

SITE

Name: Devon Great Consols

Parish: Gulworthy

Local Authority: West Devon

National Grid Ref:

OS Sheets:

Locality Description: Disused mine complex located on the E side of the River Tamar, opposite Gunnislake.

Nature and Status of Site: The site lies within the [Cornish Mining World Heritage Site](#) and includes two County Geological Sites (Wheal Anna Maria CGS and Rementor Mine CGS) (www.devonrigs.org.uk) and the Devon Great Consols [Site of Special Scientific Interest](#) (SSSI).

Summary of Geological / Geomorphological Interest: The largest mine in Devon, once the highest producer of copper and arsenic in Devon and Cornwall and, indeed, for a while, in the whole world!. The main lode was followed for a distance of around 4 km and was so productive that it became necessary to construct a mineral railway direct to Morwellham Quay to transport the ore and also to construct facilities there specifically for its handling.

Up to 1300 persons were employed and the original sett contained five large mines along the two-mile lode. Wheal Maria, in the west, was the site of the first discovery and was so prolific that ore was being mined more quickly than it could be moved on! Copper to the value of over £1 million was produced in 21 years and shares in the company changed hands for as much as £800 each (Richardson, P.H.G. 1992. Mines of Dartmoor and the Tamar Valley after 1913. Devon Books). Copper production continued until about 1880, with arsenic also being an important product from 1865 until 1910. Production continued in a small way until 1925.

Despite extensive reprocessing of the dumps of the Devon Great Consols complex, significant areas of geological material remain, including evidence of both copper and arsenic mineralisation, including in the Wheal Anna Maria CGS. The Devon Great Consols SSSI, however, lies on a parallel lode with mainly iron ore mineralisation.

South of the Devon Great Consols complex lies Frementor Mine CGS-, developed in the only part of the Gunnislake granite mass to cross the Tamar into Devon. The granite here includes well developed greisen veins and the mine worked a distinct tin-tungsten deposit.

Safety Considerations: Devon Great Consols will be open to public access via the Mining Heritage Project in early 2009, however, currently there are massive safety issues at the site. The area includes extensive mine workings, including shafts, adits and open excavations. Potentially dangerous buildings also remain and arsenic contamination is extensive. Therefore, visitors should observe sign posting and keep to marked trails. Visits to other areas of the site may require permission. For an update of the projects progress, please visit www.tamarvalleymining.org.uk/.

Educational Age Groups: AS/A2 Level/College Students, Undergraduate University research, professional or amateur geologist.

Parking and Access: For bus and train timetables, visit www.traveline.org.uk. Limited parking is available in the area and the site is best accessed along public footpaths.

Contact: Tamar valley AONB Service www.tamarvalley.org.uk for further information regarding trails and access.

The Cornwall and West Devon Mining Landscape World Heritage Site (online) available at www.cornishmining.org.uk

References:

BULL. B.W. 1982. *Geology and Mineralogy of an area around Tavistock, SW England*. Unpublished PhD thesis, University of Exeter.;

DINES, H.G. 1956. The metalliferous mining region of South-West England – Volume 2. *Memoirs of the Geological Survey of Great Britain, England and Wales*. HMSO. London.

PAGE, K.N. 2004. *Geodiversity Audit and interpretative review of the mining districts of the Tamar and Tavy rivers in West Devon: Part 1 – Geodiversity Audit and selection of County Geological Sites*. Report to Devon County Council, 92pp.

STEWART, R.J. (Ed) 2003. *Devon Great Consols: A collection of contemporary articles and reports*. Tamar Mining Press, Calstock, 60pp;

SPARROW, C. and WILKINS, J. 2001. *Devon Great Consols & Bedford United – Mineralogical Report*. A Report to Cornwall County Council. Cornwall Environmental Consultants Ltd., CEC 1447 (11pp + Appendices).

Online References

The Cornwall and West Devon Mining Landscape World Heritage Site (online) available at www.cornishmining.org.uk

For visitor information about the Morwellham Quay heritage site go to <http://morwellham-quay.co.uk/>

Detailed Geology:

Wheal Anna Maria CGS (SX42677367): The main workings at Wheal Anna Maria were on the Devon Great Consols Main Lode, the largest sulphide deposit in south-west England. The lode was 2 m to 10 m wide, with a centre dominated by chalcopyrite, with pyrite, quartz, chlorite 'peach' and more locally fluorite and siderite. The margins of the copper-rich lode were dominated by arsenopyrite. There appears to have been little development of secondary copper minerals. At least two other lodes were worked in the Wheal Anna Maria sett, at least one of which, South Lode, was a branch of Main Lode. Site (a) to the north of the CGS admirably represents the generally mineralogy of Main Lode and has remarkably survived later reprocessing (see below) – the tip yields common chalcopyrite, with associated pyrite and arsenopyrite, often in a quartz or quartz-chlorite veinstone. Localised blue and green crusts represent the development of secondary copper minerals within the spoil, and not the original mineralogy of the lode, however.

Area (b) to the south, in contrast, is dominated by large rock fragments, typically with brownish weathered surfaces, and yielding common samples of arsenopyrite-rich veinstone - thereby apparently providing a contrasting mineralisation phase. Additional minerals recorded in Area (b) include quartz, massive fluorite, siderite, chalcopyrite and scorodite. Mineralogical analysis of samples from boreholes in the Wheal Anna Maria Sett, probably also from within area (b) at 4276733 - and not therefore on Main Lode - identified arsenopyrite, chalcopyrite, pyrite, galena and sphalerite in quartz-chlorite gangue, with a vuggy centre to the lode containing quartz, fluorite, dolomite, siderite and rare childrenite. Matildite and bravoite also are recorded from 'Devon Great Consols' and ?brochantite and 'iron sulphate' have been noted forming in dump material. Notably, some underground workings have survived and are being surveyed by specialist groups. The country rock belongs to the Tavy Formation (Upper Devonian), and lies within the metamorphic aureole of Gunnislake granite mass (adapted from Page 2004).

Fremontor CGS (SX42567254): This former tin and tungsten mine was initially worked as an opencast within the only part of the Gunnislake granite body that crosses the Tamar into Devon. The deposit showed a well developed zonation and comprised quartz veins 5-15 cm wide, with cassiterite, which unite into a 0.6-0.9 m lode. The western part of the workings include a small but deep quarry with an excellent development of parallel greisen veins (Tamar-Tavy Geodiversity Audit Site 106.2), apparently similarly orientated to the east-west lode. These veins appear to have yielded wolframite, quartz, arsenopyrite, chlorite and fluorite. Confirmation of this mineralisation is available amongst loose material, which occasionally shows small grains of cassiterite within the altered (i.e. greisenised) granite bordering a central quartz vein. Purple fluorite is also seen in this context. The unaltered granite is a typical white biotite granite with relatively small feldspar phenocrysts. The entrance to the quarry breaches an adit and small stope on a gossany quartz-rich c. 15cm thick, sulphide-bearing vein. An adit mouth is present a short distance to the east and a second, smaller quarry some metres further. Around 100 m to the east of the first quarry, an overgrown shaft appears to be present on the south side of the forestry track. Additional minerals recorded from the site include chlorite, sericite, arsenopyrite and chalcopyrite, with rutile and tourmaline in thin sections. Towards the margins of the granite outcrop, 'spotted' slates in surface brash are clear evidence of contact metamorphism (ex Tavy Formation). (Page 2004).

LOCATION PLAN

DEVON GREAT CONSOLS

GULWORTHY, WEST DEVON

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Scale 1:30000



Site Locality

Parking and Access

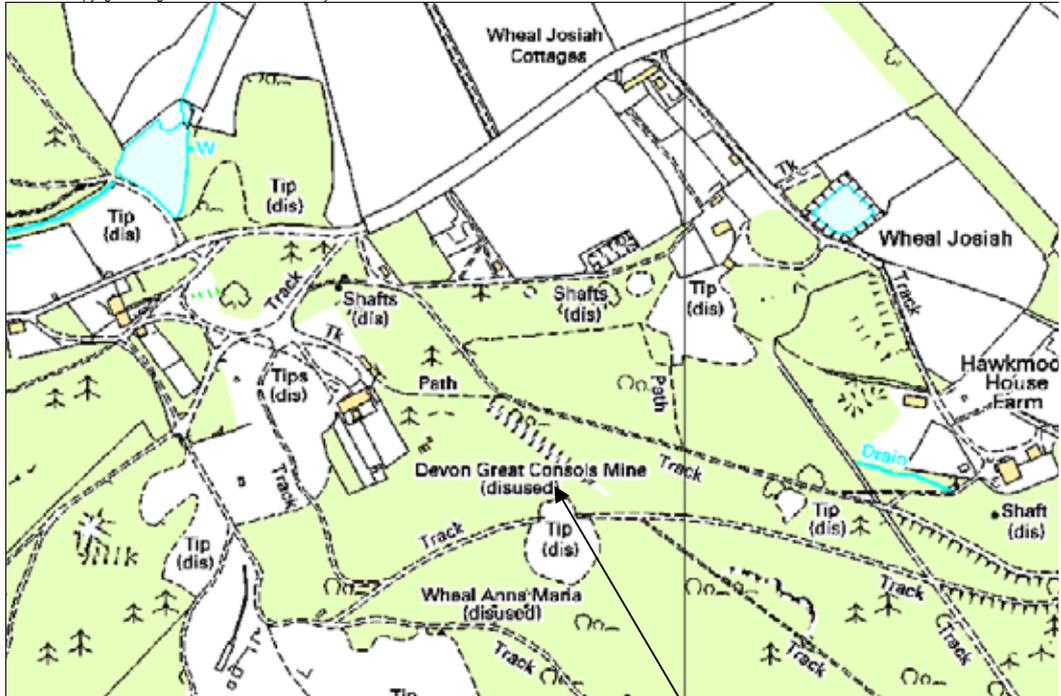
- For bus and train timetables, visit www.traveline.org.uk.
- Limited parking is available in the area and the site is best accessed along public footpaths.
- Consult the Tamar Valley AONB Service www.tamarvalley.org.uk for further information regarding trails and access.

SITE PLAN

DEVON GREAT CONSOLS

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Scale 1:7500

Location of Devon Great Consols with a number of other disused mines in the area.

Main points of Interest

- The site of what was once the worlds most productive copper mine
- Remains of arsenic processing works and other features of industrial archaeological significance survive.
- Traces of mineralisation locally present in mine dumps amongst tailings from ore processing.
- Exposures of the Gunnislake granite body present in the Frementor Mine area.

DEVON GREAT CONSOLS

Kevin Page



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Mine dumps on Devon Great Consols Main Lode at Wheal Anna Maria showing traces of copper mineralisation (blue crusts formed due to the weathering of primary copper sulphide mineralisation).

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Remains of the flues of the arsenic calciner in the southern part of the Wheal Anna Maria site with surrounding dumps of original mineralised and country rock.

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Tailings from mineral processing dominating the southern part of the Wheal Anna Maria site.

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Exposures of the Gunnislake granite body in the quarry at Fremmentor Mine