DEPARTMENT OF MINES SOUTH AUSTRALIA

Report on

WHEAL BARTON COPPER MINE

SECS. 404, 442, HD. JELLICOE, CO. EYRE

(W.G. SMITH)

Ъy

L.G. Nixon Geologist

MINERAL RESOURCES SECTION GEOLOGICAL SURVEY

CONTENTS

1.	Abstract
2.	Introduction
3.	References
4•	Geology
5.	Conclusions

Appendix - Analytical and petrological reports.

MAP NO.

S 2092

TITLE

SCALE

Sketch Map Wheal Barton Copper Mine (Secs. 404, 442) $40^{\dagger} = 1^{\prime\prime}$

Rept. Bk. No. 48/149 G.S. No. 1373 D.M. 579/59

10th June, 1959.

DEPARTMENT OF MINES SOUTH AUSTRALIA

Report on

WHEAL BARTON COPPER MINE

SECS. 404, 442, HD. JELLICOE, CO. EYRE

(W. G. Smith)

1. ABSTRACT

1

Greywacke sediments of Cambrian age predominate at and around the Wheal Barton Mine. Copper mineralisation together with varieties of Manganese occur along a shear zone in bleached greywackes which in places have been mined profitably. Previous literature suggests that all the ore at the mine has been mined to a depth of 80 or 100', hence the drilling of shallow holes in the mined area cannot be recommended. It is suggested that geophysical work be done to the north of the old mine in an attempt to locate other lodes or deep holes be drilled in the mine area into the primary ore zone to test the width and grade of the lode at depth.

2. INTRODUCTION

Following a request from Mr. Smith for particulars of terms and conditions for drilling from 4 to 6 holes to a depth of between 60-70 ft. at the Wheal Barton Mine, a survey of the existing workings was carried out and previous literature consulted to ensure that the drilling was warranted. On 16/4/59 a pace and compass survey of the mine was carried out and samples collected for assay and petrological examination.

3. REFERENCES

Mining Review 2	5. 19	16. pp.	64-65	(R.L.	Jack)
Mining Review 3	50. 19	919. pp.	36-37 ((R.L.	Jack)
Mining Review 7	'5. 19	41. pp.	54 -55 (A.T.	Armstrong)

4. GEOLOGY

Sediments of the Kanmantoo Group of Cambrian age, predominantly greywackes, occur at and around the Wheal Barton Mine. Beds strike 003^e and dip 75-80^o E. In the vicinity of the lodes the country rock has been hydrothermally altered and sheared to a white kaolinised sericite schist (See petrological report P. 198/59 appended). Mineralisation occurs along a shear zone striking 003⁰ dipping between 50-70⁰ W.

Ore minerals exposed in the workings include malachite and azurite. Samples of ore from the dump contain kernels of chalcocite surrounded by secondary copper carbonates and limonite (see petrological report P. 200/59).

Varieties of manganese including wad, psilomelane and pyrolusite, were seen occurring as lenticles parallel to the main shear direction in the lode. (See petrological report P. 199/59).

At the time of the writer's visit all the workings in Sec. 404 had been filled in and ploughed over. Current work is confined to the southern half of the road between Secs. 404 and 442. In Sec. 442 some old pits and possibly a collapsed shaft together with a recent costean were mapped, but it is evident that other old workings have been filled in, the dumps levelled and the whole ploughed.

The existing shaft on the road is about 20 feet deep and sunk on the underlie of the lode at 55° W for the first 15 feet steepening to 70° W at the bottom. The lode averages 3' in width. A sample cut from 15 feet below the surface on the hanging-wall side of the north face assayed 7.2% Cu over 24 inches, the remaining 12 inches to the footwall was composed of barren quartz. See appended assay results.

A trench has been dug along the lode six feet north of the shaft and it varies in depth from 6 feet at the north end to about 8' at the south where the trench has broken through to the shaft. A sample cut 5 feet below the surface at the north end of the trench assayed 22.4% Cu over a lode width of 24 inches.

It is possible that the present workings are over some of the old underground workings.

R.L. Jack is of the opinion that all the ore in the old mine has been worked out to a depth of 80-100 feet. Considering this the writer cannot recommend the sinking of shallow diamond drill holes in the vicinity of the old mine.

`**-2-**

A small fault located approximately 45 chains north north easterly from the workings in Sec. 442 may be a continuation of the mineralised shear on which the Wheal Barton is located and appears to warrant some investigation by geophysical methods. This area is outlined on the locality map appended (See Map No. S 2092).

-3-

5. CONCLUSIONS

Sediments in the area are predominantly greywackes of the Kanmantoo group of Cambrian age.

The Wheal Barton Copper Mine is located on a mineralised shear through these sediments which have been hydrothermally altered and bleached to a white kaolinitic sericite schist in the vicinity of the lode.

The ores seen were mainly secondary copper carbonates although chalcocite, occurring as kernels surrounded by secondary copper, was found on the dumps.

Previous reports suggest that the mine is worked out to a depth of 80 to 100 feet and thus shallow holes cannot be recommended in the vicinity of the mine.

It is recommended that a geophysical survey be carried out over the area outlined on the accompanying map.

L.G. Kuren per anf

L.G. Nixon Geologist MINERAL RESOURCES SECTION

LGN:AGK 10/6/59

APPENDIX

1. ANALYTICAL REPORT

Sample No. A 162/59

Sample No. A 163/59

7.2% Copper

22.3% Copper

Locality: Secs. 404, 442, Hd. Jellicoe.

2. <u>PETROLOGICAL REPORT</u> (N.P.N.C. 88/59)

Thin and polished sections.

<u>P. 198/59</u> - This rock is a kaolinised sericite schist which has probably been formed by hydrothermal alteration of an argillaceous siltstone. The constituents of the rock are kaolinite, sericite, and quartz, with accessory tourmaline and zircon. Bleaching is the result of hydrothermal alteration.

<u>P. 199/59</u> - The specimen contains a central layer of azurite and malachite enclosed in a colloform aggregate of manganese minerals. Bands of very fine grained pyrolusite alternate with bands of wad, and layers of quartz grains occur in a matrix of psilomelane. These layers of quartz grains are sometimes seen cutting across the pyrolusite-wad layers.

The mode of emplacement was apparently supergene enrichment.

P. 200/59 - This rock consists predominantly of kaolinite, with spherical inclusions of copper minerals and grains of garnet. A small amount of quartz is also present. The spherical inclusions consist of a core of chalcocite surrounded by secondary carbonates (azurite and malachite) and limonite. Garnet is sometimes associated with the inclusions of copper minerals.

P. 201/59 - The composition of this rock is similar to P. 200/59, but the copper minerals and garnet are more abundant. Again the chalcocite is surrounded by azurite, malachite, and limonite, with associated garnets. The azurite forms a band and fills the interstitial spaces between the garnet crystals. Malachite is found staining much of the kaolinite.

From the nature of the chalcocite and the garnet, it appears that this is possibly a skarn rock which has been shattered, and subsequent weathering of the sulphide has given the carbonates.

Examined by: R.A. Both & M.J. Bucknell.





200-10.58 2918