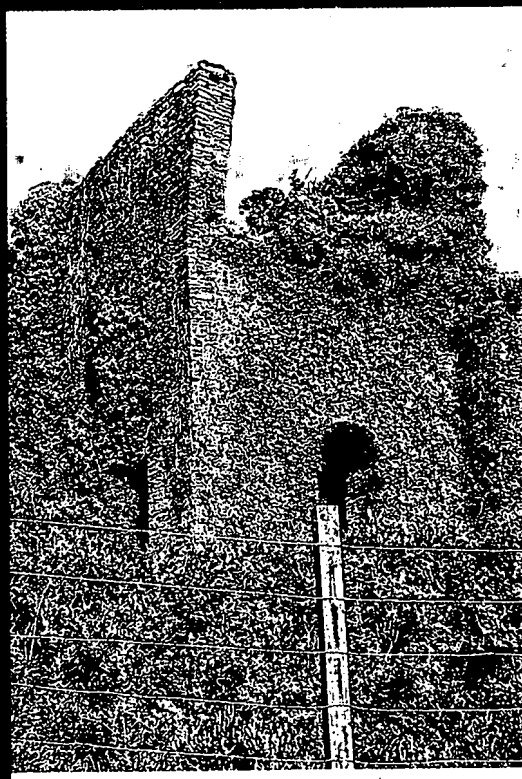

CAU 1998

Cornwall Archaeological Unit

Preliminary assessment of industrial sites of archaeological importance

Dec 1998

Preliminary assessment of industrial sites of archaeological importance in the Tamar Valley

Colin Buck Dip Arch

December 1998

Cornwall County Council

Acknowledgements

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Caradon District Council, Cornwall County Council, Cornwall Wildlife Trust, Countryside Commission, English Partnerships, Environment Agency, European Union (EAGGF), North Cornwall District Council, Tamar Valley Countryside Service, The National Trust, West Devon Borough Council.

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The front cover photographs in descending order show sites.

Deerpark Mine (Luckett). Site No 15. Boiler house chimney stack.

Prince of Wales Mine (Harrowbarrow). Site No 30.

Spoil heap at Devon Great Consols.

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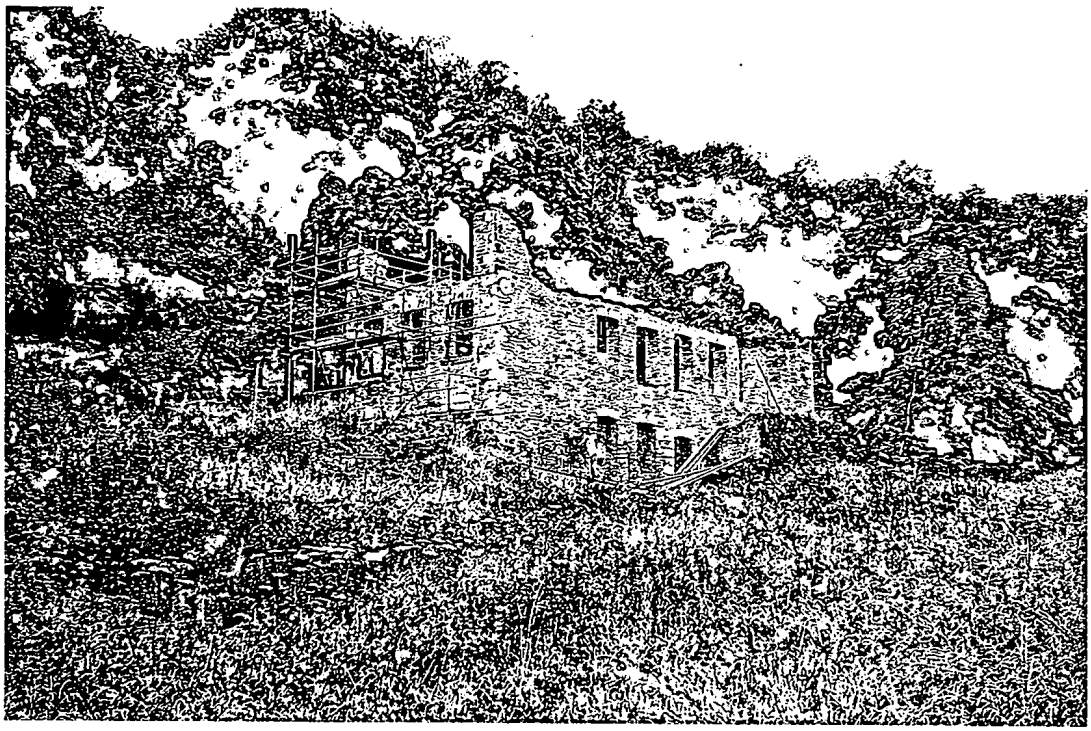
CONTENTS

Introduction

In October 1997 Cornwall Archaeological Unit (CAU) was asked by the Environment section (Land Reclamation) of the County Council's Planning Directorate to undertake preliminary archaeological assessments of mine sites within the Tamar Valley project area. The identified sites have been analysed under various criteria to become possible candidates for inclusion in a programme of health and safety works under a Land Reclamation Fund (LRF) scheme operated by Cornwall County Council with English Partnerships.

The Tamar Valley Strategy aims to co-ordinate the various reclamation schemes within the unifying umbrella of the Cornwall Land Reclamation Strategy. This assessment survey fits into the wider Tamar Valley Strategy, and aims to provide a preliminary insight into the nature, extent and condition of mine sites within the project area. Consolidation and safety works to these sites, to allow safe public access and the provision of site information, will play an important part in the reclamation schemes.



Consolidation works to Danescombe Valley paper mill (during a recent Land Reclamation Scheme jointly funded by the National Trust, Environmental Trust and English Partnerships). Site No 37.

2 Historical Background of the Tamar Valley

Setting the scene

The Tamar Valley is considered to be one of the most attractive areas of the south-west. The lower and broader part of the valley from Cotehele southwards (and from the junction of the River Tavy with the Tamar eastwards), has wide expanses of reed bed and mud flats, which attract a variety of wading birds. Upriver from Calstock the meandering valley narrows and is particularly scenic with its steep and rocky outcrops with wooded valley sides.

Away from the River Tamar the countryside is more rolling with the majority of the land now in cultivation. Kit Hill (333m above sea level) forms a distinct Cornish landscape feature to the west whilst Dartmoor provides a similiar function further inland on the Devon side. The upland ridge of Hingston Down, which adjoins Kit Hill on its eastern side, stretches eastwards to the Tamar Valley. It is on or near these upland sites that not only prehistoric occupation has been found, but also the first signs of industrial archaeology can be interpreted in the landscape.

Prehistory

There is evidence of prehistoric activity on the Cornwall side of the Tamar Valley with Neolithic sites represented by a henge at Castlewich, a long barrow on Kit Hill, a suggested stone axe source and flint scatters south of Callington. In Devon, Neolithic axes have been found at Tavistock, Bere Ferrers, and Buckland Monachorum. Bronze Age sites in Cornwall include a large complex of barrows on Hingston Down/Kit Hill and further examples on Viverdon Down. Away from the higher ground, a beaker cist grave was discovered at Harrowbarrow during 1988. Across the Tamar at Heathfield (Beacon), between the parishes of Lamerton and Milton Abbot a Bronze Age barrow cemetery has been located. Cadson Bury Iron Age hillfort lies near Callington whilst in Devon, earthwork defensive enclosures of probable Iron Age date are found overlooking the Tamar at Furzeleigh (or Dunterton, opposite Carthamartha Woods on the Cornwall side of the Tamar) and a similiar feature in nearby Dunterue Wood. Other Iron Age enclosures includes Ramsdon Camp in Milton Abbot parish, Northcott Wood in Northcott parish, and an earthwork enclosure at Berra Tor in Buckland Monachorum parish. Iron Age/Romano-British Rounds (enclosed farmsteads) in Cornwall are recorded at Bury (St Dominick), Carthamartha Woods and Castlepark Hill in Lezant parish.

The Tamar Valley itself is likely to have been well occupied in this era, both due to its preferred more fertile lowland sites, and utilisation of the river as not only a means for transport, but also for trade. Later Medieval and post-medieval settlements have hidden or removed much archaeological evidence for prehistoric occupation.

Medieval

Domesday Book and medieval place-name evidence indicate a typical medieval farming landscape with settlements largely confined to lower ground with the uplands left as open pastures. Medieval farming settlements are evidenced by documentary sources and associated strip-based field systems (for example at Maders and Metherell/Harrowbarrow in Cornwall), and appear to have been small co-operative hamlets (of 3-6 farmsteads). Examples on the Devon side of the Tamar are in similiar locations to those in Cornwall, with a medieval strip field complex south of Dunterton. The farming landscape both sides of the Tamar, now largely consists of single farms, several of which are the sole survivors of former medieval hamlets.

As well as farming settlements, there are churchtowns within the ancient parishes (e.g. Stoke Climsland, Pillaton, St Dominick, and Botus Fleming in Cornwall; Milton Abbot, Chillaton, Lamerton, Buckland Monachorum and Bere Ferrers in Devon). In Calstock and Landulph parishes the principal settlements are the villages of Calstock and Cargreen, both medieval river ports on the Tamar. Similarly, Bere Ferrers was founded as a river port and expanded as a settlement. In Cornwall, Stoke Climsland and Calstock were Duchy manors since the 13th century, with the remains of an extensive Duchy deer park at Kerrybullock, near Luckett, and manorial deer parks at Greystone and Trecarrell.

Industrial activity in the Tamar Valley is by no means confined to the post-medieval period. Although tin appears to have been worked in Cornwall since the Bronze Age, during the 12th century the alluvial gravels of Dartmoor and possibly the Tamar Valley fulfilled the country's needs. Documentary evidence from the late 13th century and early 14th century, attest to lead/silver mining in the Bere Alston and Lopwell districts, with later 16th century references to silver mining and refining in Calstock parish. Documentary evidence for 15th century tinworks around Luckett, with traces of streamworking on the lower slopes of Kit Hill, west and east of Luckett, and near the Silver Valley (Cornwall) provides further proof of medieval mining. On both sides of the Tamar Valley alluvial and shallow ore extraction proceeded sporadically until the mid/late 18th century, when renewed interest in copper ore production (fuelled no doubt by the rapidly expanding market of the Industrial Revolution), led to the boom years of copper/tin production from the mid 19th century.

Post-medieval

The west-east ore lodes containing silver, lead, tin, and copper attracted thousands of miners from West Cornwall by the mid 19th century, as lodes ran out and ore prices fluctuated. Parts of the Tamar Valley (Gunnislake, Calstock, Tavistock and Bere Alston) had become heavily industrialised by the 1880's, mainly due to mining and quarrying, together with their support industries and transport infrastructure. Settlement patterns were drastically altered to accommodate migrant labour (often from west Cornwall). This has mainly affected the parishes of Calstock, Callington and the southern part of Stoke Climsland (settlements of Calstock, Luckett, Metherell, and Latchley). In Devon the Borough town of Tavistock and Bere Alston were similiarly affected by massive population expansion.

A few settlements have arisen purely as a result of industry; for example Gunnislake (formerly 'Williamstown', named after the Williams family, mining magnates from west Cornwall) and St Ann's Chapel/Drakewalls, which is largely mid 19th century ribbon development along the medieval Hingston Down ridgeway road to New Bridge, Gunnislake. North of Callington, Kelly Bray was a simple farm; but discoveries of tin at surface led to tinworks being established west of the later Redmoor Mine (Martyn, 1748). Larger mines were established here by the mid 19th century (Holmbush and Kelly Bray) together with the building of the rail link to Calstock (East Cornwall Mineral Railway), which led to further prosperity.

On the Devon side of the Tamar Valley small scale settlements such at Weir Quay, Morwellham, and Devon Great Consols were built afresh to provide housing for the local miners and support infrastructure. Additional land was made available for housing at Tavistock and Bere Alston.

The River Tamar provided an easy and cheap routeway to supply the needs of this ever increasing population. Shipbuilding, lime-burning, the manufacture of fire-brick and furnace linings, quarrying, coal and timber import merchants etc thrived. Tavistock, Calstock, Gunnislake, Morwellham and Bere Alston expanded throughout the early to mid 19th century as population and industrial centres, whilst mines at Devon Great Consols, Bedford and Russell United, Gunnislake Clitters, Okeltor and numerous smaller concerns provided rich returns for their 'adventurers'. The years 1844 to 1870 saw the Tamar Valley become the richest copper-producing centre in England, with some of the highest grade ore ever to be treated in the country, transported down the Tamar to the South Wales smelting works.

At the end of the copper boom years, arsenic was seen as an alternative to copper (by 1871 sales of refined arsenic contributed to 20% of Devon Great Consols receipts), as the best copper lodes had been worked out and its market price had slipped to uneconomic extraction levels. The arsenic deposits in the Tamar Valley mines (previously discarded but found within and adjacent to copper lodes) were among the richest and most extensive in the country. The greatest producer of arsenic in the country, Devon Great Consols and Gawton for a number of years refined half the world's arsenic. Other large processing centres in Cornwall included Greenhill, Coombe, Luckett and numerous other smaller mines. Arsenic was used in the world's chemical industries for the manufacture of glass, enamel and insecticides (other uses included constituents in paints, dyes and pigments), and was produced locally until 1925 when low market prices finally destroyed these last remnants of the Cornish/Devon mining industry.

Small quays near villages along the River Tamar and estuaries testify to continual trade from medieval times until the mid 18th century. These small localised sites increased in number as market demand for agricultural lime (to neutralise acidic soils and re-claimed land) grew. New lime kilns and quays were built in later years to serve an increasing demand for finer building lime (mortar and lime-wash) to meet the demand for new houses. These were built until the late 19th century, creating in the Tamar Valley the highest concentration of these structures in Cornwall and Devon. These and other newly built quays for mine related use, imported wood, coal, iron etc and exported their products for smelting (e.g quays at Halton, Weir Quay, Calstock, Gunnislake, Cotehele, Morwellham, Gawton, New Quay etc).

The lower Tamar Valley, with its favourable climate and well drained south facing tributary slopes, had been developed as a centre of market gardening from at least the middle of the 18th century and possibly much earlier. By the late 19th century Botus Fleming and Calstock parishes in Cornwall and Bere Ferrers in Devon, with other neighbouring parishes became famous for their cherry orchards as well as producing a variety of other fruits, vegetables and flowers as major exports. Produce from the various farms, orchards and valleys were sent by river transport into Plymouth and beyond, the trade finally ceasing in the 1950's. By this date the Union Smelting Works at Weir Quay was used as a jam factory. This fruit/flower industry however, appears to have been the Tamar Valley's commercial swansong.

As a postscript to any historical assessment of the industrial archaeology of the Tamar Valley, reference should be made concerning the degradation and removal of many of the Tamar Valley's mine sites during the past century. This has taken two forms: Firstly the gradual decay of wooden structural components causing walls to collapse and the consequence of weathering, causing chimneys and other buildings to fall down. Secondly the ongoing removal of mine buildings and features, destroying for example in Cornwall, engine houses, chimneys, brickworks and arsenic works etc, but in Devon all of the upstanding structures of Devon Great Consols within six months of the demise of the mine. Not least has been the damage caused by removing redundant steam engines from their houses.

There is, however, much still left of Cornwall and Devon's mining heritage Consideration is now being given to including the Tamar Valley's major mine sites as a component of Cornwall's application for World Heritage Site Status. English Heritage are in the final stages of assessing mine sites in the area for designation as Scheduled Monuments. It is further hoped that the Tamar Valley Land Reclamation Strategy will provide a framework for derelict mine buildings to be consolidated, ensuring their survival for years to come, and to provide increased public access and awareness of the recent industrial history and landscape of the Tamar Valley.

3 Site Survey

The survey method used for this preliminary outline assessment included the desk-based analysis of Ordnance Survey 1880-1884 1:2500 maps of the study areas. Both Cornwall and Devon's archaeological Sites and Monuments Records were referred to as well as relevant historical and industrial archaeological texts (Booker 1971 and Hamilton Jenkin 1965 and 1974, see Section 10.0 Bibliography list). Other useful sources included the survey findings of the Tamar Valley Rapid Information Survey carried out in 1984 by the author and Nigel Thomas of CAU for RCHME. For sites on the Devon side of the Tamar Valley, two survey reports by the Exeter Museums Archaeological Field Unit (now Exeter Archaeology) were studied; namely the survey of Gawton Mine and Arsenic Works (1989), and the Devon Great Consols Arsenic Works (1989, and in PDAS 47, 1989).

Locations of mines were noted from the 1st edition Ordnance Survey (c1880/4) 1:2,500 scale maps and confirmed by modern Ordnance Survey Pathfinder maps (1:25,000 scale). Not all of the mine sites that were identified were visited for a site assessment. After consideration of a variety of factors (including the quality of industrial archaeological remains, proximity to public footpaths and fulfilling English Partnership's grant funding criteria), a site assessment list was compiled (see Section 4 for Cornwall and Section 6 for Devon). Field visits within Cornwall were made during November 1997, and those for Devon in March 1998.

It is important to note that there are a number of sites not assessed where there are prominent remains (e.g. Hingston Down and Okeltor Mines). These have not been assessed, principally due to lack of potential for public access (at the time of preparing this report). It is likely therefore that in future, further works (perhaps using different funds) will be proposed in order to carry out the conservation of these important sites.

Each of the mines have been described in the gazetteer (Section 5 for Cornwall and Section 7 for Devon) generally in terms of their statutory planning designation, historical background, principal extant features, and site/feature condition. Preliminary reclamation suggestions have been itemised and relevant remarks about the site or area noted. Site numbering for both the Cornwall and Devon mines have broadly followed a north to south orientation (irrespective of the site's county of origin).

These outline assessments carried out for each site are not to be seen as adequate archaeological surveys. Most sites will require a full survey including the identification of each feature, with specific relevant management proposals and recommendations for the site as a whole. Adequate recording both before, during and after the works have been carried out, is both necessary and in some cases statutory given the historical and environmental importance of these mines on both sides of the Tamar Valley.

Gazetteer notes and comments

In order to facilitate inclusion of site assessments into each of the appropriate County Sites and Monuments Record (SMR) systems, the relevant SMR site record number, OS map reference, Listed Building Number, and Scheduled Ancient Monument reference are recorded for each mine site. The Site Number (with relevant county indicated) corresponds to the list sheets and the location map reproduced in the appendix at the end of the gazetteer. Each mine site entry also notes the date of the site visit and the field workers initials. No bibliographic references have been given in the individual mine site descriptions due to space restrictions. However a full bibliography is given at Section 10.0.

A letter (A, B or C) is given after the site number for each item of the site list (refer to Section 4.0 for Cornwall and Section 7.0 for Devon). These grades promote significance as assessed against different criteria, for example: the quality and quantity of extant remains, proximity to public footpaths and trails (for example the Tamar Valley Discovery Trail local village circuits), and the site's possible eligibility for English Partnership grant funding. The sites which were assessed in many cases therefore, were either 'A' or 'B' grades. In some cases following the field survey, a site may have been 'up' or 'down' graded.

South Tamar Mine: the remnants of an engine house chimney, an exposed and weathered structure which has not been consolidated. Site No. 75

4 List of mine sites (Cornwall) in the Tamar Valley PROJECT area

Prince of Wales pumping engine house. Site No 30

List of mine sites (Cornwall)

(**Bold text** denotes assessed sites reproduced in the gazetter)

39 B	Mine south of Wheal Edward	
40 B	Wheal Zion	
41 B	Wheal Arthur	
42 C	Wheal Edward Mine	
43 A	**Drakewalls (East)**	31
44 B	Slimeford	
45 A	**Netstakes**	32
46 A	**Bealswood Brickworks**	33
66 C	Harewood Consols Mine	
68 A	Okeltor Mine	
79 C	Lime Kilns-various sites along Tamar (a selection marked on the location map).	
82 A	**East Kit Hill Mine**	34

NOTE:

This list is only a preliminary assessment of the possible sites that could be considered for inclusion in the Cornwall section of the Tamar Valley Project. There are various other Industrial Sites, Lime kilns/shafts/ openworks along the side of the Tamar Valley which have not been listed nor shown on the map. No quays/ canals have been properly viewed nor commented upon. The list therefore is a first stage rapid trawl of the principal sites.

Letters shown after the site number are the gradings applied to each site. Grade **A** *sites have been viewed and site sheets have been recorded (apart from Okeltor). Refer to Section 5 for the individual site assessment sheets, and the appendix for the location map of all the Tamar Valley Sites.*

5 Gazetteer of mine site descriptions (Cornwall)

Site No.9(a)	**Description**
Site Name:	**Redmoor Mine (north)** **Site Visit: CB 14/11/97**
O.S Grid Reference (SX)	3570 7140 (SX37SE) PRN 42286 CDC D0025
Brief site History:	The Holmbush, Kelly Bray and Redmoor Mines all worked lead, copper and tin lodes from at least the 1830's (although Holmbush may date from the early C17th). Between 1843-54 Redmoor and Kelly Bray Mines were worked in conjunction by the Callington Mining Company. An outbreak of Cholera in 1849 and reduced production resulted in the mine being put up for sale in 1854 which included a 50" engine (in 1852), 60" pumping engine, 22" steam whim, 24 heads of stamps, a crusher and five water wheels. After partial re-workings the mines of Holmbush, Kelly bray, and Redmoor were re-named Callington United in 1888, operating until 1892. Further re-working of the Redmoor (south) site, as an arsenic processing works continued until 1908.
Main extant features:	* Open incline shaft (at least seven shafts are shown on the 1883 OS map). * Surface evidence of shafts that have partly subsided (near the road access to Cornwall Farmers Depot), now temporarily fenced. * Surface evidence of mine buildings and a mine spoil heap. * Surface evidence of other mine openworks.
Condition:	The open incline shaft (probably a twin skip road and/or adit shaft) is deep and dangerous. Other shafts in the area have, within the past ten years, partially opened up and been temporarily fenced. There is little scope for building consolidation works.
Reclamation ideas:	* Treat/fence open shaft. * Treat/fence other 'sunken' shafts. * Carry out a Geo-technical survey of the area to locate other shafts and openworks.
Remarks:	There is concern for public safety in this northern part of Redmoor Mine.
Notes:	

Site No.9(b) **Description**

Site Name: **Redmoor Mine (south)** **Site Visit: CB 14/11/97**

O.S Grid Reference (SX) 3560 7100 (SX37SE) PRN 42286 CDC D0025

Brief site History: See description given for Redmoor (north) Site 9 (a) . The 1883 OS map shows the (disused) buildings of this mine were mainly concentrated in this southern half. This certainly included two engine houses. Nearby to the west is a large arsenic processing works with calciner, flue and chimney. To the south is a dressing floor site, with visible settling tanks. Presumably the mine buildings fell into dis-repair until in 1981, when South West Consolidated demolished the Engine (built c1872?) and Boiler houses. Other arsenic refining buildings appear to have been left unscathed.

Main extant features:

* The demolished remnants of winding and pumping engine houses.
* Open shafts across the site (some fenced).
* Reservoir pond and spoil heaps over large area..
* Arsenic flues and labyrinth.
* Dressing floor with intact buddles and lots of a light green substance!
* Ancillary mine building (miners dry?).

Condition: The engine houses are piles of rubble (the bases may survive). The arsenic flues (above and below ground) and related buildings survive, but are covered with much vegetation. There is fly tipping on the site. The reservoir pond is in a relatively good condition, but covered by gorse/brambles etc on the interior and sides. Some of the shafts are open and dangerous.

Reclamation ideas:

* Remove the rubble debris from around the engine houses to reveal the engine house foundations and consolidate where necessary.
* Remove dense ivy etc from arsenic flues and dressing floor buildings.
* Consolidate dressing floor (buddles, tanks etc), flues, calciner etc.
* Locate, treat and fence mine shafts.
* Remove fly-tip debris from site .

Remarks: The site is currently used as a recreational walk by locals. Most of the eastern half of the site is devoid of buildings, mainly mine spoil waste and shafts. The site is plainly seen along the Kelly Bray to Callington road.

Notes: There is a strong case for reclamation work here.

Site No. 10	**Description**
Site Name:	**Holmbush Mine (Stoke Road)** **Site Visit: CB 14/11/97**
O.S Grid Reference (SX)	3600 7210 (SX37SE) PRN 42290 (N.Cornwall D.C)
Statutory Designation	Two Listed engine houses and two chimneys (II) No.8/192-195.
Brief site History:	Refer to the Redmoor Mine (north) sheet for the 19th century history of the mine. By 1837-8 the copper mine was operated by two pumping engines of 39" and 50" cylinder, together with an 18" winding and crushing engine. The main shaft at that time was Flop Jack's Shaft (at the Winsor Lane valley bottom site (worked via flat-rods). A 70" powered the Hitchen's Shaft engine house from 1868, but this was increased to an 80" by 1881/2. This main engine house complex west of the Stoke Climsland road contained also a rotative winding engine and midway between the two engine houses, a copper crushing house, powered by a nearby water wheel. The winding house appears to have been built in the late 1880's and is relatively well preserved. The main production period was 1845-1886. Copper, lead and silver was produced up to the late 1880's.
Main extant features:	* Pumping engine house, large boiler house (3 boilers) and chimney. * Winding engine house, boiler house and chimney. * Copper crushing house with loadings etc. * Water wheel pit with crank and drum-pit. * Reservoir ponds. * Hitchen's Shaft (choked?)
Condition:	Ivy and other vegetation covers the engine houses, boiler houses, chimneys and other masonry features. Most of the wooden lintels in the engine houses have rotted, taking with them sections of the masonry above. The mortar in the chimneys, especially around the top brick courses has partially weathered away. The reservoir ponds have vegetation growing on the sides and base.
Reclamation ideas:	* Structural remediation works to the engine houses are necessary. * Remove dense ivy etc from engine, boiler houses and chimneys. * Consolidate engine and boiler houses, chimneys, water wheel pit and crusher complex. * Remove dense vegetation, some small tree clearance from reservoir ponds, site and some fly-tipped debris.
Remarks:	Popular route for local people with mine complex sited in attractive woodland. High visual amenity site with impressive engine houses. Public car parking area already created nearby. (See Buck, 1998 CAU archaeological assessment report on this mine.)
Notes:	An excellent example of a public mine site needing safety and consolidation works. It is important that Hitchens Shaft is located and fenced or made safe.

Site No. II **Description**

Site Name: **Holmbush Mine (Winsor Lane)** **Site Visit: CB 14/11/97**

O.S Grid Reference (SX) 3616 7210 (SX37SE) PRN 42290 (N.Cornwall D.C)

Statutory Designation Listed engine house and chimney (II) No.8/199.

Brief site History: Refer to the account given for Holmbush Mine (Stoke Road) Site 10. This valley bottom site was the centre of mine operations for a long time before the large steam engines were constructed by Stoke Road. As described above, these engines from the early C19th onwards worked Footway, Wall and Flop Jack's Shafts via flat-rods. The rotative engine house appears to have possibly pumped or most likely hauled from two shafts and quite likely powered the dressing and crushing floor (although no signs of this were visible during the OS 1883 survey).

Main extant features:

* Rotative winding/stamping engine house (and extant roof).
* Boiler house (nearly full height walls).
* Chimney (nearly full height).
* Wall Shaft under water, Flop Jack Shaft visible but choked.
* Dump quarrying and mine spoil dumps to the north.

Condition: The engine house, boiler house and chimney are severely overgrown with ivy etc. The roof slates have gone in places, as have some of the roof timbers. As with most of the mine buildings, the lime mortar has eroded or weathered away (especially at the exposed south-west walls of buildings and chimneys), and lintels have rotted leaving structural problems at the heads of doors, windows etc. The northern part of the mine in this valley now has a deep pool with a surrounding marshy area. This site has suffered from fly-tipping.

Reclamation ideas:

* Conduct a structural survey of the engine house.
* Remove dense ivy etc from engine house and chimney.
* Re-point parts of the engine house.
* Repair the roof timbers and re-slate the roof or remove altogether.
* Treat/fence nearby mine shafts.
* Put in a drainage scheme to alleviate the flooding problem (check with English Nature in case this is now an important habitat).

Remarks: High visual amenity site. This may well be the best preserved engine house in the area. Given the relatively good state of preservation of the roof, it seems appropriate to re-roof and timber the structure. There is a strong case for remedial works here. (See Buck, 1998 CAU archaeological assessment report on this mine.)

Notes:

Site No.14(a) **Description**

Site Name: **New Consols Mine (Luckett)** **Site Visit: CB 14/11/97**

O.S Grid Reference (SX) 3870 7269 (SX37SE) PRN 42293 (N.Cornwall D.C.)

Statutory Designation Listed eng hse, calciners, chimney (II) No.8/165-167, Conservation Area AONB.

Brief site History: Copper mines operating from c1764 onwards, sited along Luckett's East-West valley were amalgamated by 1843 into the New Consols group. This failed in 1848, but a year later was re-named New Wheal Martha. By 1865 the copper mine employed 190 people, and apart from using water wheels had 50" (Phillip's Shaft) and 22" engines. By the late 1860's the low copper price ensured the demise of this mine. In 1869 substantial re-organisation of the surface layout resulted in seven new Brunton calciners, new copper crushing (28") and stamping engines (36"). By the early 1870's 180 men (34 women and 45 boys) were employed at the mine. Phillip's Shaft engine house was modified to take a larger 80" engine. The mine was closed in 1879, after profiting in its latter years from arsenic production rather than tin/copper ore. A copper processing mill (from Prince of Wales Mine) was re-erected in the late 1930's and re-processed dump material from surrounding mines until 1952 when it closed. Phillip's Shaft had been cleared and linked to the mill via an aerial ropeway.

Main extant features:

* Crusher engine house.
* Stamps engine house (partially demolished).
* Water wheel pit and settling ponds.
* About nine arsenic calciners, chimney, flues, labyrinth etc.
* Arsenic processing building (re-roofed).

Condition: The site has been progressively dismantled from 1952-1970's. Vegetation and trees have inhabited the site. The stamps engine house has been partially dismantled, the crusher house in better condition. The lower part of the site has slimes wastes, and arsenic material.

Reclamation ideas:

* Remove ivy etc from all structures.
* Conduct a structural survey of the engine houses and chimney.
* Consolidation works are necessary to most buildings.
* Consider removal of arsenic waste, to reveal calciners, flues etc.
* Small scale tree/overgrowth/rubble clearance from major buildings.
* Limited landscape works (brambles/gorse/contaminants etc).

Remarks: Highly sensitive for the local community of Luckett. Local people would prefer low-key intervention, large scale landscape works may not be appropriate. Tree growth etc has taken 40 years to inhabit the site. Consolidation works to buildings and associated small scale clearance seems to be the best option.

Notes: An important and high visual site, close to the Tamar Valley Discovery Trail.

Site No.14(b) **Description**

Site Name: **New Consols Mine (Phillip's Engine House only)**
Site Visit: CB 14/11/97

O.S Grid Reference (SX) 3872 7381 (SX37SE) PRN 42293 (N.Cornwall D.C)

Statutory Designation Listed engine house and attached chimney (II) No.8/164, Conservation Area AONB.

Brief site History: Copper mines operating from c1764 onwards, sited along Luckett's East-West valley were amalgamated by 1843 into the New Consols group. This failed in 1848, but a year later was re-named New Wheal Martha. By 1865 the copper mine employed 190 people, and apart from using water wheels had 50" (Phillip's Shaft) and 22" engines. By the late 1860's the low copper price ensured the demise of this mine. In 1869 substantial re-organisation of the surface layout resulted in seven new Brunton calciners, new copper crushing (28") and stamping engines (36"). By the early 1870's 180 men (34 women and 45 boys were employed at the mine. Phillip's Shaft engine house was modified to take a larger 80" engine. The mine was closed in 1879, after profiting in its latter years from arsenic production rather than tin/copper ore. A copper processing mill (from Prince of Wales Mine) was re-erected in the late 1930's and re-processed dump material from surrounding mines until 1952 when it closed. Phillip's Shaft had been cleared and linked to the mill via an aerial ropeway.

Main extant features:

* Pumping/ winding engine house with substantial timber components (main girder, spring beams, winch and most of the roof with slates).
* Extant boiler house chimney (full height).
* Choked ? shaft
* In-situ tramway rails to ore-bin loadings and aerial ropeway supports.

Condition: The engine house and chimney is covered with overgrowth. The roof and other timber components described above are not in a good state of repair and may collapse. The shaft throat is not visible and may well be superficially choked with debris. The aerial ropeway shed and ore bin structure appears to be in a dangerous condition.

Reclamation ideas:

* Conduct a structural survey of the engine house and internal timber.
* Remove dense ivy etc from engine house and chimney.
* Re-point parts of the engine house.
* Repair the roof timbers and re-slate the roof if appropriate.
* Treat/fence the mine shaft.

Remarks: The Boiler house has gone. The engine house is sited within a complex of barns (a barn abuts the north wall of the engine house). The high degree of survival of the original roof, seems to justify its re-build. The site is very near a public footpath. The southern edge of the site is very steep and will need safety works/fence.

Notes: This is a very important site, and is sited on a highly prominent location within Luckett.

Site No.14(c)	**Description**
Site Name:	**New Consols Mine (Arsenic chimneys and flue)** **Site Visit: CB 14/11/97**
O.S Grid Reference (SX)	3870 7269 (SX37SE) PRN 42293 (N.Cornwall D.C)
Statutory Designation	Listed arsenic chimney (II) No.8/105. AONB.
Brief site History:	See description given for New Consols Mine. By the 1870's the mine produced more profit by producing arsenic (a by-product of roasting copper ore to remove its impurities), than producing copper ore. Unfortunately the arsenic chimneys were not sited far enough away, and the village was affected by its poisonous fumes. During the mid-1870's the village school had to be closed due to the fumes. An injunction was brought against the mine, which closed down, presumably as long as it took to build the new and very long arsenic flue (for 1.0km up the southern side of Luckett hill) and two arsenic chimneys.
Main extant features:	* Two arsenic chimneys, one 3/4 extant (Listed II), the other base only. * Arsenic flue (running parallel to the road), extant in places.
Condition:	The flue is overgrown in most places along its length. Its roof has collapsed in many places. The extant chimney has some ivy on it, and its mortar needs re-placing in places.
Reclamation ideas:	* Conduct a structural survey of the chimney. * Remove ivy etc from the chimney. * Re-point parts of the chimney. * The top chimney section needs to be consolidated (with the addition of lightning conductors).
Remarks:	Probably the longest arsenic flue in Cornwall. Site adjacent to a public road and very visible from nearby Kit Hill.
Notes:	High visual site, and a strong case for consolidation works.

Site No. 15	**Description**
Site Name:	**Deerpark Mine** **Site Visit: CB 14/11/97**
O.S Grid Reference (SX)	3910 7300 (SX37SE) PRN 42301 (N.Cornwall D.C)
Statutory Designation	Listed engine house and chimney (II) No.8/98-99. AONB.
Brief site History:	This is a very good example of a small scale mid-C19th undertaking, of which there are many documented examples, but little surviving evidence. The site's isolation within the woodland may have ensured its survival. The mine's owners, thinking they had discovered the western extension of the Devon Great Consols Lode, drove two adits into the side of the hill in the early 1850's and attempted to purchase a 50' water wheel. Presumably the workings were not very successful as a fresh prospectus was issued in 1868. Operations continued until 1875 when the mine closed. The mine had reached a depth of 58 fathoms, with the items for sale including a 40" pumping engine, a 56' diameter water wheel lifting 24 heads of stamps, together with buddles, burning house and horse whim.
Main extant features:	* Pumping engine house with boiler house and chimney. * Open shaft (fenced), two adits (un-located). * Large wheelpit and nearby dressing floor with buddles. * Calciner, arsenic flues. * Ancillary mine buildings (offices, smithy, carpenters).
Condition:	All of the buildings are covered with ivy, small trees and other vegetation, as one would expect due to their siting in woodland for nearly 150 years. Woodland tracks have destroyed part of the arsenic flue and part of the engine house side and rear walls have collapsed internally. The open pumping shaft appears to be open to water (possibly 80m below).
Reclamation ideas:	* Structural remediation works to the engine house may be necessary. * Remove dense growth etc from engine, boiler house and chimney. * Remove dense ivy etc from calciner, wheelpit and other buildings. * Consolidate and re-point engine and boiler house, chimney, water wheel pit, crusher complex and mine buildings. * Create an access to the dressing floor, wheelpit and calciner complex. * Treat Shaft.
Remarks:	Very sheltered mine site, located next to the Tamar Valley Discovery Trail. Small, nicely preserved, mid C19th mine.
Notes:	A very important site and a strong case for remedial works.

Site No. 16 **Description**

Site Name: **Wheal Benny Mine** **Site Visit: CB 14/11/97**

O.S Grid Reference (SX) 3974 7312 (SX37SE) PRN 42302 CDC D0128

Statutory Designation Listed mine buildings (II) No. 1/146. AONB.

Brief site History: Wheal Benny operated as a tin mine from 1883 and was entirely powered by water. The lodes were accessed by four adits driven into the slopes of the Tamar Valley. A large water wheel wound ore up the shaft and drove a small set of stamps. A year later another water wheel was added to pump out the deeper levels. Discoveries of arsenic (found with the tin ore), resulted in the construction of the calciner, flues and chimney. More arsenic than tin was produced, the mine closing in 1886, having employed 25 people at its height. In 1901 the mine was re-opened as part of Kit Hill Mines, but closed again three years later. A final attempt to work the mine took place from 1918-20 when it was amalgamated with East Kit Hill Mine, again without success.

Main extant features:

* Two large water-wheel pits with associated launders and leats.
* Arsenic collection complex (calciner, labyrinth, flues and chimney).
* Dressing floor complex (stamps plinth, buddles, related water-wheel).
* Ancillary mine buildings (offices, smithy, carpenters, miner's dry).
* Mine shaft (choked), three adits (portals partly choked).
* Other mine shafts east of the mine adjacent to the main trackway.

Condition: All of the buildings are covered with ivy, small trees and other vegetation, as one would expect due to their siting in woodland. Sections of the arsenic flue roof and side walls have fallen inwards (north of the trackway). The roof superstructure has collapsed into the centre and lowest part of the calciner. The chimney has partially collapsed, as have small sections of the steeply rising flue (south of the trackway).

Reclamation ideas:

* Structural remediation works to the calciner may be necessary.
* Remove dense growth etc from all masonry buildings and wheelpits.
* Consolidate and re-point all masonry buildings and wheelpits.
* Locate and treat open adits and shafts as appropriate.
* Fence dangerous features and slopes.
* Thin, remove trees etc whose roots threaten masonry features.

Remarks: This mine is probably the best preserved example of an entirely water powered mine in Cornwall. A very sensitive reclamation scheme should make safe buildings for public access and consolidate the site for future generations.

Notes: The mine lies astride the Tamar Valley Discovery Trail, and so has high visual amenity. Careful ground survey and map search needs to be carried out to attempt to locate for treatment the numerous shafts located either side of the track.

Site No. 24 **Description**

Site Name: **Dimson (Plymouth) Brickworks** **Site Visit: CB 14/11/97**

O.S Grid Reference (SX) 4268 7186 (SX47SW) PRN 42146 CDC D0038

Statutory Designation AONB.

Brief site History: Manufacture of bricks and tiles in the area began in earnest with the repeal of the tax on bricks in 1850. The exhaustion of the Stourbridge clay deposits in Worcestershire twenty years later placed enormous demands on the local brickworks as the Hingston Down clay was suitable for use as heavy duty 'blue' fire bricks (from the early 1870's). The Plymouth Fireclay Company started up at the same time as other works in the area, but appears to have re-used an older site as the 1839 Tithe map indicates the presence of brickworks, confirmed by Kelly's Industrial Directories of 1856. The works used 'Hoffman' kilns, and clay was mined near the kiln and trammed to the crushing and kneading mills (producing fire-bricks). It was then fired in a huge (c40m diameter) structure consisting of small kilns (c 20) with flues interconnecting to a very wide and tall central chimney stack. The works are shown as disused on the OS 1905 map. The central stack was dismantled approximately 30- 40 years ago, and the stone removed to form Lopwell Dam.

Main extant features:

* Circular feature (c40m diam) with some intact kilns and the rubble remnants of the centralised chimney stack (c4m high).
* Ancillary buildings associated with the kiln (kneading mill etc).
* Deep open clay extraction pit (fenced).
* Tramway stone piers either side of road.

Condition: Although the site has a spread layer of rubble and brick with fly-tipping, the size, extent and function of the building is easily recognisable. many of the kilns are visible, but have been masked by overgrowth and trees. The clay pit is deep and again overgrown with trees and vegetation. The stone piers either side of the road are eroding and the mortar also in many places has weathered out, leaving spaces where the outer skin has fallen out.

Reclamation ideas:

* Remove surface rubble, vegetation and trees from the kiln site.
* Consolidate the circular side walls, kilns and chimney remnants.
* Securely fence the clay pit.
* Repair and repoint the stone piers either side of the road.

Remarks: If this site could be cleared and opened up to the public, it could prove to be a quite spectacular site. These are the best remnants of a substantial kiln site in this end of Cornwall.

Notes: High visual amenity, immediately next to the road leading to Gunnislake. The site has its own access from the road.

Site No. 25(a) **Description**

Site Name: **Gunnislake Clitters (upper) - Skinners Shaft** **Site Visit: CB 13/11/97**

O.S Grid Reference (SX) 4220 7200 (SX47SW) PRN 42136 CDC D0031

Statutory Designation AONB.

Brief site History: This mine produced copper, tin, wolfram and arsenic from 1820 to 1909 (most copper was produced between 1860 and 1890). An adit driven in just above river level drained these early workings, and a water-wheel powered the dressing floor. The mine was re-opened in 1858 for copper extraction (as Clitters Adit) and soon utilised steam engines for pumping, winding, stamping and crushing. A tramroad was built from the mine to the head of the canal near Gunnislake to bring in mine materials (wood, iron, and coal etc). Falls in the price of copper and tin forced closure in 1889. In 1900 Clitters Adit, Old Gunnislake Mine, Hawksmoor Mine and Hingston Down Mine were amalgamated and re-opened as Clitters United. A large centralised milling plant was built on the Clitters sett which re-processed dump material from all the local mines, as well as importing foreign ores by barge. This operation closed down in 1909, only to re-open during the 1914-18 war as a wolfram processing site (from the new Kit Hill works via an aerial ropeway). The site finally closed at the end of the First World War. The two engine houses at Skinner's Shaft (pumping and winding), smithy, magazine etc and the nearby copper crushing engine (separated by the stamps floor) were all constructed during the 1862-4 period.

Main extant features:

* Complete mine complex of winding, pumping, stamping/crushing engines with large boiler houses and stamps floor.
* Open shaft with high stone collar.
* Ancillary mine buildings (Smithy, Carpenter's shop, Magazine etc)
* Extant chimneys (one full height).
* Dressing floor spoil heap.

Condition: All of the buildings and the site have a degree of ivy and vegetation cover which is affecting the structural integrity of the former (tree roots etc). Rotted lintels and brick arches have, in some cases collapsed, creating structural weaknesses to the engine houses. Weathering erosion has removed much of the surface mortar pointing and water has entered the centre of walls creating further damage.

Reclamation ideas:

* Remove dense ivy etc from engine and boiler houses.
* Repair and consolidate engine houses, chimneys and components of the mill complex.
* Remove dense vegetation, some small tree clearance from site and remove fly-tipped debris.

Remarks: This site has a high visual amenity value. It is sited next to a road, overlooks the Tamar Valley, and lies within the AONB. This is a very sensitive and beautiful woodland site and careful thought for the type, method and extent of safety works, will be required when planning.

Notes: A high priority site. (See Buck, 1998 CAU archaeological assessment report on Gunnislake Clitters mine.)

Site No.25(b) **Description**

Site Name: **Gunnislake Clitters (lower) - 20C Processing Mill**
Site Visit: CB 13/11/97

O.S Grid Reference (SX) 4220 7215 (SX47SW) PRN 42136 CDC D0042

Statutory Designation Pumping engine house and chimney are Listed (II) No.2/106. AONB.

Brief site History: See historical account given in Site No. 25 (a). By 1907 a complex network of inclines and tramways connected the new processing mill to Skinner's Shaft and the nearby East Cornwall Mineral's Railway (replacing a steeply inclined haulage road - in use by 1880). The 1860's copper dressing floor was supplanted by the later (early 1900's) processing mill (which ran up the valley side). This mill was then partially built over (and dumped over) by later 1914-18 mill additions/ extensions. The Listed engine house and chimney (sited on the Tamar river bank), was erected (over the old wheel-pit) between 1883 and 1906, to house a rotative pumping engine to pump water up the valley side to the processing mill reservoirs.

Main extant features:

* Engine and boiler house with chimney on wheelpit and adit outflow.
* Massive processing mill spoil dump.
* Extensive remnants of the 1900's Processing Mill and machine bases built on terraces stretching down the valley.
* Numerous reservoir ponds, arsenic calciners, flues and chimneys.
* Inclined tramway route downslope and tramroad to Hawkmoor mine.
* Open adits and possibly shafts with an area of prospecting pits.

Condition: The site has been neglected for the last 85 years. Its woodland environment has resulted in the deposition of layers of leaves/branches overlying processing floors/machine bases, reservoirs, flues etc. Substantial walls and chimneys have been covered with ivy and trees. Collapse to large sections of the (Listed) engine house bob-wall has serious structural implications. The enormous 20C processing floor dump appears to have spread, as its edges erode due to weathering and bike activity. Occasional fly-tipping occurs over the site.

Reclamation ideas:

* Structural remediation works to the engine house are necessary.
* Remove dense ivy etc from engine and boiler house.
* Consolidate engine houses, chimneys and components of the mill complex.
* Remove dense vegetation, some small tree clearance from site and remove fly-tipped debris.

Remarks: This site has a high visual amenity value. It is sited next to a road, overlooks the Tamar Valley, and lies within the AONB. This is a very sensitive and beautiful woodland site and careful thought for the type, method and extent of safety works, will be required when planning.

Notes: A high priority site. (See Buck, 1998 CAU archaeological assessment report on Gunnislake Clitters mine.)

Site No.25(c)	**Description**
Site Name:	**Gunnislake Clitters Wood (east)** **Site Visit: CB 31/10/97**
O.S Grid Reference (SX)	4250 7230 PRN 42136
Statutory Designation	AONB.
Brief site History:	See historical account given in Site No's 25 (a) and 25 (b) above. There appears to be no readily available recorded site history for this easterly section of the Clitters complex. The archaeological surface evidence seems to suggest that the steep valley sides of the wood have been traversed (along its contours) by a series of post-medieval prospecting pits (possibly interconnecting below ground), openworks and shafts. The OS marks the site of a few 'Old Quarries' and tramways from shafts along the valley sides. The public footpath route is an ancient (possibly prehistoric) route from the bridge to Latchley/Chilsworthy/ Luckett villages.
Main extant features:	* Lode back pits. * Open shafts. * Openworks. * Early routeway. * Large and small quarries.
Condition:	There may be some unstable ground in and near the lode-back pits. The open shafts appear to have been fenced by the land owners. All of these mine features are in close proximity to a public footpath. Some sections of the footpath boundary walls have collapsed.
Reclamation ideas:	* Carry out desk based research/survey to identify any other shafts. * Securely fence/treat shafts. * Fence openworks (carry out a H & S risk assessment). * Repair footpath boundary walls.
Remarks:	This is a very sensitive and beautiful woodland site and needs careful thought for the type, method and extent of safety works. Site within AONB statutory designation and on route of TVDT..
Notes:	A high priority site but requires considerable assessment before the works are finalised.(See Buck, 1998 CAU archaeological assessment report on Gunnislake Clitters mine.)

Site No. 26	**Description**
Site Name:	**South Devon Mine (Wheal Bramble) Site Visit: CB 14/11/97**
O.S Grid Reference (SX)	4174 7250 (SX47SW) PRN 42135 CDC D0134
Statutory Designation	Listed Mine captain's house and Chimney stack (II) No. 2/57. AONB.
Brief site History:	This copper mine named South Devon (or Wheal Bramble), operated in the 1850's and 1860's, perhaps working part of the earlier Chilsworthy Mine sett. There were two adits, the longest being 150 fathoms (North Lode), ventilated by a 20ft water-wheel. In December 1854 Smee's Shaft (South Lode) was 33 fathom's deep and drained by a 40" engine. In the middle of 1857 the mine and materials were purchased and work continued under the name River Tamar Mine. It was still active in 1862 when it mined to 70 fathoms below surface and employed 20 people. It was disused by 1883, but re-opened in 1896, 234 tons of mis-pickel being produced in 1897/8 (the detached chimney may date to this last re-working).
Main extant features:	* Lower walls of a pumping engine house and boiler house. * Open pumping shaft (with protective wall and fence). * Detached chimney (full height). * Extant mine building (miner's dry ?).
Condition:	The engine and boiler house walls are covered with ivy etc. The shaft is open to an unknown depth, surrounded by an old protective wall and modern wire fence. The detached chimney was covered with ivy, but the owners have cut the roots. This has revealed the stonework to be in a relatively good condition, apart from the brick coping, which is loose in places. The mine building is in a good condition, apart from the roof.
Reclamation ideas:	* Remove dense ivy etc from engine, boiler house and remnants from chimney. * Consolidate and re-point engine house, chimneys and mill complex. * Treat/securely fence shaft. * Re-slate mine building roof.
Remarks:	Remnants of a small mid 19th century mine. Of relatively small significance when compared to its easterly neighbour-Gunnislake Clitters, but a good example of a small mid 19th century Tamar mine.
Notes:	Although the site is privately owned, it can be partly viewed from the road. The engine house, shaft, and chimney is at the lower (road) end of the site. Public access to the site will need to be confirmed by the owners.

Site No. 30 **Description**

Site Name: **Prince of Wales Mine** **Site Visit: CB 13/11/97**

O.S Grid Reference (SX) 4010 7055 (SX47SW) PRN 42142 CDC D0035

Brief site History:

In 1850 Wheal Fortune, Wheal George, Wheal Barnard and West Edward copper and tin mines were combined into Calstock United mining company's Prince of Wales Mine (the previous site of Wheal Pleasant). Mining began in 1863 and continued until 1914. A 6.6m water wheel and small 25" pumping engine worked the site until the early 1870's when the mine closed. It re-opened in 1879 with a larger 50" pumping engine, 24" steam whim and new dressing floors. The lower section of the mine (south of the road) housed the arsenic calciner, large reservoir ponds and a waterwheel. Ten years later as tin became more profitable than copper, the mine invested in a stamping engine and new tin dressing-floors. Copper processing seems to have been relocated to the lower section of the mine. in the early years of this century a milling plant was erected to process ore taken from surface dumps of other nearby mines. From 1863 to 1914 the mine produced 10,845 tons of copper ore, over 1000 tons of black tin and 7,720 tons of iron pyrites which yielded arsenic.

Main extant features:

* Three engine houses (pumping, winding, stamping).
* Open pumping shaft and about three others (all choked).
* Reservoir ponds and two chimney stacks and large surface dumps.
* 20th century mill complex (concrete) and adit.

Condition:

The engine houses are in a poor state of repair, all were built with a soft local stone and wooden lintels have now rotted. The main pumping engine house is covered with dense ivy etc. High (contaminated ?) mill spoil dumps in the southern area of the northern half of the site. Other areas are obscured by dense vegetation. The southern part of the site is covered by woodland and overgrowth, no features are readily visible.

Reclamation ideas:

* Remove dense ivy etc from engine and boiler houses.
* Repair and consolidate engine houses, chimneys and mill complex.
* Remove dense vegetation and some small tree clearance from site.
* Fencing/cover-down of spoil dumps (test for contamination).
* Treat/fence open shafts.

Remarks:

Both parts of the mine are immediately adjacent to a road, but the northern site contains engine houses etc and provides a good view of the Tamar estuary.

Notes:

High visual amenity and a high priority site.

Site No. 32 **Description**

Site Name: **Wheal Langford Mine** **Site Visit: CB 31/10/97**

O.S Grid Reference (SX) 3828 6954 (SX36NE) PRN 42266

Statutory Designation Both engine houses Listed (II) No.8/16. Site within AONB.

Brief site History: This mine produced Copper and Silver. Originally known as East Cornwall Silver Mine it opened in 1836. The winding engine house may date to 1835. It worked under various names (alias Wheal David and Wheal St. Vincent) but under its present name working was renewed for the third time in 1848. Operations continued until 1856 when machinery consisting of a 64" pumping engine, a 12.5" rotary and two horse-whims were offered for sale. As New Langford, further trials took place in 1884-6, but the mine closed soon after. The Lodes extended west-east along the nearby road and down the Silver Valley. The processing area of the mine was centered further to the east, at the intersection of the Silver Valley and the road to Harrowbarrow.

Main extant features:

* Winding Engine House (full height).
* Pumping Engine House (full height).
* Boiler House Chimney (nearly full height).
* Engine House Shaft (choked).

Condition: Overgrown site with Ivy etc covering both engine houses. Structural damage caused by collapsed wooden lintels. Pointing has been eroded from most walls. Winding Engine House needs to be completely re-pointed. Upper brick section of chimney is quite unstable due to weathering and erosion of mortar. Pumping Engine shaft has probably not been made safe. A corrugated roofed lean-to has been constructed against the northern side of the pumping engine house.

Reclamation ideas:

* Ivy and vegetation needs to be removed to allow structural survey.
* Structural remedial works are necessary to both engine houses, especially the Winding Engine house.
* Repair re-pointing to both engine houses and chimney.
* Consolidation of the top section of the chimney.
* Remove excess vegetation from site.

Remarks: Both Engine Houses are Listed (II). This is a small site, the lower western part needs to be drained.

Notes: Site has high visual amenity (immediately adjacent to a road). The remainder of the mine's buildings (to the east) have for the most part been converted for domestic use.

Site No. 33 **Description**

Site Name: **Wheal Brothers Mine** **Site Visit: CB 31/10/97**

O.S Grid Reference (SX) 3913 7002 (SX37SE) PRN 42295 CDC D0127

Brief site History: This mine opened under the name of Wheal Duchy and although started life as a copper prospect it mined silver (silver lead) between 1810 and 1816. It re-opened as Wheal Brothers in 1833, during three months of which nearly £6000 worth of silver ore was sold, and later £9000 worth of dividends were paid. The mine closed soon after. Nearby Wheal Sisters and Silver Valley Mines were worked after this mine closed, but all ceased production by the 1860's, by which time copper and tin had also been produced.

Main extant features:

* Lower walls of substantial boiler house and engine house with stack.
* Protective walls around two shafts (three others shown on 1880 map).
* Spectacular wheelpit and pond with associated leats.
* Arsenic flue winding around the site to substantial chimney.
* Lower walls of calciner visible and shallow openworks.

Condition: General overgrowth on site, with tree thinning necessary. Build up of rubble in some areas. Arsenic flue roof collapsed in places. Public footpath is flooded to the north of the site. Boiler house walls are collapsing in some areas. The protective stone walls around the two shafts are being vandalised. The arsenic chimney is choked with ivy etc (structural condition cannot be assessed).

Reclamation ideas:

* Protective walls around shafts need repair and consolidation, as do the boiler and engine house walls and arsenic flue.
* General site vegetation and rubble clearance is necessary.
* Public footpath north of the site needs a small drainage scheme to permit access.
* Arsenic chimney needs vegetation removal, repair and consolidation.
* Safety fencing needs to be erected around the wheelpit/header pond.

Remarks: A small secluded but impressive mine sited in woodland. A public footpath goes through its centre.

Notes: Appears to be a good candidate for careful safety works with minimal intervention.

Site No. 43 **Description**

Site Name: **Drakewalls Mine (east)** **Site Visit: CB 13/11/97**

O.S Grid Reference (SX) 4258 7068 (SX47SW) PRN 42143 CDC D0033

Statutory Designation AONB.

Brief site History: The first specific documentary reference for this copper, tin and arsenic mine, was in 1793 when it only mined tin, using waterwheels as its power source, with water brought by leats from Kit Hill. Frequent summer drought and deepening shafts meant that steam engines were necessary by 1843, when a pumping engine was purchased. By the 1860's a new 40" stamping engine and 26" winding engine worked the mine, which by now mined copper. Its rich returns by 1875 (£350,000 from Main Lode) earned it the title 'Dolcoath of East Cornwall'. By 1895 Drakewalls was abandoned as the ore market price had dropped far below the economical cost of operating the mine. By 1901 the mine was re-started and the levels pumped out (which took two years) "*so much ground has been taken away (by mining) that great underground caverns exist which can be traversed only by boat*". By 1905 no returns had been made from pumping out the mine and it ceased working for the final time. The stamps were maintained at work until 1909.

Main extant features:

* Winding engine, boiler house and chimney stack.
* Water wheel pits.
* Openworks.
* Calciner (mine building).

Condition: The eastern part of this mine is very overgrown with trees, brambles but especially Japanese Knotweed. Fly-tipping has occurred in places. The structural stability of the engine house gives rise for concern, as wooden lintels have collapsed, bringing down masonry above. A heavy covering of vegetation masks this building and other low lying features. Part of the southern half of the site (east Drakewalls) is used by a local builder and the eastern fringe of the site by a house and garden.

Reclamation ideas:

* Structural remediation works to the engine house are necessary.
* Remove dense ivy etc from engine and boiler house.
* Consolidate engine houses, chimneys and mill complex.
* Remove dense vegetation, some small tree clearance from site and remove fly-tipped debris.
* Fencing/cover-down of spoil dumps (test for contamination).

Remarks: High visual amenity site with excellent access to the public transport network (buses, trains).

Notes: A high priority site in view of the works already carried out on the other half of the mine.

Site No. 45	**Description**
Site Name:	**Netstakes Quay (Lime Kilns and cottages) Site Visit: CB 31/ 10/97**
O.S Grid Reference (SX)	4340 7065 (SX47SW) PRN N/A CDC D0049
Statutory Designation	AONB.
Brief site History:	Most of the lime kilns remaining in the Tamar Valley were built between 1770 and 1830 (the lime trade reaching its height between 1810 and 1850). Netstakes Quay was also used by a local shipbuilder by the early 1860's, constructing 100 ton ocean going ships. It is possible that the existing domestic house near the quay was originally constructed as a small boat-house. The two lime kilns and pair of lime-burner's cottages provide an excellent example of this industrial/agricultural trade and the infrastructure that grew up around it. The last lime to be produced in kilns by the Tamar was burnt in 1916 at Halton Quay, for dressing Viverdon Down-then being ploughed up as a war measure.
Main extant features:	* Two Lime kilns (one connected to a domestic house). * A pair of semi-detached lime-burner's cottages. * Netstakes Quay. * An adit or perhaps incline shaft (fenced).
Condition:	The roof of the lime-kiln connected to the house is used as a car-port, but it seems to be structurally in a good condition, as does the other nearby kiln. The cottages only have the gable walls (with fireplaces) as a major structural feature and ancillary outbuildings (incl WC). The Quay inner wall survives as an overgrown feature. The adit/shaft has been fenced off by the landowners, access could not be gained to accurately confirm the feature's function.
Reclamation ideas:	* Repair and consolidate the lime kilns. * Repair and consolidate the lime burner's cottages. * Reveal the quay. * Fence/Grill the adit/shaft.
Remarks:	The site is along the route of the Tamar Valley Discovery Trail and local village circuit and has a high visual amenity value for members of the public as they walk from Gunnislake.
Notes:	Priority project with much public benefit.

Site No. 46 **Description**

Site Name: **Bailswood (Bealeswood) Brickworks Site Visit: CB 14/11/97**

O.S Grid Reference (SX) 4361 7135 (SX47SW) PRN 42148

Statutory Designation AONB.

Brief site History: See background history recorded in the Dimson Brickworks sheet. The OS 1884 map shows the site operational with a rotary steam engine powering the various kneading and crushing mills, presumably sited under the large rectangular building east of the steam engine). The later 1905 OS map shows the site to be further developed, with a greater surface area under cover. A tramway extends west of the complex, presumably into the clay pit. The finished product was loaded onto barges for export.

Main extant features:

* Rotary steam engine house with boiler house and square chimney.
* Gable walls of the main processing building and lower side walls.
* Other ancillary buildings related to the brickworks.

Condition: The whole site has become very overgrown with trees and vegetation, making identification of low features problematical. The engine house and square stack are covered with ivy etc. The two surviving walls of the processing building have been affected by vandalism, in particular the northern wall (c 4.0m high), which has in some places been demolished. Local people have beaten a track through the overgrowth to reach the sites.

Reclamation ideas:

* Structural remediation works to the engine house are necessary.
* Remove dense ivy etc from engine, boiler house and chimney.
* Consolidate engine house, chimney and processing complex.
* Remove dense vegetation, some small tree clearance from site and remove fly-tipped debris.

Remarks: The site is along the route of the Tamar Valley Discovery Trail and has a high visual amenity value for members of the public as they walk from Gunnislake along the River Tamar.

Notes: A priority site.

Site No. 82 **Description**

Site Name: **East Kit Hill Mine** **Site Visit: CB 13/11/97**

O.S Grid Reference (SX) 3880 7110 (SX37SE) PRN 42299 CDC N/A

Statutory Designation Listed engine house, chimney and building (II) No.8/146-148. AONB.

Brief site History: The working history of this mine ran parallel to that of Kit Hill Consols. It was extracting tin by 1853 and became part of Kit Hill United Mines, eventually closing in 1909. The mine was powered by a small rotative beam engine. This (similiar to Kit Hill summit mine), hauled ore from a shaft, stamped/crushed ore and powered the buddles on the dressing floor. All of these surface features are visible on the 1884 and 1906 OS maps, as well as a small calciner. The engine house remains the most complete example worked by the Kit Hill mines. In recent years the engine house and chimney have been consolidated. At the western end of the field is a spoil dump and buildings from the WW1 wolfram working of the hill, which was linked by an aerial ropeway to the Gunnislake Clitters processing plant.

Main extant features:

* Stamping/winding engine house (recently re-pointed).
* Boiler house and mine building (arsenic calciner) and magazine.
* Dressing floor (intact buddles) and small reservoir.
* Shafts (approximately eight-presumably not treated, now choked).
* Two choked adits and leats.
* WW1 wolfram processing building, dump and aerial ropeway bases.

Condition: The engine house and chimney have recently been re-pointed (with new wooden lintels) and walls 'capped', the former (I think) needs more work. Other buildings are covered with ivy (including the stamp loadings and fly-wheel slots). The buddles and dressing floor are covered with gorse/brambles. Shafts are either choked or have 'Clwyd' caps. The wolfram buildings are covered with vegetation and rubble. The mine magazine mortar pointing has been eroded.

Reclamation ideas:

* Re-point parts of the engine house.
* Remove dense ivy etc from boiler house and nearby buildings.
* Consolidate calciner, magazine and wolfram site.
* Remove dense vegetation from dressing floor.
* Fencing/cover-down of spoil dumps (test for contamination).
* Locate treat and fence mine shafts.

Remarks: The site is often quite wet, a drainage scheme is necessary. There is no public access to the site (only via a private road).

Notes: The Trevithick Trust has shown interest in taking on the lease of the engine house. Perhaps a longer term view is that this mine should be part of the Kit Hill country park, or managed by CCC. It is an important and complete complex.

6 List of mine sites (Devon) in the Tamar Valley PROJECT area

Devon Great Consols (arsnic flue and chimney stack). Site No 19

List of mine sites (Devon)

(**Bold text** denotes assessed sites reproduced in the gazetter)

2 C	Wheal Carpenter Mine	
3 C	Wheal Grace	
4 C	Wheal Conquer Mine	
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6 A	**Capunda Mine**	38
7 B	Catsbridge Mine	
8 C	Millhill Mine/Quarry	
17 B	West Devon Consols (Lamerhooe)	
18 B	**Devon Great United (West Maria)**	39
19	**Devon Great Consols (Summary)**	40
19(a) B	**Devon Great Consols (Wheal Fanny)**	41
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20 B	Watson's Mine	
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22 B	**Bedford United (Wheal Marquis, Delve's Kitchen, Ding Dong)**	46
23(a) B	**South Bedford**	47
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47	North Impham Mine	
48 B	**Russell United (Wheal Impham)**	48
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50(a) C	Wheal Crebor Mine	
50(b) C	West Wheal Crebor Mine	
51 C	Crowndale Mine	
52 C	East Crebor Mine	
53 C	New East Russell (Devon & Courtney Mine)	
54 C	South Wheal Crebor Mine	
55 C	East Wheal Russell Mine	
56 C	William and Mary Mine (Devon and Cornwall United)	

57 B	Virtuous Lady Mine	
58 B	West Down Mine	
59 B	Little Duke Mine	
60 C	Lady Bertha Mine	
61 C	South Lady Bertha	
62 C	Tavy Consols	
63 N/A	George and Charlotte Mine (Devon and Cornwall United) (No assessment)	
64	(Maddacleave) Mined	
65 A	**Gawton Mine**	50
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69 A	**Rumleigh Brickworks**	51
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76 A	**Weir Quay (Tamar/Union Smelting Works)**	56
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80(a) A	**Lopwell Mine (Wheal Maristow)**	59
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81 C	Wood Mine	

NOTE:

This list is only a preliminary assessment of the possible sites that could be considered for inclusion in the Cornwall section of the Tamar Valley Project. There are various other Industrial Sites, Lime kilns/shafts/ openworks along the side of the Tamar Valley which have not been listed nor shown on the map. No quays/ canals have been properly viewed nor commented upon. The list therefore is a first stage rapid trawl of the principal sites.

Letters shown after the site number are the gradings applied to each site. Grade A sites have been viewed and site sheets have been recorded. Refer to Section 7 for the individual site assessment sheets, and the appendix for the location map of all the Tamar Valley Sites.

7 Gazetteer of mine site descriptions (Devon)

Site No. 6	**Description**
Site Name:	**Wheal Devon Capunda (Cu, Pb, As)** **Site Visit: 18/3/98 CB**
O.S Grid Ref (SX)	4015 7540 SX47NW/8
Statutory Designation	AONB
Brief site History:	From 1852-8 an adit was driven from the side of the Tamar on an east-west lode and at least four shafts sunk. In 1853 a 40" engine was erected and further levels opened up. Six lodes were discovered, the largest being 14ft in width. The mine was closed in 1858, with surprisingly, no recorded returns made. A year later a new company was formed (stating two lodes had been worked to 50 fathoms below adit). Many tons of lead ore was said to have been raised in the upper levels but in depth the lode depth appeared to be copper. Of the three principal shafts Engine Shaft was 34 fathoms deep, Whim Shaft 50 fathoms deep and Trial Shaft 20 fathoms (all below adit). Whether the site was reworked is not known.
Main extant features:	* Three sites, two in open fields and the third in woodland. * The first probable shaft site is in a grassed over spoil mound, near a modern barn (shaft not located). * The second (Whim Shaft) also lies in a grassed over spoil dump (c4m above GL), with an excellent example of a horse whim site and perfectly preserved 'melior' stone in-situ. * The edge of the nearby woodland contains at least one shaft, possibly two, and the likely site of the engine house (no remains).
Condition:	There are no building remains on the site. The horse-whim site is well preserved, but its shaft is not visible (presumably only choked). The spoil heaps have been used to dump rubbish etc. The only visible shaft(s) are those in Buddlemead Wood.
Reclamation ideas:	* Locate and treat the three/four shafts. * Remove the dumped rubbish.
Remarks:	All of the shafts appear to be on private land. There appears to be no public access to the site. The Tamar Valley Discovery Trail is one and a half fields away, only the spoil mounds are visible.
Notes:	This site may not be eligible for English Partnerships funding, due to its lack of public access or extant remains.

Site No. 18 **Description**

Site Name: **Devon Great United (Cu, As)** **Site Visit: 18/3/98 CB**

O.S Grid Ref (SX) 413 740 SX47SW/518

Statutory Designation AONB

Brief site History: The success of this mine was assumed to emulate that of its neighbour, Devon Great Consols. The site consisted of the setts of West Wheal Maria and Wheal Fortescue, and Wheal Williams on the Cornwall side of the Tamar (below Latchley). When the setts were taken over in the early 1880's, they contained a 56" pumping engine (with two boilers), a 14" rotary engine, a steam whim (24"), a Cornish copper crusher, 12 head of stamps, and a Brunton calciner etc. Copper ore and arsenic were found above the 71 fathom level, selling for £45,000 at the two previous setts. The four lodes were worked from Watson's, Willesford's and Fortescue's Shafts. Devon Great United operated from 1883 to the turn of the century, during which time the mine was sunk to the 144 fathom level, with little success.

Main extant features:

* A large proportion of the mine buildings centered around the West Maria section of the mine (Watson's and Willesford's Shafts) have been demolished (up to the 1950's), and the shafts capped. Low remnants can be seen in the undergrowth (magazine and sett stones are intact).
* However the Fortescue section contains good examples of the Brunton calciner, arsenic flue, labyrinth, and related buildings (arsenic stack has been demolished), sited on land owned by Tavistock Woodlands.
* Earlier shafts or lode back/costean pits are visible in the hillside.

Condition: Consolidation works to the Fortescue remnants are important as stone is being robbed from the flue. The flue and labyrinth is not in a good state of repair, and is falling down the steep hill. There is very little to see in the remainder of the mine. Low mine buildings are set in dense undergrowth.

Reclamation ideas:

* Ivy and vegetation needs to be removed from the calciner, flue, labyrinth, and nearby buildings to allow survey and consolidation.
* Remove excess vegetation and fly-tipping from site.
* Locate and confirm the structural details of any shaft plug/cap.
* Investigate other nearby shafts.

Remarks: If the footpath route mentioned below comes into being, there may be sufficient cause to carry out safety works to the Fortescue section of the mine, which is visible and next to the footpath route.

Notes: The Capeltor site has a Countryside Stewardship Scheme, and is planning a footpath route through the (West Maria) mine site. The eastern section of Devon Great United (and the part with the best remains), is owned by Tavistock Woodlands.

Site No. 19

Description

Site Name:

Devon Great Consols (Cu, As) - Summary

Site Visit: 18/3/98 CB

O.S Grid Ref (SX)

41 73, 42 73, 43 73 SX47SW/504

Statutory Designation

No 19th C Listed mine buildings (apart from domestic houses), AONB C 20th arsenic works and chimney Listed Grade II.

Brief site History:

The cutting of Gard's Shaft in 1844 within this mine, saw the first discovery (from 18 fathoms down to 50) of what became the most productive lode in Europe. During the following year as Main Lode was followed eastwards it deepened with Wheal Fanny down to 55 fathoms, Wheal Anna Maria, Wheal Josiah (below 50 fathoms), and Wheal Emma (in 1848-a mile from Wh. Maria) the lode was found at 60 to 132 fathoms. In 1845 the lode had been proven for nearly two miles (5-6ft thick), and the complex renamed Devon Great Consols. In the first full year of working a profit of £73,622 had been made. By 1847 four steam engines had been installed, and large 40-50ft water wheels were built using long leats from the Tamar (culminating in 33 wheels being used on the mine). In the mine's first 12 years of working, ore sales realised £1.4 million pounds. To reduce transport costs the ore was taken by barge and cart to Morwellham. By 1858 this route was replaced by a 4.5 mile standard railway from Wh. Maria to a point above Morwellham where trucks were let down over a half mile 1 in 3 incline. The quay and dock itself was massively expanded. By 1865 the mine covered 140 acres, working four main lodes, via 15 shafts. There were forty miles of levels and over 1000 men, women and children employed. The late 1860's slump in copper prices, caused a re-think and by 1871 the mine had constructed a large arsenic reduction works at Wheal Anna Maria, to process mundic found next to the copper ore lodes. By 1872 arsenic provided 20% of the mine's receipts and four years later half the country's arsenic, in refinery works which covered 8 acres. By 1890 the mine was selling three times as much arsenic as copper (tin had not been found under the copper, as at Dolcoath). By 1898 a decline in the price of arsenic and the high price of coal led to overall losses for the first time. The mine and quay finally closed in June 1902. Six months later most of the buildings were levelled by its workforce.

Main extant features:

* 19th century mine complex buildings have gone (demolished months after the mine closed in 1903 (by Duke of Bedford).
* Main 19th century remnants include: large spoil dumps, well preserved reservoirs, settling tanks, leats, tramway and railway routes and inclines.
* Most shafts and waterwheel pits are either not visible/choked near surface
* 1920's arsenic refining works remain with long flue and stack (36m high).

Condition:

As listed above, the engine house complexes have been demolished and rubble removed, leaving only shaft sites. Most mine sites are now sited in thick conifer woodland, although most are accessible via nearby paths. Large spoil heaps are the main visual evidence of the mine sites/arsenic processing.

Reclamation ideas:

* Vegetation clearance around low building remnants.
* Shaft treatment (fencing?) if public access permitted.
* Consolidation works to 1920's arsenic complex, flue and chimney.

Remarks:

All consolidation/safety works dependant on public access being permitted. This is a very important historic mine and well worth consolidating the remains if public access can be gained.

Site No. 19(a) **Description**

Site Name: **Wheal Fanny (Devon Great Consols) (Cu,As)**
Site Visit: 18/3/98 CB

O.S Grid Ref (SX) 421 737 SX47SW/504/2

Statutory Designation No Listed buildings (apart from mine captain houses), AONB

Brief site History: During 1845, after the discovery of the rich, shallow copper ore lode (Middle Lode), Main Lode was followed eastwards (following a 70 fathom southward movement due to the 'Great Cross Course'), to sites which later became mines within their own right: Wheal Fanny, Wheal Anna Maria, Wheal Josiah and later in 1848 Wheal Emma (all part of 'Devonshire Great Consolidated Copper Mining Company'). Both Wh.Fanny and Wh.Josiah were started in March 1845. To instigate the former, a new shaft had been sunk at a distance of 160 fathoms (south east) of Wh.Maria. At this time a water wheel was erected to power a crusher mill. Three main shafts appear to have been used at this mine; Western and Eastern Shafts (both 65 fathoms deep) and Ventilating Shaft. Wheal Fanny does not seem to have contained a steam engine, rather the water wheel pit, crusher and dressing floor complex, with later settling ponds, if the OS 1884 1:2500 map can be used as evidence. Although the mine is shown as operating by this date, some buildings appear to be disused and unroofed. The mine stopped operating by the end of 1902, however in 1915, the upper levels of the mine were re-opened for the extraction of arsenic ore. The ore was calcined at the Coombe Works near Calstock, until the new refinery at Wh.Anna Maria had been built in 1921. In 1922 an incline was built from the mine to Wh.Anna Maria, but owing to an arsenic price slump, mining was suspended in early 1925, and never re-started. Ore dumps were re-processed during the 1939-45 war.

Main extant features:

* Three shafts, one is visible (Western Shaft), nearby to the west are low remnants of the buddles, dressing floor and building.
* The ore dumps and settling tanks survive (some of which are full).
* In the cutting (*'Old Quarry'* on the 1884 OS) building remnants survive.

Condition: The building remnants are obscured by vegetation. The visible shaft appears to show signs of movement. The settling ponds and ore dumps appear to be stable.

Reclamation ideas:

* The low buildings need vegetation removed for consolidation works (if appropriate).
* The settling ponds may need consolidation works to ensure the complex is not flooded during very wet conditions.

Remarks: If footpaths and trail routes are to be developed in Devon Great Consols, then a small amount of vegetation clearance, re-pointing, and shaft safety works could be carried out.

Notes: All of the mine site is highly accessible to members of the public (who, in fact, use it at the moment).

Site No. 19(b) **Description**

Site Name: **Wheal Maria (Devon Great Consols) (Cu, As)**
Site Visit: 18/3/98 CB

O.S Grid Ref (SX) 416 738 SX47SW/504/1

Statutory Designation No Listed buildings (apart from mine captain houses), AONB

Brief site History:

The cutting of Gard's Shaft in 1844 at North Bedford (soon renamed Wheal Maria), saw the first discovery of what became the most productive lode in Europe. During the following year Main Lode was followed eastwards to Wheal Fanny, Wheal Anna Maria, Wheal Josiah and later in 1848, Wheal Emma. By 1846 two large water wheels had been erected at Wheal Maria, for stamping, crushing, hauling, and a 40" pumping engine. A new Count House, Smithy, Carpenters and Stables had also been built. A new 50ft water wheel was erected by 1847 for hauling ore up the deepening shafts (Gard's and Morris's Shafts), and the dressing floors extended. To reduce the expense of carting ore to Morwellham, a 4.5 mile standard guage railway was built from this mine (with tracks to nearby mines) to a point above Morwellham where a stationary 22" steam engine (built at the mine's foundry) and incline allowed the ore wagons to arrive at the quay. To reduce costs 'the Great Leat' was constructed (2 miles long and 18ft wide), by 1849 to power two (40ft by 12ft) water wheels, using flat rods to pump three shafts at Wheal Maria and Wheal Josiah (over 2160ft uphill). A 35ft x 45ft water wheel worked the foundry machinery, and water held at the (still extant) large reservoirs was also used by the foundry (employing 9 men and two boys in 1860), which maintained Consol's eight steam engines. By 1865 it was possible to walk underground for 2.5 miles from Wheal Maria to Wheal Emma. By 1872 only 16,392 tons of ore had been brought to surface (compared with 28,836 tons in 1857), and the ore price had slumped. Mundic was worked as well as ore and processed in its new arsenic plant after 1871, but by 1891, Wheal Maria was still sending ore from the 157 fathom level. After the closure of the mine in 1902, and the levelling of the mine's buildings, work resumed at Wh. Maria in 1923 for arsenic and tin (to supply the new arsenic works that were erected in 1921 at Wh.Anna Maria). Mundic mining was suspended by the start of 1925, the (second) arsenic refinery closing in 1930.

Main extant features:.

* High rear retaining wall and side wall of the mine's foundry, and wheelpit.
* Low linear walls (water tanks?) above retaining wall, nearby extant building with east gable, and well-preserved reservoir tank.
* Mine complex buildings have gone, Morris's and Gard Shaft not fenced, visible and choked, all in conifer woodland.
* Remnants of flue/sluice for leat nearby.

Condition:

As listed above, the engine house complex has been completely robbed, leaving only shaft sites (all in woodland). Remnants of a possible smelting site and a central flue or leat (part underground/ part surface), is visible.

Reclamation ideas:

* Vegetation clearance around low smelting features and leat/flue.
* Shaft treatment (fencing?) if public access permitted.
* Vegetation clearance along linear features, extant building and pond.

Remarks:

All consolidation works dependant on public access being permitted.

Site No. 19(c) **Description**

Site Name: **Wheal Anna Maria (Devon Great Consols) (Cu, As)**
Site Visit: 18/3/98 CB

O.S Grid Ref (SX) 426 732 SX47SW/504/5

Statutory Designation 1920's Arsenic Works and Chimney (SMR504/5/4) Listed II (5/117) AONB.

Brief site History: Work started at Wheal Anna Maria in 1845, presumably the cutting of Engine Shaft, and two years later extensive dressing floors erected, to which all the ore raised at Wh.Josiah (a distance of 210 fathoms) was transported by an incline railway. The two large water wheels described in the Wheal Fanny historical section (pumping shafts via long flat-rods from 1849), drained Engine Shaft and others. A year later a 50ft x 4ft water wheel was erected at the mine to work the new crusher and stamps. Consols new railway system (the only standard guage railway line to be owned and worked by a mine in the west country), commenced at Wh.Anna Maria, where large bins (holding up to 200 tons of ore) had been constructed, and a large coal yard for the Consol's eight steam engines. The combination of decreasing ore prices and reduced production, prompted a change of direction for Consols, which sensibly concentrated on arsenic rather than copper (prolonging its life for another 38 years). By 1869 the new arsenic refinery near Wh. Anna Maria produced 160 tons of refined arsenic a month (half the world's total supply at that time). The works were described in 1868 as having five calcining furnaces, three refining furnaces, and two separate flues (total length 1415m) to a 36m high stack. In their final form the works included arsenic condensers, seven calciners (including Oxland and Brunton types), three refiners, 1654.8m of flues, an arsenic mill driven by a steam engine, store buildings, cooper shops and changing houses, all covering 8 acres. Closure of the mine in 1902 was followed by almost complete demolition of all buildings. Just before 1921 the railway to Morwellham was relaid between Wh.Anna Maria and Bedford United as a narrow guage tramway. From 1921-22 a small arsenic works was built consisting of two Brunton calciners, a Flat bed reverberatory furnace, arsenic refiner, arsenic mill, steam engine and boiler house, crusher house, bottle furnace, arsenic condensers and flue with waterfall chamber and stack. An incline was built in 1922 to transport ore from Wh.Fanny to Anna Maria. By 1925 Wheals Fanny and Maria had closed, the refinery closing later.

Main extant features:

* Low segments of walling and short lengths of flue are the only remnants of the c 8 acre 1870's arsenic refinery.
* 1920's arsenic works with buildings as described above (incl flue/ stack).

Condition: Virtually all of the C19 mine buildings have gone. The small 1920's arsenic refinery survives, although the arsenic condensers have not fared well, during the intervening years. The stack and flue seem stable.

Reclamation ideas:

* Consolidate the 1920's arsenic works (Listed Grade II), after vegetation clearance etc, and the related flue and stack.
* Investigate whether it is feasible to excavate the arsenic works to reveal the structures.

Remarks: If footpaths and trail routes are to be constructed in Devon Great Consols, then the coverdown area may be suitable for use as viewing/ information/heritage site ?

Site No. 19(d)	**Description**
Site Name:	**Wheal Josiah (Devon Great Consols) (Cu, As)** **Site Visit: 18/3/98 CB**
O.S Grid Ref (SX)	430 736 SX47SW/504/6
Statutory Designation	No Listed buildings (apart from mine captain houses), AONB
Brief site History:	The cutting of Gard's Shaft in 1844 at Wheal Maria, saw the first discovery of what became the most productive lode in Europe. During the following year Main Lode was followed eastwards to Wheal Fanny, Wheal Anna Maria, Wheal Josiah and later in 1848 Wheal Emma. The main shafts were Field (45 fathoms), Richard's (98 fathoms) and Hitchen's (90 fathoms). A 40" pumping steam engine (of similiar specification to the Wh.Maria engine) was erected also in 1845, and a steam whim. The ore being taken by incline to the lower dressing floors at Wh.Anna Maria below. The 1849 new water wheels drained two shafts at Wh.Josiah (Richard's and Hitchen's Shafts). One of the large supply rerservoirs at Wh.Josiah (the natural site for locating them, as it was the highest point of the mine), was supplied via a pumping water wheel (near the Tamar), to work the mine's saw mills, a large hammer, lathes, and punching and cutting machines. By 1865 the deepest part of Wh.Josiah was 220 fathoms, and in later years a man engine was installed. At least another 40" engine was installed at this mine from Wh.Emma by this date, but the ore was beginning to run out. Attempts in the early 1870's to find tin beneath the copper lodes were made by deepening Richard's Shaft from 230 to 300 fathoms, without success. This mine presumably contributed arsenic to the original refinery, but does not appear to have been re-used in the later 1920's re-working of some of the upper levels of the other nearby sites.
Main extant features:	* Wheal Josiah Mine cottages (Listed Grade II). * Waste dumps, railway/tramway routes, reservoir ponds etc. * Engine Shaft visible as partially subsided fill with visible shaft timbers. * Low remnants of Hitchen's engine house. * Extant (railway ?) buildings (roofed) near terrace of miner's cottages.
Condition:	The waste dumps have been partially removed during the past eighty years. The railway/tramway routes are in a good condition through the woods but not in open areas. The reservoir ponds are the best preserved features of the mine (some of which still hold water). The low engine house remains are covered in vegetation and need to be conserved, as are the possible railway buildings. Approximately 95% of all surface mine buildings have gone.
Reclamation ideas:	* Locate and treat (if necessary) the main mine shafts. * Vegetation/tree clearance from archaeological features. * Consolidation works to the low engine house features.
Remarks:	Possible use of upper part of the site as car parking for people to access the different railway/tramway/leat 'heritage' routes that run through Devon Great Consols.
Notes:	See other sheets with reference to high visual amenity for the landscape along existing routeways, but low visual resource for upstanding archaeological features along these routes.

Site No. 19(e) **Description**

Site Name: **Wheal Emma (Devon Great Consols) (Cu,As)**
Site Visit: 19/3/98 CB

O.S Grid Ref (SX) 438 737 SX47SW/504/13

Statutory Designation No Listed buildings (apart from mine captain houses), AONB

Brief site History:

The cutting of Gard's Shaft in 1844 at Wheal Maria, saw the first discovery of what became the most productive lode in Europe. During the following year Main Lode was followed eastwards to Wheal Fanny, Wheal Anna Maria, Wheal Josiah and later in 1848 Wheal Emma (700 fathoms to the east). By 1850 Wh.Emma boasted a Count house, smithy, and carpenter's shop. In terms of machinery the mine had a steam whim and a 40" pumping engine. The new railway from the main complex passed south of the mine, and a new incline railway was built to connect to it. By the early 1880's the mine was producing more arsenic than copper ore. The 1884 OS map shows three complexes of engine houses: a pumping engine on the high ground at Thomas's Shaft (where the mine ancillary buildings were sited), the stamping/crushing engine with dressing floor near Incline Shaft (and large spoil dumps with tram lines), and at the bottom of the incline an engine house (winding) between two shafts (New Shaft and Railway Shaft). West of this latter site at the head of a tributary valley lies Agnes's Shaft and some settling ponds (with high reservoir walls and a winding tower). In an attempt to find tin under the copper lodes in 1883 (as at Wh.Josiah), Railway Shaft was deepened from 205 to 260 fathoms, without finding tin. Closure of the mine in 1902 brought about instant demolition of Wh.Emma's surface buildings. Copper precipitate works at Blanchdown (south of Agnes Shaft) carried on until 1940.

Main extant features:

* The cylinder bedstone and a wall remain at the winder engine site (both shafts are not visible at surface), at the bottom of the incline.
* The engine house complex at the top of the incline has also been mostly destroyed, leaving a few ancillary buildings (now roofless).
* The lower wall remnants of the stamping/crushing engine house are visible in the undergrowth and the site's reservoir pond.
* Two shafts south of the engine house, one open the other choked.
* Parallel to the well preserved incline route is a large mine spoil dump.
* Extant settling ponds and winding tower below Agnes Shaft (not visible).
* Extant but perhaps contaminated settling/precipitate tanks at Blanchdown.

Condition:

The engine house remnants are all sited in wooded areas and have overgrowth covering the building and area. One of the shafts is open (near Incline Shaft). A large part of the top engine house site has been built over by modern farm buildings. The linear mine spoil dump seems to be stable. Flytipping and farm refuse has been dumped over the northern end of the mine. The reservoir sites all appear to be well preserved. A white liquid emanates from the filled up settling/precipitate tanks at Blanchdown.

Reclamation ideas:

* Locate and treat (if necessary) the main mine shafts.
* Vegetation/tree clearance from archaeological features.
* Consolidation works to the low engine house features.

Remarks:

The railway route from Wh. Maria/Josiah to Wh. Emma could provide an excellent circular woodland landscape and industrial heritage walk.

Notes:

Part of a large complex of mine sites in the area.

Site No. 22	**Description**
Site Name:	**Bedford United Mine (Cu, As, W)** **Site Visit: 19/3/98 CB**
O.S Grid Ref (SX)	438 725 SX47SW/503
Statutory Designation	AONB
Brief site History:	This mine was a highly productive sett (Devon's third largest copper producer), with a recorded output of 66,000 tons of copper ore, and smaller quantities of arsenic, tin and wolfram. Re-started in 1841 (with documented origins from 1707), as an amalgamation of several old workings using adits cut into the hillside, namely: Wheal Marquis, Delve's Kitchen, and Ding Dong. Throughout the life of the mine waterwheels were used to pump out the deeper levels (a 45ft and 50ft wheel), from the mine's five lodes. A two mile leat supplied the water from the southern end of the Tavistock Canal. A new incline shaft was sunk in the 1850's (14ft by 5ft) which had a twin tramroad. In 1859 227 people were employed, and in the same year a connecting branch to the newly laid Devon Great Consols railway was constructed, upon which ore was taken to Morwellham's quays. In 1864 the mine was 100 fathoms below deep adit (48 fathoms), and hauled ore up the incline via a 16" steam engine. The company was reconstructed in 1877 and continued operating until 1890 when it closed. Further limited work was carried out above adit from 1915 to 1925, for arsenic and tin.
Main extant features:	* The centre of the mine was immediately north of (present day) West Gulworthy Farm. There are no extant building remnants (removed by 1906), apart from the converted count house. * Part of the boiler pond is extant, and the causewayed rail route to the Consols main line. * The large spoil heaps have been reduced and flattened to allow working space for the Tavistock Woodlands business. * The fate of the shafts are unknown.
Condition:	Modern barns are sited over the site of the mine buildings (apart from a couple of low walls. The reservoir pond and spoil heaps have been denuded and their shape altered. The shafts were not located.
Reclamation ideas:	* Locate shafts and treat if the public will have access to the site. * Clearance of the nearby Devon Great Consols railway route (and bridge under the road).
Remarks:	Utilisation of the Devon Great Consols railway as a 'linking' mine heritage trail, seems to provide an excellent opportunity for members of the public to view landscape industrial archaeology.

Site No 23(a,b) **Description**

Site Name: **South Bedford Mine and adit (Cu, Sn, Fe)**
Site Visit: 19/3/98 CB

O.S Grid Ref (SX) 434 718 SX47SW/511

Statutory Designation AONB

Brief site History: This mine lay at the western end of an east-west lode, which extended to East Wheal Crebor, south of Tavistock. Prior to the 19th century, surface evidence indicates the lodes were certainly worked from the back of the lodes, with later steam engines facilitating deeper workings. By 1850 the smaller mines were amalgamated into East Gunnislake (on the Cornwall side) and South Bedford. Between 1854 and 1871 the group returned 5,300 tons of copper ore, and some pyrite and tin. The mine is shown as disused on the 1884 OS map, with buildings close to the Tamar and related shafts, two main shafts and possibly three adits. North of the lower part of the mine and near the Tamar is the site of Ding Dong Adit (SX 4340 7205), which previously drained Ding Dong Mine. Lode back pits and shafts are the only remnants of this copper mine, but its drainage adit was used (and still is) to drain nearby mines (Wheal Impham and Wheal Luscombe).

Main extant features:

* The main complex of buildings are near Engine Shaft, close to the Tamar. These are relatively well preserved and appear to have contained a rotary steam powered winder and crusher engine.
* A well preserved cobbled floor near the open shaft with a low fence.
* Below the shaft is a substantial retaining wall with ore-shoots (and fake arched doorways), to load ore to barges for smelting.
* North of the mine site is Ding Dong Adit, with a pipe and water wheel contraption attached. The adit is open and still drains the mines.
* East of the mine site is a detached chimney, suggesting either arsenic refining or a steam engine in the eastern section of the mine.

Condition: The mine buildings consist of substantial wall remnants, and the ore-shoot wall can all be viewed from Gunnislake. Vegetation and the relatively inaccessable nature of the mine site has ensured its survival. The chimney is 3/4 extant, but the flue is missing. Other building sites can be seen near the main complex as well as earlier lode back pits and costean trenches. The Gard Shaft site was not examined.

Reclamation ideas:

* Ivy and vegetation needs to be removed from the mine buildings and chimney to allow survey and consolidation.
* Remove excess vegetation and fly-tipping from site.
* Treat open shafts and locate others.
* Place a grille in the Ding Dong Adit.
* Open up the river towpath for public access to the mine.

Remarks: There is an excellent river towpath running from Gunnislake bridge for an unknown distance past the mine site, which could be used by the public as a footpath along the river and provide access to the mine.

Notes: This site has high potential for public presentation if public access can be assured.

Site No. 48 **Description**

Site Name: **Russell United (Wheal Impham) (Cu, Sn)**

Site Visit: 19/3/98 CB

O.S Grid Ref (SX) 4385 7115 SX47SW/521, 531

Statutory Designation AONB

Brief site History: Wheal Impham is an old mine referred to in 1724 as a copper mine out of which 100 tons of ore had been produced. The mine still operated between 1799 to 1820 but had closed by 1884. It seems to have worked a single east-west lode utilising a single adit, whose portal is near Chimney Rock, at the side of the Tamar. Russell United Mine appears to be a much later mine, operating from the mid 1850's to the late 1880's, and was sited to the south of Wheal Impham. There seems to be no main building complex, rather isolated shafts with surrounding spoil dumps. Production figures are available from 1852 to 1875, with 1,230 tons of copper ore realising £3,880 in 1875.

Main extant features:

* At Wheal Impham, openworks, shafts and processing areas were located as part of this mine during the site survey.
* Due to the nature of the site it was very difficult to find surface evidence of this mine (steep and deeply wooded valleys covered with conifer plantations).
* A large spoil heap and low remnants of a building were found, but none worthy of consolidation works.

Condition: The remnants of Wheal Impham are preserved as dumps, lode-back pits and some shafts. A shaft (and stone collar) with possible horse whim platform/processing area is sited near a footpath used by the public. Further site investigation (with the 25" OS 1884 map), will need to be carried out before other sites are located and assessed.

Reclamation ideas:

* Define footpath/trail routes and locate nearby shafts etc.
* Treat (fence or rebuild collar wall) shaft.
* Locate and treat other nearby shafts to existing and proposed trails.

Remarks: This site should be re-graded to a 'C' site until such time that a footpath trail route can be formalised, allowing a strategy for this mine site to be formulated.

Notes:

Site No. 49 **Description**

Site Name: **Wheal Luscombe (Cu)** **Site Visit: 19/3/98 CB**

O.S Grid Ref (SX) 442 719 SX47SW/516

Statutory Designation AONB

Brief site History: East and South Luscombe Mines were worked by following the lode back from the steep Tamar slopes eastwards. Wheal Luscombe (East) was, according to tradition, the first mine in Devon to possess a steam engine by 1803 (this site has been possibly identified by the author). In 1816 to facilitate drainage, the workings were connected to Ding Dong Adit, but the lode soon after encountered elvan. As East L(i)scombe the mine returned 3,269 tons of copper ore in the years 1821 to 1834. At a later period the Luscombe North and South Lodes together with Chimney Rock Lode (Wheal Impham), were included in the sett of Bedford United. According to Dines (1956, 670), the mine's output to 1828 (when it ceased operating) was 3,327 tons of copper.

Main extant features:

* A large deep feature is labelled by the OS as a 'Quarry'. It is likely, as it lies on the east-west lode line (c15m deep, c60m long and vertical), that this feature is a gunnis or open work, probably of late medieval date. It may well have been re-used as a quarry in the late 19th century.
* Many examples of early copper mine lode-back/costean pits.
* Two open shafts, both fenced (Engine and William's Shafts). Engine Shaft not only has evidence of the siting of perhaps Devon's first engine house (balance bob slot in the shaft collar indicative of a pumping engine), but also an excellent horse-whim site.

Condition: The gunnis has near vertical sides, with rubble and overgrowth at its base. The two main shafts are open, but fenced with barbed wire. Engine Shaft has a horse-whim in an excellent condition. The site is in woodland, no doubt ensuring its survival.

Reclamation ideas:

* Assuming the site can be grant aided, the gunnis/quarry should be fenced, and entrance closed off.
* The open shafts should be fenced more permanently, and horse-whim fenced.
* Remfrey's Shaft (sited east of the woods in a small plantation, should be located and if necessary treated.

Remarks: This site may well not be applicable for English Partnership funding, given that it is sited away from the existing proposed footpath routes.

Notes:

Site No. 65	**Description**
Site Name:	**Gawton Arsenic Works and Mine (Sn, Cu, As)** **Site Visit: 9/3/98 CB**
O.S Grid Ref (SX)	452 689 SX46NE/527
Statutory Designation	SAM 1024 (main building complex), Site of Local Antiquity (part)
Brief site History:	Prior to construction of the later Arsenic works, the site was a mid 1840's Copper mine. Falls in the price of Copper ore (1860's onwards) meant arsenic production was more profitable. By 1875 the site included an engine house, smithy, quay, stables, cooperage and limekilns with stores and housing. In 1880 construction of arsenic plant additional to the copper mine site (King Shaft), included a 300m length of arsenic flue to the new highly visible leaning chimney stack and a new furnace and refinery complex. In 1894/5 there were further major additions to the site with a new engine house with crusher, grinder and jigger. The flues were also extended (second flue) with new refineries and Brunton calciners (1897). Some of these buildings used recycled burnt ore in the form of blocks. By this date the mine was second only to Devon Great Consols for its production of refined arsenic (totalling 70% of the world's production). There are four main shafts (Engine, Bayly's, Fuller's and Pearce's). The mine closed in 1903.
Main extant features:	* Two engine/boiler houses (pumping and crushing). * Long arsenic flues and chimney. * Quay remnants with cooperage, limekilns and furnace/refinery. * Mine captain's house and nearby store houses. * Remnants of four arsenic calciners. * Large spoil heaps.
Condition:	The site and buildings have been affected by dense overgrowth. Small trees growing on buildings are affecting their structural integrity. The long arsenic flues are in places, ruinous. The upper sections of most buildings are weathered and in many instances collapsing. Most of the buildings (apart from the concrete ones) have lost their surface lime mortar pointing, due to the damp conditions and weathering.
Reclamation ideas:	* Ivy and vegetation needs to be removed from the site and buildings to allow structural survey. * Structural remedial works are necessary to most of the buildings. * Re-pointing is necessary to most wall faces of most buildings. * Consolidation and repair is necessary to long lengths of the arsenic flues and the top of the chimney stack.
Remarks:	If this site is consolidated and made safe and accessible to the public, it would be of great heritage interest.
Notes:	Arsenic (or copper precipitate) contamination will need to be assessed. Water running through the centre of the site is curiously turning stones green! The site is accessible via public footpaths and the River Tamar. Good archaeological survey by Exeter Archaeological Unit (1989).

Site No. 69	**Description**	
Site Name:	**Rumleigh Brickworks**	**Site Visit: 9/3/98 CB**
O.S Grid Ref (SX)	448 697 SX46NW/546, Site of Local Antiquity (part)	
Statutory Designation	AONB	

Brief site History:

One of the pioneers of brick and tile making was Thomas Westlake, who in addition to the factory at Calstock, took over the Gunnislake Bealeswood works, until he concentrated production at his Rumleigh factory near Bere Alston. Here, a deposit of boulder clay produced a finer-quality brick. The works, with the Hoffman Kiln (central stack) and engine house for working the clay and nearby clay pit are all shown on the OS 1883 map. The site was subsequently used for arsenic refining, as Westlake continued brick manufacture from his Gunnislake and Calstock works. The site is shown as disused on the OS 1907 map.

Main extant features:

* Buildings not shown on the 1883 OS map (arsenic refining related?).
* Two chimney stacks and related buildings (one an engine/boiler house).
* Substantial remnants of the Hoffman kiln (without its stack).
* Other low remnants of buildings shown on the aerial oblique view of the site (and Gawton), after the turn of the century (Booker 1974, 53).
* Clay pit(s).

Condition:

The site is very flooded in its southern half (clay pit and building sites), making site inspection and building interpretation difficult. The remainder of the site has been used by the site owners as a car scrapyard. The interior of the kiln has been used as a car parts store. Buildings are covered with vegetation/ivy and some have been affected structurally by the continual wet ground foundations.

Reclamation ideas:

* A drainage scheme to dry out the southern half of the site, allowing public access and the buildings to consolidate their foundations.
* Vegetation removal and consolidation of existing buildings and chimneys.
* Consolidation and repair of the Hoffman kiln (possibly the best example of its type in the south-west).

Remarks:

Highly visible site on Gawton Marsh from both the River Tamar and Okel Tor Mine (east of Calstock), and the Tamar Valley Discovery Trail. Site by association could be part of any reclamation works to nearby Gawton Mine.

Notes:

Priority for public presentation.

Site No. 70	**Description**	
Site Name:	**Ward Mine (Pb)**	**Site Visit: 11/3/98 CB**
O.S Grid Ref (SX)	427 687 SX46NW/512	
Statutory Designation	AONB	
Brief site History:	Ward or South Ward Mine is located on the northern end of the eastern most north-south lead/silver lode. In 1832 the mine was advertised for sale and included an engine of 60hp. The mine was reopened in 1869 and continued in operation until 1876. Engine Shaft (sited 5m south of the 24" rotary engine house (winding and pumping), is sunk vertically to the 60 fathom level and thence to the underlie to the 90. This was never a successful mine, with recorded production for the years 1873-6, being 130 tons of lead ore and 390 oz of silver.	
Main extant features:	* Engine and boiler house extant and converted to living accommodation. * Chimney stack has been demolished, but flue is visible under the access road to a nearby house (converted smithy, near the former dressing floor). * Engine Shaft is visible as a converted pond (cap detail not known). * There may be another shaft in the spoil heap south of the engine house, presently used as a septic tank.	
Condition:	The 'dry' pond feature has structural cracks and lies immediately adjacent to the public footpath (which runs through the owners front garden). The engine and boiler house are in a good condition.	
Reclamation ideas:	* Engine Shaft needs to be investigated given its signs of its instability, and possibly made safe due to its proximity to the public footpath, although it is sited in private property.	
Remarks:	A good example of a small 19th century lead mine, with extant engine and boiler house (albeit converted).	
Notes:	The public footpath passes between the front of the engine house and shaft.	

Site No. 71	**Description**
Site Name:	**Tamar Valley Mine (Buttspill-Ag, Pb) Site Visit: 11/3/98 CB**
O.S Grid Ref (SX)	437 678 SX46NW/523, Site of Local Antiquity (part)
Statutory Designation	AONB
Brief site History:	This mine site marks the northern end of a north-south silver/lead lode, which starts near South Tamar Consols (south of Weir Quay). The ore had a high silver content at surface with lead pre-dominating at depth. Documentary evidence confirms that the area was mined for silver (financed and operated by the crown), from c1290. The mine certainly was worked in Elizabethan times, and further documentary evidence suggests its operation in the 1780's. In the 19th century it was documented as being operational from the early years (to a depth of 67 fathoms). By 1843 under the name Green Valley Mine an engine was erected and the 17 and 27 fathom levels investigated. By 1855 the mine was re-opened as Berealston United and a smelting furnace erected. The lode was developed to a depth of 47 fathoms. From 1866 to 1876, (in its last six years produced 650oz silver and 620 tons of fluorspar), and a further 90 tons of fluorspar in 1885-6 (sold chiefly to French buyers for glass making).
Main extant features:	* Shafts (some fenced) and lode-back pits along the bottom of the valley are indicative of medieval/post-medieval mining. * Stamping/winding (rotative?) engine house partially extant with full height chimney and 3m high boiler house walls. * Site of smithy and magazine not visible in nearby working area. * Capstan site visible north-west of engine house. * Related shafts not visible (presumably choked). * Large spoil heap north and west of engine house obscures probable furnace site.
Condition:	The engine house and chimney stack are densely covered with ivy and overgrowth, but appear to be stable. Shafts near the mine cannot be located but the five sites are located by the OS (1883 1:2500). Shafts in the valley are all choked. The spoil heap has been partially vegetated, and there is fly-tipping near the engine house.
Reclamation ideas:	* Ivy and vegetation needs to be removed from the engine/boiler houses and chimney to allow structural survey and consolidation/re-pointing works. * Remove excess vegetation and fly-tipping from site. * Fence the valley shafts (east of the footpath). * Footbridge over the river from the footpath to access the mine.
Remarks:	The ancient surface mine site and the later 19th century engine house are all visible and adjacent to the public footpath.
Notes:	Existing footpath route is publicised in the Bere Ferrers Parish Footpath Guide. This is a mine set in a scenic valley, will used by locals. This is a priority site.

Site No. 73 **Description**

Site Name: **Lockridge Mine (Ag, Pb)** **Site Visit: 11/3/98 CB**

O.S Grid Ref (SX) 439 665 SX46NW/511

Statutory Designation SSSI, AONB

Brief site History:

This mine site marks the centre of the eastern north-south silver/lead lode, which starts near South Tamar Consols (south of Weir Quay). The ore had a high silver content at surface with lead pre-dominating at depth. Documentary evidence confirms that the area was mined for silver (financed and operated by the crown), from c1290. The mine certainly was worked in the early 19th century. In 1845 it was documented as being amalgamated with Whitsam and Furzehill under the name of East Tamar Consols. By 1847 six shafts had been cleared to depths of 30 to 40 fathoms below adit. At Lockridge (or Goldstreet) the shaft was 54 fathoms deep to connect with a level heading towards it from Whitsam. Flooding of the South Tamar Mine in 1856 (working the southern end of the lode), hastened the end of this mine (as the workings were connected). Work concentrated at Furzehill and Lockridge, but by 1861 the 50" engine was unable to cope with the rising water. By 1861 the East Tamar group as a whole had returned 2,580 tons of lead ore, 19,530 oz of silver and over 1,400 tons of fluorspar.

Main extant features:

* Remnants of mine building (pumping engine?), with concrete additions.
* Fully extant chimney (with false windows), detached from engine.
* Associated building (ancillary boiler house?).
* Flue cut through upslope from engine to chimney site.

Condition:

The 2.0m high remnants of the engine house walls seem to be stable. The chimney stack appears to be stable but the partly fallen down tree leaning against it (on its weather side) may well push it over. A small amount of ivy covers the upper section of the stack. A small section of flue part way upslope has collapsed, and the area temporarily fenced.

Reclamation ideas:

* Ivy, vegetation (and the tree) needs to be removed from the chimney to permit structural survey and from the engine house to allow consolidation and re-pointing works.
* Confirm the location and structural details of the shaft plug/cap.
* Re-build the collapsed section of boiler flue and cover.
* Remove excess vegetation and fly-tipping from site.

Remarks:

It is extremely urgent that the fallen tree leaning against the chimney is removed. This site is next to the Tamar Valley Discovery Trail, and so should have a high priority for safety works.

Notes:

The industrial remnants are very visible from the footpath trail route, and the site used by locals for walking, therefore a priority site for consolidation and safety works.

Site No. 74 **Description**

Site Name: **East Tamar Mine (Furzehill) (Ag, Pb)** **Site Visit: 11/3/98 CB**

O.S Grid Ref (SX) 517 629 SX46NW/538

Statutory Designation AONB

Brief site History:

This mine site covers the southern section of the eastern north-south silver/lead lode, which starts near South Tamar Consols (south of Weir Quay). The ore had a high silver content at surface with lead predominating at depth. Documentary evidence confirms that the area was mined for silver (financed and operated by the crown), from c1290, with this mine specifically mentioned in 1305 producing (with three others on this lode) a total of £1775 worth of silver and £810 worth of lead. The mine certainly was worked in the early 19th century. In 1845 it was documented as being amalgamated with Whitsam and Lockridge under the name of East Tamar Consols. By 1847 six shafts had been cleared to depths of 30 to 40 fathoms below adit. At Furzehill the shaft was 46 fathoms deep, but by 1854 the main shaft had been deepened to 112 fathoms. The mine was equipped with a 58" pumping engine, and a 36" winding and stamping engine operating 24 head of stamps. Flooding of the South Tamar Mine in 1856 (working the southern end of the lode), hastened the end of these mines and work concentrated at Furzehill and Lockridge. By its closure in 1861 the East Tamar group as a whole had returned 2,580 tons of lead ore, 19,530 oz of silver and over 1,400 tons of fluorspar.

Main extant features:

* A long narrow section of lode back pits and possibly shallow medieval shafts (and 19th century air shafts) following the lode.
* Extant full height chimney.
* Remnants of an engine house and boiler house (east walls). Related masonry have been buried under dumped subsoil/shillet.
* Large spoil heap south of the mine buildings.

Condition:

The medieval/post medieval lode back mining strip has fly-tipped debris along its course. The chimney stack seems to be stable, but covered with vegetation. The engine house walls appear to be stable. The spoil heaps are eroding away and may well be toxic.

Reclamation ideas:

* Clear fly-tipping from the surface mining strip and public footpath.
* Vegetation needs to be removed from chimney to permit structural survey.
* The engine and boiler house needs to be excavated to allow consolidation and re-pointing works.
* Confirm the location and structural details of the shaft plug/cap.

Remarks:

This long section of mine demonstrates to good effect surface mining during the past 600 years in the Bere Ferrers peninsula. A public footpath or roads run along its entire course.

Notes:

A public footpath runs along the lode line. This seems to be a good route to have an extension/alternative to the Tamar Valley Discovery Trail. Again, a priority site.

Site No. 76 **Description**

Site Name: **Weir Quay area (Tamar/Union Smelting Works)**
Site Visit: 11/3/98 CB

O.S Grid Ref (SX) 4340 6500 SX46NW/509, 510

Statutory Designation Union Smelting Works Listed II (2/26), AONB

Brief site History: Ores from Tamar Consols and other local mines were smelted at these works. Built in the 1820's but acquired by PN Johnson (a metallurgist as well as engineer) in 1842, who extended and re-equipped them, possibly to specialise in the smelting of lead and silver ores. Eighteen furnaces could smelt well over 300 tons of lead ore a month and employed 90 men. The deep water berth at Weir Quay, was deepened to take vessels of 400 tons, bringing South Wales coal, and ore from Spain, France, Wales and N. Ireland. In 1850 the new Pattinson process was introduced, enabling much smaller amounts of silver to be extracted from lead ores. In 1852 the Tamar Smelting Works were sold by the mine, and closed in c1860. The adjacent Union Smelting Works was built in 1849 and operated until 1896. The smelting house was re-used as a jam factory (the troughs which had held the refining furnaces made excellent coppers for boiling Tamar Valley fruit).

Main extant features:

* Tamar Smelting Works - the main smelting building has gone but evidence of the furnaces and flues can be seen in the site's north wall. The paved yard and ore store buildings can be seen, with the stables and other buildings adjacent to the road converted for domestic use. The smelting site now lies across private house gardens.
* Union Smelting Works - The extant smelting house, adjacent assay and count house grouped around a cobbled courtyard has been described by English Heritage as; *'the most complete survival of the 19th century smelting industry in the Tamar Valley'*. All are roofed with some original fixtures and fittings internally, but a complete survival externally.

Condition: Remnants of the Tamar Works north wall (containing flues and furnaces etc), and paved areas can be seen from the quay and road. Most of the site now lies in different private hands. A portion of ground between the two smelting works (containing flues etc) is overgrown and needs clearance. This part of the site is visible from the road.

Reclamation ideas:

* Vegetation clearance of the site for the portion of ground visible to members of the public, and perhaps consolidation works ?
* It is doubtful if the various landowners of the main Tamar Smelting Works site would permit unlimited public access, and so grant aid for consolidation works and public information about the site may be limited.

Remarks: This site is highly visible from the adjacent Tamar Valley Discovery Trail, and this interesting complex would warrant interpretation for members of the public.

Notes: A very interesting complex of smelting works for industrial historians. This site needs further consideration. It is very important and every effort should be made to consolidate it.

Site No. 77 **Description**

Site Name: **North Hooe Mine (Tamar Consols) (Ag, Pb)**
Site Visit: 11/3/98 CB

O.S Grid Ref (SX) 427 661 SX46NW/525

Statutory Designation AONB

Brief site History: Both North and South Hooe Mine worked the southern half of the western north-south silver/lead lode (Ward Mine working the northern end of the lode). These lodes were worked at surface from the late 13th to the late 15th centuries. Although South Hooe Mine was far more prosperous than its northern namesake, both were operating by 1809 and both purchased by the Tamar Silver Lead Co. in 1835, of which Percival Norton Johnson was manager, a great engineer and innovator. Seven years later North Hooe was reopened, and reached its peak production in 1846 of 1,200 tons of silver-lead ore. The shaft was sunk to only 110 fathoms below adit, with levels every ten fathoms. The engine pumped water to South Hooe mine for the dressing floors. The mine's machinery was sold in 1855, but the workings re-investigated in 1886 and 1906, both unsuccessfully.

Main extant features:

* Pumping engine house, with nearby Count house/smithy.
* The main shaft appears to have been capped with concrete, and used as a source of water (with the balance bob box visible).
* Chimney and boiler house have gone but the reservoir site is visible.
* East of the engine house is the dressing floor area and spoil dump which may well have contained a set of stamps (possibly worked by flat rods from the pumping engine).
* Between the two sites is surface evidence of a tram road and a small quay excavated out of the rock at water level, from which a small pier seems to have been built (to take the ore by barge to Weir Quay for smelting).

Condition: There are structural concerns with the engine house (nearly full height) where the wooden lintels have rotted, removing large sections of walls above, at the north and north-west corners. Vegetation and trees cover the building, inside and out. The nearby mine building has fared better with an intact north gable and lower south gable and side walls. The balance bob box is in good repair although its rear wall is missing.

Reclamation ideas:

* Ivy and vegetation needs to be removed from the engine house to allow a structural survey and consolidation/re-pointing works.
* Remove excess vegetation and fly-tipping from site.
* Confirm the structural details of the shaft plug/cap.

Remarks: One of the few nearly full height engine houses remaining in the Tamar Valley. The site is very close (100m) from the Tamar Valley Discovery Trail, and demonstrates the extraction, processing and export of the ore for smelting to Weir Quay.

Notes: The site is close to existing footpaths, the Tamar Valley Discovery Trail and the site provides a beautiful walk through the woods to South Hooe Mine. Therefore, this should be a priority site.

Site No. 78 **Description**

Site Name: **South Hooe Mine (Tamar Consols) (Ag, Pb)**
Site Visit: 11/3/98 CB

O.S Grid Ref (SX) 425 657 SX46NW/508

Statutory Designation AONB

Brief site History: Refer to North Hooe Mine for pre-19th century background. Between 1784/5 this mine was recorded as producing 6500oz silver. The richest lodes lay south of the mine under the Tamar. The mine's acquisition in 1835, managed by PN Johnson, was to ensure ore production until 1876 (producing as Tamar Consols) 326,300 oz of silver and over 9000 tons of lead, from its maximum depth of 260 fathoms. Between 1879 and 1882 nearly 800 tons of fluorspsar was produced. This mine is one of the few which had an underground steam engine sited at the bottom of a long 25° incline (115 fathoms down), to aid winding of the ore up the 1680 ft long incline. By 1842 there were seven steam engines (three pumping and three steam whims). A year later a 14" engine had been erected to haul ore up the incline. By 1852 over 200 people were employed at the mine, and nearly £44,000 had been paid out in dividends. In 1861 the mine was described as the deepest lead mine in England. Operations finally ceased in 1885 (see Tamar Smelting Works, used to smelt its ore and also owned by the mine).

Main extant features:

* The site stretches along the shoreline, its northern edge cut into the bedrock (on the eastern side of the mine). At this site an engine house is located, its beam wall seems to be at full height, but the rear wall is missing (the shaft appears to be choked, with a dressing floor nearby).
* Low boiler house walls are visible on the eastern side of the engine house, and other related remnants of mine buildings in proximity.
* At the western side of the mine a drainage adit is visible where it outflows into the Tamar. Nearby are spoil heaps and features that appear to be denuded reservoir ponds.

Condition: The spoil heaps are covered with vegetation, and the reservoir ponds partly destroyed at the western half of the mine. The eastern half appears to contain the mine building remnants. The engine house is partially covered with vegetation, but its structural condition could not be closely assessed. Other mine building remnants can be seen but they all appear to be sited in the garden of a private house.

Reclamation ideas:

* Ivy and vegetation need to be removed from the engine house to allow a structural survey and consolidation/re-pointing works.
* Confirm the structural details of any shaft plug/cap.

Remarks: The western part of the mine does not appear to be near a footpath or open for public access. The eastern section with the engine/boiler house is visible from a public footpath but appears to be sited in private property.

Notes: Further archaeological assessment would be necessary for this important mine.

Site No 80(a,b)	**Description**
Site Name:	**Lopwell Mine (Wheal Maristow) (Ag, Pb)** **Site Visit: 9/3/98 CB/A.Sherrell**
O.S Grid Ref (SX)	**80A** SX 471 648 SX46SE/104 **80B** SX 474 653 SX46NE/529
Statutory Designation	AONB
Brief site History:	In 1294 (four years after the first documentary reference for silver/lead mining at the Bere mines), 370lb of silver ore was sent to the king from Martinstowe (Maristow), where there was probably a quay. Three years later silver worth £4046 and £360 worth of lead was sent. At this time it appears the quay at Maristow was as important as Weir Quay and Hole's Hole, for the import/export of mine products. Surface mining for the silver/lead must have followed the north-south lode in the Tavy valley. Later post-medieval mining saw the erection of a steam pumping engine by 1822 and a 400yd long flue to the chimney (out of sight of the landowner's house). The dressing floors and small lead smelter were located a little way upstream. Engine Shaft was sunk to 40 fathoms at which depth levels were driven 30 fathoms north and 100 fathoms south. Production figures and closure date are not known.
Main extant features:	* (80A) Access/drainage adit cut into the rock face near engine house. * Full? height engine house (beam wall) with boiler house lower walls. * Working area and building to the north near a mine access road. * Quay wall visible at Tamar edge, with ore shoot retaining wall and processing site south of engine house. * Open shaft to water at depth of c10m below surface level, with timber staging visible. * (80B) Large shaft with substantial square stone collar wall. Stone possibly robbed from nearby rectangular rock-cut, which may have sited the engine house. * Nearby mine building (smithy?) with intact south gable and side walls.
Condition:	(80A) The engine house is obscured for its upper half due to dense vegetation, but appears to be structurally sound. The quay below the engine house has been mostly washed away, and the nearby ore shoot and retaining wall is slightly leaning at an angle. The processing area to the south is densely overgrown. (80B) The collar wall is in a reasonable condition and the shaft seemingly choked at 5.0m below ground level. The nearby mine building is also overgrown but stable.
Reclamation ideas:	* Ivy and vegetation needs to be removed from the engine/boiler house and mine buildings to allow a structural survey and consolidation. * Remove excess vegetation and fly-tipping from sites. * Confirm the structural details of any (collar) shaft plug/cap. * Investigate other nearby shafts (80B). * Grille engine shaft and the adit entrance.
Remarks:	80A site is next to the Tamar Valley Discovery Trail and highly visible. 80B is also next to tracks in woods that show evidence of old processing sites/shafts.
Notes:	Possible high priority for reclamation safety works, dependent upon access.

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Both Cornwall and Devon's Sites and Monuments records were consulted during this project. Details of Listed buildings and Scheduled sites in Devon were provided by West Devon Borough Council.

9 CAU Archive

The Archive produced during this project has been incorporated into the Cornwall and Isles of Scilly Sites and Monuments Record (SMR) housed at the Cornwall Archaeological Unit, Old County Hall, Station Road, Truro, Cornwall. Historical background information and records gained from site visits in Devon have been forwarded for inclusion in Devon's Sites and Monuments Record, Environment Section, County Hall, Topsham Road, Exeter, Devon. The records held in Cornwall consists of the following:

*	Photographs (Cornwall)	GCS 22473 - 22515
*	Photographs (Devon)	GBP 756/13-35 GCS 22985 - 23036
*	Project Information	Folder A 3017/1997066 (Cornwall) and SMR Relevant folder (Devon) and SMR
*	Computer Report File name	Sites/ Sites Q-T/ STRTREP.SAM
*	Other info. etc.	SMR Tamar Valley LRF (Cornwall) SMR Tamar Valley LRF (Devon)

Devon Great Consols calciner labyrinths

Appendix
Location map of mine sites