# GEOLOGY AND GOLD GEOCHEMISTRY

# of the R.H.S. CLAIMS

R.H.S. 9 to 12

SKEENA MINING DIVISION

NTS 103 P/13E

55° 56' North; 129° 43' West

Owner and Operator: Falconbridge Limited

By

T. Heah

October 1, 1984

SUMMARY

In 1984, a 12-day program of geological mapping and rock geochemical sampling was carried out on the 4-unit R.H.S. claims east of Stewart, B.C.

The purpose of the program was to assess the gold potential of the property.

Several new gold-quartz veins, uncovered by the recession of the glacier around the property, were found. These veins, though interesting in themselves, are not continuous or numerous enough to make the property economic at present. Gold values up to 1,200 ppb are present in quartz-pyrite veins.

More ice recession is needed to uncover more veins of economic interest, at which time a further detailed mapping and sampling program is recommended.

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# I. INTRODUCTION

## LOCATION AND ACCESS

The R.H.S. claims are located approximately 17 kilometres due east of Stewart, B.C. Two of the claims, R.H.S. 9 and 10, cover the eastern edge of a nunatak, while part of R.H.S. 11 and all of R.H.S. 12 are located on the Cambria Icefield.

Access to the claims is by helicopter from Stewart.

## PROPERTY

The property consists of four claims, R.H.S. 9, 10, 11 and 12, which have been grouped under the name of "R.H.S.". They cover a total area of 0.64 $km^2$.

Falconbridge Limited is the current owner and operator of the claims. The claims are listed as follows:

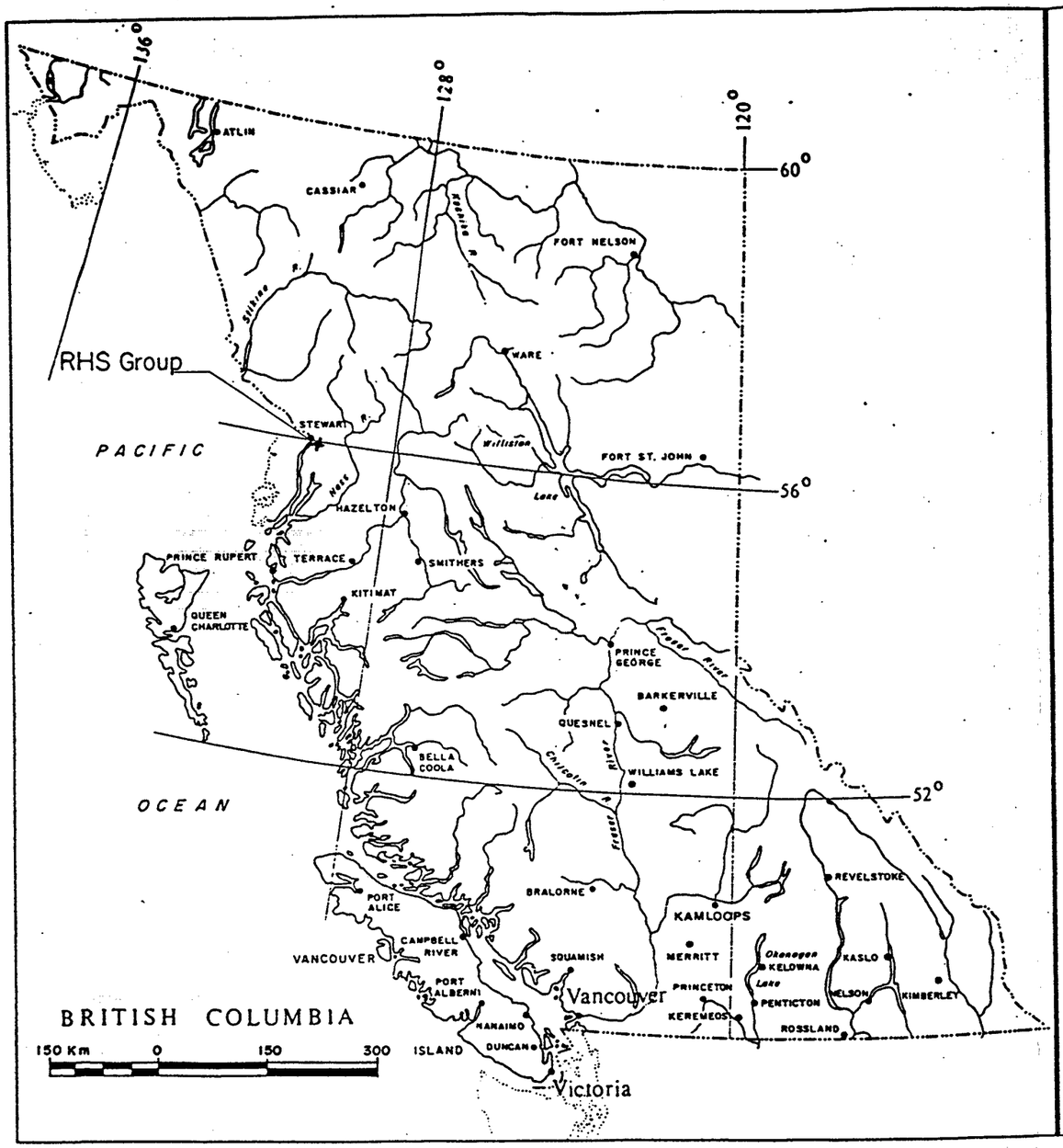
| Claim | No. of Units | Record No. | Area ($km^2$) | Expiry Date |
|---|---|---|---|---|
| R.H.S. 9 | 1 | 22238 | 0.16 | Aug. 15/84 |
| R.H.S. 10 | 1 | 22239 | 0.16 | Aug. 15/84 |
| R.H.S. 11 | 1 | 22240 | 0.16 | Aug. 15/84 |
| R.H.S. 12 | 1 | 22241 | 0.16 | Aug. 15/84 |

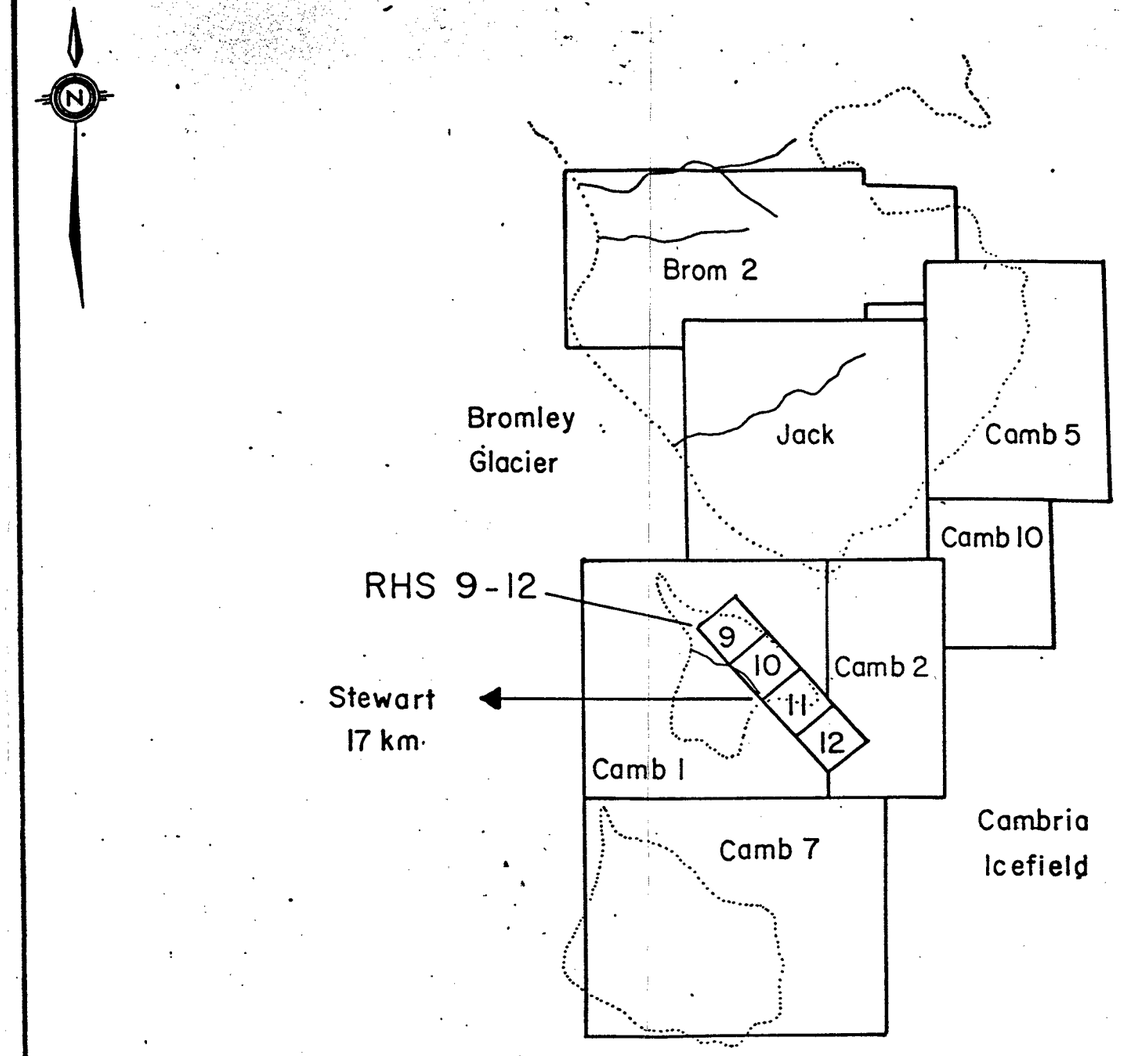
## HISTORY OF WORK

The claims were originally staked to cover small but high-grade gold showings on a nunatak in the Bromley Glacier.

In 1969, as part of a larger mapping program, part of R.H.S. 9 was geologically mapped by S.N. Charteris (Charteris, 1969).

Talus blocks of quartz monzonite containing spectacular quartz-molybdenite veins were found in June, 1973 (McDougall, 1973). This prompted packsack diamond drilling in June and July, 1973 of a small nunatak on R.H.S. 9, as well as geological mapping along the northeastern edge of R.H.S. 9 and 10. This work located spotty, high grade (1.08oz/t) gold showings in small, irregular quartz-pyrite veins.




FALCONBRIDGE LTD.

# LOCATION MAP

SCALE 1 50000

DRAWN BY: TH

DATE: Sept 7, 1984

N.T.S.: 103P/13E

FIG. NO: 1

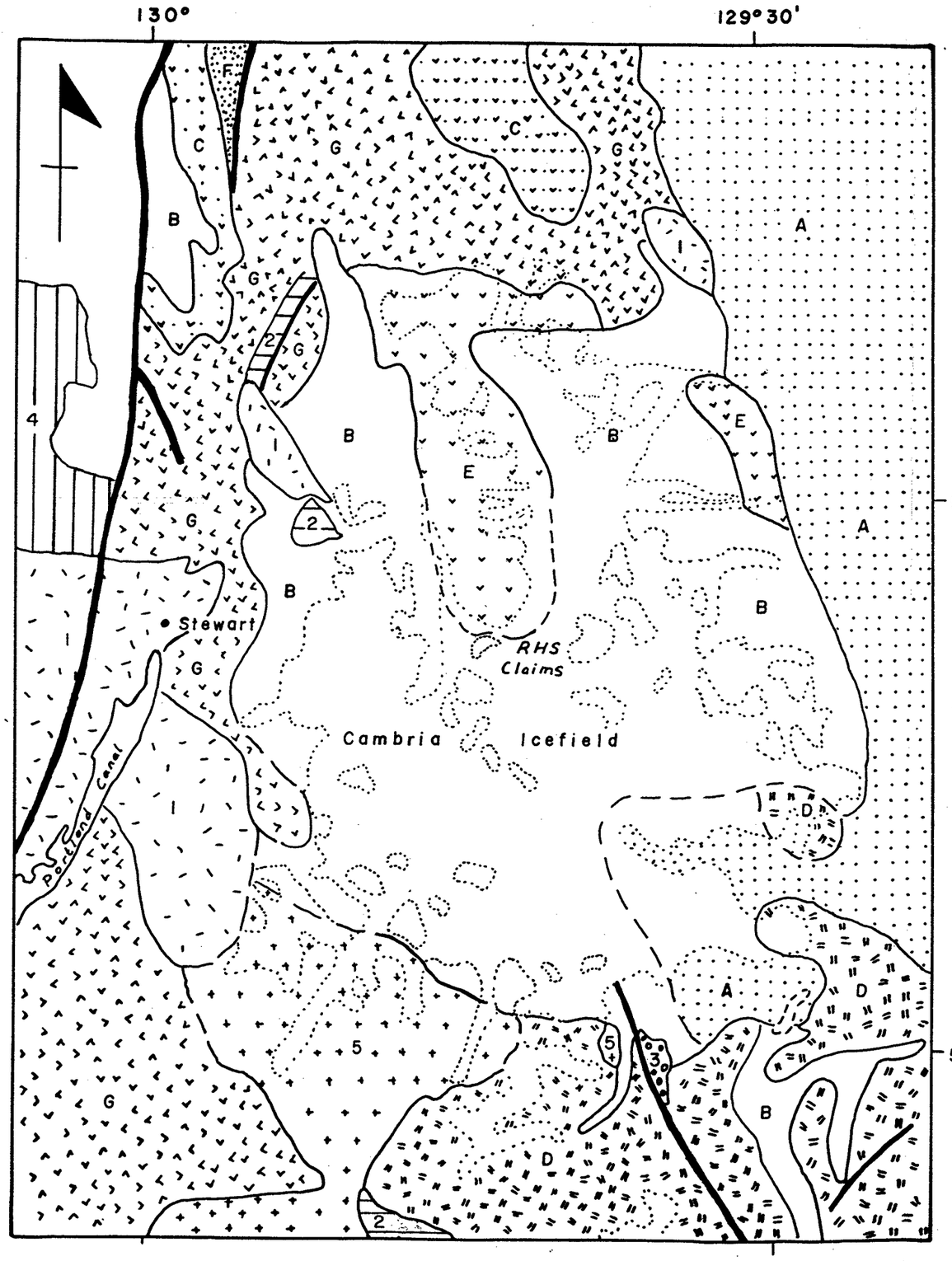
## PRESENT WORK

The purpose of the present work was to locate additional gold-mineralized veins by geological mapping and rock geochemical sampling.

Although rocks in the area are heavily mineralized with pyrite and pyrrhotite, gold values are generally low and only spot highs are present. Few new veins were located, and it is the author's view that the claims are uneconomical at the present time. However, since ice recession is rapid (approximately 3m vertically per year), more veins on R.H.S. 11 and 12 may be uncovered in the future.

1:2,500 scale geological mapping was carried out over the exposed claim area, which covers a total of 0.4 $km^2$. A 1:2,500 scale topographic base map produced from B.C. Government airphotos by McElhanney and Associates was used to plot all geological and geochemical data.

Thirty-six rock samples were submitted for fire gold analysis. Of these, 29 were submitted for whole rock analysis and 6 were submitted for 26 element ICP. The pulps from 7 samples were later submitted for gold assay. The analytical procedures are described by Min-En Laboratories and found in Appendix II. Sample descriptions are listed in Appendix III, and results are listed in Appendices IV, V and VI.




LEGEND

SEDIMENTARY AND VOLCANIC ROCKS

JURASSIC AND CRETACEOUS

A — Siltstone, argillite, greywacke, conglomerate (includes upper part of HAZELTON GROUP)

JURASSIC

MIDDLE JURASSIC

B — HAZELTON GROUP: siltstone, greywacke, sandstone

C — Volcanic breccia, conglomerate, sandstone, tuff

D — HAZELTON GROUP: andesite, tuff, basalt

E — Rhyolite, breccia, tuff, andesite

LOWER JURASSIC

F — Quartzite, greywacke, argillite

G — HAZELTON GROUP: andesite, basalt

INTRUSIVE ROCKS

EARLY TERTIARY

1 — Quartz monzonite

2 — Quartz diorite

JURASSIC AND CRETACEOUS

3 — Feldspar, augite and hornblende porphyries

TRIASSIC AND JURASSIC

4 — TEXAS CREEK: granodiorite

AGE UNKNOWN

5 — Granodiorite

SYMBOLS

Contact: known, inferred

Fault

Limit of icefield

FALCONBRIDGE LIMITED

REGIONAL GEOLOGIC SETTING OF THE R.H.S. CLAIMS

SCALE: 1:250,000

Compiled from USGS map 2138 and GSC map 1385A

Compiled by T. Heah

Figure 2

## II. GEOLOGY

### REGIONAL GEOLOGICAL SETTING

The R.H.S. claims are located close to the boundary between the Coast Plutonic Complex (CPC) and the Intermontane Belt, and have been mapped as belonging to the Middle Jurassic Hazelton Group. Hutchison et al. (1973) describe these rocks as siltstone, greywacke and sandstone. North of the Cambria Icefield, Middle Jurassic volcanics outcrop. Early Tertiary, felsic intrusions outcrop to the west of the Cambria Icefield, in the CPC, and granodiorite of unknown age outcrops to the south. To the southeast and east of the area, Middle Jurassic sediments outcrop (Figure 2).

### GEOLOGY OF THE R.H.S. CLAIMS

The rocks in the claims are a moderately westward plunging, steeply inclined and isoclinally folded panel of metasediments. Intrusives of various compositions are present as sills and dykes. Mineralization consists of pervasive pyrite and pyrrhotite in host sedimentary rocks and minor sulfides associated with quartz veins.

Four metasedimentary and three intrusive units were distinguished during mapping (Figure 5).

### LAYERED METASEDIMENTARY ROCKS

Four main units were observed during mapping on the property. Most of the property is rusty weathering, due to pervasive, finely disseminated pyrite and pyrrhotite. Bedding and contact trends are generally northwesterly with moderate to steep southwest dips.

The whole package of rocks is apparently overturned, with tops to the northeast, as shown by graded bedding, flame structures and loading structures in argillites and siltstone.

#### ARGILLITE

Rusty weathering, black and grey argillites make up most of the property. These are aphanitic to fine-grained, conchoidally fracturing rocks with abundant disseminated pyrite and pyrrhotite (5-15%). These rocks are thinly interbedded with light grey siltstones in parts. Fine-grained pyrite bands are both conformable to and crosscut bedding. Rusty fractures in the argillite are due to oxidized pyrite and pyrrhotite.

Calcareous layers within the argillite are often metamorphosed to a lighter, cream coloured calc-silicate rock with remnant bedding. The calc-silicate mineral assemblage varies from place to place, but may

consist of any one or a combination of: tremolite ± actinotite ± epidote ± almandine ± diopside ± dolomite, quartz and calcite.

SKARN

Skarns, besides being found as screens and layers within argillite, make up continuous, resistant bands from one to thirty metres thick. These rocks weather to a patchy rust and cream colour, distinguishing them from the surrounding argillites. Contacts with the argillites are often bedding plane faults or gradational. Screens of argillaceous limestone and black calcareous argillites, both with remnant bedding, occur within the calc-silicate unit, as do coralline argillites.

This unit is often banded, and consists of fine-grained white, siliceous rock interbedded with fine-grained greenish (epidote - tremolite - actinolite - almandine - diopside) bands. Darker green, chloritic bands are also present, expecially near intrusive rocks.

CONGLOMERATE

Rusty weathering limestone conglomerate, originally mapped as quartzitic pebble conglomerate, outcrops in the southeast and northwestern parts of the property. The present work shows the conglomerate to be a re-crystallized limestone pebble and coral conglomerate with an argillaceous matrix. The clasts are rounded to sub-rounded, and composed of grey calcite and limestone. In parts, the "clasts" are actually re-crystallized corals displaying crude septa. The matrix is grey to dark grey, fine-grained, siliceous argillite and displays a conchoidal fracture. The size of the clasts ranges from one to five cm in diameter.

QUARTZITE

Rocks mapped as quartzite are rusty to grey weathering, very fine to fine-grained, grey and siliceous. These rocks are almost invariably interbedded with argillite, and contacts with other metasedimentary units are gradational.

INTRUSIVE ROCKS

Three intrusive rock units were distinguished. These are: andesite, quartz monzonite and diorite.

ANDESITE

Andesite is generally light to dark grey weathering and found as both sills and dykes. On fresh surface,

it is seen to be grey, fine to medium grained, and porphyritic, with plagioclase phenocrysts of up to 20% of the rock. In parts, xenoliths of metasediments, usually argillite, are present.

QUARTZ MONZONITE

This unit is present mostly on the northeastern section of R.H.S. 10. It is light grey to white weathering, hypidiomorphic and coarse grained, with biotite greater than hornblende in amount. It contains about 1% disseminated pyrite in parts. Border phases are chilled and finer grained.

Molybdenite in pyrite - quartz veins are found as fracture coatings within this unit.

DIORITE

Diorite is rusty weathering, medium grained, hypidiomorphic with disseminated pyrite up to 5%. This unit is restricted to just one outcrop, on the southern corner of R.H.S. 9.

## III. MINERALIZATION

Mineralization consists mostly of pervasive pyrite and pyrrhotite in metasedimentary rocks and quartz veins. Other forms of mineralization, consisting of sphalerite, chalcopyrite and galena, are found in minor amounts associated with pyrite in quartz veins. Molybdenite in coarse pyrite-quartz veins within quartz monzonite occurs on R.H.S. 10 near the glacier edge.

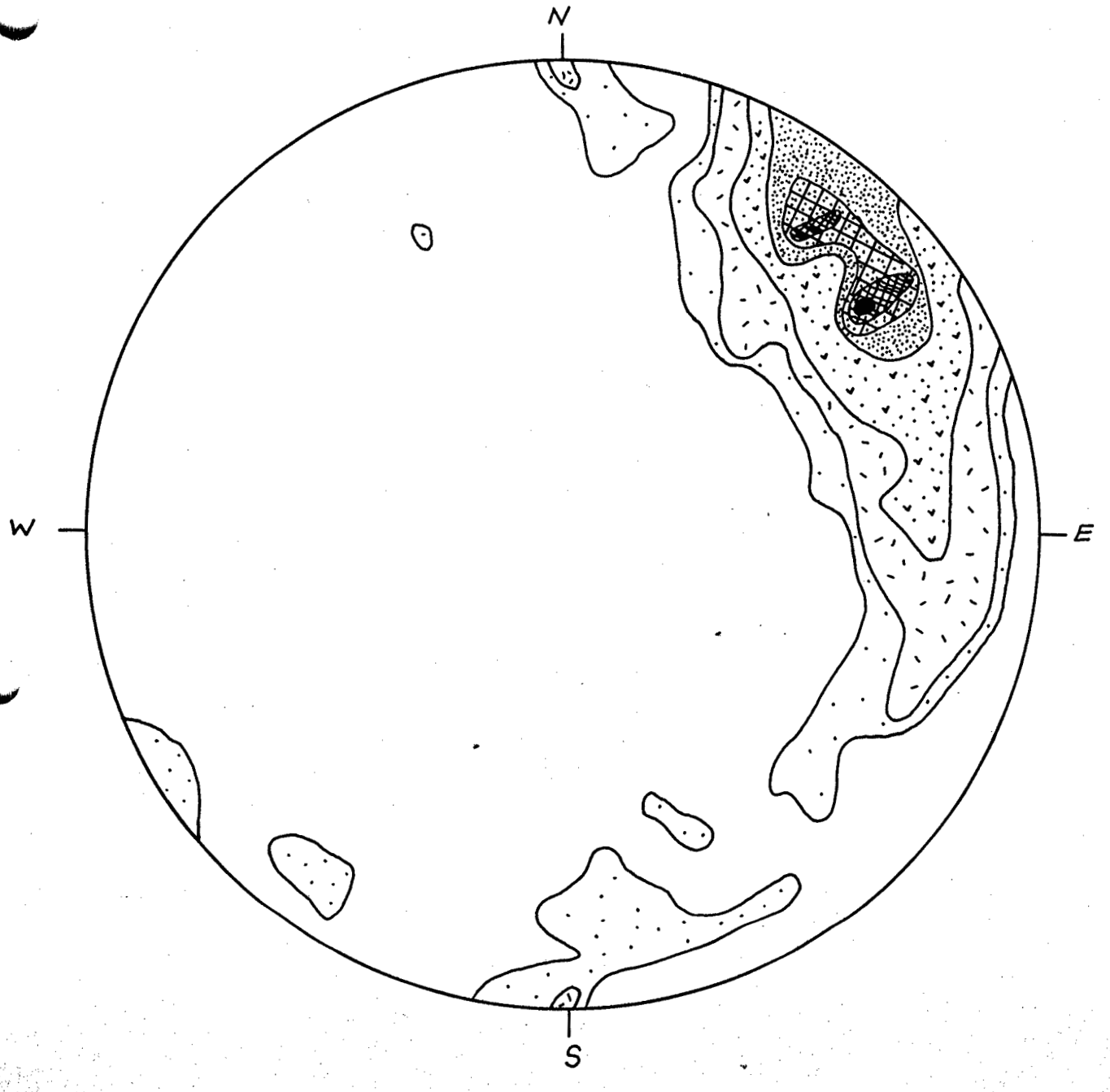
The majority of quartz veins on the property are found near or along fault contacts as resistant bands trending northwesterly, and conformable to bedding.

The veins pinch out along strike, and range from 10 cm to 1m thick at their thickest sections.

The highest gold values were 1,200, 800, 570, and 250 ppb, all from quartz veins. Host rocks analyzed for gold by fire methods returned generally low values.

At present, the low number of quartz veins and the spotty nature of gold values makes the property uneconomic. However, veins may be uncovered in the future with recession of the ice.

Schmidt Contour Plot of Bedding Poles
178 Poles Measured



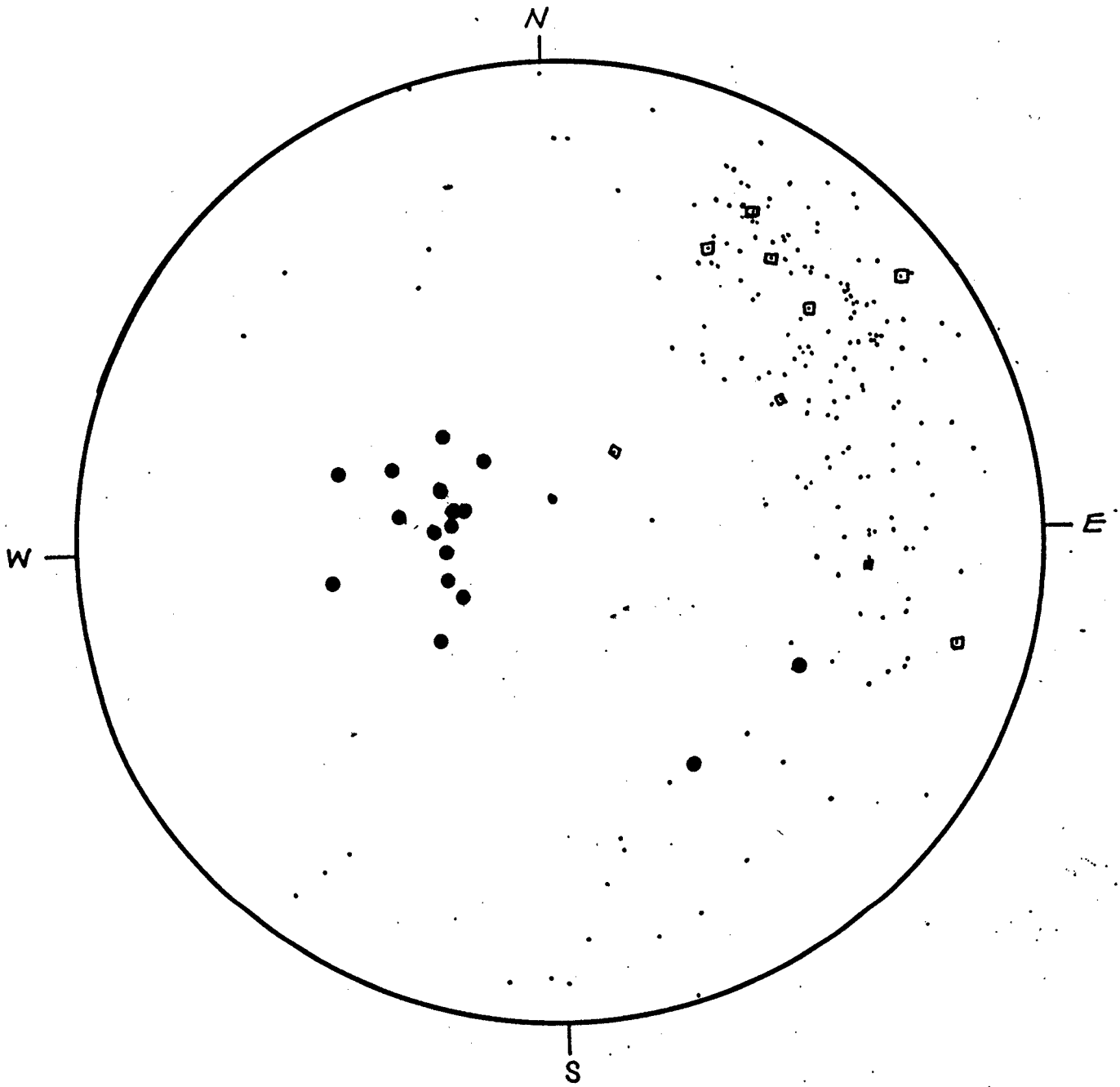

Legend

% points per 1 % area

| | | | |
|---|---|---|---|
| | 1 % | | 11 % |
| | 2 % | | 12 % |
| | 5 % | | 15 % |
| | 10 % | | |

Figure 3

Wulff Net Plot of Measured Structures




LEGEND

• Bedding pole

● Fold axis

⊡ Axial plane pole

Figure 4

# IV. STRUCTURE

## FOLDING

Rocks in the area were observed to have undergone at least two phases of cylindroidal folding - a tight to isoclinal phase and a later open phase.

Minor fold structures in argillite enable a structural analysis to be performed on the area. The Schmidt equal area net (Figure 3) shows two closely spaced spot highs (15% and 12% of total points per 1% area) of poles to bedding, denoting tight to isoclinal folds with a westerly plunging fold axis.

Most of the measured fold axes of tight and isoclinal folds plunge steeply to the west, but are displaced by later folding (Figure 4), as are the axial planes, which tend to fan (Figure 4) along a roughly great-circular path.

## FAULTS, JOINTS AND CLEAVAGES

Faults in the area are mostly bedding plane faults, and are most often developed between rocks of different competencies. Fault zones are narrow (1 - 2m wide), with well developed gouge zones consisting of brecciated and phyllitic country rock. Pyrite and pyrrhotite are ubiquitous in these zones, as are quartz and calcite veins, which are often heavily mineralized with pyrite, pyrrhotite, chalcopyrite, galena and sphalerite. Measurements of displacement along faults were difficult to determine because of the nature of the faults (i.e. bedding-plane type).

Well developed gently southwest dipping joints were observed in the argillite.

Closely-spaced fanning axial planar cleavages were observed in argillite at one station and these may be related to dewatering during folding.

## V. GEOCHEMISTRY

Limited rock geochemical sampling aimed at locating gold quartz veins was carried out on the property. Several of the host rocks were also sampled and analyzed for gold by fire and six major elements. Analytical procedures and results are listed in Appendices II-VI.

Gold values range from 1 to 1,200 ppb, with the higher values being obtained from quartz veins.

Pulps from 7 samples were assayed for gold (Appendix IV), and returned results ranging from 0.001 - 0.041 oz/ton. Sample 21565 (0.018 oz/ton) was taken from a quartz vein assaying 1.08 oz/ton in 1973 (McDougall, 1973). Sample 21566, which gave a fire gold result of 1,200 ppb, was re-submitted for a pulp assay, which gave only 0.041 oz/ton gold. This sample gave elevated silver, cadmium, copper, manganese, lead and zinc values (Appendix VI).

Whole rock geochemistry results gave moderate to high $SiO_2$ contents (up to 912000 ppm), which supports field observations that the sediments are highly siliceous in general. $Fe_2O_3$ values are generally elevated in the sediments due to the pyritiferous nature of the rocks. Sample 21580, with $Fe_2O_3$ of 104,000 ppm, is a hornblende basalt dyke, while 21552, a biotite quartz monzonite intrusive, has low $Fe_2O_3$ of 15,900 ppm.

CaO values of skarns are generally elevated, as expected, except in fine-grained skarns barren of abundant calc-silicate minerals (e.g. 21562).

## VI. CONCLUSIONS AND RECOMMENDATIONS

Gold mineralisation on the property is restricted to quartz-pyrite veins. These veins in themselves are interesting though gold values are erratic. At present, the small number of these veins makes any further work unadvisable. With further ice recession, however, more veins may be exposed on R.H.S. 11 and 12, and more work should then be carried out in the form of detailed mapping and rock geochemical sampling with an established grid.

## VII. REFERENCES


Charteris, S.N.

1965: Preliminary Report on the R.H.S. Group, Portland Canal District, British Columbia; Falconbridge Limited Report, 5p.

1969: Report on the 1968 Exploration of the R.H.S. Group, Portland Canal District, British Columbia; Falconbridge Limited Report, 8p.

Hattie, D.W.

1973: Exploration of a Molybdenite Showing and Other Notes on the R.H.S. Group; Falconbridge Limited Report, 11p.

Hutchison, W.W., Berg, H.C. and Okulitch, A.V.

1973: Skeena River; Geological Survey of Canada Map 1385A.

McDougall, J.J.

1973: Notes on the R.H.S. Property; Falconbridge Limited Report, 5p.

Smith, A.

1962: Synopsis - R.H.S. Group; Falconbridge Limited Memorandum, 1p.

## VIII. STATEMENT OF QUALIFICATIONS

The author graduated in 1982 from the University of British Columbia with a BSc (Honours) in Geology. He has worked periodically for Falconbridge Limited for a total of 1 1/2 years since graduation.

APPENDIX I

ITEMIZED COST STATEMENT

1. WAGES

| | | |
|---|---|---|
| a) | Geologist - July 19 - Aug. 2, 1984<br>15 days @ $90.00/day | $ 1,350.00 |
| b) | Assistant - July 18 - Aug. 2, 1984<br>16 days @ $55.00/day | 880.00 |
| TOTAL | | $ 2,230.00 |

2. FOOD AND ACCOMODATION

| | | |
|---|---|---|
| a) | Food: $25.00/man/day - 31 man-days<br>for period July 18 - Aug. 2, 1984 | $ 675.00 |
| b) | Accomodations: Motels - 3 nights<br>@ $30.00/night | 90.00 |
| | Camp - 13 days @ $10.00/day (cost<br>includes supplies for building<br>and maintaining camp) | 130.00 |
| TOTAL | | $ 895.00 |

3. TRANSPORTATION

| | | |
|---|---|---|
| a) | Truck rental - July 18 - Aug. 2, 1984<br>16 days - Chevy Blazer from Company | $ 350.00 |
| b) | Gas - Vancouver - Stewart - Vancouver<br>(July 18, 19, August 31, Sept. 1, 4 days) | 240.00 |
| c) | Plane Ticket - Vancouver - Prince Rupert -<br>Stewart, (July 19) | 230.00 |
| d) | Helicopter (fuel included) - 3.8 hrs. | 2,481.00 |
| TOTAL | | $ 3,301.00 |

4. ROCK GEOCHEMICAL ANALYSIS

| | | |
|---|---|---|
| | 6 rock samples analysed for Au geochemistry<br>fire assay with A.A. finish and 26 element<br>ICP @ $17.00/sample | $ 102.00 |
| | 29 rock samples submitted for Au and<br>whole rock analysis @ $20.00/sample | 580.00 |
| TOTAL | | $ 682.00 |

5. PREPARATION OF REPORT

| | |
|---|---|
| a) Wages: | |
| Geologist - 7 days @ $90.00/day | $ 630.00 |
| Draftsman - 7 days @ $55.00/day | 385.00 |
| b) Materials: | |
| Pencil - manuscript topographic map prepared by McElhanney and Associates | 1,950.00 |
| Drafting materials, map reproduction, etc. | 100.00 |
| TOTAL | $ 3,065.00 |

6. MISCELLANEOUS COSTS

| | |
|---|---|
| Rental of climbing - safety equipment at $10.00/day for 12 days | 120.00 |
| TOTAL COST | $10,293.00 |

# APPENDIX II

## GEOCHEMICAL PROCEDURES

Analytical procedures for fire gold, whole rock and 26 element ICP analysis are described here. The analyses were carried out by Min-En Laboratories Ltd., at 705 W. 15th St., North Vancouver, B.C.

Analytical Procedure for Fire Gold Geochemical Analysis:

After drying the samples at 95 C soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed and pulverized by ceramic plated pulverizer.

A suitable sample weight 15.00 or 30.00 grams are fire assay preconcentrated.

After pretreatments the samples are digested with Aqua regia solution, and after digestion the samples are taken up with 25% HCl to suitable volume.

Further oxidation and treatment of at least 75% of the original sample solutions are made suitable for extraction of gold with Methyl Iso-Butyl Ketone.

With a set of suitable standard solution gold is analysed by Atomic Absorption instruments. The obtained detection limit is 1 ppb.

Analytical Procedure for Whole Rock Analysis and 26 Element ICP:

After drying the samples at 95 C soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by jaw crusher and pulverized by ceramic plated pulverizer.

1.0 gram of the samples are digested for 6 hours with HNO3 and HClO4 HF mixture.

For those elements which do not yield complete dissolution, a Lithium tetraborate dissolution or potassium hydroxide dissolution is applied.

After cooling samples are diluted to standard volume, the solutions are analysed by computer operated Jarrell Ash 9000 ICP. Inductively coupled Plasma Analyser reports are formated by routing computer dotline print out.

# APPENDIX III

## ROCK GEOCHEMICAL SAMPLE DESCRIPTIONS

| SAMPLE NO. | DESCRIPTION | TYPE OF SAMPLE |
|---|---|---|
| 21551 | Rusty black argillite; 1% mixed pyrite and pyrrhotite | Grab |
| 21552 | Fine-med. gr. biotite quartz monzonite; minor hornblende; quartz eyes | Grab |
| 21553 | Very fine grained, rusty, black argillite; disseminated pyrite and pyrrhotite | Grab |
| 21554 | Rusty black argillite, veins and disseminations of pyrite | Chip Across 1m |
| 21555 | Quartz vein in quartz monzonite; contains coarse pyrite cubes (15%) and bornite | Grab |
| 21556 | Chlorite - biotite schist | Grab |
| 21557 | Rusty black argillite | Grab |
| 21558 | Grey and black siliceous argillite with 10% pyrite as stringers and disseminations | Grab |
| 21559 | Black argillite, 5% disseminated pyrite | Grab |
| 21560 | Pyrite - quartz vein in argillite | Chip Across 1m |
| 21561 | Black argillite with stringer pyrite and pyrrhotite | Grab |
| 21562 | Skarn (chlorite - actinolite - quartz) with 10% pyrrhotite, minor bornite | Grab |
| 21563 | Black argillite with 10% pyrite - pyrrhotite as veins | Grab |
| 21564 | Black argillite, 5% finely disseminated pyrite | Grab |
| 21565 | Fine grained calc-silicate with quartz vein. Pyrite, bornite, molybdenite | Grab |
| 21566 | Pyrite - quartz vein in argillite | Grab |
| 21567 | Skarn with py-quartz vein | Grab |
| 21568 | Pyrite - quartz vein | Grab |

| | | |
|---|---|---|
| 21569 | Quartz vein with stringers of pyrite, bornite and chalcopyrite up to 50% | Grab |
| 21570 | Pyrite-quartz vein; limonite stains | Chip Across 1m |
| 21571 | Grey, fine grained quartzite; 5% disseminated pyrite | Grab |
| 21572 | Fine grained grey to black argillite; 3% finely disseminated pyrite | Grab |
| 21573 | Quartz vein with 15-20% pyrite, 2% sphalerite | 10m Chip Sample |
| 21574 | Fine grained, dark grey argillite with 15% pyrite | Grab |
| 21575 | Tremolite - almandine - quartz skarn with pyrite and minor sphalerite | Grab |
| 21576 | Bedded, black argillite; 1% pyrite | Grab |
| 21577 | Black argillite; 5% disseminated pyrite in quartz stringers; Vuggy | Grab |
| 21578 | Black, graphitic argillite, slightly schistose; 10% disseminated pyrite and pyrrhotite | Grab |
| 21579 | Fine grained, grey skarn with chlorite pods; 5% disseminated pyrite and pods of pyrite | Grab |
| 21580 | Hornblende basalt dyke | Grab |
| 21581 | Fine grained diopside - tremolite skarn; 5% disseminated pyrite | Grab |
| 21582 | Fine grained biotite - quartzite; 10% disseminated and stringer pyrite | Grab |
| 21583 | Fine grained, siliceous argillite; quartz stringers, 10% disseminated pyrite | Grab |
| 21584 | Fine grained, dark grey argillite; quartz stringers; 10% disseminated pyrite | Grab |
| 21585 | Fine to medium grained, dark grey argillite; 5% disseminated pyrite | Grab |
| 21586 | Medium grained, tremolite - actinolite skarn; 2% disseminated pyrrhotite | Grab |

## APPENDIX IV

## FIRE GOLD ROCK GEOCHEMISTRY RESULTS AND GOLD ASSAY RESULTS

MIN-EN Laboratories Ltd.
*Specialists in Mineral Environments*
705 WEST 15th STREET NORTH VANCOUVER, B.C. CANADA V7M 1T2

PHONE: (604)980-5814 OR (604)988-4524 TELEX: 04-352828

## GEOCHEMICAL ANALYSIS CERTIFICATE

COMPANY: FALCONBRIDGE LTD.
PROJECT: 303-608-008
ATTENTION: T. HEAH

FILE: 4-773/P1
DATE: AUGUST 21/84
TYPE: ROCK GEOCHEM

*We hereby certify* that the following are the results of the geochemical analysis made on 30 samples submitted.

| SAMPLE NUMBER | AU-FIRE PPB |
|---|---|
| 21551 | 32 |
| 52 | 60 |
| 53 | 5 |
| 54 | 20 |
| 55 | 40 |
| 56 | 5 |
| 57 | 10 |
| 58 | 110 |
| 59 | 1 |
| 60 | 2 |
| 61 | 1 |
| 62 | 7 |
| 63 | 1 |
| 64 | 1 |
| 65 | 570 |
| 66 | 1200 |
| 67 | 1 |
| 68 | 250 |
| 69 | 2 |
| 70 | 22 |
| 71 | 25 |
| 72 | 9 |
| 73 | 800 |
| 74 | 12 |
| 75 | 4 |
| 76 | 2 |
| 77 | 10 |
| 78 | 2 |
| 79 | 1 |
| 21580 | 1 |

*Certified by* _____

MIN-EN Laboratories Ltd.
*Specialists in Mineral Environments*
705 WEST 15th STREET NORTH VANCOUVER, B.C. CANADA V7M 1T2

PHONE: (604)980-5814 OR (604)988-4524 TELEX: 04-352828

## GEOCHEMICAL ANALYSIS CERTIFICATE

COMPANY: FALCONBRIDGE LTD.
PROJECT: 303-608-008
ATTENTION: T. HEAH

FILE: 4-773/P2
DATE: AUGUST 21/84
TYPE: ROCK GEOCHEM

*We hereby certify* that the following are the results of the geochemical analysis made on 15 samples submitted.

| SAMPLE NUMBER | AU-FIRE PPB | |
|---|---|---|
| 21581 | 12 | |
| 82 | 8 | |
| 83 | 15 | |
| 84 | 15 | |
| 85 | 14 | |
| 86 | 20 | |
| 87 | | |
| 90 | | |
| 91 | | |
| 92 | | NOT FROM RHS PROPERTY |
| 93 | | |
| 94 | | |
| 95 | | |
| 21596 | | |
| NO TAG | | |

SOME OF THESE SAMPLES SHOULD HAVE BEEN REQUESTED FOR ASSAY.

*Certified by* _____

MIN-EN Laboratories Ltd.
*Specialists in Mineral Environments*
705 WEST 15th STREET NORTH VANCOUVER, B.C. CANADA V7M 1T2

PHONE:(604)980-5814 OR (604)988-4524 TELEX: 04-352828

# *CERTIFICATE OF ASSAY*

COMPANY: FALCONBRIDGE LTD.
PROJECT: 303-608-008
ATTENTION: TOM HEAH

FILE:4-773R
DATE: SEPT.15/84
TYPE: PULP ASSAY

*We hereby certify* that the following are assay results for samples submitted.

| SAMPLE NUMBER | AU G/TONNE | AU OZ/TON |
|---|---|---|
| 21552 | .25 | 0.007 |
| 21555 | .02 | 0.001 |
| 21558 | .24 | 0.007 |
| 21565 | .61 | 0.018 |
| 21566 | 1.40 | 0.041 |
| 21568 | .39 | 0.011 |
| 21573 | .98 | 0.029 |

*Certified by*

MIN-EN LABORATORIES LTD.

# APPENDIX V

## WHOLE ROCK GEOCHEMISTRY RESULTS

COMPANY: FALCONBRIDGE LTD. | MIN-EN LABS ICP REPORT | (ACT:LI+) PAGE 1 OF 1
PROJECT No: 303-608-008 | 705 WEST 15th ST., NORTH VANCOUVER, B.C. V7M 1T2 | FILE No: 4-773
ATTENTION: T. HEAH | (604)980-5814 OR (604)988-4524 | *TYPE WHOLE ROCK* | DATE: AUGUST 21, 1984

| (REPORT VALUES IN PPM) | AL203 | BA | CAO | FE203 | NA20 | SIO2 |
|---|---|---|---|---|---|---|
| 21551 | 73000 | 1070 | 6240 | 15300 | 1990 | 830000 |
| 21552 | 139000 | 1300 | 11200 | 15900 | 37800 | 741000 |
| 21553 | 60600 | 623 | 952 | 22500 | 4090 | 867000 |
| 21554 | 62400 | 493 | 26900 | 36300 | 932 | 813000 |
| 21556 | 132000 | 1890 | 9070 | 57500 | 14800 | 683000 |
| 21557 | 137000 | 865 | 36400 | 60600 | 21900 | 686000 |
| 21558 | 140000 | 896 | 53300 | 73700 | 22700 | 633000 |
| 21559 | 162000 | 771 | 12400 | 85100 | 32700 | 698000 |
| 21560 | 79100 | 884 | 24100 | 59400 | 7700 | 725000 |
| 21561 | 150000 | 925 | 41100 | 51800 | 31600 | 644000 |
| 21562 | 150000 | 782 | 20400 | 49000 | 34400 | 672000 |
| 21563 | 117000 | 648 | 31400 | 62800 | 13600 | 685000 |
| 21564 | 153000 | 1040 | 30900 | 71100 | 29300 | 636000 |
| 21567 | 72500 | 387 | 21600 | 45600 | 12800 | 749000 |
| 21571 | 113000 | 2000 | 13000 | 57500 | 6550 | 732000 |
| 21572 | 93700 | 1240 | 6270 | 41700 | 9250 | 797000 |
| 21574 | 35600 | 489 | 6660 | 41900 | 914 | 912000 |
| 21575 | 122000 | 3710 | 91100 | 39500 | 28900 | 658000 |
| 21576 | 138000 | 621 | 18700 | 67400 | 21900 | 673000 |
| 21577 | 117000 | 243 | 84100 | 59700 | 11800 | 655000 |
| 21578 | 115000 | 1200 | 32700 | 53000 | 11200 | 699000 |
| 21579 | 161000 | 1210 | 37200 | 71000 | 42300 | 592000 |
| 21580 | 139000 | 354 | 106000 | 104000 | 22000 | 508000 |

COMPANY: FALCONBRIDGE LTD. | MIN-EN LABS ICP REPORT | (ACT:LI+) PAGE 1 OF 1
PROJECT No: 303-608-008 | 705 WEST 15th ST., NORTH VANCOUVER, B.C. V7M 1T2 | FILE No: 4-773A
ATTENTION: T. HEAH | (604)980-5814 OR (604)988-4524 | *TYPE WHOLE ROCK* | DATE: AUGUST 21, 1984

| PORT VALUES IN PPM) | AL203 | BA | CAO | FE203 | NA20 | SIO2 |
|---|---|---|---|---|---|---|
| 21581 | 114000 | 182 | 186000 | 37800 | 16200 | 611000 |
| 21582 | 154000 | 3910 | 11800 | 73100 | 15300 | 654000 |
| 21583 | 92900 | 648 | 20300 | 22600 | 20400 | 741000 |
| 21584 | 154000 | 1000 | 15400 | 66200 | 27800 | 643000 |
| 21585 | 184000 | 778 | 54500 | 80900 | 37700 | 568000 |
| 21586 | 169000 | 425 | 63300 | 57800 | 38600 | 611000 |

## APPENDIX VI

## 26 - ELEMENT ICP ROCK GEOCHEMISTRY RESULTS

COMPANY: FALCONBRIDGE LTD. MIN-EN LABS ICP REPORT (ACT:GE03B) PAGE 1 OF 3
PROJECT No: 303-608-008 705 WEST 15th ST., NORTH VANCOUVER, B.C. V7M 1T2 FILE No: 4-773R/P1+2
ATTENTION: T. HEAH (604)980-5814 OR (604)988-4524 *TYPE ROCK GEOCHEM* DATE: AUGUST 21, 1984

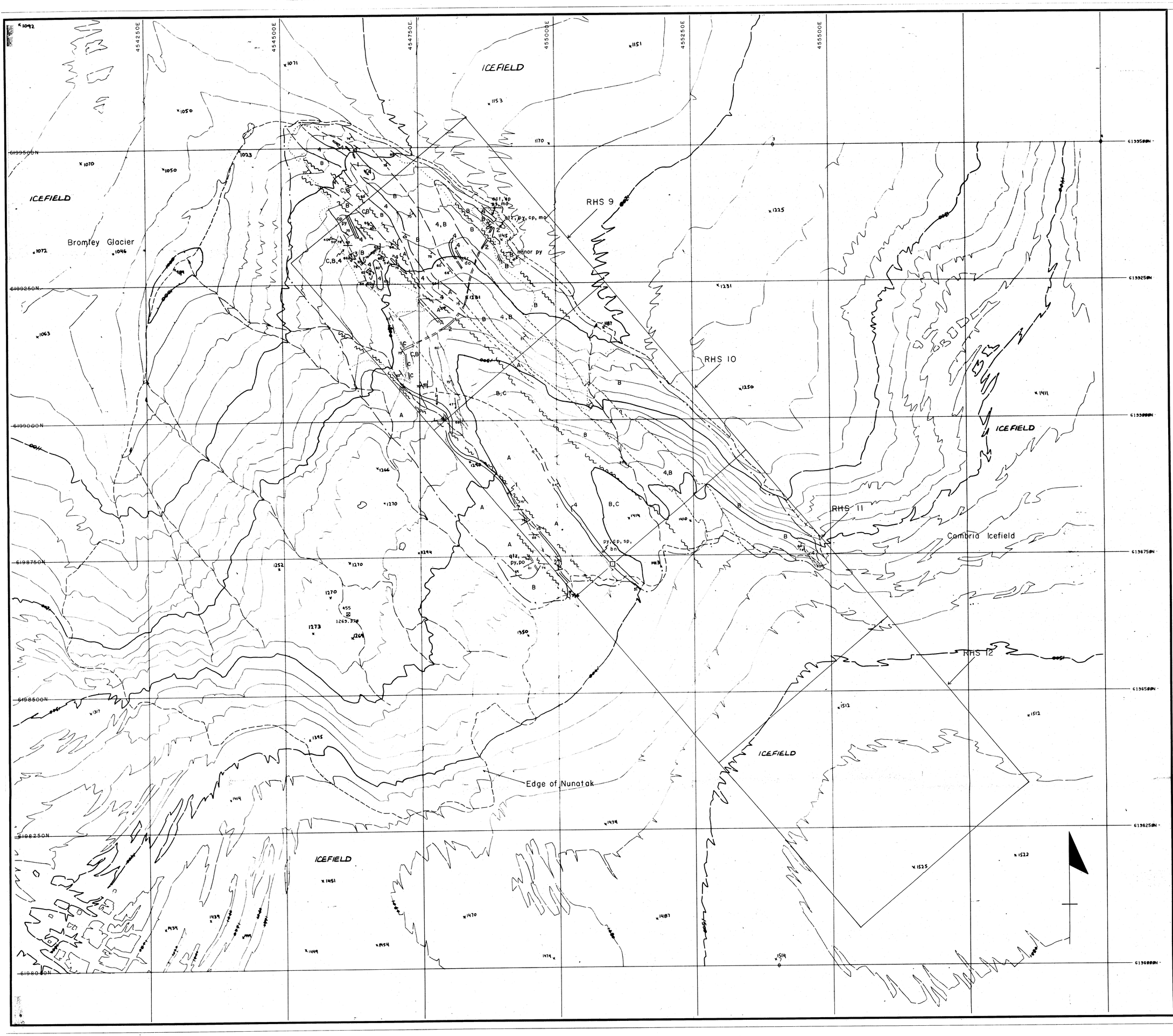
| (REPORT VALUES IN PPM) | AG | AL | AS | B | BI | CA | CD | CO | CU | FE | K | MG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21555 | 1.1 | 2390 | 22 | 0 | 6 | 5730 | .3 | 12 | 322 | 19000 | 1150 | 1220 |
| 21565 | 8.0 | 3120 | 38 | 30 | 26 | 7380 | 4.6 | 10 | 634 | 17900 | 1880 | 1430 |
| 21566 | 13.7 | 4440 | 74 | 14 | 37 | 10700 | 10.5 | 22 | 1590 | 57000 | 930 | 3630 |
| 21569 | 2.2 | 18200 | 36 | 12 | 12 | 14000 | .6 | 47 | 717 | 107000 | 523 | 3140 |
| 21570 | 7.3 | 2270 | 20 | 2 | 6 | 1480 | .2 | 73 | 255 | 133000 | 173 | 4130 |
| 21573 | .8 | 1170 | 126 | 0 | 2 | 4240 | .3 | 11 | 22 | 27100 | 667 | 1110 |

COMPANY: FALCONBRIDGE LTD. MIN-EN LABS ICP REPORT (ACT:GE03B) PAGE 2 OF 3
PROJECT No: 303-608-008 705 WEST 15th ST., NORTH VANCOUVER, B.C. V7M 1T2 FILE No: 4-773R/P1+2
ATTENTION: T. HEAH (604)980-5814 OR (604)988-4524 *TYPE ROCK GEOCHEM* DATE: AUGUST 21, 1984

| (REPORT VALUES IN PPM) | MN | MO | NA | NI | P | PB | SB | SR | TH | U | V | ZN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21555 | 303 | 10 | 164 | 17 | 370 | 21 | 1 | 16 | 8 | 0 | 13.1 | 34 |
| 21565 | 526 | 1640 | 139 | 19 | 229 | 44 | 4 | 20 | 10 | 13 | 10.3 | 234 |
| 21566 | 1260 | 778 | 212 | 21 | 495 | 81 | 6 | 36 | 4 | 0 | 46.9 | 735 |
| 21569 | 539 | 16 | 706 | 106 | 377 | 6 | 5 | 68 | 3 | 0 | 32.3 | 30 |
| 21570 | 148 | 24 | 48 | 48 | 0 | 37 | 5 | 13 | 2 | 0 | 90.7 | 25 |
| 21573 | 415 | 3 | 15 | 19 | 95 | 20 | 6 | 11 | 2 | 0 | 2.4 | 61 |

COMPANY: FALCONBRIDGE LTD. MIN-EN LABS ICP REPORT (ACT:GE03B) PAGE 3 OF 3
PROJECT No: 303-608-008 705 WEST 15th ST., NORTH VANCOUVER, B.C. V7M 1T2 FILE No: 4-773R/P1+2
ATTENTION: T. HEAH (604)980-5814 OR (604)988-4524 *TYPE ROCK GEOCHEM* DATE: AUGUST 21, 1984

| (REPORT VALUES IN PPM) | BA | SE |
|---|---|---|
| 21555 | 37 | 0 |
| 21565 | 94 | 0 |
| 21566 | 36 | 0 |
| 21569 | 42 | 1 |
| 21570 | 32 | 1 |
| 21573 | 37 | 0 |




LEGEND

INTRUSIVE ROCKS

| | | |
|---|---|---|
| 1 | ANDESITE | LIGHT TO DARK GREY WEATHERING;GREY,FINE TO MEDIUM GRAINED PORPHYRITIC UP TO 20% PLAGIOCLASE PHENOCRYSTS.MAY INCLUDE SCREENS OF METASEDIMENTS. |
| 2 | QUARTZ MONZONITE | LIGHT GREY TO WHITE WEATHERING;HYPIDIOMORPHIC COARSE GRAINED 1:1>1> QUARTZ MONZONITE.1% DISSEMINATED PYRITE. |
| 3 | DIORITE | RUSTY WEATHERING;MEDIUM GRAINED HYPIDIOMORPHIC WITH PYRITE DISSEMINATION UP TO 5%. |

LAYERED ROCKS

| | | |
|---|---|---|
| 4 | SKARN | RUSTY WEATHERING,FINE TO MEDIUM GRAINED,WITH REMNANT BEDDING AND SCREENS OF LIMY SHALES AND ARGILLITES.QUARTZ-TREMOLITE-ACTINOLITE EPIDOTE-ALMANDINE-DIOPSIDE-DOLOMITE ASSEMBLAGE. |
| A | CONGLOMERATE | RUSTY WEATHERING;APHANITIC TO FINE GRAINED, GREY TO BLACK ARGILLITE MATRIX WITH GREY, ROUNDED CALCIUM CARBONATE CLASTS RANGING FROM 1mm TO 15cm.IN PARTS,CLASTS MAY BE RECRYSTALLISED CORAL.CLASTS OCCUPY 20-40% OF ROCK.MAY CONTAIN LIMESTONE BEDS. |
| B | ARGILLITE | RUSTY WEATHERING;NORMALLY INTERBEDDED WITH SILTSTONE.GREY TO BLACK,FINE GRAINED,SILICEOUS. Py AND Po AS FINE DISSEMINATIONS AND FRACTURE COATINGS. |
| C | QUARTZITE | GREY TO RUSTY WEATHERING;FINE TO MEDIUM GRAINED, GREY AND HARD.DISSEMINATED Py AND Po. INTERBEDDED WITH ARGILLITE AND SILTSTONE. |

SYMBOLS USED

- LIMIT OF OUTCROP
- GEOLOGICAL CONTACT:DEFINED,APPROXIMATE
- BEDDING
- FAULT:DIP DIRECTION INDICATED
- FOLD AXIAL PLANE;FOLD AXIS
- FOLD AXIS
- LOCATED CLAIM POST
- LIMIT OF GEOLOGICAL MAPPING

SULFIDE MINERALS:

| | |
|---|---|
| bn | BORNITE |
| cp | CHALCOPYRITE |
| mo | MOLYBDENITE |
| po | PYRRHOTITE |
| py | PYRITE |
| sp | SPHALERITE |

SILICATE MINERALS:

| | |
|---|---|
| act | ACTINOLITE |
| ca | CALCITE |
| do | DOLOMITE |
| ep | EPIDOTE |
| qtz | QUARTZ |
| tr | TREMOLITE |

GEOLOGICAL BRANCH
ASSESSMENT REPORT

12,718

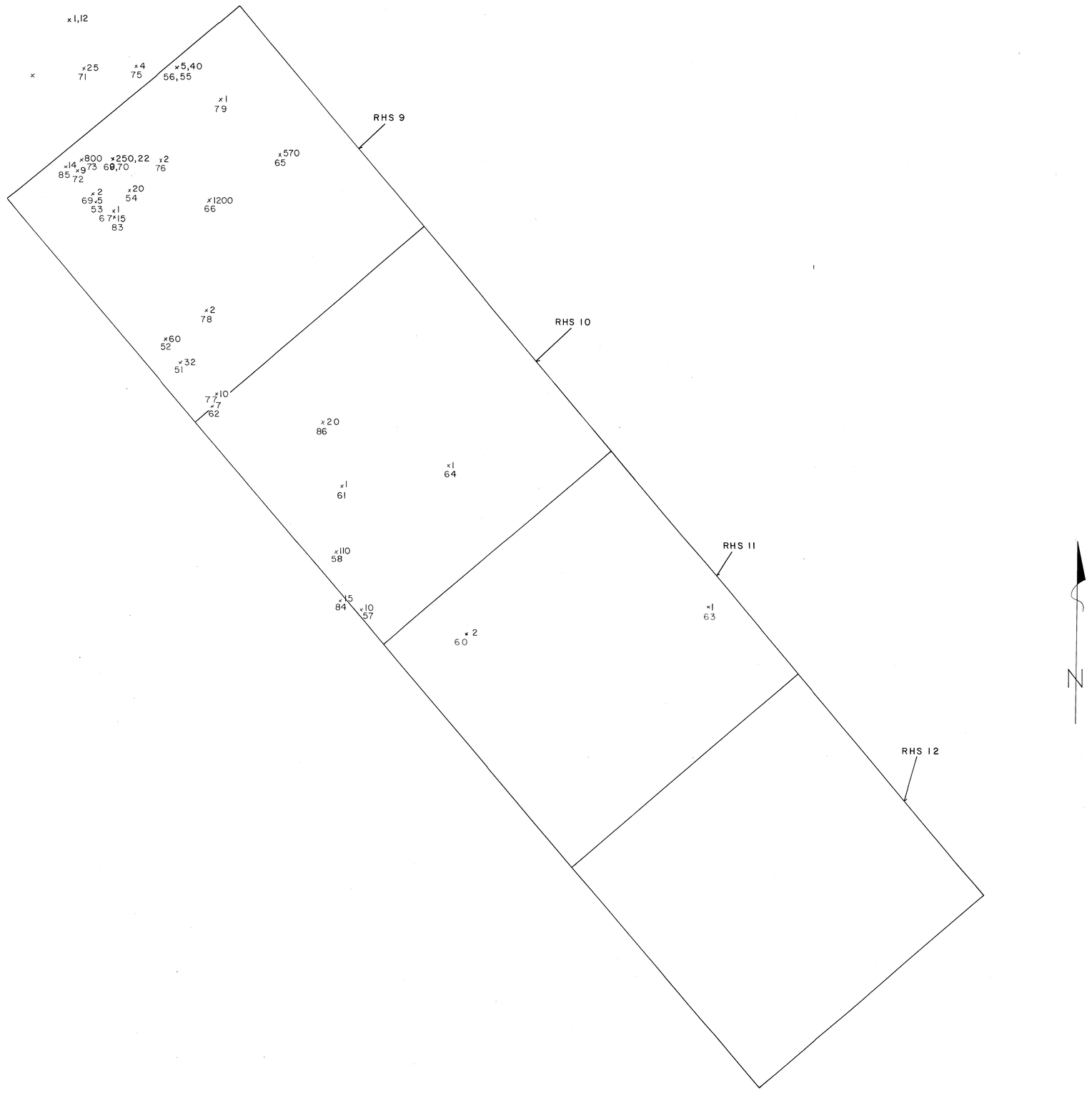
Claim boundaries located by compass and located claim post.

0 50 100 150 200 m

SCALE: 1:2 500

FALCONBRIDGE LIMITED

| | |
|---|---|
| PROPERTY: RHS Stewart | PROJECT NO.: 008 |
| LOCATION: Stewart, B.C. | |
| TYPE OF MAP: Geological | |
| WORKING PLACE: Falconbridge, Delta | |
| BASED ON: Fieldwork by T. Heah & B. Evans | |
| DATE OF WORK: July, 1984 | MAP REF. NO.: |
| DRAWN BY: BKE | FIG. NO.: 5 |
| DATE: Sept 10, 1984 | N.T.S. NO.: 103P/13E |




GEOLOGICAL BRANCH
ASSESSMENT REPORT

12,718

LEGEND

x50 Gold in ppb
60 Sample Number - Prefixed by 215

0 50 100 150 200m

SCALE: 1:2500

FALCONBRIDGE LIMITED

| | |
|---|---|
| PROPERTY: R. H. S. | LOT NO.: 008 |
| LOCATION: STEWART, B.C. | |
| TYPE OF MAP: FIRE GOLD ROCK GEOCHEMISTRY | |
| WORKING PLACE: | |
| BASED ON: Fieldwork by T.H. and B.K.E. | |
| DATE OF WORK: July, 1984 | MAP REF. NO.: |
| DRAWN BY: T. B. | FIG. NO.: 6 |
| DATE: Sept., 1984 | N.T.S. NO.: 103P/13E |