

## Information Sheet 1F: Metalliferous mineralisation

### General description

Some of the most remarkable metalliferous mineral deposits in south-west England are present in the Meldon area. Unlike most other deposits in region which are conventional hydrothermal veins, those between Meldon and Sticklepath to the east, exploited mineralised skarn deposits within the Lower Culm Group of the Greystone nappe (apparently primarily within Firebeacon Chert Formation). Three small mines in the Meldon area were worked on a small scale for copper in the nineteenth century, from west to east, Homerton Mine (Locality M3), Forest Mine (Locality M2; now under Meldon Reservoir) and Red-a-ven or Meldon Mine (Locality M1) (Dines 1956, Edmonds et al. 1968, Hamilton-Jenkyns 1981, Fletcher et al. 1997).



Mine waste tips at Red-a-ven / Meldon Mine (Photo: Kevin Page 2005)

The Meldon mines worked what is presumed to be the same mineralised bed. The primary ore was chalcopyrite, typically associated with other sulphides including pyrrhotite (iron sulphide), löllingite (iron arsenide) and arsenopyrite (iron sulph-arsenide) and a rich association of metamorphic minerals. Conspicuous amongst the latter are green garnets and locally axinite – other typical minerals include epidote, chlorite, sphene (including the very rare tin-containing form malayite), apatite and scapolite. Wollastonite and hedenbergite also recorded (Dearman and El Sharkawi 1965a, b; El Sharkawi and Dearman 1966; Edmonds et al. 1968). There are some suggestions in De la Beche (1839) and Dines (1956) that tin might also have been produced by Forest Mine but this requires confirmation, not least as the nature of the ore worked within such unusual deposits is unclear. The location of this mineralisation is also very significant as it is developed in a zone of flexure which is probably related to the intrusion of the Dartmoor granite, as discussed on Sheet 1G (cf. Grocott and Taylor 2002).

Hydrothermal veins with tin deposits are widespread however, across the Dartmoor granite as are alluvial stream deposits, where the heavy cassiterite has concentrated after weathering out from such veins. There is no confirmed evidence of such deposits close to Meldon itself although stream workings are present to the east in the upper reaches of Moor Brook (Page 2006) and on a larger scale in the East Okement valley near East Okement Farm (Page 2006).

## Representative exposures in the Meldon area

LOCALITY	NGR	DESCRIPTION	REFERENCES
M1/LC21: Red-a-ven / Meldon Mine / Meldon Aplite Quarries SSSI (part).	57019177	<p>Also known as Devon Copper Mine and Okehampton Wheal Maria. Dumps and other workings of former copper mine with rich assemblages of metamorphic minerals form mineralised beds in the Firebeacon Chert Formation (Lower Culm Group, Lower Carboniferous; Greystone Nappe). Dumps include cherts with diopside-albite-garnet hornfels and massive garnet-rich rock, often rich in sulphides. The garnets are probably mainly grossularite. Pyrite is common in veins, and intergrown with other minerals.</p> <p>Accessory minerals include epidote, chlorite, sphene (including the very rare tin-containing form malayite), apatite and scapolite. Wollastonite and hedenbergite also recorded. Chalcopyrite reported as the main sulphide with smaller amounts of arsenopyrite and sphalerite. Pyrrhorite is abundant in some samples. Löllingite occurs disseminated in a malayite bearing pyroxene-garnet (tin containing)-wollastonite hornfels. Unusual tin geochemical anomaly noted around mine. The main mineralised bed worked appears to have been around 0.75 m thick (as exposed in the Red-a-ven Brook at LC4c), with abundant pyrrhorite, also arsenopyrite and chalcopyrite.</p> <p>Forms part of Meldon Aplite Quarries SSSI and is of at least national geological importance. Mineral collecting problems apparent, including illegal excavation of mine dumps (see also Sheet 1C, Locality LC21).</p>	Dearman and Butcher (1959), Dearman and El Sharkawi (1965b), Edmonds <i>et al.</i> (1968, pp.40, 132, 168, 204, 205), Hamilton-Jenkins (1981, pp.58-59); Fletcher <i>et al.</i> 1997).
M2: Forest Mine	56149122	Site now submerged beneath Meldon Reservoir. Dumps recorded as containing chert, shaly hornfels and calc-silicate hornfels (Firebeacon Chert Formation, Lower Culm Group, Lower Carboniferous; Greystone Nappe) with pyrite, arsenopyrite, axinite (recorded as abundant on dumps) and actinolite. Veins of quartz and calcite also recorded with massive arsenopyrite. The tin lodes recorded in this area by de la Beche, across Longstone Hill appear to misinterpreted extensions of the bedded copper deposits (although Collins, 1912, does suggest that Forest Mine produced some tin, although this needs independent confirmation).	De la Beche (1839, p.302), Collins (1912), Dines (1956, p.752, as 'Homerton Mine'), Edmonds <i>et al.</i> (1968, pp.40, 204, 205), Hamilton-Jenkins (1981, pp.58-59).
M3/LC11: Homerton Mine	55499067	Shaft and adit on west side of SW extension of Meldon Reservoir, and probably partly submerged by it. Meldon Shale and Quartzite Formation recorded with shaly hornfels and chialstolite slate. Former contains pyrite, arsenopyrite and chalcopyrite (dips 40o-50o NW). Firebeacon Chert Formation recorded subsurface (Lower Culm Group, Lower Carboniferous; Greystone Nappe) (see also Sheet 1C, Locality LC11).	Dines (1956, p.752, as 'Forest Mine'), Edmonds <i>et al.</i> (1968, pp.32, 40, 205).

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