DOLMAGE CAMPBELL & ASSOCIATES (1975) LTD.
CONSULTING GEOLOGICAL & MINING ENGINEERS
1000-1055 WEST HASTINGS STREET
VANCOUVER, CANADA V6E 2E9

Border Resources Ltd.
(Property Owner & Operator)

Geological Report

COQUIHALLA NICKEL PROPERTY

NORTH GROUP CLAIMS

New Westminster M.D. - NTS 92H/6
Lat: 49°29'00"N - Long: 121°16'00"W
Claims: G 1-2; GWH 2; N 22-27,28FR,29FR; TAX 51-56

SOUTH GROUP CLAIMS

New Westminster M.D. - NTS 92H/6
Lat: 49°26'00"N - Long: 121°14'00"W
Claims: EV 1-2; TOY 3-9

October 25, 1983

J.A. Chamberlain, Ph.D., P.Eng.
Vancouver, Canada

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1.0 SUMMARY

The Coquihalla nickel property of Border Resources Ltd. is located about 175 kilometres east of the city of Vancouver in southwestern British Columbia and is accessible by a well maintained road which services logging and mining companies presently operating in the area. The property comprises two non-contiguous claim groups totalling some 480 hectares, located on a sinuous band of serpentinized peridotites known as the Coquihalla ultramafic complex.

Exploration work has been carried out intermittently on the property since 1958 and has included geological mapping, bedrock geochemistry, airborne magnetometer surveying and diamond drilling. This work has shown that the Coquihalla ultramafics contain an average of 0.22% nickel and 0.01% cobalt. The rocks are unusual in that nickel sulphide in the form of fine pentlandite is present in all samples examined mineralographically, and that the sulphide accounts for a significant portion of the total rock nickel. Reserves at the above grades are very large, on the order of hundreds of millions of tonnes.

Metallurgical test work indicates that recoveries of over 50% of the nickel are possible by flotation methods with concentrates grading between 2 and 3 percent nickel. CANMET, Ottawa, has stated that the metallurgical results obtained so far warrant additional follow up work, particularly if zones of higher grade mineralization can be located on the property.

A two-stage program of work is recommended which has as its objective the discovery and definition of large tonnages of higher grade material than have hitherto been found. The first stage consists of boundary surveys and geophysical work totalling $43,000.00. The second stage consists of diamond drilling geophysical targets developed in the first stage and totals $138,000.00.

2.0 INTRODUCTION

The present geological review of the Coquihalla nickel property was commissioned by Mr. G.W. Hornby in his capacity as president of Border Resources Ltd.

2.1 Location, Access (121° 15'W, 49° 29'N)

The subject property is located on both sides of the Coquihalla River 16 kilometres east of Hope, B.C. It is accessible by a well maintained gravel road which presently services logging and mining companies operating in the area, (Figure 1).

2.2 Previous Work

The deposit was originally brought to the attention of Mr. G.W. Hornby in about 1958 by Mr. E.B. Johnson. In February, 1968, Hornby and Johnson staked and recorded eight mineral claims across the serpentine belt near Jessica.

Some mineralogical work was done by Dr. J. Gower at the University of British Columbia in 1969. He identified the presence of nickel-bearing needles or rods in the serpentine.

Preliminary metallurgical tests by Britton Research Limited described in a report dated July 5, 1968, indicated that samples assaying 0.23% Ni produced a first concentrate assaying 1.33% Ni, with an overall nickel recovery of 46%. Tailings assayed 0.15% Ni after 4-stage rougher flotation and it was concluded that this "residual" nickel occurred within silicate minerals.

A report of the B.C. Research Council dated August, 1969, showed that fine, opaque rod-like needles observed in the Coquihalla serpentinites were nickel-iron sulphides. The needles were found to be 1-5 microns wide and 10 to 50 microns long. The writer of the report concluded that the nickel content of the serpentine matrix could be as low as 0.01 percent, and that most of the nickel in the rock might therefore be present as sulphide.

In 1970, five exploration diamond drill holes were completed on the property. Dr. J.A. Chamberlain of Dolmage Campbell and Associates logged the core from this drilling program. Chamberlain then conducted a geological reconnaissance of the property in November of 1970 and made a second examination in April of 1971 when two additional holes were drilled. The total footage drilled in both programs was 991 feet.

In 1971, Britton Research Ltd. conducted follow-up metallurgical tests in conjunction with detailed mineralographic studies by Chamberlain. These studies indicated that a significant percentage of the total

rock nickel occurs in the sulphide fraction, principally as finely dispersed pentlandite with some millerite.

An airborne geophysical survey of the Coquihalla property was flown and completed in April, 1971. The survey was conducted with a Scintrex Magnetometer mounted in a Jet Ranger helicopter, using a line spacing of 650 feet, with a terrain clearance of 300 feet. The results of this high-resolution airborne work outlined the ultramafic body clearly and produced evidence of cross-faulting near the Coquihalla River.

In 1981, Dr. J.A. Chamberlain and Mr. Peter Hall collected a group of bulk samples for the purpose of conducting additional metallurgical tests. Test work was supervised by Dr. H.E.A. von Hahn of A-Min-Tech Research Ltd., Vancouver, and subsequent metallurgical studies were undertaken in Ottawa in 1983 by the Mines Branch under the supervision of Louis Sirois, (Section 2.4).

2.3 Mineral Claims

The Coquihalla property of Border Resources Ltd. comprises two non-contiguous claim groups, situated north and south of the Coquihalla River, respectively.

The North Group (Figure 2) consists of 15 contiguous, "non-metric" mineral claims plus two fractions with a total area of approximately 295 hectares, as follows:

Tax 51 to Tax 56, incl.
N22 to N27, incl.
G1, G2
GWH2
N28 Fr.
N29 Fr.

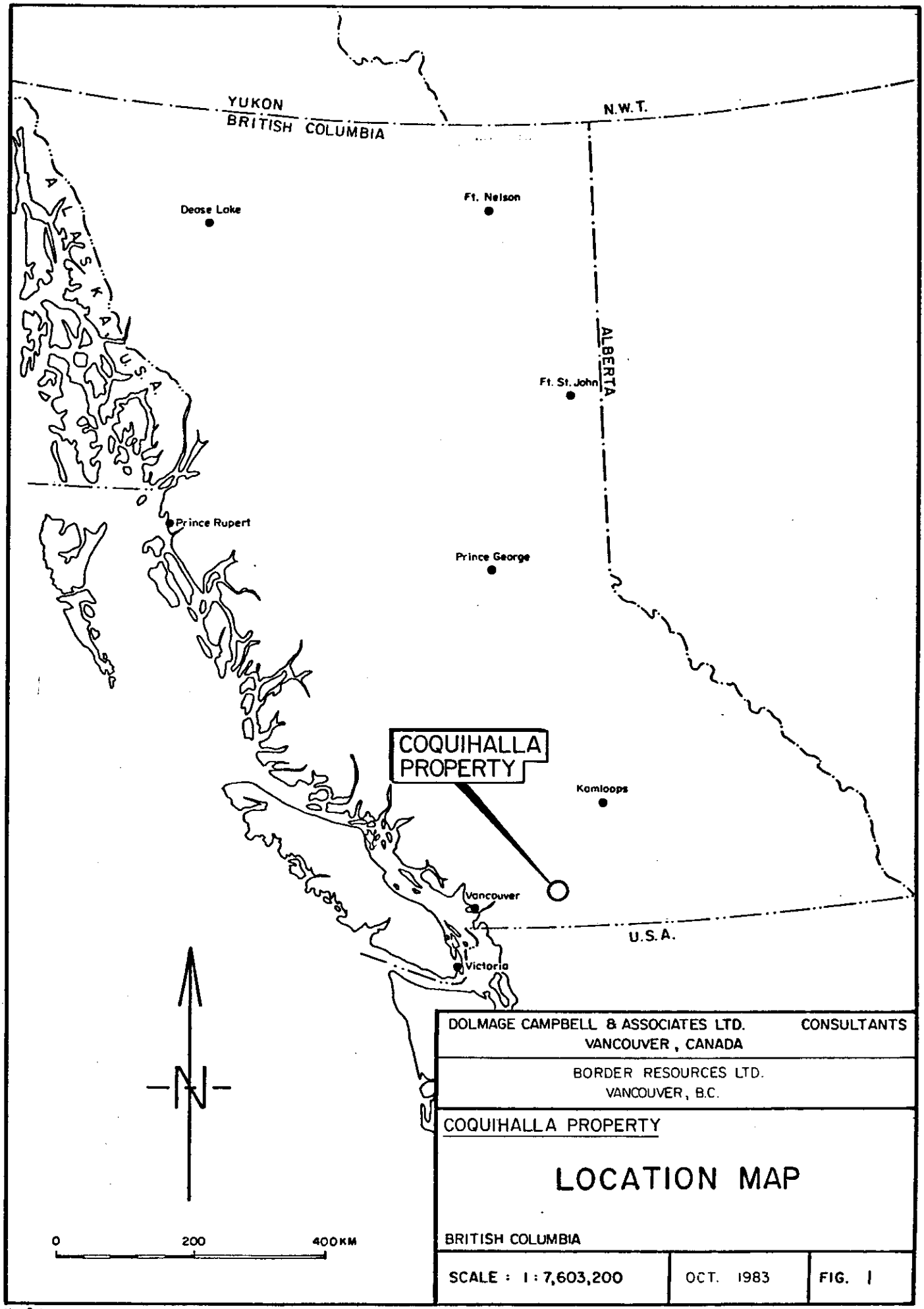
The South Group (Figure 3) consists of nine contiguous "non-metric" mineral claims with a total area of approximately 188 hectares, as follows:

Eve 1, Eve 2
Toy 3 to Toy 9, incl.

Most of the development work carried out to date has been concentrated on the North Group.

2.4 References

British Columbia Research Council Report 2297, 1969, Mineralogical Examination and Electron Probe Microanalysis of Nickel Bearing Serpentinite.



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BORDER RESOURCES LTD.
VANCOUVER, B.C.

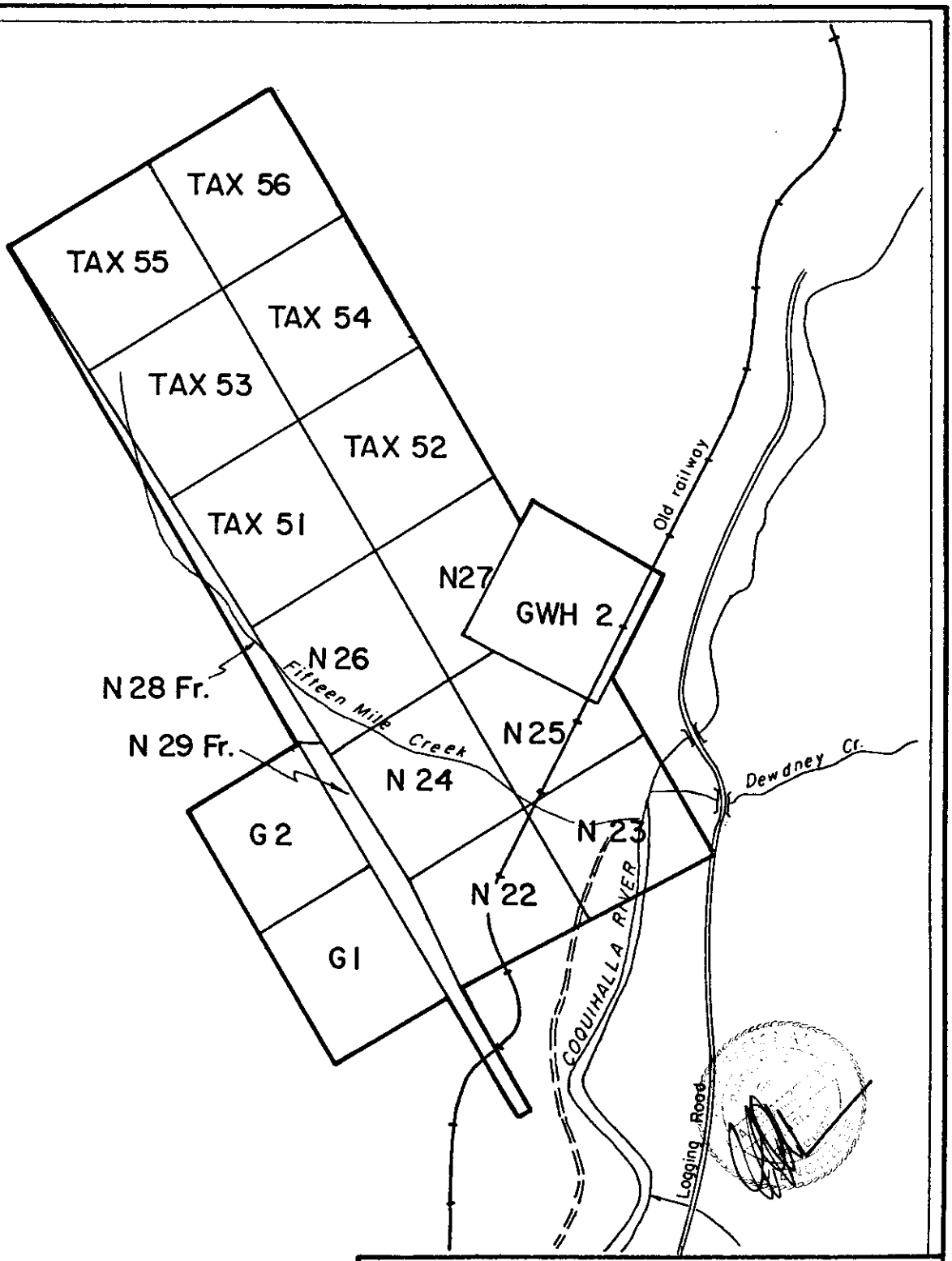
COQUIHALLA PROPERTY

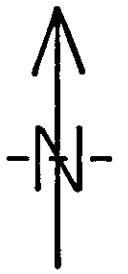
LOCATION MAP

BRITISH COLUMBIA

SCALE : 1 : 7,603,200	OCT. 1983	FIG. 1

Map B-1





0 500 1000METRES

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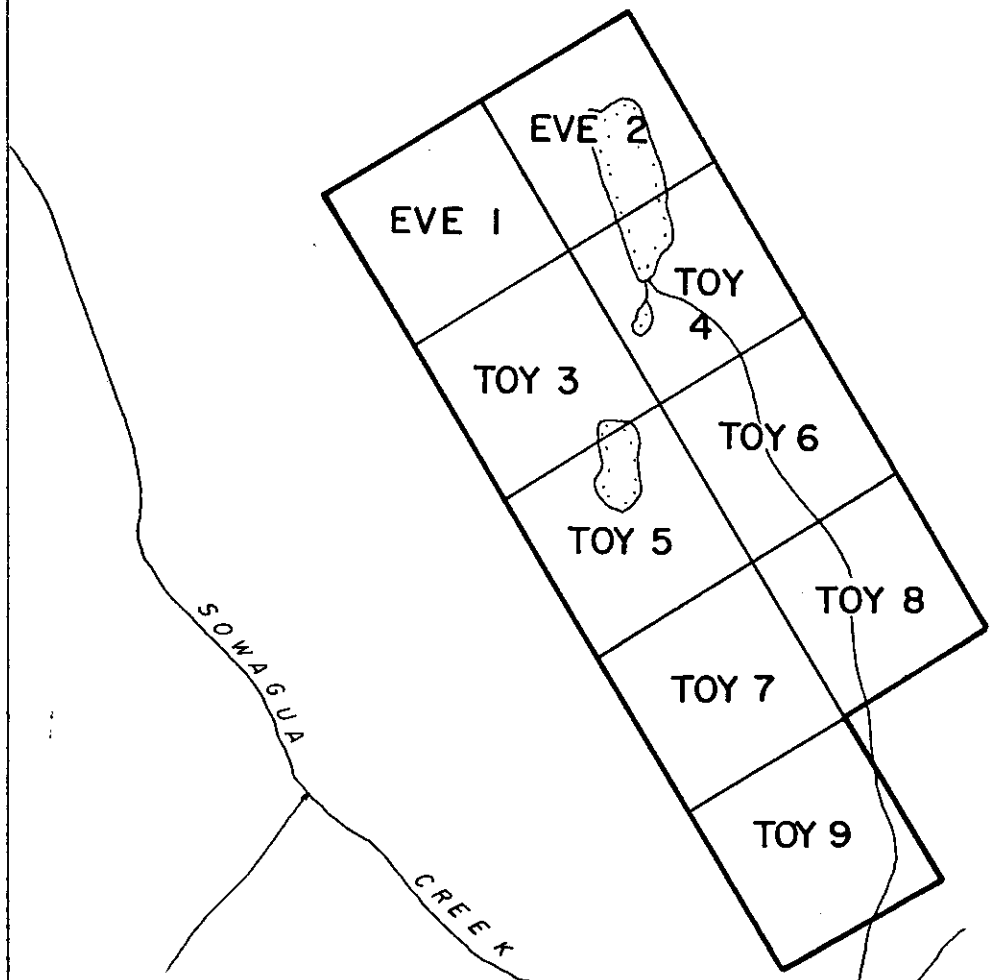
COQUIHALLA PROPERTY

NORTH CLAIM GROUP

SCALE : AS SHOWN	OCT. 1983	FIG. 2

VanCal/1326



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COQUIHALLA PROPERTY

SOUTH CLAIM GROUP

SCALE : AS SHOWN	OCT. 1983	FIG. 3

VanCal/1326

Chamberlain, J.A. and Campbell, D.D., 1969, Nickel Distribution in the Coquihalla Ultramafic Belt.

Chamberlain, J.A., 1970, Progress Report No. 1, Nickel Distribution in the Coquihalla Ultramafic Complex, for Mountain Pass Mines Ltd.

Britton, John, 1971, Concentration Tests on Samples of Nickel-Bearing Material Submitted by Mr. M.M. Menzies.

Chamberlain, J.A., 1971, Progress Report No. 2, Nickel Distribution in the Coquihalla Ultramfaic Complex for Mountain Pass Mines Ltd.

Chamberlain, J.A., 1971, Geological Report (Menzies-Hornby Project) Coquihalla Property, B.C.

Chamberlain, J.A., 1972, Notes on Geology, and Claim Boundaries in Vicinity of Tarrgent Creek, Jessica Property, B.C., for Mountain Pass Mines Ltd.

Chamberlain, J.A., 1972, Interim Report in 1972 Geochemical Program, Coquihalla Property, for Mountain Pass Mines Ltd.

Chamberlain, J.A. and Hall, P., 1981, Sampling for Nickel in the Coquihalla North Group Claims, for Border Resources Ltd.

Cristovici, M.A., et al, 1983, Investigation to Recover Ni-Co-Fe-Cr from Ore Samples Submitted by Border Resources, Division Report MRP/MSL 83-7 (CR), Mineral Sciences Laboratories (CANMET), Dept. of Energy, Mines and Resources, Ottawa.

Von Hahn, H., 1980-1982, Metallurgical Progress Reports 2, 4, 8, 9, 10, 11, 12, for Border Resources Ltd.

3.0 GEOLOGY

3.1 General

The Coquihalla nickel property is located on the east side of the Coast Range Plutonic Complex within a belt of metamorphic rocks designated as the Ladner Series. These rocks are of Mesozoic age and are characterized by a thick sequence of complexly folded black slates and cherts with intercalated basalts. The Ladner Series is host to low grade gold deposits currently being mined by Carolin Mines Ltd. a few kilometres northeast of the subject property.

The Coquihalla ultramafic complex is part of a sinuous band of serpentinites which extends to the north-northwest some 50 kilometres before crossing the Fraser River in the vicinity of Boston Bar. The Coquihalla rocks were emplaced after those of the Ladner Series. Contacts between the two are believed to be fault controlled, (Figure 4)..

3.2 Coquihalla Ultramafic Complex

Where it crosses the subject property, the ultramafic complex is about one kilometre in width and extends for three kilometres from the Coquihalla River northward to the claim boundaries. The margins of the complex are in apparent fault contact with basaltic rocks of the Ladner Series. Shearing is generally present over one or two metres in such cases.

The ultramafic complex was previously thought to consist of primarily homogeneous serpentinites. Detailed mapping (Chamberlain, 1971) has shown that the serpentinites were derived from rocks varying in composition from dunite through peridotite to pyroxenite. In addition it was found that in places there is a complex association between serpentinite and diorite. The diorite occurs as dike-like bodies within the ultramafics. Contacts between the two rock types are commonly, but not always, the locus of shearing. Detailed examination of some unsheared contacts reveals an apparent gradational change in mineralogy over a few centimetres. Carbonate is a common constituent in such localities, both as stringers and disseminations through the rock.

In several areas of good exposure on cliff faces, tabular to lenticular blocks of diorite appear to be "floating" in a sheared serpentine matrix. The diorite in such localities is not noticeably altered.

Most of the evidence bearing on the origin of the ultramafic-diorite complex points to emplacement in the solid state as a series of fault slices (see Section 3.3 following on Structure).

3.3 Structure

Narrow fault zones trending parallel to the north-northwest regional trend are common features of the map area. Most of these structures have been developed either on diorite-serpentinite contacts, or along the main contacts of the Coquihalla belt with country rocks. The consistency of the "contact faulting" is such as to indicate that the mafic-ultramafic complex was emplaced in the solid state as a fault slice.

Faults of a different orientation can be inferred on the basis of the aeromagnetic work referred to previously. These are east-west striking "cross-faults" which offset the north-trending magnetic axis of the Coquihalla belt with apparent left-hand displacements. No direct evidence for the existence of such faults was noted during the mapping program but the configuration of the geology on either side of the Coquihalla River strongly implies that at least one fault of this type is present, (Figure 4).

Inasmuch as the complex folding of the Ladner Series is not reflected in the ultramafic complex, the period of folding appears to have taken place prior to emplacement of the ultramafics. This indicates that the ultramafics are younger than the country rocks in terms of time of emplacement, even though they may have crystallized at a much earlier time.

4.0 GEOCHEMISTRY, MINERALOGY

4.1 Nickel Distribution

The nickel content of the Coquihalla ultramafics has been determined on a great number of samples during various investigations over the years. The vast majority of samples have a total rock nickel content that falls in the range of 0.18 to 0.24 percent. The average total rock nickel content is close to 0.22 percent.

Nickel is partitioned variably between sulphide, oxide and silicate minerals within the ultramafic host rock. In addition, a small quantity of the total nickel may occur as native nickel-iron alloys such as awaruite. One measure of the sulphide nickel content of the ultramafics is obtained by exposing test samples to a weak acid leach in which sulphides are preferentially dissolved. Such analyses have shown that 26 to 77 percent of the total rock nickel is present in the form of sulphide. Recent tests conducted by the Mines Branch in Ottawa (Cristovici, et al, 1983) reported that two samples taken by the writer from the North Group contained 57.1 and 77.3 percent of the total rock nickel as sulphide, respectively.

Detailed mineralographic examinations of the Coquihalla ultramafics indicate that sulphides such as pentlandite or millerite are present as finely disseminated grains in virtually all samples, (Chamberlain, 1969, 1970, 1971).

The partitioning of nickel between silicate and oxide phases in these rocks is not readily obtainable by assay techniques. Secondary magnetite formed during the serpentinization process contains a significant fraction of the total nickel in cases where it is abundant. It has also been observed that sulphides tend to be finer grained and less abundant in zones containing relatively large quantities of secondary magnetite. Sulphide grain sizes and textures are reviewed in Section 5.0 (Metallurgy).

4.2 Cobalt Distribution

The cobalt content of the Coquihalla ultramafic rocks averages about 0.01 percent. Experience with sulphides in other ultramafic deposits suggests that this quantity of cobalt is probably in solid solution in pentlandite where cobalt may substitute for nickel in the sulphide lattice. It is also possible that some of the minute metallic grains that occur in the Coquihalla serpentine are wairauite, a naturally occurring cobalt-iron alloy.

5.0 METALLURGY

Nickel sulphides account for a significant portion of the total rock nickel in the Coquihalla ultramafics (Section 4.0). Detailed mineralographic studies (Chamberlain, 1970, 1971) indicate that pentlandite is the most common nickel sulphide, followed by relatively rare millerite or heazlewoodite. The sulphide grains are generally free, but some may occur as sulphide-magnetite intergrowths (middlings). Over 90 percent of the total nickel sulphide occurs as grains less than 75 microns in diameter. Some of the fineness of the sulphides appears to be due to shearing of the host rock with concomitant fragmentation of the sulphide grains.

Metallurgical test work was conducted on samples of the Coquihalla ultramafic in 1971 by John Britton. The flotation tests produced a first concentrate containing 49% of the total nickel with a grade of only 0.38 percent nickel. Secondary and tertiary flotation tests on the primary tailing produced rougher concentrates containing 68 percent of the total nickel with a grade of 0.44 percent nickel. Attempts to upgrade the concentrate by cleaning were unsuccessful and no further test work was carried out at that time.

Metallurgical laboratory-scale tests were undertaken in 1980-81 by Dr. H. von Hahn of A-Min-Tech Research Ltd. on samples obtained from four different sites on the North Group. The purpose was to improve on earlier results of nickel flotation, to recover magnetite and chromite by magnetic separation, to look for evidence of precious metals and to obtain a measure of sulphide and non-sulphide nickel present in the ultramafic samples. The samples contained 0.21 to 0.22% nickel, 0.012 to 0.014% cobalt, 5 to 6% iron, about 0.27% chromium and traces of precious metals. The main sulphide species is pentlandite. Iron and chromium are present principally as magnetite and chromite. The best results were obtained with a sample designated Site 4 (Figure 4). Nickel recoveries of up to 53.7% of total nickel, at a grade of 2.3% were achieved in three stages of rougher flotation. The corresponding cobalt figures were 52.8% recovery and 0.13% grade. The similarity of recoveries and degree of upgrading for both nickel and cobalt confirms that cobalt is closely associated mineralogically with the nickel, (Section 4.2). The highest figures for rougher concentrate grade, as obtained in the first flotation stage of one of the tests, were 6.6% nickel at 30% recovery.

Magnetic separation tests by von Hahn were done on flotation tailings by means of a Davis tube. These gave iron recoveries of up to 63% at a grade of about 40%. Chromium recoveries were 62.9%, with the grade being 1.9%. The similarity of recoveries and degree of upgrading are also indicative of close mineralogical association of magnetite and chromite.

The results of Dr. von Hahn's work were sufficiently encouraging to cause a decision to be made to commission CANMET, Ottawa to do further work with the view of improving recoveries and grades of both the sulphides and the magnetite-chromite. Accordingly, in 1983 CANMET tested

material from sites 9 and 11 (Figure 4) using flotation and magnetic separation techniques. Results of this work were reported by Cristovici, et al, 1983, (Section 2.4). CANMET's results were inferior to those of A-Min-Tech. CANMET produced concentrates grading 6 percent Ni or more, but at this level of concentration recoveries did not exceed 30 percent. They stated that even under optimistic conditions recoveries would not exceed 50 percent, but then pointed out that the nickel minerals showed positive response to flotation. Concentrate grades of over 20% Ni were produced under strictly controlled conditions and CANMET concluded that "these results deserve further attention and constitute good grounds to continue the investigation for beneficiation of this ore."

6.0 RESERVES, ECONOMIC CONSIDERATIONS

Intermittent rock exposures of the Coquihalla ultramafic complex extend from the drift covered area near the Coquihalla River up-slope (northward) to the limit of the mineral claims of Border Resources Ltd., a distance of over two kilometres (Figure 4). The ultramafic complex is approximately one kilometre in width, but it should be emphasized that a significant portion of it is composed of dioritic material. Earlier field work by the writer (1971) suggested that about 50 percent of the complex was composed of diorite, but more recent field studies (1981) indicate a smaller diorite component of perhaps 30 percent. The problem is difficult to resolve more precisely because of (a) the presence of extensive overburden and (b) access difficulties of the terrain.

Regardless of the extent of the diorite component, it is clear that surface-indicated reserves of ultramafic rock grading 0.2 percent nickel or higher are immense. The economics of a mining operation are more dependent on the development of a low-cost metallurgical process to treat the nickel-bearing rock than they are on proving the existence of an additional hundred million tonnes or so of reserves at these grades.

The Coquihalla ultramafics are unusual in that nickel sulphide (mainly pentlandite) is present in virtually all samples, albeit often in very small amounts. Previous exploration work on the property by the present writer was oriented toward the search for evidence of sulphide zoning within the ultramafics. Several hundred surface samples failed to indicate sufficient variation in either sulphide or total rock nickel to focus attention on any one target area for follow-up work.

With the increased likelihood of a feasible metallurgical treatment for the Coquihalla ultramafics being developed (Section 5.0), it seems logical to extend exploration efforts to locate higher grade nickel sulphide zones within the complex. Such efforts should now be directed to possible subsurface target areas under surface showings or drift-covered areas using ground geophysical exploration methods (see Section 7.0).

7.0 CONCLUSIONS

The Coquihalla mineral claims of Border Resources Ltd. are located in southwestern British Columbia 16 kilometres east of the town of Hope. The claims are underlain by an ultramafic complex consisting of serpentinized dunites, peridotites and pyroxenites plus diorite. The ultramafic complex appears to have been emplaced in the solid state as a series of fault slices. The nickel content of the ultramafic rocks averages about 0.22 percent. The nickel sulphide pentlandite is present in virtually all samples and appears to account for a significant part of the total rock nickel.

A program of work is recommended in the following section having the objective of outlining a specific zone within the ultramafic complex in which:

(a) little or no diorite is present to dilute grade.

(b) the total rock nickel content of the rocks is largely present in the form of recoverable sulphide.

(c) the nickel grade is at or above the higher end of the range of grades so far found to be present on the property.

(d) sufficient tonnages are present to sustain a large scale mining operation.

7.1 Recommendations

The following recommended development work on the Coquihalla mineral claims of Border Resources Ltd. comprises a two-stage program in which successful results are required in the first stage in order to justify proceeding with the second stage program.

Stage 1

(a) Boundary Survey

Because the Border Resources claims are bounded by those of other mining companies such as Aquarius Resources Ltd., with the mutual boundaries passing close to some zones of interest, a boundary survey of the subject claims should be implemented.

Estimates cost: $ 8,000

(b) Geophysical Program

A pulse EM survey over the property designed to probe for deeper zones containing above average concentrations of sulphides. The target depth should be 75 metres.

Line cutting	5,000	
Instrument survey	15,000	
Interpretation and report	4,000	
(c) Program Management	2,000	34,000

Stage 2

(a) Diamond Drilling

Diamond drilling of geophysical targets discovered in Stage 1. Assume three targets with three 150 metre holes assigned to each:

9 150 metre holes @ $75/m	$101,250	
Mobilization costs	4,000	
Helicopter 20 hours @ $500	10,000	

(b) Assaying

Nickel and Cobalt assays as required.	3,500	

(c) Management, Consulting

Geological supervision 25 days @ $450	11,250	
Interpretation and report	8,000	138,000
Total		$172,000

Respectfully submitted by,
DOLMAGE CAMPBELL & ASSOC. (1975) LTD.

Joseph A. Chamberlain, Ph.D., P.Eng.

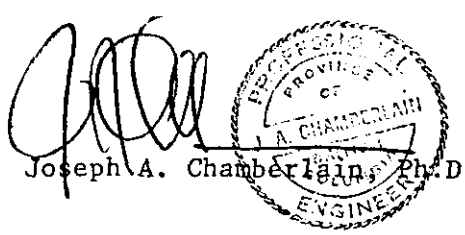
STATEMENT OF COSTS

Coquihalla Property

Geological Report and outline of
1984 Exploration Programme

Report Preparation (4¼ days @ $450./day)	=	$1875.00
Communications (BC Tel.- Aug.29)	=	4.28
Draughting (9 hrs. X $20./hr.)	=	180.00
Typing (6 hrs. X $15./hr.)	=	90.00
Materials and supplies (reprographics)	=	49.25
TOTAL:		$2198.53

Respectfully submitted by,
DOLMAGE CAMPBELL & ASSOC. (1975) LTD.



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8.0 CERTIFICATE

I, Joseph A. Chamberlain of Maple Bay, B.C., do hereby certify that:

1. I am a consulting geological engineer.

2. I am a graduate of the University of British Columbia, (1955), and of Harvard University, (M.A., Ph.D., in Structural and Economic Geology, 1957, 1958).

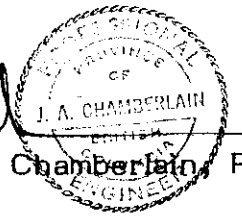
3. I am a registered Professional Engineer of the province of British Columbia.

4. From 1952 until the present, I have been engaged in regional geological studies, mining and mining exploration, engineering geology, and geological research for various companies and government institutions on a world-wide basis. I was Geologist and Research Scientist for the Geological Survey of Canada for nine years specializing on the geology of nickel, copper and uranium.

5. This report is based on results of personal examinations of the Coquihalla Ultramafic Complex as well as on mineralographic studies of samples from the subject property.

6. I have not received, nor do I expect to receive, any interest, directly or indirectly in the Border Resources Ltd. properties described herein.

Respectfully submitted,



Joseph A. Chamberlain, Ph.D., P.Eng.

Vancouver, Canada

N

0 1000 2000 3000 FEET
0 500 1000 METRES

NORTH CLAIM GROUP

SOUTH CLAIM GROUP

Fifteen-Mile Creek

Dewdney Creek

AREA OF DEEP OVERBURDEN

JESSICA STATION

COQUIHALLA RIVER

Logging road

DIORITE FLOAT Creek

DIORITE FLOAT Creek

CAMP

UPPER CAMP

CABIN

PLACER WORKINGS

SOWAQUA CREEK

Old railway

Creek

LEGEND

- OVERBURDEN
- ANDESITE
- PERIDOTITE, SERPENTINITE
- PROXENITE
- DIORITE
- CHERT, SLATES, METAVOLCANICS

- STRIKE, DIP OF FEATURE
- FAULT
- CONTACT - PROBABLE, INFERRED
- CLAIM GROUP BOUNDARY
- X OUTCROP
- DRILL HOLE
- BEDROCK SAMPLE

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COQUIHALLA PROPERTY

GEOLOGICAL PLAN

SCALE 1:12,000 | OCT. 1983 | FIG. 4