



SOUTHWEST BRITISH COLUMBIA

VANCOUVER ISLAND

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VERNON RIDGE AREA (92C/15E, 16W)

A reconnaissance survey defined the area of pyritization previously described under the name Lucky Strike. The zone is centred on the upper south slope of Vernon Ridge, extending from a saddle 800 metres west of the summit of Mount Vernon west-northwest for at least 4 000 metres. The maximum width is 1 500 metres. Within the zone the rock has been bleached, silicified in part, and mineralized with disseminated clots and discrete grains of pyrite. Sporadic grains of chalcopyrite occur both within and outside the zone. In places silicification extends beyond the pyritization, and there is a crude shell of epidotization.

The fresh rock is mostly grey to dark grey and commonly porphyritic with plagioclase phenocrysts. Aphanitic phases were found in and outside the pyritized zone to the west. Reddish fragments were found in the rock both north and south of the ridge, and would suggest that it is part of the Bonanza Formation. A bedded section was found on the ridge 500 metres west of Mount Vernon summit; three bands of silty argillite, 3.5 to 6 metres thick, are separated by thinner bands of massive light grey rock. Their attitude is 100 degrees 15 degrees south, and the section emerges on the north, west, and south. The rock above the bedded section is partly greenish and amygdaloidal and partly massive and intrusive in appearance.

The source of the alteration and pyritization has not been determined. A Bonanza volcanic centre has been suggested, but the amount of volcanic breccia found is low. In any case, the area of alteration is large enough to contain a copper zone, and a reconnaissance soil sampling survey would appear to be warranted.

Reference: *B.C. Ministry of Mines & Pet. Res., Geological Fieldwork, 1975, p. 40.*

BOB, HAB (92L/7)

Brief visits were made to the property after Imperial Oil Limited concluded a short program of diamond drilling. Mineralization is associated with bodies of limestone and basalt contained in the Nimpkish batholith near its northeast margin and extending 2.8 kilometres southeast from the Steele Valley. The limestone has been interpreted as an interlava lens in the Karmutsen Formation, but it appears larger and cleaner than usual for such lenses, and may be an infolded section of the Quatsino Formation. Five mineralized zones were identified. Zone F is beside a road just northwest of Steele Creek and consists of about 1.5 metres of fairly massive magnetite capped by limestone and overlying garnet-epidote skarn at the top of Karmutsen basalt. Zone E is the Bonanza mine, an open cut just below the Beaver Cove road, from which Chester F. Millar of M.B.H. Developments Ltd. mined 5,649 tons of ore in 1968 and 1971. Some magnetite and chalcopyrite remain in garnet-epidote skarn, which is intruded by a post-mineral feldspar porphyry dyke in the headwall of the pit, but the sidewalls are in fresh basalt. Some black limestone rubble was found at the entrance suggesting that limestone may have capped the ore prior to mining. Zone A is on

the crest of the ridge, south of a small triangular lake known as White Fang Lake. Extensive skarn contains scattered magnetite, pyrite, and chalcopyrite, and was explored by 10 diamond-drill holes. The overall grade was found to be low.

Zone B is on the upper slope northwest of zone A. Limestone and skarn are both extensive and suggest a canoe-shaped structure, with skarn both overlying and underlying the limestone. Considerable magnetite and sulphides are present in the skarn. This zone has not been drilled. Zone H is 350 metres to the northwest, and is represented by a single small outcrop of limestone and mineralized skarn. Six holes had been diamond drilled with encouraging results. The writer logged core from a hole which had been stepped back to gain greater depth; the upper third of the hole cut mainly intrusive rocks, but the lower two-thirds was mainly in partly altered andesite or basalt containing sporadic chalcopyrite and pyrrhotite.

References: *B.C. Ministry of Mines & Pet. Res.*, GEM, 1973, p. 258; 1974, p. 213; Assessment Reports 4350, 4898.

WASHLAWLIS HILL (92L/11W)

A day was spent on this hill following a report that considerable coarse volcanic breccia was present which could be marginal to a Bonanza volcanic centre. This hill rises to an elevation of over 150 metres from a small plateau between Washlawlis Creek and the north fork of Waukwaas Creek 3.5 kilometres east of Rupert Arm. A quarry at 140 metres elevation in the east end of the hill exposes a southeast-dipping section through the contact between the Parson Bay and Bonanza Formations. Rock of mixed sedimentary and volcanic origin grades upward through tuff to a massive porphyritic volcanic rock. Some 60 metres west of the quarry and 35 metres higher on the hill, rounded and angular bodies appear in the porphyritic rock. The rounded bodies are widespread, 5 to 8 centimetres across, and differ from the matrix only slightly in appearance. The angular bodies are 2.5 to 4 centimetres across and are less common and more distinct from the matrix. Some bodies of angular breccia partly enclose patches of the volcanic rock 30 centimetres and more across. The structures in these rocks resemble pillows, pillow breccias, and autobrecciated lavas more than out-thrown volcanic breccia. They continue to the summit, where they are overlain but also partly interbedded with conglomerate containing well-rounded pebbles of varied lithologies. This conglomerate may be a basal Cretaceous outlier.

Most of the north face of the hill is a bluff, which may be a modified fault scarp. Toward the east, two smaller hills are separated from the main hill by deep gullies. They contain breccia and quasi-breccia similar to that higher on the south side, and have evidently been down-dropped. The Parson Bay beds strike toward these hills, but do not appear in them. East of the quarry, Bonanza volcanic rocks with vague fragment-like structures are again exposed, and are probably separated from the Parson Bay beds by a concealed fault.

Reference: *B.C. Ministry of Mines & Pet. Res.*, Geological Fieldwork, 1974, p. 76.

ISLAND COPPER (92L/11W)

Selected exposures in the open pit were examined and a section of drill core was logged. Pale green, fine-grained bedded tuffs had been exposed along the upper north wall of the pit. Some thin bands of volcanic breccia with fragments ranging up to 3 centimetres across are intercalated with the tuffs. These

beds are wrapped around a broad arch which plunges south-southwest at about 30 degrees into the altered and mineralized zone in the centre of the pit. In the west wall they are overlain by dark lapilli tuff, which is increasingly altered toward the porphyry. The End Creek fault separates the porphyry and altered volcanic rocks from massive, hematite-streaked, brownish grey tuffs exposed along the south wall. These tuffs are cut by veins of epidote, chlorite, and calcite-zeolite, and by films of pyrite.

The copper-molybdenum mineralization decreases gradually to the north and south, and the orebody is defined by a cutoff grade of 0.3 per cent copper. Below -80 metres elevation a submarginal zone in the centre splits the orebody into north and south zones. This submarginal zone is notably hard and difficult to drill. The core shows highly altered volcanic rock indistinctly brecciated, healed with quartz containing finely disseminated magnetite, then cut by younger veinlets of white quartz. In places there is almost complete replacement by the white quartz, leaving only scattered patches of disseminated and massive magnetite. Remnants of porphyry are more obviously brecciated, and the fragments are partly replaced by disseminated magnetite. In places both the dark magnetite-bearing quartz and the white quartz are laced with pyrite and chalcopyrite. While magnetite and quartz are present to some degree in the orebody, the characteristic hardness of the submarginal zone appears to reflect a much greater abundance.

Reference: *B.C. Ministry of Mines & Pet. Res., GEM, 1972, pp. 293-301.*