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A REVIEW OF THE BANKS ISLAND GOLD OCCURRENCES

BANKS ISLAND

SKEENA MINING DIVISION

INTRODUCTION

The writer was requested to review all of the available information on the Banks Island gold deposits, formerly owned by Falconbridge Nickel Mines and McIntyre Mines, now owned by Hecate Gold Corp.

Information available consisted of numerous reports and maps by Falconbridge, drill sections and logs by McIntyre and underground geology and assays by Hecate Gold Corp.

GEOLOGY

Banks Island is underlain mostly by intrusive rocks thought to be Jura-Cretaceous in age (G.S.C.). These include irregular northwest trending bodies of medium grained quartz monzonite, quartz diorite, and diorite. They are slightly gneissic or foliated, the attitude of which is northwesterly, dipping steeply easterly.

Sedimentary bands, persistent over considerable lengths, occur as in folded pendants within the intrusives. The sediments, which include limy or argillaceous rocks and irregular but wider lenses of limestone are thought to be of Permian or older in age (G.S.C.). The sediments have been metamorphosed to a large degree to schists, phyllites, hornsfels, skarn and marble.

On the southern half of Banks Island, two persistent sedimentary bands have been interpreted by MacDougal as limbs of a south plunging, isoclinally folded syncline. The east limb can be traced almost continuously for 20 miles to the south end of the island; the west limb southward for 10 miles where it is lost under Hecate Straits.

The nose of the proposed fold would occur beneath Banks Lake. Since it is not exposed, the structure is hypothetical.

More sediments occur on strike 10 miles to the north. This is thought by MacDougal to be a segment of the east limb, the fold now plunging to the north

## STRUCTURE

Two principal fault directions are recognized. The first is slip faulting paralleling the metasediments, the second is cross-cutting east-west faults. Work to date has concentrated at the intersection of the east-west faults with a limestone horizon, often slip faulted with graphite.

East-west faults, with which the mineralization appears related, are more numerous in the area between Banks Lake and Waller Lake. In this area the structures are more obvious due to extensive erosion. Other than Keetch Lake to the south east and Kingkown Inlet and Lake to the northwest, other strong lineaments in this direction are not as obvious. It is not unrealistic to assume other significant east-west faults are present but hidden by overburden.

## MINERALIZATION

A great number of occurrences of mineralized float and outcrop were located along the sedimentary belt. These consist of auriferous massive pyrite, pyrrhotite, chalcopyrite, sphalerite and galena in quartz gangue.

Work by Falconbridge was concentrated within a 3 mile length of metasediments. Within this area they located two significant massive sulfide deposits, namely the Discovery and Bob. McIntyre located the Tel zone within the same general area. Numerous other mineralized zones were located but to date contain no potential ore shoots.

All mineralized deposits and zones were located on or adjacent to a limestone bed at the intersection of strong cross-cutting east-west shears. There appears to be a greater concentration of these shears between Banks Lake and Waller Lake. It is within this area that the Discovery, Bob and Tel deposits are located, as well as the Kim, Englishman, Quartz Lode, Island, Crossbreak and Banks Lake zones.

South of this area, the next major east-west shear is at Keetch Lake. A zone of narrow gash veins, gold-bearing, are located on the north side of the lake.

East-west shears are not obvious south of Keetcha Lake. While this area has not been thoroughly prospected, no significant gold occurrences are known. Spotty occurrences of sulfides were located but were low in gold.

The main area of interest, referred to earlier as being 3 miles long, is lost to the south beneath Waller Lake. Falconbridge located the favourable limestone bed in islands and along the shore of the lake. To the north, the favourable horizon passes under Banks Lake. These water covered areas add approximately 4 miles of strike length to the favourable host rock.

## MINERALIZED ZONES

Falconbridge explored the Banks Island property intermittently from 1960 to 1976. During this time they explored much of Banks Island but concentrated their efforts along a limestone bed at east-west shear intersections where auriferous massive sulfides were located. They covered the entire east limb of the metasediments with geochemical soil sampling from Banks Lake to Waller Lake as well as conducted self potential and electro-magnetic surveys over selected areas. Many areas were tested by diamond drilling, both by pack-sack and AX drilling. The following is a summary of the more interesting zones.

A. Zones with potential ore reserves.

### 1. Discovery Zone

The Discovery zone occurs in a brecciated zone between a garnet-epidote skarn complex and an underlying body of massive marble. Its attitude is NW/SE-60 NE. The skarn zone is in contact to the north-east with a crushed zone of intensely altered silicified and sericitized quartz monzonite.

The zone is poorly exposed on surface as a 3-4 foot wide quartz-sulfide vein. Drilling along the intrusive-sedimentary contact traced this contact for 2000 feet, but delimited the zone of interest to approximately 300 feet of strike length. Additional drilling reduced the mineralized strike length to 200 feet but did prove continuity for at least 300 feet in depth.

A "level plan" plot by the writer of the mineralized zone indicates it to occur within a flexure in the metamorphosed sediments. This slight fold appears to be plunging steeply to the east.

The mineralized zone pinches out along strike, widens and then narrows with depth. Assuming an average width of 8-10 feet Falconbridge estimate the deposit to contain 70-100 tons per vertical foot, grading 0.4 oz/+Au, 1.0 oz/+Ag, 1% Pb and 1.5% Zn.

Geochemical data compiled by Falconbridge indicate an anomalous trend continuing to the southeast for approximately 1500 feet. This trend is slightly east of that of the skarn-intrusive contact and may indicate another mineralized shear zone. They located no mineralization in this area.

### Comment

The Discovery Zone appears to be a small mineral deposit with a greater length down plunge than along strike. Only deeper drilling would define its depth potential.

## 2. Bob Zone

The Bob Zone occurs along the Survey Bay fault zone near its intersection with the western limb of Banks Island sedimentary belt (Banks Island Syncline). In this area the fault splits; one branch trending easterly, the other northeasterly.

Geology within the zone consists of foliated granodiorite cut by a scattering of fine grained granite dykes.

Along each branch fault is a section of limestone and skarny sediments enclosed within the granodiorite. The limits of these sedimentary sections are poorly known due to lack of outcrop. Each limestone body contains a poorly defined quartz vein mineralized with massive coarse grained combinations of pyrite, arsenopyrite, sphalerite, chalcopyrite and galena in descending order of abundance.

Pack sack and diamond drilling on the mineralized exposure on the east striking branch fault intersected sections of quartz veins and quartz breccia zones well mineralized with gold bearing massive sulfides. Drilling indicated the fault zone to have lateral continuity but that the mineralized section was limited in strike length. It was not drilled to test its continuity at depth.

Hecate Gold Corporation, during late 1977-early 1978 tested the above mineralized zone with approximately 1250 feet of decline and ramps. Leg 3 of the decline followed the mineralized zone for 328 feet, a 144 foot section of which averaged 0.92 oz/+Au over an average width of 5.5 feet. While the fault structure continued along strike both to the east and west, the width and degree of mineralization diminished sharply. The last leg of the decline (leg 4) intersected the fault structure at a depth of approximately 200 feet (60 m) where it remained strong but assay values were much lower.

### Comment

The above underground work clearly indicates the lensey nature of the mineralization but it does not define its depth potential or plunge (if any). There is no indication from the underground work whether or not similar mineralization might be repeated along strike.

It is interesting to note that while the mineralization on surface occurs within limestone, underground it is almost entirely within the quartz-sulfide shear zone in granodiorite. The limestone which it intersected trends approximately N/35E at the portal and N45W/45NE in legs 2 and 3. If the limestone exposures are all in the same horizon, then there must be an east plunging syncline in decline area.

Tonnage potential in this zone appears very limited.

### 3. Tel Zone

The Tel Zone occurs in a fracture zone at its intersection with favourable strata in limestone near an intrusive contact. The limestones vary from thinly bedded light gray to dark gray to coarsely crystalline. Limy chert and chert beds are also present. Within the fracture zone bleaching is common, as are bands of chlorite, muscovite, epidote and pyrite. Bleaching is commonly too light yellow colour.

The mineralization as exposed in surface pits and drill core occurs both as quartz-sulfide veins and as irregular replacements in limestone. Mineralization includes abundant pyrite with lesser sphalerite, arsenopyrite and pyrrhotite in quartz gangue.

Drilling to date indicates a mineralized zone approximately 100 feet long and at least 100 feet deep. The deposit has not been tested at depth. Calculations by the writer, using sections drawn by McIntyre Mine and Falconbridge, and inferring mineralization to reasonable depths depending on widths of drill intersections, indicate 9075 tons averaging 1.129 oz/+Au and 1.002/+Ag to an average depth of 120 feet.

#### Comment

The Tel Zone is similar to the Discovery and Bob Zones in that the better grades and widths occur on one drill section, then thin out from here in both directions along strike. As in the other zone, it has potential for more tonnage at depth.

### B. Other mineralized zones of interest

Numerous other mineralized zones were explored by Falconbridge, some in considerable detail.

#### 1. Kim Zone

The Kim Zone occurs within a N80W shear zone in foliated quartz monzonite. This zone is characterized by very strong sericite-chlorite - quartz alteration to such a degree that the original rock can not be recognized. Alteration varies from 30 feet to 200 feet in width and has been traced for at least 2000 feet along strike. Prospecting along the zone, marked on surface as a water and debris-filled depression, located a great number of well mineralized float samples. These assay up to 3.502 oz/+Au.

Falconbridge recognized several series of quartz-sulfide veins, all of which are seldom over 2 feet wide. They occur (a) parallel to foot and hanging wall, attitude N80W/60-70N; (b) across the main shear, attitude N70-80E/55-75S. Thought by Falconbridge to be the most important set. (c) As a limited group varying from N15-35W/55-75N; (d) along the shear walls, attitude

ORE RESERVE CALCULATIONS - TEL ZONE

Ore Block	Length Ft.	Average Width (Ft)	Approximate Length of Ore Shoot	Volume Cu Ft.	Tonnage	Grade Au oz/+ Ag oz/+		Remarks
I N	4.9	2	100 (est)	980	122.5	0.45	0.40	Only two drill intersections each narrow and at 100' depth. no information closer to surface.
1 5	4.9	2	150 (est)	1470	183.75	0.45	0.40	
TOTAL 1	9.8			2450	306.25			
2	20.5	8.0	150	24600	3075	1.347	1.0 est.	One 47' intersection heavily weights hole in inferred width and grade. May only have true width of <u>±</u> 6 feet.
3	23.8	5,5	120	15708	1963.5	1.117	1.0 est.	
4	18.9	10.0	150	28350	3543.75	1.00	1.02	Good information, shales on or near section. May be at best part of zone.
5	21.3	1	70	1490	186.37	1.24	1.6	
					9074.87			

Total tons                      9074.87

Avg. grade                      1.129 Au  
    1.00 Ag

E/30-60N. Considered of low importance by Falconbridge.

Falconbridge conducted considerable packsack and AX drilling on this zone. They located a section within the shear zone which contained, over a strike length of 600 feet, a mineralized zone which averaged 0.437 oz/+Au, 1 oz/+Ag, 0.5% Pb and 1% Zn over a width of 2.4 feet. This average was obtained from 175 core samples from 60 drill holes.

An examination of Falconbridge maps and assays showed that many of the higher grade samples were obtained from packsack holes immediately below mineralized pits and/or outcrops.

Very low to trace amounts of gold were found throughout the entire width of the strongly altered shear zone. No areas of mineable widths or grades were indicated.

#### Comments

While this zone has received a considerable amount of drilling no zone equivalent to either the Discovery, Tel or Bob is indicated. If the zone is to be investigated for a larger, low grade deposit, then a considerable amount of closely spaced drilling is required.

#### 2. Englishman Zone

This zone consists of an east-west trending shear zone in strongly altered quartz monzonite. Its surface impression is a shallow depression 50 feet wide in which a creek flows and drains into a slough. High grade float was found along this trend.

Soil sampling over this area located a broad area of anomalous silver-arsenic-zinc samples. They approximately define an area 1200 feet long by 100 or more feet wide.

Drilling of this anomalous zone by Falconbridge failed to locate any areas of mineral concentration. Wide zones of creamy light green strongly altered intrusive were intersected which contained a scattering of narrow (1-12 inches wide) quartz and quartz-carbonate veins containing minor pyrite and very minor molybdenite and sphalerite. The eastern-most hole (11-76) intersected some narrow massive sulfide veins. These returned low assays in gold.

#### Comment

Drilling did not test the central part of this anomalous area, which also coincides with a weaker part of the geochemical anomaly. While there is no encouragement in this zone to date, further drilling could be conducted along strike to the west (toward Discovery Zone) or to the east.

### 3. Crossbreak Zone

This zone occurs along the western limb of the Banks Island sedimentary belt, in a geological setting very similar to that of the Bob Zone.

In this area an east-west fault displaces the sedimentary belt, the northern side moving at least 600 feet westerly relative to the south side.

The only mineralization to date was located 250 feet north of the fault in or near an easterly dipping limestone band. This band occurs in a 1000 foot (+) width of occasionally graphitic metasediments. Fine grained disseminated arsenopyrite and pyrite are present as replacements within a well defined shale and limestone breccia. Its dimensions and orientation are unknown.

A 3 foot wide quartz vein was located 70 feet north of the above showing. It occurs in metasediments near the limestone. This is implied to be located along an east to west graphitic shear.

One drill hole by Falconbridge beneath the mineralized showing in limestone intersected limestone breccia. Assays of the breccia returned only trace amounts in gold. One packsack hole tested the crossbreak fault in the vicinity of a geochemical anomaly. It did not locate any gold bearing zones.

#### Comment

The Crossbreak fault is a very strong feature. More detailed exploration in this area might lead to the discovery of a mineralized zone, however, none is indicated at the present time.

### 4. Other Zones

Numerous other areas are present in which either mineralized float and/or narrow mineralized veins were located. In all cases, no significant zones of mineralization were found. Some of these occurrences were tested by drilling, others remain unexplored.

#### Comment

Most of these can be explored only by diamond drilling. This is an expensive prospecting tool. Added to the cost is helicopter services, since there are no roads on the property.



### CONCLUSIONS

Exploration by Falconbridge Nickel Mines and McIntyre Mines located numerous gold bearing massive sulfide occurrences, both as float and as narrow veins. Some areas were explored in detail, resulting in the development of small "ore shoots" at the Discovery, Bob and Tel zones. Many other mineralized areas were tested but failed to locate any significant mineral concentration.

It is concluded that a considerable amount of additional exploration could be conducted on Banks Island, both to follow-up scattered occurrences not previously explored in detail and to search for additional mineralized east-west shears.

It is also concluded that any additional deposits located may be of similar size to those already known. Unless proven otherwise by deeper drilling, these are too small to support a mining operation and too scattered to be mined collectively.

### RECOMMENDATION

It is recommended that the company not option the property since a large expenditure is required (approximately \$2,000,000) to earn a 50% interest. For this expenditure the company is not buying into a partially developed ore body but must start from grassroots to locate a mineable deposit.

Respectfully submitted,

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