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COULTER - SLOUGH CREEKS, ISLAND MTN.,

WELLS, B.C. NTS 93H/4

INFORMAL REPORT ON COMPANY AND

PUBLISHED DATA

J.C. STEPHEN

APRIL 18, 1986

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INTRODUCTION

A series of reports dating from 1964 to 1985 were made available to the writer for examination. These reports are listed under "References" at the end of this informal report.

The Coulter Creek - Slough Creek drainages have been worked for placer gold at intervals since the 1870's following discovery of gold in the Cariboo in 1860. Lode gold mining has been conducted at Island Mountain Mines and Cariboo Gold Quartz Mine near Jack of Clubs Lake to the south-east of Island Mountain.

Substantial efforts have been made to explore, and to place in production, the Coulter Creek placer deposit during the period since 1964. Recommendations have been made to carry out further geological, geochemical and geophysical surveys as well as diamond drilling.

COULTER CREEK PLACER

From examination of the available reports it is apparent that some 1113 ounces of gold production can be documented for Coulter Creek between 1878 and 1948. A hydraulic pit was developed in glacial gravels interlayered with clay and silt. The north rim of an apparent old channel was exposed in an adit at the base of the gravels. A portion of this adit was in bed rock. In 1964 W.M. Sharp, P.Eng., obtained five samples from within this adit. Samples 1 and 2, and samples 3 and 4, were combined into single samples for gold pan concentration and assaying. Values reported were calculated to range from $5.46 to $7.00 per cubic yard with gold valued at $35 per ounce. No detailed description of the methods of obtaining, concentrating and assaying this material was given.

W.M. Sharp's report of January 1966 indicates that some 30,000 cubic yards of material had been excavated since 1964. Only 30 ounces of gold were recovered and it is stated that "... major losses (to 90%) have occurred ..".

Seismic surveys were resorted to and drilling to test the gravels was recommended. The "... average depth of cover ... averaged about 100 feet ...".

No detailed plans or sections of the hydraulic pit were available to the writer during this report examination but the data leaves the impression that a considerable depth of very low grade material was being bulk mined and mixed with a limited thickness of "pay" gravel. If we presume that the overall figures are approximately correct then 30,000 cubic yards of material were sluiced to recover 30 ounces of gold. At $400 per ounce this recovered value was $0.40 per cubic yard. Even if we assume the 90% loss to be correct then the available gold was only $4.00 per cubic yard at current prices. It might be presumed then that the high grade material from the adit, grading $5.46 to $7.00 at $35 gold, would grade $62.40 to $80.00 per cubic yard at $400 per ounce gold over a depth of 6 to 8 feet (page 5, W.M. Sharp, June 1964). Using an average value of $71.20 over 7 feet for the "pay" gravel then:-

(7 feet x \$71.20) + 100 feet x (-\$0.70) = 107 feet @ \$4.00
\$498.40 + (-\$70) = \$428

Thus, even allowing for 90% loss in the hydraulic operation, the grade and thickness of the "pay" gravel was overestimated. I would personally doubt that losses were anything like 90%.

Presumably the original adit was driven where the best gold values were obtained. It is not reasonable to project sample values from such a limited area to any large volume of gravel. Sharp, himself, states (page 5, June 1964) "... the bottom 6 foot to 8 foot depth of channel gravels are <u>locally</u> (underlining added) worth $5.50 to $7.00 per cubic yard ...". Insufficient attention has been paid to this sentence.

Later stripping using Caterpillar tractors is reported to have excavated ".. over 100,000 cubic yards". (Clive W. Ball, P.Eng., Oct.29, 1982). Samples were being taken from the pit walls and processed in a "Flying Dutchman" gold sluice box. No data is available as to the results of this sampling. C.W. Ball states the upper rim of the pit varies from 25 to 44 metres above the adit level.

There are indications in the reports examined that W.M. Sharp surveyed cross sections of the pit. This data, together with sample reults of the 1982 program, should be carefully examined to determine average values in the "pay gravel" and in the 100 feet or so of overlying glacial material which probably carries very little gold.

GEOPHYSICAL SURVEYS

Magnetometer surveys were conducted on three isolated aeromagnetic anomalies. The aerial survey data was not available to the writer and the ground survey plots are not all identifiable as to which anomaly is shown. Three anomalies were surveyed, of which No. 1 anomaly is said to have an EM anomaly flanking it to the northeast. No information is given as to the type of EM equipment used.

Anomaly No. 3 is said to be "... the sharpest and most exciting anomaly of the group." This anomaly reaches a peak of 1424 gammas above a background of approximately 500 gammas. It's overall width is about 75 metres and the shape of the contours suggest that the causitive body is cut by two or three northeast trending faults. No history of magnetic mineralization, or of magnetic rock types being directly associated with gold mineralization, in this area is known to the writer.

Brief examination of published information regarding the regional geology indicates the presence of "serpentinite", of "... basaltic rocks ... converted to actinolitic amphibolite north of Pundata Creek ..", and of "... highly ankeritized rocks believed to be igneous sills possibly originally approaching diorite in composition." All of these igneous type rocks could give rise to magnetic anomalies similar to Anomaly No. 3. A partial copy of a paper by P.C. Benedict, describing the Island Mountain Mine, is attached as Appendix I with this report. The extent of the altered igneous sills at this mine is well shown. The scale is ½ that of the attached Anomaly No 3 map and, if magnetic, these sills could account for this type of magnetic anomaly.

The question then arises as to whether the altered sills at Island Mountain were, in fact, magnetic.The close spatial relationship between the sills and the mineralized zones is suggestive of a genetic relationship. If there is a genetic relationship between these igneous bodies and the gold mineralization the vicinity of such sills would be good prospecting ground. It is the writer's opinion, however, that the ankeritic alteration of these sills would destroy the magnetic susceptibility of the rock and no anomaly would remain. Magnetically anomalous sills may not, then, be altered. This alteration may be a necessary part of the mineralizing process.

No information was available in the reports examined to indicate whether any ankeritized boulders were present in the drainage of Coulter Creek. If present these might suggest favourable conditions for detailed prospecting.

CONCLUSIONS

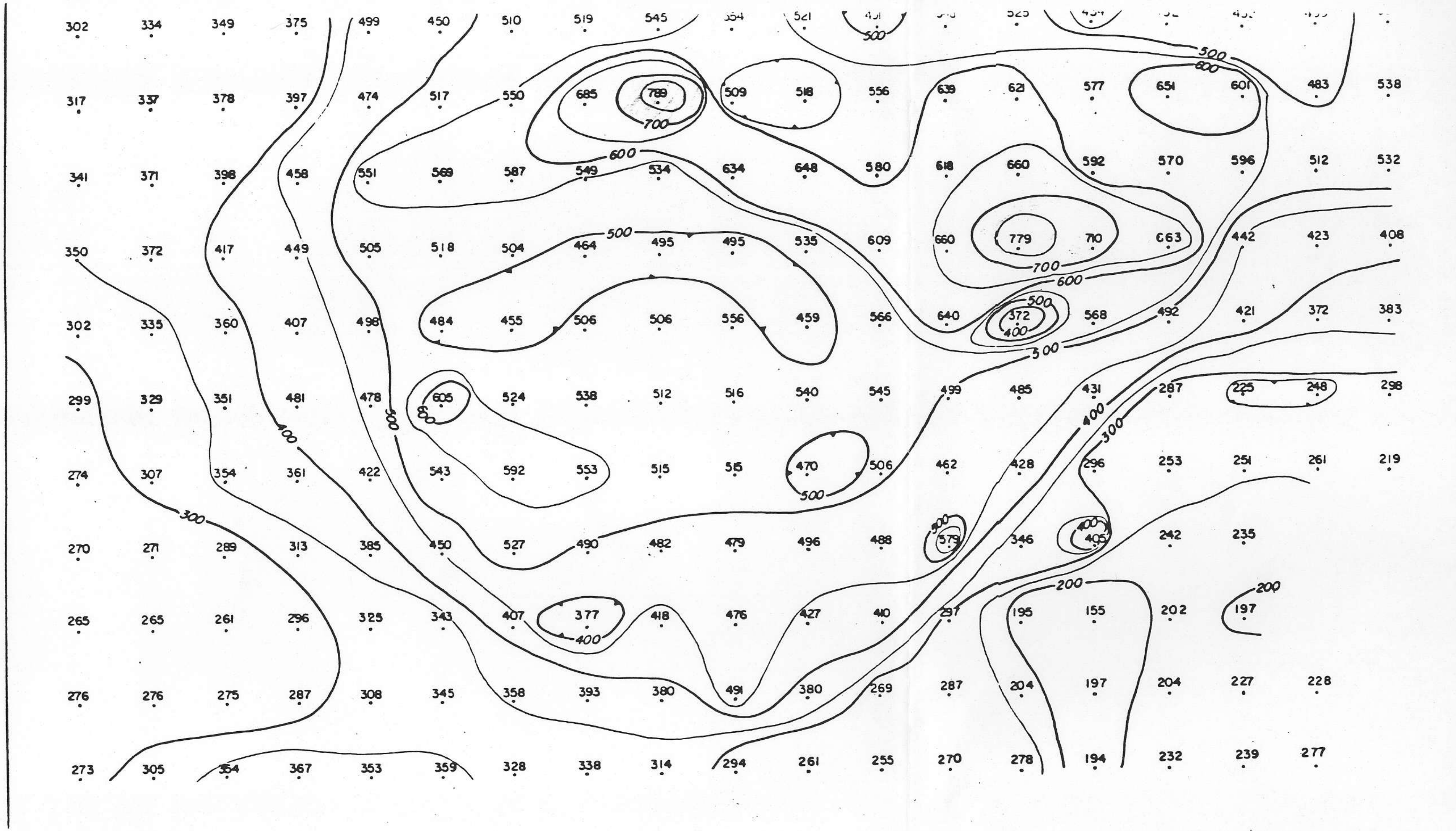
The writer concludes that the high grade placer assays reported represent a limited yardage of commercial grade gravel. Dilution from overlying gravels is too great for successful bulk mining.

The magnetic anomalies are probably due to volcanics or basic intrusive rocks. Gold bearing structures may, or may not, be associated with these igneous rocks. A limited program of very detailed prospecting with close spaced soil sampling may be justified. The presence of arsenopyrite, sphalerite and galena in the ores of the region indicate that arsenic, zinc and lead anomalies may be most easily detected by the soil sampling.

In the writer's opinion no large expenditure of money is justified by the data examined.

Respectfully submitted,
J.C. Stephen Explorations Ltd.

J.C. Stephen



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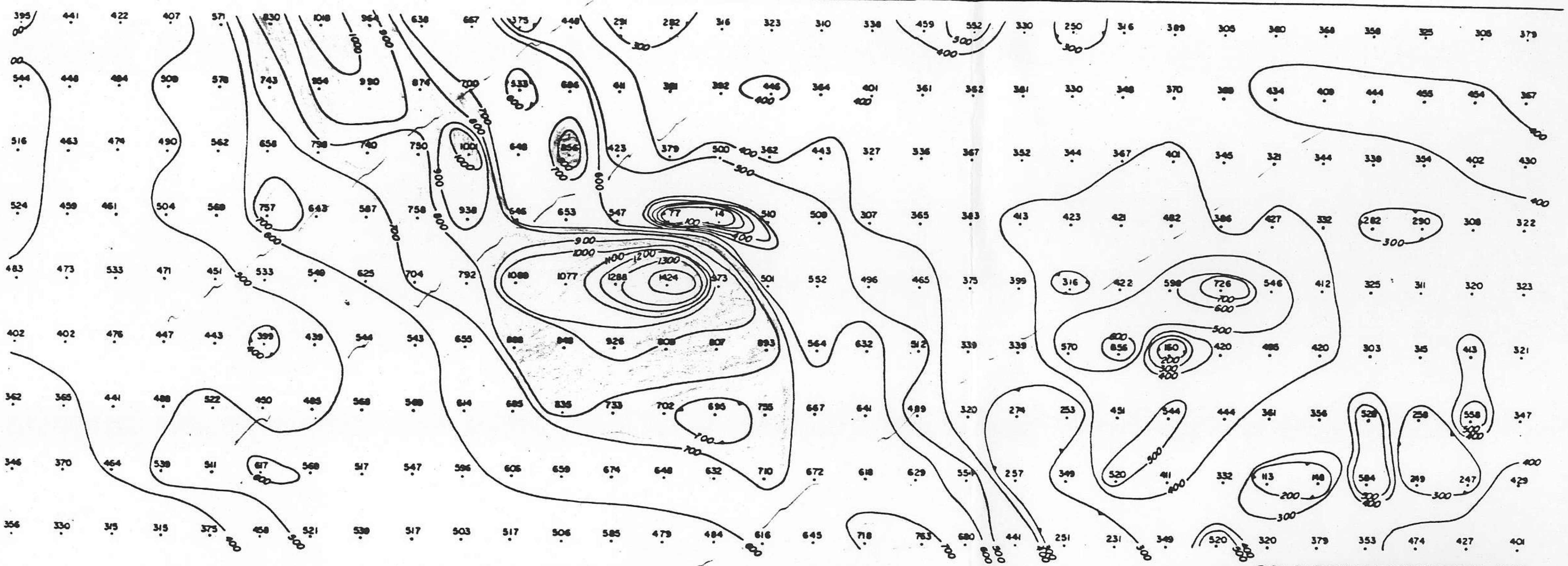

NOTES 1. Total magnetic field intensity reduced by 58,000 γ
2. Contours are in 100 γ intervals

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GROUND MAGNETOMETER SURVEY
MAGNETIC ANOMALY 3

SCALE 1" = 25 METRES

0 — 50 METRES
0 — 100 — 200 FEET

To accompany geophysical report by D.H. Piemderleith, M.Sc., dated Dec 12 / 1983

FIGURE

Narrow Lake
Wendle Lake
Wendle Creek
Doe L
Swash L
Bowron
Stony Lake
Stephen L
Stephanie Ck
Eighteen Mile Ck
Fourteen Mile Ck
Indianpoint River
Indian Lake
Kruger Creek
Kruger L
Towkuh Creek
Kibbee Lake
Indianpoint
Bowron Lake
Big Valley
Westcreek Pass
Lottie L
West Creek
Yuzkli
Pundata Ck
Willow River
TWO SISTERS MOUNTAIN
MOUNT WILEY
Summit
Nine Mile L
Eight Mile L
MOUNT MURRAY
ISLAND MTN
Jack of Clubs Lake
Wells
Beaver Pass
Four Mile L
PINEGROVE MOUNTAIN
COTTONWOOD
MOUNT NELSON
BARKERVILLE MTN
Barkerville
Tucker L
Lightning Creek
Wingdam
PROVINCIAL
FOREST
MOUNT ANDERSON
Stanley
GRUB MOUNTAIN
MOUNT BURNS
MT AMADOR
MOUNT PINKERTON
RICHFIELD MTN
BALD MTN
Groundhog
Cabin
MOUNT HOWLEY
MOUNT GUYET
PALMER RANGE
MOUNT TINSDALE
HIGHLAND
FRASER
QUESNEL
Q
Ma
Hks
Hyb
Hc
Hi
Mg
Mgg
Dbs
Aul
Ɛmi
Ɛmu
Ɛyp
30'
15'
122 00'
45'
30'
15'

APPENDIX I

ISLAND MOUNTAIN MINE

1948

WELLS, B.C.

By P. C. BENEDICT*

*Geologist, Newmont Mining Corporation of Canada, Limited.

The Island Mountain mine is at the southeast end of Island mountain, across Jack of Clubs lake from the Cariboo Gold Quartz mine.

The orebodies consist of quartz veins and pyritic replacement deposits in limestone. To December 31, 1944, there has been mined 296,273 tons of quartz-vein ore averaging about 0.34 oz. gold a ton, and 101,002 tons of sulphide ore averaging about 0.83 oz. gold a ton, a total of 397,275 tons averaging 0.46 oz. From this, 175,985 fine oz. of gold and about 26,450 fine oz. of silver were recovered, having a value of $6,510,521.

More than 95 per cent of the production has come from a band 500 feet wide along the contact of the Rainbow and overlying Baker members and extending about 100 feet into the latter. Evidence that the Rainbow belongs stratigraphically above the Baker is presented later in this paper. Both members are most variable lithologically, and individual beds and whole series of beds pinch out in short distances. In part, at least, this is due to squeezing out incidentally to intense folding. No section can be claimed with assurance to be really representative. However, both members are composed predominantly of quartzitic rocks. Both contain argillaceous quartzite, argillite, limy quartzite, limy argillite, limestone (marble), and minor amounts of highly ankeritized rocks believed to be igneous sills possibly originally approaching diorite in composition.

The Rainbow is characterized by bands of considerable thickness of dark grey to almost black (locally termed 'smoky') quartzite, the individual beds of which are low in argillaceous content but are in many places separated by thin argillaceous partings. The Baker contains only limited amounts of such material and light-coloured beds predominate. These consist of sericite schist and quartzite, with all gradations to argillite and limestone. Within the Baker, but near its contact with the Rainbow, are two fairly persistent, highly carbonatized sills. Some 'smoky' quartzite, identical in appearance with that characteristic of the Rainbow, occurs in the Baker, but the stratigraphic thickness of such rock is generally small. Furthermore, it is often more argillaceous than that in the Rainbow and in some beds it is limy (Fig. 1).

REGIONAL STRUCTURE

The strata of the Cariboo series have been subjected to at least two periods of folding. At Island Mountain, minor folds related to the older orogenic movement are tight, with axial planes that dip a few degrees less steeply than the predominant bedding (Fig. 3). The younger minor folds are gentle and open, with axial planes approaching vertical (Fig. 4). These later folds are observable here and there in surface outcrops, but the older tighter folds can rarely be identified. Presumably most of the recorded areal observations regarding small (drag) folds relate to the younger, open structures.

The strike of the strata at Island Mountain mine and for some miles to the southeast is predominantly northwest, and the dip northeast, usually between 30° and 60°. Uglow's (1) small-scale mapping indicates a general continuation of this attitude for some miles to the northeast where Palæozoic rocks are found still dipping in the same direction. Uglow shows the position of the principal axis of the anticlinorium about 4 miles to the southwest of Island Mountain mine, striking northwest. Hanson (2), apparently in general agreement, considered that the various members of the Richfield formation that he differentiated occur in more or less normal sequence from the 'basal argillite' (to the southwest) to the Baker member at the top, though he offered an alternative possibility involving a southeast plunge, which is not in agreement with conditions observable underground at Island Mountain. Underground development had not progressed to the point where the persistent northwest plunge of the older folds was definitely provable until some 4 or 5 years after the date of Hanson's field work.

Interpretation of the structure as exposed in the underground workings of the mine leads to the following conclusions. Although the Baker is indubitably resting on the Rainbow, the folding is of such a nature (Fig. 5) that the simplest interpretation is that the next larger anticline is to the northeast of the mine and that the beds are overturned, the Rainbow being younger than the Baker though lying below it. This conclusion is based solely on the character of the folding; the writer has found no other evidence substantiating it, and no conflicting evidence. Efforts to determine gradations in grain size have not been successful, and cross-bedding has not been identified. Neither the Rainbow nor other differentiated members of the Richfield series are positively known to outcrop again either northeast or southwest of the area mapped by Hanson.

VEINS

Uglow(1) differentiated between *A* and *B* veins, and Hanson(2) subdivided the *B* veins into diagonal and transverse (to the bedding). The *A* variety, Uglow states, are for the most part of no economic importance, nor have they been at the Island Mountain mine. He classified as *A* veins those striking within 30° of the bedding, although usually dipping more steeply than the bedding, but in mine parlance an *A* vein is any vein that has not one of the two *B* vein attitudes. The *B* diagonal veins strike N.60° to 80°E. and dip steeply south, and nearly all of the quartz vein ore mined at Island Mountain has come from such structures. Transverse *B* veins (locally called 'horsetails'), of which there are thousands, have average strikes of N.40°E. and dip 50°S.E. In general, they probably have as high, or a higher, gold tenor than the diagonal veins, but at Island Mountain mine very few of them are wide enough, or their spacing is not close enough, to make their extraction profitable.

The workable *B* quartz veins contain 15 per cent or more of moderately coarse pyrite and an average of about 2 per cent arsenopyrite. In places, very fine-grained pyrite, with associated high gold content, is encountered. Sphalerite, galena, and scheelite occur sporadically, and cosalite* and visible gold are infrequently observed. Ankerite is fairly common, particularly along the walls and in leaner parts of the veins. Sericite is common in *A* veins and occurs in the lower grade parts of *B* veins.

The diagonal quartz veins have little persistence and exhibit only a moderate tendency toward recurrence where they might be expected (making due allowance for rake and faulting) on successive mine levels. Average dimensions of the ore shoots are about 125 feet long, 5 feet wide, and 100 feet on the dip. Such an ore shoot will usually comprise from 100 per cent to 50 per cent of the total volume of the vein. In places, two or even three veins occur in close proximity, but in general the ore-bearing veins are some hundreds of feet apart.

*$2PbS.Bi_2S_3$. Identification not certain.

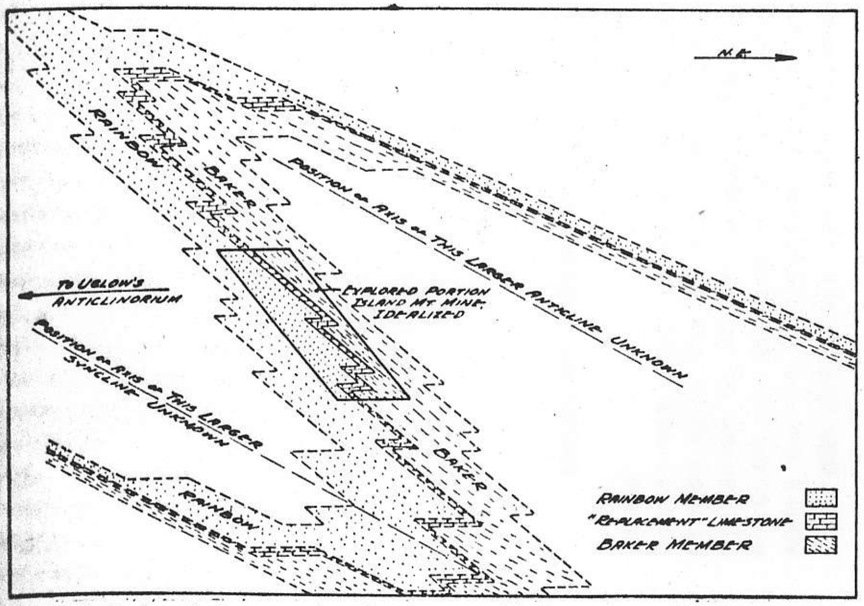

Fig. 5.—Idealized vertical cross-section, showing type of folding in Island Mountain mine and simplest interpretation of regional structure hypothetically extrapolated.

With few exceptions, the ore-bearing veins lie within 'smoky' quartzite with its associated thin interbeds of black argillite, the latter forming less than 20 per cent of the rock. The veins strike at a large angle to the bedding and, upon encountering a sill, or a bed that is not quartzite, they die out or pinch down to unworkable dimensions within a foot or two. Consequently, most of the veins rake east, thereby tending to maintain their stratigraphic position. Some are limited by faults that, although indistinguishable in appearance from post-vein faults, may be pre-vein, for in many instances considerable work has not succeeded in picking up their extensions.

At their junction with the diagonal ore veins, 'horsetails' are frequently larger than average, more abundant, and contain more pyrite. Possibly 30 per cent of the quartz vein tonnage may be attributed to the mining of such material adjacent to the diagonal veins proper.

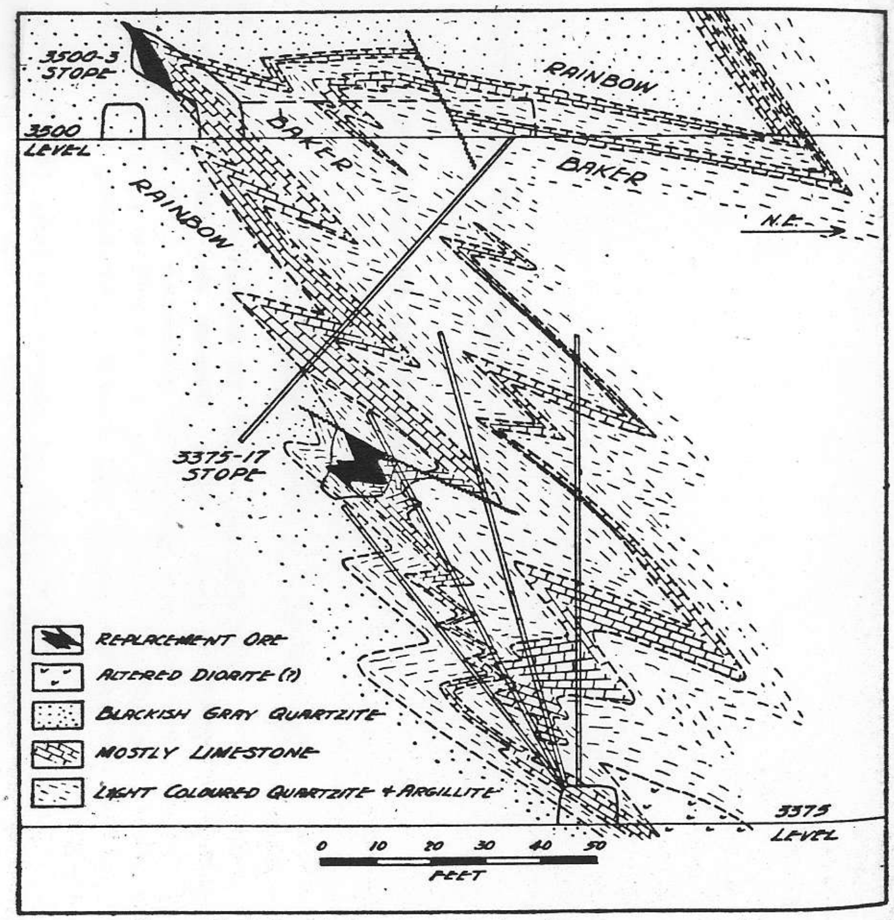

Fig. 6.—Typical vertical cross-section through replacement orebodies.

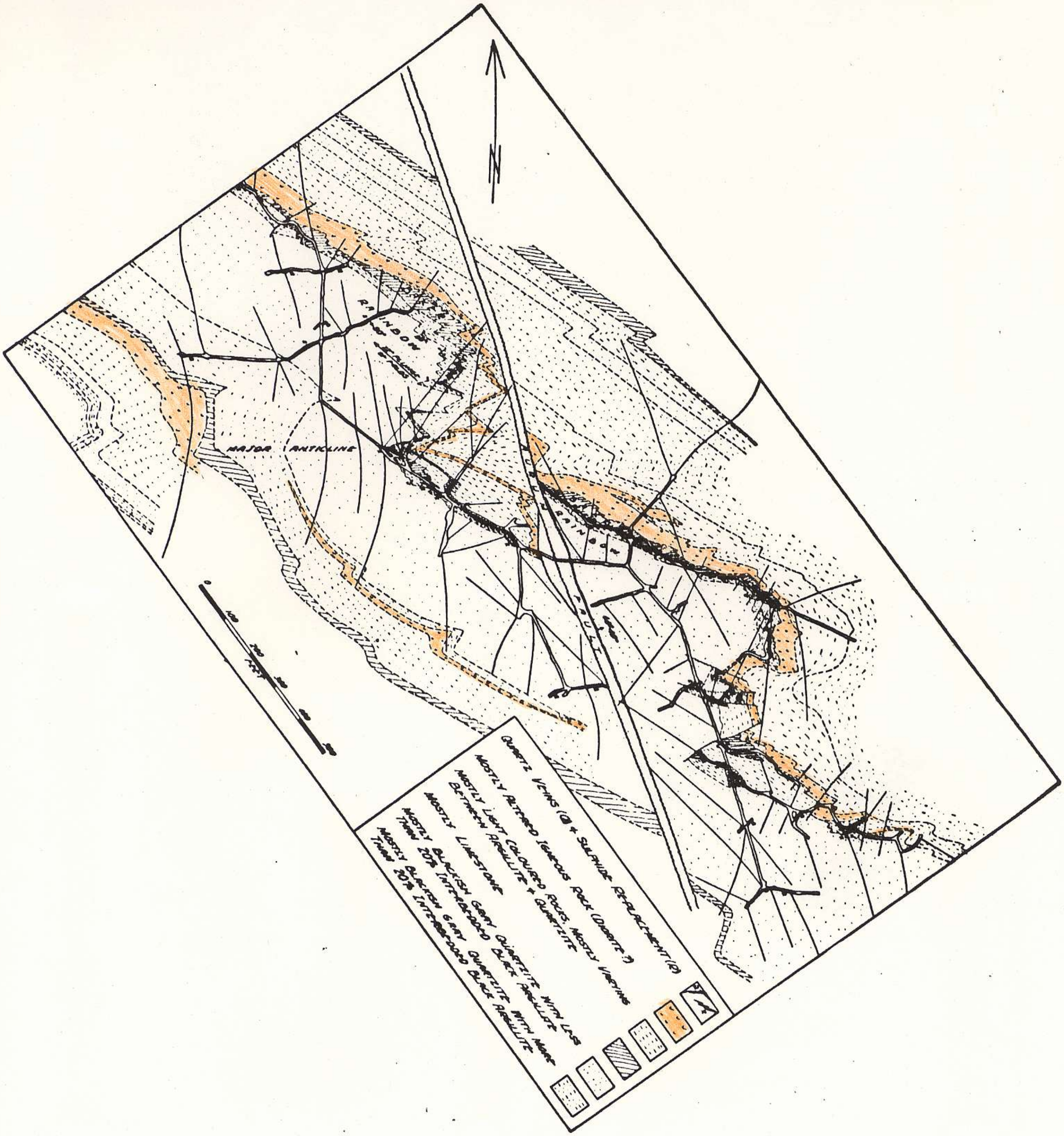

Fig. 1.—Generalized geological plan of 3,500-foot level, Island Mountain mine.

Figure is oriented to true north to conform to orientation of the magnetometer survey maps.

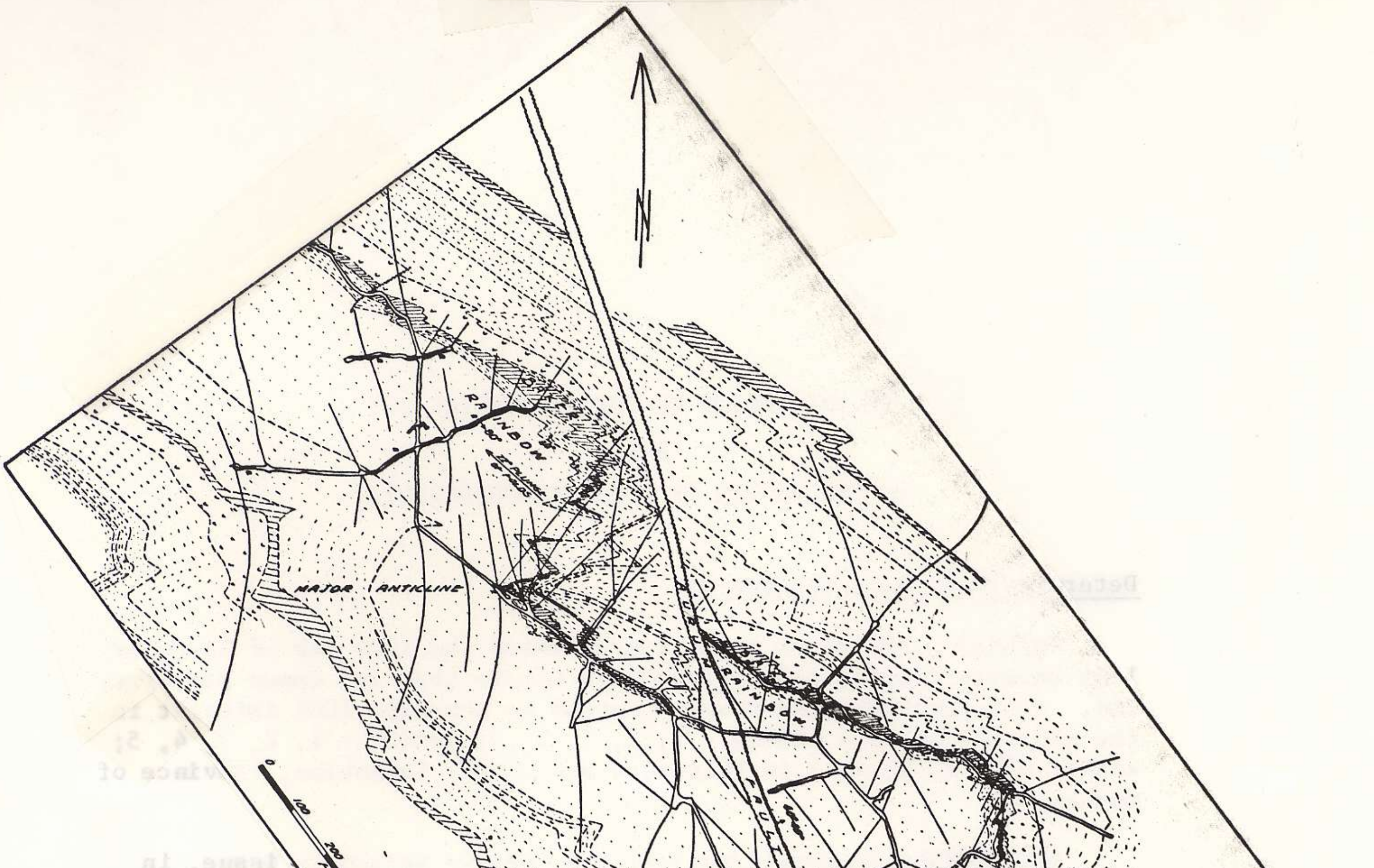

Fig. 1.—Generalized geological plan of 3,500-foot level, Island Mountain mine.

Figure is oriented to true north
to conform to orientation of the
magnetometer survey maps.

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