

REPORT ON THE COPPER-NICKEL DEPOSITS OF
THE FIVE MILE DISTRICT AND THE POSSIBILITY
OF A BORING CAMPAIGN TO TEST THEM.

The copper-nickel deposits of this district occur in the form of narrow lodes in association with a dyke of ultra-basic igneous material. The country rocks are slates (grey and red) and breccias belonging to the Dundas series of the Cambro-Ordovician System. The ultrabasic dyke is intrusive into the slates and breccias and has a general north and south trend with an easterly dip. It is generally narrow (10 to 20 feet in width) but apparently has "bulges" common to such dykes. The lodes occur at, or a short distance west of, the footwall of the dyke and have a similar dip to the dyke.

The dyke and lode have been found to occur at numerous points along a length of 100 chains. Wherever the lode has been found it has been mined for the production of ore. A certain amount of search has been made between the points where the ore is known to occur, but without results. The generally flat and swampy nature of the surface does not, however, facilitate surface prospecting.

The ore contains pyrite, pyrrhotite, chalcopyrite, pentlandite, the important constituents being the nickel and copper contained in the above minerals. It is an important ore from the Commonwealth point of view as it is the only nickel deposit known to occur. The percentages of nickel and copper have a considerable range. The ore sold in the past contained approximately 5% copper and 11% nickel. The total value of the metallic contents is approximately £20 per ton and the market value at the mine is £4/10/0 to £5/10/0 per ton.

In planning a drilling campaign to test the copper-nickel deposits there are two main factors.

(a) TESTING THE KNOWN LODES OR ORE-LODES. - As stated above the ore-bodies occur at numerous points along the line of the dyke. Wherever mined these ore bodies have been proved to be short in length and somewhat irregular in occurrence. While not ideal for testing by drilling they are sufficiently regular to enable a drilling campaign to test their extensions in length and depth. There is no doubt that such a campaign would be invaluable in connection with the future mining of these ore-bodies.

ORE BODIES OCCUR NEAR -

1. THE COPPER NICKEL MINING COMPANY SHAFT - (Formerly the North Shaft of the Dundas Cuni Mining Company.

Three bore-holes have been recently put down on the northerly extension of this lode. Of the two designed to intersect it at 50 feet, one intersected ore and the other did not. The third bore-hole was sited between the above two and intended to cut the ore at a depth of 100 feet. It gave a core of 3 feet 6 inches of ore.

Other bore-holes in this locality could be designed to (a) Further prove the northern extension in length and depth.

(b) Prove the southern extension.

2. DUNDAS CUNI SOUTH SHAFT - A considerable amount of mining was carried out to a depth of 75 feet from this mine prior to 1915 and approximately 1189 tons of ore were produced.

One bore was sunk recently to cut the lode but did not intersect any ore. As the ore-body existed south of the shaft, another bore-hole to prove the southerly extension and one or more to prove the extension in depth would be useful, especially if the ore-body has a southerly pitch.

3. MELBOURNE COPPER-NICKEL NORTH SHAFT OR BLOWFLY SHAFT - Two small ore-bodies were exposed at the surface in this locality and some 300 tons of ore mined from them. It is stated that two bore-holes did not intersect any ore at a depth of 50 feet. Further bore-holes do not appear to be warranted.

4. MELBOURNE COPPER-NICKEL SOUTH OR VAUDEAU SHAFT - Considerable mining was carried on from this shaft to a depth of 122 feet. The Melbourne Copper-Nickel Company in 15 months produced 2776 tons of ore and in addition to refunding the capital expenditure provided £9,600 in dividends.

At least three bore-holes were put down in 1914 No. 1 cut ore body at 50 feet and proved 10 feet of ore, No. 2 cut it at 100 feet and proved 1 foot of ore while No. 3 did not reveal any ore at 200 feet in depth. It is stated that Nos. 4 and 5, bores were put down north and south of No. 1 and variously stated that they did and did not reveal any ore. It has been estimated that there are 1,500 tons of ore above the 122 foot level and it is stated that the ore-body at this level had been driven on for 41 feet.

In view of the above bore-holes, there does not appear to be scope for many more. The most useful ones would be those carefully sited to intersect the ore-body at 150 feet, 200 feet, and deeper if the results of the above warranted such being carried out.

5. NICKEL REWARD. - Copper-nickel ore was mined at this locality during or prior to 1894. It is reported that the ore-body was 30 feet long and 2 to 8 feet wide. Two bore-holes were put down in 1914 but did not intersect any ore. Recently in sinking a new shaft, ore was discovered on one side of it.

From the surface, it is difficult to determine the position and strike of the ore-body and in view of the failure of the two bore-holes to intersect ore, it is not recommended that any others should be put down until surface work has more clearly defined the characteristics of the occurrence.

A parallel lode of pyrite occurs about one chain to the east of the workings but does not appear to be worth drilling.

6. DEVERAUX WORKINGS - This occurs to the south-west of the Reward Workings and apparently on a parallel line of lode to that described above. Shallow shafts have exposed copper nickel ore and a recently excavated trench is stated to have exposed ore at the approach and at the shaft with which it connects. To the north of the shaft the ore body does not appear in the usual position on the west side of the ultrabasic dyke. In this ore body, the composition of the ore differs from the above in that the copper content (13 to 18 per cent) exceeds the nickel content (5 to 9 per cent).

As in the case of the Reward Claim it is recommended that further surface prospecting be carried out before any boring is attempted.

B. TESTING THE DYKE IN BETWEEN THE KNOWN ORE-BODIES
The long narrow dyke with the copper-nickel ore bodies developed along its western wall at intervals offers generally favourable opportunities for testing by drilling. This is due to the fact that its course and dip are known and so bore-holes can be readily sited to cut it at any required depth. Further the geological occurrence of the ore on its western or footwall is definitely established.

In carrying out such drilling, however, to test the dyke where no surface indications of ore occur, it must be realised that it is "Blind Stabbing" but under favourable geological conditions.

Several bore-holes of this nature could be put down between the Copper-Nickel Shaft and the Dundas Cuni shaft (one has already been sited near No. 3 trench to cut the dyke at 50 feet depth), between the Dundas Cuni Shaft and the Melbourne Copper-Nickel Shaft; and between the latter and the Reward Claim workings.

CONCLUSIONS. - It is suggested that bore-holes could with advantage be put down as follows :-

A. TESTING KNOWN ORE BODIES -

- (1) Copper-Nickel Shaft. To further prove the northern extension especially in depth, and to test the southern extension.
- (2) Dundas Cuni Shaft. To prove the southern extension and the extension in depth.
- (3) Melbourne Copper-Nickel Shaft. To prove the extension in depth.

B TESTING THE DYKE BETWEEN KNOWN ORE-BODIES.

- (1) Between the Copper-Nickel and Dundas Cuni Shafts.
- (2) Between the Dundas Cuni and Melbourne Copper-Nickel Shafts.
- (3) Between the Melbourne Copper-Nickel and the Reward Claim workings.

Signed (P.B.Nye)

GOVERNMENT GEOLOGIST.

Hobart 16/8/30