest settling tanks and chimney (outside the development area but within the same ownership) added. A staggered section through the dry was drawn at 1:200 to illustrate the relationship of settling tanks, dry, furnace and linhay with details at appropriate scales, specifically including the furnace openings at 1:20. Additional elevations, sections and plans were drawn as required, at 1:20 or 1:50 scale.

The fieldwork recorded where possible:

- Building type and function
- Date of construction and any subsequent alteration
- Architect / style of design
- Materials, method of construction
- Plan form
- Façade treatment and fenestration
- Interiors, particularly fixtures and fittings and internal arrangements
- Subsidiary features such eg. machinery, ephemera. decoration
- Historical significance
- Source materials
- The setting of the building in the landscape / townscape

### **2.7.2 Report**

This report describes the results of the archaeological work. Copies of the archive report will be submitted to: the client; the County Historic Environment Record; Cornwall Record Office; National Monuments Record in Swindon and all significant contributors where (with the exception of the client's and contributors' copies) they will be available for public consultation. The report will additionally be made available on the Online Access to the Index of Archaeological Investigations (OASIS).

### **2.7.3 Site Archive**

The site archive will be prepared in line with the brief and deposited with the Cornwall Record Office, within six months of the completion of the final report and confirmed in writing with the Historic Environment Planning Advice Officer. A summary of the contents of the archive shall be supplied to the Historic Environment Planning Advice Officer.

The online OASIS record will be completed when the report is submitted.

### 3 Results

The china clay dry is described by building (B1-10). The numbers were assigned in a clockwise manner starting at **B1** in the northeast corner where former settling tanks were located, round to **B10** in the central northwest area. Measurements are expressed in metres and described as length by width by depth unless otherwise stated.

**B1** (Plate 1) measured 43m northeast to southwest by at least 27m and was surrounded by varying extents of earth bonded and faced granite walling with Portland cement repairs. The remains of two further walls, previously divided it into at least three settling tanks, each provided with an opening to the southeast. To the northwest a modern revetment, with traces of original walling at the base, held back the natural ground that rose 3.5m to the northwest. The northeast wall was 21.90 metres long by 0.80m average width. It survived to its full height of 2.05 metres at its southeast end. The majority of the southeast wall survived to its full height of 2.05m with a considerable batter to the southeast side so that the base of the wall was 0.9m average width and the top was 0.45m in average width. This wall had four openings with granite quoins, each opening providing for a settling tank. Two of these measured 1.2m wide whilst the others had recently been widened. These openings had concrete floors and rebates for shuttering to control the flow to the drying floor. The southwest wall was at least 27 metres long by 0.8 metres wide, though this included a 10 metre extension to the northwest. Within these walls fragments of the original granite block flooring survived laid on sand levelling.

**B2** had undergone some modern adjustment, including a concrete floor and modern stepped access from the level of the drying floor 2m above. However the earth bonded, granite faced walls survived to a height of between 1.9m and 2.1m.

**B3** (Plate 4 and Plate 5) measured 73m in length by 5.6m linking the chimney to the southwest to the furnaces at the northeast end. A modern break midway along allowed access to a static caravan. Apart from a narrow concrete path along the northwest wall the whole area is substantially overgrown. A test trench through the leaf litter exposed the remains of the drying floor. This consisted of parallel granite supports averaging 0.1m wide and descending in excess of 0.4m into the organic debris. These were centred at intervals of 0.3-0.4m with fragments of the grey-white concrete floor tiles around them (Plate 16). The 0.3m square by 0.08m thick concrete tiles had probably been laid on shuttering around an iron grid of 0.3m squares. The broken fragments included a noticeable groove around the edge, to accommodate this, though no trace of the iron remained. A concrete drainage channel ran immediately alongside the granite wall of **B1**.

A 1.5m wide by at least 0.3m high opening connected the flue to the chimney beyond the gable wall. A large granite slab formed the lintel. The gable wall survives to a maximum height of 6.5m (Plate 11).

At the northeast end of **B3** two furnaces (Plate 2 and Plate 3) measured 0.9m wide by 1.2m high to the top of the shallow brick arches. The furnaces were

constructed in Carbis brick (*Plate 17*) and granite rubble though much of the inside had filled with organic and other debris including decayed brick from the former vaulted ceiling above.

Granite built **B4** (*Plate 6* and *Plate 7*) was immediately south and parallel to **B3**. The concrete floor of **B4** lay 1.6m below the level of the drying floor and separated from it by a 0.6m wide granite wall that was 2m in height. The southeast elevation included four openings averaging 5m wide. The southwest end of **B4** had been used to store brown-grey granite slabs with at least one weathered surface from the floor of **B1**. An iron pipe bracket and an unidentifiable paddle shaped iron object were recorded amongst the pile (*Plate 17*).

Access for the static caravan in **B1** divided **B4** and **B5**. A 1.1m high shuttered concrete wall butts up to the rounded terminus of the granite wall dividing **B3** and **B4** (*Plate 15*). The granite built southeast elevation of **B5** is of similar construction to the corresponding elevation of **B4** with 5m wide openings.

The chimney (**B6**) (*Plate 9*,

*Plate 10* and *Plate 11*) was constructed of lime mortared granite blocks up to a height of approximately 11.5m with an iron brace at the top of this section. Above this the chimney was built in brick to its full height of approximately 25m. The facings of the bricks had been significantly eroded, particularly on the north face and nearer the top of the chimney. At the base the chimney was 3.2m diameter, tapering evenly towards the top.

Settling tanks **B7**, **B8**, **B9** and **B10** are described together as they are similar in design and construction (*Plate 12* and *Plate 13*). All were obscured by considerable vegetation including trees with basal trunk diameters of up to 0.2m and heights in excess of 8m. The tanks increase from west to east and are divided by granite walls 0.6-0.65m wide and 1.4m high. **B7** was the smallest at 14.8m in length by 5.8m whilst **B8** and **B9** were both 15.6m in length and slightly wider. **B10** measured in excess of 29m in length although a protrusion in the wall at 15.6m suggests it may originally have been shorter. Dense vegetation precluded description of the flooring. To the north of **B7** two voids may represent an inlet pipe or channel which supplied the settling tanks.

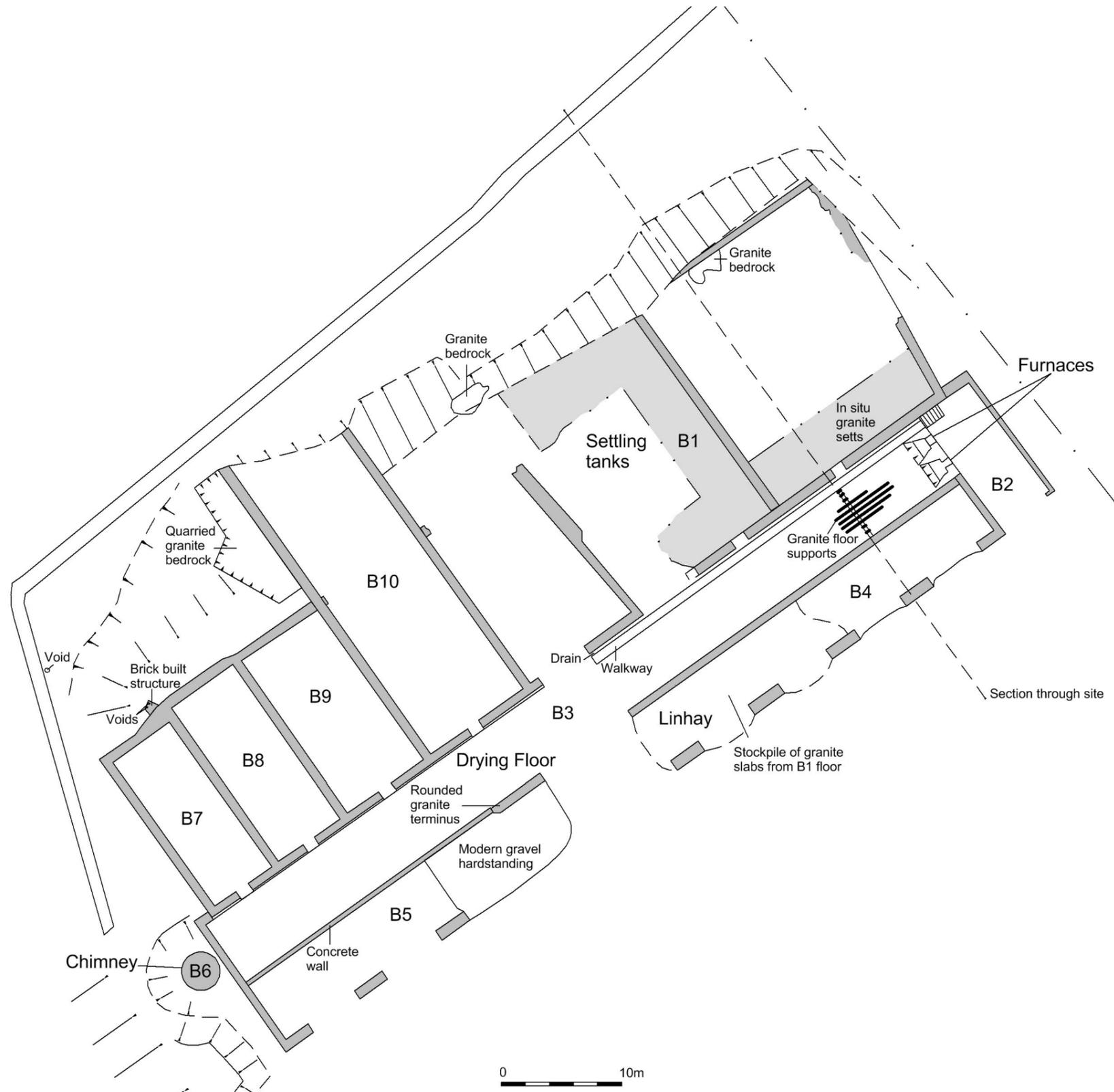


Figure 6 Site plan

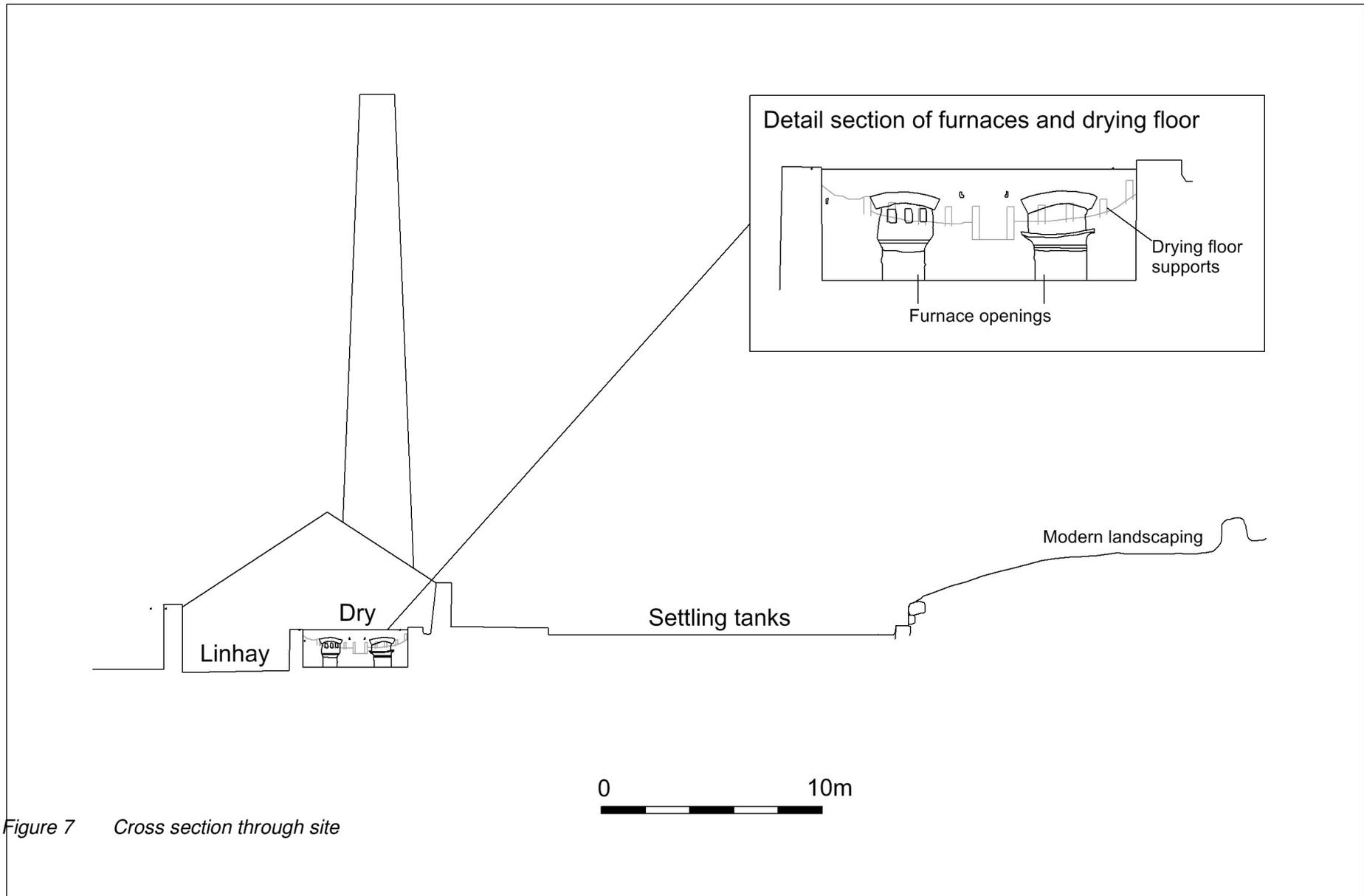
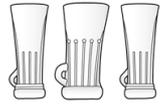


Figure 7 Cross section through site



*Plate 1 B1 settling tank and retaining wall, looking north*



*Plate 4 Section through B3 drying floor showing flues and granite supports for floor, looking southeast*



*Plate 2 Furnaces, looking south*



*Plate 5 Section through B3 drying floor also showing wall dividing dry and linhay, looking southeast*



*Plate 3 Eastern furnace showing flues, looking southwest*



*Plate 6 B4 linhay with openings for vehicles, looking west*



*Plate 9 Chimney B6 showing granite and brick construction*



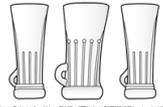
*Plate 7 Internal view of B4 linhay, looking northeast*



*Plate 10 Chimney B6 detail showing change in construction, drip ring and iron retaining band*



*Plate 8 Chimney flue opening at southwest end of the dry B5, looking south*



*Plate 11 Base of chimney B6 and southern external wall of B5 dry and linhay, looking north*



*Plate 13 Overgrown settling tanks B7, B8 and B9, looking northeast*



*Plate 12 Inserted concrete rebate for shutters in settling tank B8 opening and controlling flow of clay slurry to the dry, looking north*



*Plate 14 Varied wall construction of B1 wall, looking southwest*



*Plate 15 Concrete wall butting up to the earlier granite construction dividing the dry (B3) from the linhay (B5), looking southwest*



*Plate 16 Fragment of concrete from the drying floor found in area B3 close to excavated section – clearly showing the rebate presumably for iron grid reinforcement*



*Plate 17 Fragments of floor, Carbis bricks and iron objects found in areas B3 and B4*

## 4 Discussion

Dense vegetation, modern alterations and removal of materials following the closure of the dry have made parts of the interpretation challenging.

All china clay kilns required settling tanks for initial water reduction and concentration of the clay; a drying floor of porous tiles over hot flues, with associated furnaces and chimney; and a storage and collection area called a linhay. To reduce labour these were placed next to each other and stepped downhill if possible so that gravity did the hard work.

The highest area at Bilberry occupied by areas **B1** and **B7-10** consists of rectangular spaces and can be interpreted as settling tanks (*Plate 1* and *Plate 13*). Subdivision within **B1** could have related to insertion of filter presses but no evidence for this was found. Tank **B10** is similar in size to **B1** but in construction style to **B7-9**. The 90° protrusion 15.6m along the length of the wall indicates that extension has occurred. **B10** would originally have been the same length, and age, as the other tanks (**B7-B9**). All the tanks have openings controlling the clay slurry issue to the dry (**B3**) below. Below the dry, the linhay **B4** had large openings suitable for vehicular access probably allowing carts to be loaded directly from the dry and taken to the station one kilometre away at Bugle (*Plate 6*). The ideal was to transfer the clay directly into the carts from the drying floor but contemporary sources suggest that transportation was so inefficient clay had to be stored in the linhay. This indicates why it was important for the linhay to have a roof.

Given the broken nature and relative depth of floor tiles recorded in the dry, it seems likely that any re-usable materials were sold off following the closure of the dry.

The iron pipe bracket from area **B4** could be indicative of a water supply for washing facilities for employees but no other evidence was discovered (*Plate 17*). **B5** is likely to have been a continuation of the linhay.

The linear anomaly and spring shown on the 1881 OS map may relate to earlier china clay streamworks. After this, the dry shows a number of phases of development.

The earliest phase (Phase 1 *Figure 8*) is not shown on the 1907 OS map and may have been started in 1908 when Jack Gilbert was reportedly captain (Ivor Bowditch *pers com*). This included a small dry and one, possibly two settling tanks.

The rounded terminus of the granite wall of **B3** (*Plate 15*) suggests that the original dry did not continue further to the southwest. This may correspond to the wider settling tanks **B10** and at the southwest end of **B1**.

This set up must have been served by a chimney and linhay. Whilst it is possible that an earlier integral chimney existed immediately beside the wall terminus, the extant chimney is notably independent of the adjacent dry and seems likely to predate it.

The lower part of chimney **B6** seems to relate to Phase 1, though its overall height seems excessive for such a small original dry. An integral chimney would

be more typical for the period (Cole, 2007; 15). The short kiln, subdivided tank and remote stack are all typical of Herring and Smith's (1991; 142) Phase 2 pan kilns dated to 1835-1880. The first phase at Bilberry is demonstrably later.

Phase 2 includes additional settling tanks **B7-9** and presumably a new chimney (**B6**) probably incorporating re-used material from the previous structure. This set-up – a relatively modest one at the time – appears to be that depicted on the 1938 OS map, presumably operated by Jack Gilbert and his son up until 1932.

Phase 3 includes the large settling tanks (**B1** and **B10** extension) built sometime between 1938 and 1963 (OS maps) as a massive extension to the dry. The general absence of concrete within this phase is indicative of an early date, certainly soon after 1938, as mass concrete was the typical building material for dries from the 1920s onwards (Herring and Smith, 1991; 142). Continued use of granite was probably due to the readily available supply from the quarried settling tank extensions. The two furnaces are part of the surviving building which included an extended dry and linhay and probably a heightened chimney.

The Carbis bricks found in **B3** and **B4** are suggestive of an early 20<sup>th</sup> Century build and it seems likely that the upper brick courses of the chimney are also Carbis bricks relating to a heightening of the chimney at the same time. The Carbis China Clay and Brick Company was incorporated in 1920 (National Archives BT 31/32419/166806), being bought out by English China Clay in 1933 (London Gazette 28/6/1933). Notably the Carbis China Clay and Brick Company is also recorded as dissolving in 1948 (National Archives BT 31/32419/166806). It is tempting to associate the use of Carbis brick with the takeover of the Carbis China Clay and Brick Company by English China Clay in 1929. The buying of the site by such a large company would explain the scale of the extension as well as the use of potentially old building stock.

The roofed furnace room **B2** appears to have been an afterthought since its masonry butts up to the large settling tank **B1**.

The shuttered concrete wall and concrete settling tank opening details are a later refinement.

On balance it seems likely that the Phase 3 extension was undertaken shortly after 1938. The scale of this suggests a travelling bridge would have been used at this stage and more direct evidence of these may come to light in the future. Mica drags above the settling tanks (to the northwest) may lie outside the study area.

By 1963 the industry was in decline and greater technological advances were changing the design of kilns. These later OS maps, dated 1963 (*Figure 5*), 1971-76 and 1985-92 demonstrate a catalogue of inconsistencies in style of delineation. For example, 1963 lacks a chimney but is otherwise more detailed than the 1938 and 1985-92 maps of the same scale.

The height of activity at Bilberry undoubtedly occurred in the early to mid 20<sup>th</sup> Century when large conglomerate operators were forming, eventually becoming English China Clays International who gained the monopoly. They are the most likely operators of Bilberry at the end of its life.



Figure 8 Phase plan of site

## 5 Conclusion

This study has highlighted the significant survival of historic fabric relating to three principle phases of Bilberry Dry in the first half of the 20<sup>th</sup> Century. This is in stark contrast to the listing which includes the chimney surviving in isolation.

The developments at Bilberry appear to be considerably behind the wider regional pattern alluded to in Smith (1992; 10; and in Cole, 2007; 15). This highlights important local development variation which may relate to individual companies or individuals charged with site management in the rapidly evolving corporate landscape of the early 20<sup>th</sup> Century.

## 6 The Archive

The AC project number is **AC11001E**

The project's documentary, photographic and drawn archive is housed at the offices of Archaeological Consultancy Ltd, Goodagrane, Halvasso, Penryn, Cornwall, TR10 9BX. The contents of this archive are quantified below:

### Written and Photographic Records

Record	A5*	A4*	A3*	A2*	A1*	≥ A0*	Total Number	Comment	Location
Drawing sheets				3			3		roll
Site notes		2					2		folder
Levels sheet		1					1		folder
Primary record sheets		3					3		folder
Project management		2					2		folder
B&W Negatives		3					3		folder
B&W Contact Prints		3					3		folder

\* = Number of sheets

## 7 Recommendations

### 7.1 Site Management

The archaeological recording of the chimney noted that there was significant damage to the brickwork on the north side of the stack. The facings of the brick had decayed, there was little pointing remaining and an iron retaining band had broken. This could lead to ingress of water causing further structural deficiencies thus destabilising the structure. It is recommended that regular monitoring and a structural survey of the chimney is undertaken to assess how far this has occurred and to advise on future management to ensure the structural integrity of the chimney.

The furnaces are a particularly important part of the kiln complex and although well preserved, are in a fragile state. It is recommended that a railing is erected across the entrances to the furnaces to prevent access and resulting damage. This would also provide protection from any debris that may come loose from the brick arches above the openings where the bricks are already significantly eroded. The restriction of access to the area above the furnaces should also be considered.

Much of the site is overgrown with vegetation, specifically trees or large plants growing from the top of the walls. It would be desirable for these to be thinned and treated with systemic round up. It is acknowledged that the trees do provide privacy for the site and the root systems may in fact be holding the fabric together in many places. Complete removal is therefore not recommended but sensitive management to enable preservation of the structure as it currently is would be desirable, particularly above the furnaces on the drying floor and on the settling tank walls.

### 7.2 Listed Building Update

The Listed Building Register should be updated to include the surviving dry structure within the curtilage of the property.

### 7.3 Further Work

Whilst outside the scope of this study, further research of material held by the China Clay History Society – specifically including John Tonkin's manuscript of China Clay Works as well as the 1946 RAF overhead aerial photographs (held at Cornwall Council) may add considerably to our understanding of developments at Bilberry.



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## 9 Appendices

### 9.1 Appendix 1 Brief

#### **BRIEF FOR DESCRIPTIVE HISTORIC BUILDING RECORDING**

**Date:** 20/12/2010

**Address:** Bilberry Dry, Bilberry, Bugle, PL26 8QU, Cornwall

**Applicant:** Messrs Allen, Easterbrook & Easterbrook

**Agent:** Mr C E C Gillard Architectural Services

Historic Environment Advisor (Archaeology): Dan Ratcliffe, Historic Environment Advisor (Archaeology), Cornwall Council Historic Environment Service, 39 Penwinnick Road, St Austell, Cornwall, PL25 5DR. 01726223463 dratcliffe@cornwall.gov.uk

**Local Planning Authority Officer:** Gemma Dunn

This brief is only valid for six months. After this period the Historic Environment Planning Advice Officer (HEAA) should be contacted. Any written scheme of investigation (WSI) resulting from this brief shall only be considered for the same period. The contractor is strongly advised to visit the site before completing their WSI as there may be implications for accurately costing the project.

#### Contractors Written Scheme of Investigation (WSI)

No works on site shall take place until the HEAA and the Local Planning Authority (LPA) have approved the archaeological contractor's WSI.

**Contractors are advised to visit the site in advance of tendering for this work in order to inform the preparation of accurate costings.**

### 1 Introduction

This brief has been written by the HEA and sets out the minimum requirements for the production of a 'Level 2 descriptive record' as defined by English Heritage in *Understanding Historic Building: A guide to good recording practice* (2006) and the production of a report making recommendations for the future management of the monument including any urgent consolidation. A Level 2 record provides an archive quality record of a building in its current state, an assessment of its significance and an indication of its potential for further research. It need provide only a basic analysis of the building concerned but should be capable of forming the basis of later more detailed analysis where required.

In this instance a Level 2 record is required in order to discharge condition 10 of planning consent C2/10/00678.

### 2 Site Location

Bilberry Clay Dry is located at SX 0201 5992 on the A391 north of Bugle to the immediate south of the hamlet of Bilberry. The dry is in single ownership although the current permission relates only to its northern half.

### 3 Planning Background

Planning Application C2/10/00678 related to 'Proposed erection of 4 bedroom Bungalow' on this site. Construction has been consented to take place to the rear of the main kiln range, in the area of former, now removed settling tanks. Access to the building plot already exists through a gap through former linhays and kiln ranges. HES commented that whilst a grant of permission risked further fragmentation of the monument's character and coherence, such damage to significance could be offset by securing recording of the monument in advance of further work and securing conservation work where feasible to the surviving fabric of the monument. Policy HE12 of PPS5 *Planning for the Historic Environment* states that where the Local Planning Authority decides that a loss of significance is justified by the merits of a scheme requiring consent, then planning obligations should be imposed to *record and advance understanding of the heritage asset*. The LPA has therefore imposed the following condition-

*"No development shall take place within the site until the applicant has secured and implemented a programme of archaeological work in accordance with a written scheme of investigation to be submitted by the applicant and approved in writing by the Local Planning Authority"*

This work should inform the production of a report, which should make (in consultation and through prior agreement with the Historic Environment Advisor) management and consolidation proposals for the monument. Basic consolidation works have been secured through the use of a further condition reading,

*No development shall take place within the site until the applicant has secured and implemented, the retention and any necessary repairs or alterations to the remaining walling of the clay dry in accordance with a written scheme to be submitted by the applicant and approved in writing by the Local Planning Authority.*

### 4 Site Background

Bilberry Clay Dry is a pan kiln formerly used for the drying of china clay slurry transported from nearby pits prior to its export away from the site. The remains are recorded on the County Historic Environment Record as follows.

MCO42016; BILBERRY - Modern china clay dries;

*A pan kiln at Bilberry, not recorded on the 2nd Edition OS 1:2500 of 1907, and visited by CAU in 1990 as part of the china-clay survey. The site is now very overgrown with scrub, laurel and willows. The kiln is constructed of granite rubble masonry, and the pan is approx 5.0m wide. The linhay is supported at the front by granite pillars, and the furnace room has two fireplaces, with the fire-doors removed. The granite settling tanks to the rear of the kiln are all in situ, though overgrown. The chimney stack is unusually tall, with a granite base and local brick cap.*

A site visit by the Historic Environment Advisor on 16<sup>th</sup> December, 2010 observed that the application area had been much cleared of trees since a 2005 aerial photograph, that the interior walling of the settling tanks to the rear of the kilns had been removed and that an access road had been created through the centre of the monument, with the applicant informing us that some walling had been removed between kiln and tanks in order to provide access for an on site caravan. Areas of the monument not included within the application area appeared largely unmanaged and in similar condition to the HER record above.

## **5 Requirement for Work**

Pan Kilns were described by the 1991 CAU survey of the clay district as "a familiar and integral part of the landscape... a truly vernacular feature of the clay district". "Where well preserved, examples of all types are of national importance; otherwise of county or local importance". Consequently surviving examples have been identified by HES as a heritage assets for their archaeological, historic and architectural significance in addition to their contribution to the unique historic character of the county. The proposed changes may constitute a significant and irreversible change to the building's significance, particularly given the permitted development rights that will be granted to the occupiers of the proposed property once this development is complete. A record of the area of the kiln within this permission (contextualised by a more basic record of the structure within the same ownership) is required in order to inform future management of the structure within the new domestic curtilage; to advance our understanding of the building type and of this example in particular; and to add to the evidence base for future planning decisions.

### Aim of the work.

To provide a basic, written, measured/drawn and photographic record of the structure concerned at an appropriate scale and level of detail to permit a full proper understanding of its present state. This record should constitute a 'Level 2 record' of the structure within the application boundary and a more cursory record of the structure in the same ownership but outside the application boundary.

This recording needs to be directed by a specialist who will 'read' the structure and record the important details. This person will be expected to produce a basic survey or to adapt one produced by a capable building surveyor. As much of the building will be retained following these works, recording should be concentrated on what will be removed or changed. Nevertheless it is vital to convey the context for the parts in question to inform future understanding.

The report should briefly demonstrate an understanding of the building in its typological context. It is not intended be an exhaustive analysis of the building but to be optimised towards the recording of those features to be lost within the wider context of the building. The archive record should be produce evidence capable of later further analytical development.

The report will identify both the significance and conservation requirements of individual elements of the structure within the application area making recommendations for any priority works required to secure their longer term conservation. The report should also make recommendations for the management and care of the structure for its present and future owners.

## 6 General Methodology

- 6.1 All stages of the investigation shall be supported by a written scheme of investigation (WSI).
- 6.2 The archaeological or historic building contractor is expected to follow appropriate codes of practice – i.e. those of the Institute for Archaeologists (IfA) / Institute of Historic Building Conservation (IHBC).
- 6.3 Details including the name, qualifications and experience of the site director and all other personnel (including specialist staff) shall be included within the WSI.
- 6.4 All of the latest Health and Safety guidelines shall be followed on site.
- 6.5 The IfA's Standards and Guidance should be used for additional guidance in the production of the WSI, the content of the report and the general execution of the project.
- 6.6 Terminology will be consistent with the English Heritage Thesaurus.
- 6.7 Documentary research will be undertaken before the commencement of fieldwork and will establish the nature and extent of existing records and understanding of the assets involved. Research will include consultation of historic Ordnance Survey and Tithe mapping, the Cornwall and Scilly Historic Environment Record, the Cornwall Record Office, relevant Local Studies Libraries and other relevant collections.

## 7 Site Recording Methodology

***Note: Where the brief is for mitigation recording of a conversion where most significant fabric will remain accessible for future study recording should be targeted on material to be lost with only sufficient recording of other parts of the building to provide sufficient context for the detailed record.***

- 7.1 The drawn record need not be comprehensive and act principally to support the photographic and written descriptive record but as a minimum should include
  - measured plans of the structure at 1:100 as appropriate
  - a site plan at 1:500
  - A cross section through the structure at the point of the furnaces at 1:100
  - Measured elevations are not required.
  - a plan annotated to show the location, shot number and direction of all photographs.

*In some cases it may be appropriate to use a diagrammatic sketch not necessarily to scale to demonstrate features not apparent on measured drawings or photography*

Plans may be based on existing architectural survey data where this exists but these must be checked on site to ensure acceptable accuracy and detail and should be recast where necessary to standard EH conventions as illustrated in *Understanding Historic Buildings* as appropriate to Level 1 and 2 surveys. All plans must be tied to the OS grid, show a north point and be accompanied by suitable labelling and naming of parts.

## 7.2 The photographic record shall include

- A general view or views of the building in its wider setting or landscape
- The building's external appearance- a series of oblique views of all external elevations. Where individual elevations show complex stratigraphy views perpendicular to the elevational frame may be appropriate.
- The overall appearance of principal spaces.
- Any relevant details such as machinery, fittings, graffiti, ephemera and decorative or structural detail not apparent from wider shots

The photographs will be taken with black and white 35mm or medium format film producing archive quality prints and negatives. Colour photography may be utilised for general shots and where it is appropriate for detail shots. For both general and specific photographs, a photographic scale shall be included.

7.4 The written record shall include items 1-3 as set out in *Understanding Historic Buildings* section 4.5.2 and include a summary description. The following may act as a useful *aide memoire* to the details required.

- Building type and function
- Date of construction and any subsequent alteration
- Architect / style of design
- Materials, method of construction
- Plan form
- Façade treatment and fenestration
- Interiors, particularly fixtures and fittings and internal arrangements
- Subsidiary features such eg. machinery, ephemera. decoration
- Historical significance
- Source materials
- The setting of the building in the landscape / townscape

The account should briefly demonstrate an understanding of the building in its typological context. Conclusions should be drawn regarding the building's development and use but there need not be detailed discussion of the evidence on which these conclusions are based. It is not intended be an exhaustive analysis of the building but to be

optimised towards the recording of those features to be lost within the wider context of the building.

## 8 Results

- 8.1 The full report shall be submitted within a length of time (but not exceeding six months) to be agreed between the applicant and the historic building contractor, Cornwall County Council Historic Environment Service and the Cornwall Records Office. A further digital copy shall be supplied on CD-ROM preferably in 'Adobe Acrobat' PDF format.
- 8.2 The archaeological contractor will undertake the English Heritage/ads online access to the index of archaeological investigations (OASIS).
- 8.3 This report will be held by the Cornwall and Scilly Historic Environment Record (HER) and made available for public consultation.
- 8.4 The report must contain:
  - A table of contents.
  - The building's precise location in National Grid and address form.
  - A brief history of the site.
  - A concise non-technical summary of the project results including a management statement indicating priorities for conservation works and future management guidance.
  - The aims and methods adopted in the course of the investigation.
  - The date of the record, name of recorder(s) and the location and contents of the deposited archive.
  - A location map, copies of any plans/drawings and copies of such photographs as necessary to illustrate the written description with appropriate annotation.
  - A written description of the building and its structure, materials and layout.
  - A full bibliography where external sources have been used.
  - A copy of the brief and approved written scheme of investigation (WSI) will be included as an appendix.
  - A digital copy of all photographs (in .TIFF format) making up the archive record to be bound into the rear cover of the HER / HEAA copy of the report on CDR or DVDR.

## 9 Archive Deposition

- 9.1 An ordered and integrated site archive will be prepared in accordance with: *Management of Research Projects in the Historic Environment (MoRPHE) English Heritage 2006* upon completion of the project. The requirements for archive storage shall be agreed with the appropriate organisation.
- 9.2 The archive including a copy of the written report, all drawn materials and all archive quality photographic prints and negatives shall be deposited with the appropriate organisation within two months of the completion of the full report and confirmed in writing with the HEAA.

- 9.3 Documentary archives will normally be deposited with the Cornwall Record Office. Photographic archives are normally deposited with the Cornwall Museum.
- 9.4 A copy of the report will be supplied to the National Monuments Record (NMR) in Swindon.
- 9.5 A summary of the contents of the archive shall be supplied to the HEAA.
- 9.6 Only on completion of 9.1 to 9.4 (inclusive) will there be a recommendation for the discharge of any archaeological recording condition.
- 10 Monitoring**
- 10.1 The HEAA will monitor the work and should be kept regularly informed of progress.
- 10.2 Notification of the start of work shall be given preferably in writing to the HEAA at least one week in advance of its commencement.
- 10.3 Any variations to the WSI shall be agreed with the HEAA, preferably in writing, prior to them being carried out.

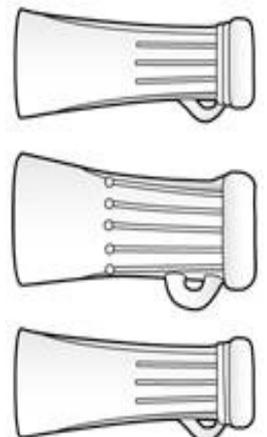
9.2 Appendix 2 Written Scheme of Investigation

## Bilberry Dry, Roche, Cornwall.

### Historic Building Recording: Written Scheme of Investigation.

**Author:** Matt Mossop MA MGSDip MIAI  
**Report Date:** 17/1/2011  
**Client:** David Easterbrook  
**Project No:** AC11001E  
**Planning Reference:** C2/10/00678  
**Statutory Protection:** None  
**Proposal:** Proposed erection of  
4 bedroom bungalow.  
**Parish:** Roche  
**District:** Central 2  
**County:** Cornwall  
**Country:** England  
**National Grid Reference:** SX 02010 59920

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England and Wales Registered Company No. 5784610



## 1 Summary

Archaeological Consultancy Limited (AC) have been commissioned by David Easterbrook, to provide a Written Scheme of Investigation for historic building recording, in accordance with a brief provided by Daniel Ratcliffe, Historic Environment Advisor (Archaeology), in advance of the erection of a proposed bungalow within the former settling tanks at Bilberry Dry (SX 02010 59920), 1 kilometre north-northeast of Bugle.

Bilberry pit kiln chimney was listed in 1987 (LBS 70952) and, substituting 'pan' for 'pit' the description of the chimney and its grid reference appear to match the surviving chimney on site, though the listing states that the rest of the dry no longer existed. The dry has remained heavily overgrown since at least 1990 when it was visited by Cornwall Archaeological Unit (now the Historic Environment Service) until the present day and it may be that the overgrowth prevented to dries' recognition in 1987. Beneath the undergrowth the chimney, settling tanks, pan-kiln, furnaces and linhays are surprisingly well preserved.

## 2 Site location

### 2.1 Location

The site is located immediately to the south of the hamlet of Bilberry, approximately one kilometre north-northeast of Bugle **and eight** kilometres north of St Austell at OS grid reference **SX 02010 59920** (Figure 1).

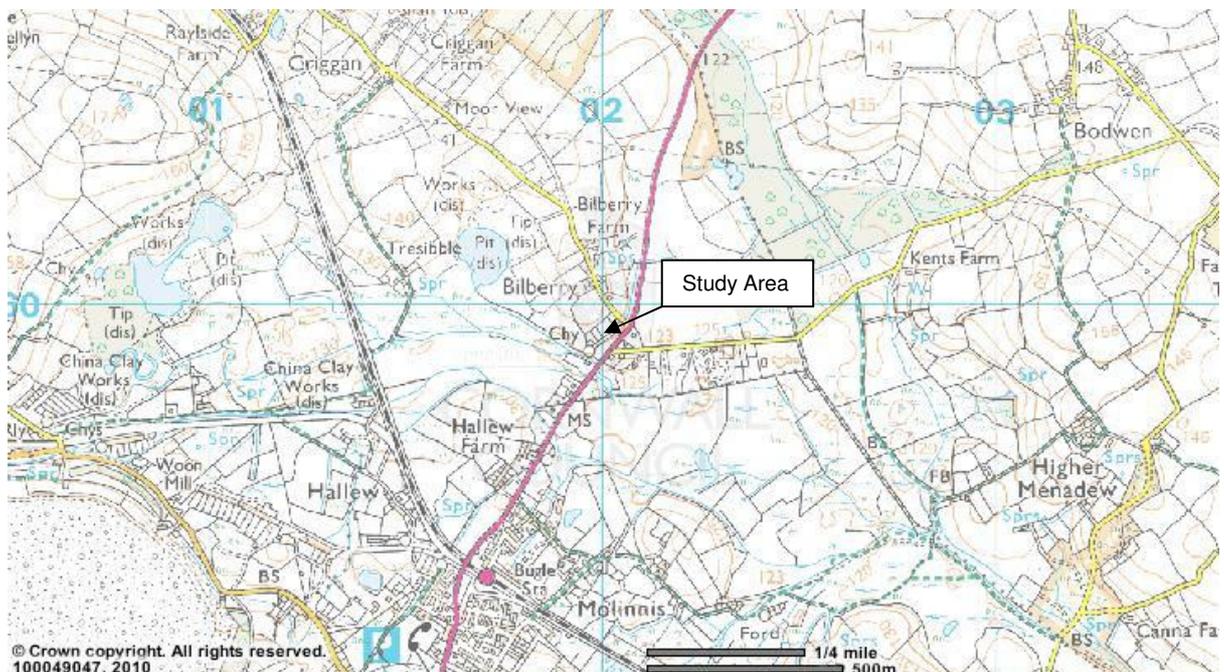


Figure 1: Site Location. Courtesy of Cornwall Council.

### 2.2 Topography

The south facing site gently slopes down to a china clay pit drain, which joins a tributary of the Par River, which itself issues at Par approximately 10 kilometres to the southeast.

### 2.3 Geology

The bedrock is recorded as St Austell Intrusion Granite (British Geological Survey), which formed about 300 million years ago, with three main minerals, feldspar, quartz and mica (Thurlow, 2005, p4). The client confirmed the presence of granite bedrock exposed in a number of trial pits, service trenches and soakaways excavated prior to archaeological monitoring and the majority of the surviving dry is built of presumably locally sourced granite. The decomposition of the white feldspar within the granite, formed a very fine mineral called kaolinite the main constituent of China Clay (Thurlow, 2005, p4) on some of the granite uplands of Devon and Cornwall. These areas include parts of western Dartmoor, Bodmin Moor, the Hensbarrow Moors north of St Austell of which the study area is a part, Tregonning Hill and West Penwith (Smith, 1992, p2).

Above the granite, superficial deposits of alluvium (clay, silt, sand and gravel) are recorded, typically laid down in the Quaternary - that is from 1.8 million years ago until the present day (British Geological Survey).

### **3 Project background**

#### **3.1 Development background**

Planning permission (application no. C2/10/00678) was granted for a proposed 4 bedroom Bungalow on site, subject to a number of planning conditions, including Condition 10, which states:

*“No development shall take place within the site until the applicant has secured and implemented a programme of archaeological work in accordance with a written scheme of investigation to be submitted by the applicant and approved in writing by the Local Planning Authority”*

and Condition 11:

*“No development shall take place within the site until the applicant has secured and implemented, the retention and any necessary repairs or alterations to the remaining walling of the clay dry in accordance with a written scheme to be submitted by the applicant and approved in writing by the Local Planning Authority.”*

The Historic Environment Planning Advice Officer (Cornwall Council) has provided a brief for descriptive historic building recording to guide the archaeological program. Subsequent correspondence with the Historic Environment Planning Advice Officer has clarified that the written scheme required by Condition 11 should:

*“be approved prior to development but that the implementation could take place at or during commencement of works according to the approved written scheme.”*

The china clay dry chimney (outside the present development area) is Grade II Listed (LBS 70952), though the dry was thought not to be extant at the time of listing (1987) and as consequence is not presently listed. It is likely that the final report recommends the inclusion of the dry as part of the listing.

#### **3.2 Archaeological and Historical background**

The Brief (Ratcliffe 2010) relates:

'Bilberry Clay Dry is a pan kiln formerly used for the drying of china clay slurry transported from nearby pits prior to its export away from the site. The remains are recorded on the County Historic Environment Record as follows.

"MCO42016; BILBERRY - Modern china clay dries;

*A pan kiln at Bilberry, not recorded on the 2nd Edition OS 1:2500 of 1907, and visited by CAU in 1990 as part of the china-clay survey. The site is now very overgrown with scrub, laurel and willows. The kiln is constructed of granite rubble masonry, and the pan is approx 5.0m wide. The linhay is supported at the front by granite pillars, and the furnace room has two fireplaces, with the fire-doors removed. The granite settling tanks to the rear of the kiln are all in situ, though overgrown. The chimney stack is unusually tall, with a granite base and local brick cap."*

A site visit by the Historic Environment Advisor on 16<sup>th</sup> December, 2010 observed that the application area had been much cleared of trees since a 2005 aerial photograph, that the interior walling of the settling tanks to the rear of the kilns had been removed and that an access road had been created through the centre of the monument, with the applicant informing us that some walling had been removed between kiln and tanks in order to provide access for an on site caravan. Areas of the monument not included within the application area appeared largely unmanaged and in similar condition to the HER record above.'

Initial analysis suggests that according to John Smith's chronology, Bilberry is best described as a late Phase 3 pan-kiln. Phase 3 pan-kilns date (Smith) between 1880 and 1920 and typically are considerably larger than their predecessors, including a number of settling tanks at the rear and a travelling bridge. It is not yet clear whether a travelling bridge was used at Bilberry.

#### **4 Project aims and objectives**

The project aims to:

- provide a basic, written, measured/drawn and photographic record of the structure at an appropriate scale and level of detail to permit a proper understanding of its present state.
- identify and record any evidence for a travelling bridge, filter presses and coal hoists
- identify both the significance and conservation requirements of individual elements of the structure within the application area.
- make recommendations for any priority works required to secure the longer term conservation of these elements.
- make recommendations for the management and care of the structure for its present and future owners.
- provide appropriate information to update the listing

#### **5 Method statement**

## 5.1 General methodology

AC complies with the guidelines set out in the IfA's Standards and Guidance and follows the IfA and Institute of Historic Building Conservation codes of conduct. The terminology will be consistent with the English Heritage Thesaurus.

## 5.2 Desk-based assessment (DBA), walk over and standing building survey

An initial DBA will concentrate on Sites and Monuments Records (SMR), photographic records at the Cornwall Studies Library, records at the Cornwall Record Office, including the trade directories, Wheal Martyn China Clay Museum, Herring and Smith and more recent publications and a map regression exercise.

Further research will be undertaken as necessitated by the findings.

A walk over and comprehensive photographic survey will record any extant visible remains on the site, concentrating especially on aspects most likely to be affected by the conversion works, especially the surviving floor of the settling tanks, the wall and its associated openings between the settling tanks and the dry and the furnaces.

The scaled monochrome 35mm photographic survey will document the structure in advance of conversion works, this will include: general views of the building in its wider setting where possible, oblique views of all external elevations, floors and features of the dry, with perpendicular shots for complex elevations and additional details of machinery, fittings, graffiti, ephemera, decorative or structural detail. Scaled digital colour photography may augment this to provide general and detailed shots and may be used within the report. All negatives, contact prints and where appropriate, CDs will be included in the archive accompanied by a photographic register detailing as a minimum, feature number, location and direction of shot. A plan will be annotated to show the location, direction and shot number for each photograph.

Existing 1:200 plans will be checked for accuracy and annotated with archaeological detail and the southwest settling tanks and chimney (outside the development area but within the same ownership) added. A staggered section through the dry will be drawn at 1:200, to illustrate the relationship of settling tanks, dry, furnace and lincay with details at appropriate scales, specifically including the furnace openings at 1:20. Additional detailed elevations and sketch elevations will be drawn if required, typically at 1:20 or 1:50 scale.

The fieldwork will record where possible:

- Building type and function
- Date of construction and any subsequent alteration
- Architect / style of design
- Materials, method of construction
- Plan form
- Façade treatment and fenestration
- Interiors, particularly fixtures and fittings and internal arrangements
- Subsidiary features such eg. machinery, ephemera. decoration

- Historical significance
- Source materials
- The setting of the building in the landscape / townscape

If very significant archaeological deposits are revealed, or objects with very significant conservation costs, a meeting will be convened with AC staff, the client, the HEPAO and relevant RCM staff member if appropriate, to discuss the most appropriate way forwards.

### 5.3 Report

A single archive report will be prepared to describe the results of the archaeological work. A digital version will also be supplied on CD-ROM. The final report will contain: a table of contents, the building's National Grid Reference, address, a brief history of the site, a summary including management recommendations, aims and methods, discussion, conclusions, location and other relevant plans tied in to the OS grid and all the remaining elements specified by section 8.4 in the brief.

Copies of the archive report will be submitted to: the client; the County Historic Environment Record (HER); Cornwall Record Office; National Monuments Record (NMR) in Swindon and all significant contributors where (with the exception of the client's and contributors' copies) they will be available for public consultation.

### 5.4 Archive

The site archive will be prepared in line with the brief.

The archive is likely to be of a documentary nature and will be deposited in a suitable form with the Cornwall Record Office, within two months of the completion of the final report and confirmed in writing with the HEAA. A summary of the contents of the archive shall be supplied to the HEPAO.

### 5.5 Web-based publications

The online OASIS record will be completed when the report is submitted.

### 5.6 Monitoring

The Historic Environment Planning Advice Officer (HEPAO) will be kept regularly informed of progress, including specifically written notice of the start of work, the completion of fieldwork, report production and archive transferral. Any necessary variations to this WSI will be agreed with the HEPAO, preferably in writing in advance of their implementation.

## 6 Project management and structure

### 6.1 Staff

The project will be undertaken principally by Matt Mossop (AC) who will undertake and direct the desk-based assessment, fieldwork, archiving and compile the report, assisted by Hayley Goacher.

*Matt Mossop MA MGSDip MIAI Project Manager*

Matt has extensive archaeological experience in England, France and Ireland from 1992 onwards, becoming a licensed director in Ireland (2001). He has directed numerous excavations and presented papers for the World

Archaeological Congress, Royal Society of Antiquaries of Ireland, universities and local groups in Ireland and the UK.

*Hayley Goacher BA (Hons) PlfA Project Officer*

Hayley completed her BA in archaeology at The University of Durham in 2009 and has archaeological experience from 2004 onwards, of both excavation and post-excavation, principally with contractual archaeological firms. She joined AC in July 2010 and has since undertaken a number of site assessments, walkover surveys photographic surveys, watching briefs, evaluations and historic building surveys most recently including Nancegollan Farm, Gamekeeper's Cottage and 54-55 Castle St.

Whilst we endeavour to avoid changes to senior project staff, AC reserve the right to change the nominated personnel if necessary.

## 6.2 Project facilities and infrastructure

The project will be based at the AC office in Halvasso, Penryn. AC has a computer network running Windows XP Professional and Vista. Report texts are generated in Word 2007.

## 6.3 Timetable

The work is anticipated to commence as soon as we have written approval from the Local Planning Authority. The fieldwork stage of the project is expected to take three days.

An archive report will be completed within 6 months of the end of the fieldwork. If the site proves complex or specialist reports are required, an interim statement will be produced in the same time-frame. The deposition of the archive will be completed within 2 months of the completion of the final report.

## 6.4 Health and safety

AC complies with all relevant health and safety guidelines and legislation. A risk assessment will be prepared for the site work and all staff will be briefed on the contents of the final version. PPE will be issued and used as required.

## 6.5 Insurance

AC has adequate insurance for employer's liability, public liability and professional indemnity. Further details are available on request.