

TR6-38-40

NICKEL IN SERPENTINE NEAR BEACONSFIELD

by T. D. Hughes.

For several years, serpentine areas near Beaconsfield have been under investigation by the Ben Lomond Mining Company and others because of the nickel, chromium and iron content and concentrations in this suite of rocks. Several reports have been prepared by the Department of Mines (in Technical Reports Nos. 1, 2, 3, 4,) and the C.S.I.R.O. (Mineragraphic Investigations Reports Nos. 682 and 722).

The serpentine is essentially portion of a complex of altered basic and ultrabasic rocks of Cambrian age and contains several variants, the most striking of which is a black and white rock, described in C.S.I.R.O. Report No. 682 and named therein "Rodingite". This rock consists principally of crystals of white grossularite (replacing the feldspar) and blackish hornblende, with minor amounts of vesuvianite and diopside and has been formed by the process of lime metasomatism of the original gabbro. The rodingite outcrops in a series of elongated lenses in the normal serpentine and it has been the contention of the Company that nickel is concentrated in the serpentine in the vicinity of the rodingite. One such outcrop of rodingite, occurring just north of the track from the Holwell Road to Andersons Creek and distant 40 chains from the road, has been investigated by shallow trenches round its edges.

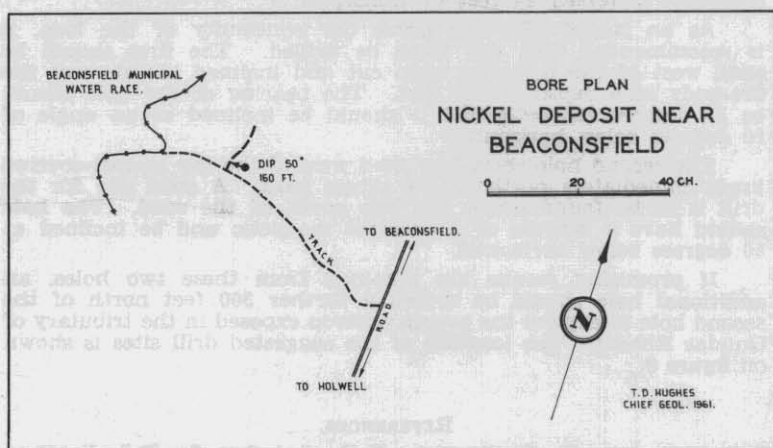


FIGURE 10.

It was decided to put down a bore in this locality to test the serpentine adjacent to the rodingite at between 50 and 100

← 5 cm →

feet below the surface. (See Figure 10 above). Details of this bore are as follows:—

0 — 7' 6"	Brown, iron-stained clay.
7' 6" — 13' 6"	Greenish-white decomposed serpentine with narrow veinlets of magnetite.
13' 6" — 14' 6"	Brown iron-stained clay.
14' 6" — 24' 6"	Decomposed greenish-white to brown serpentine with iron-oxide staining on fracture planes.
24' 6" — 30'	Decomposed greenish-white serpentine. Narrow veinlets of serpentine becoming harder at depth.
30' — 49' 6"	Mottled serpentine, dark bluish-green to pale yellow green. Variable hardness.
49' 6" — 50'	Rodingite.
50' — 59' 10"	Yellow-green serpentine with abundant magnetite as segregations of small grains.
59' 10" — 61' 4"	Rodingite.
61' 4" — 74' 6"	Yellow-green serpentine—variable in colour and hardness with veinlets of magnetite.
74' 6" — 82'	Rodingite.
82' — 86' 6"	Dark greenish-blue serpentine.
86' 6" — 92' 9"	Grey-green serpentine with zones of slip fibre asbestos.
92' 9" — 98' 5"	Grey-green serpentine with asbestos and magnetite in veins of asbestos.
98' 5" — 100' 6"	Grey decomposed serpentine.
100' 6" — 134'	Dark grey-green hard serpentine.
134' — 140'	Serpentine with abundant slip-fibre asbestos.
140' — 159'	Dark grey-green serpentine with occasional zones of slip-fibre asbestos and narrow veins of magnetite.

The angle of the bore was 50° and the direction to the west or at right angles to the general strike of the rodingite lense. The core was split and assayed for nickel and chromium with the following result:—

Depth	Ni %	Cr %
0 — 7' 9"	0.56	2.18
7' 9" — 24' 6"	0.62	0.34
24' 6" — 49' 6"	0.40	0.23
49' 6" — 59' 10"	0.17	0.12
59' 10" — 61' 4"	0.03	0.10
61' 4" — 74' 6"	0.70	0.40
74' 6" — 86' 6"	0.05	0.04
86' 6" — 92' 9"	0.24	0.22
92' 9" — 102' 8"	0.29	0.29
102' 8" — 118' 8"	0.38	0.38
118' 8" — 124'	0.36	0.22
124' — 140'	0.24	0.28
140' — 159'	0.43	0.22

The form of the nickel is doubtful. The C.S.I.R.O. reports stated that it is in the form of garnierite, nickel silicate, associated with opaline silica. Thin sections of the serpentine from 65 and 70 feet

examined by G. Everard (p. 90 this volume) showed no garnierite and he suggests that the nickel replaces some of the magnesium in the crystal lattice of the serpentine.

The results of this boring have indicated:—

1. The percentage of nickel (0.6) and chromium (2.2) in the clay above the serpentine is comparable with the many samples taken in the past by boring and trenching.
2. There is very little nickel in the rodingite but in the serpentine adjacent to it is the highest concentration of nickel.
3. Nowhere does the nickel percent approach economic proportions.
4. Further boring is not recommended.

SUMMARY

A bore put down to 159 feet, adjacent to a rodingite differentiation of serpentine, failed to reveal any economic concentration of nickel.