

1802

GEOLOGICAL REPORT

FROM AUGUST 12TH TO SEPTEMBER 7TH, 1968

ON

THE RIGA CLAIM GROUP

TOODOGGONE RIVER AREA (NTS 94E)

OMINECA MINING DIVISION

BRITISH COLUMBIA

57°126° SW.

57° 00' N. - 126° 00' W. - SW

DRYBROUGH PEAK

for

QUEBEC CARTIER MINING COMPANY

by

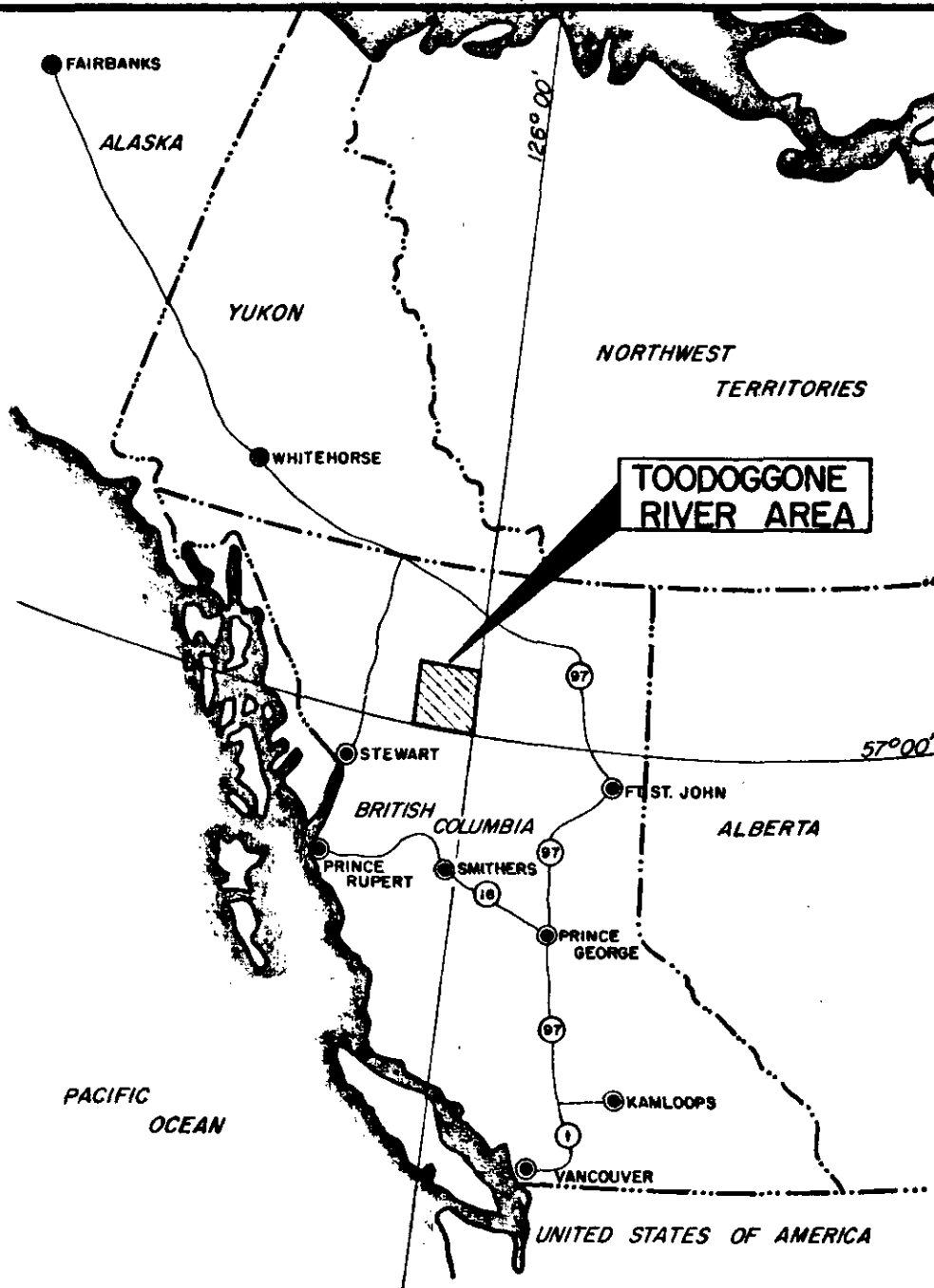
A.F. Reeve, P.Eng., Geological Engineer

CORDILLERAN ENGINEERING LIMITED

1418, 355 Burrard Street,
Vancouver 1, B.C.



A. F. Reeve



**QUEBEC CARTIER MINING COMPANY
LOCATION MAP**

TOODOGGONE RIVER AREA (94E)

LIARD AND OMINECA MINING DIVISIONS B.C.

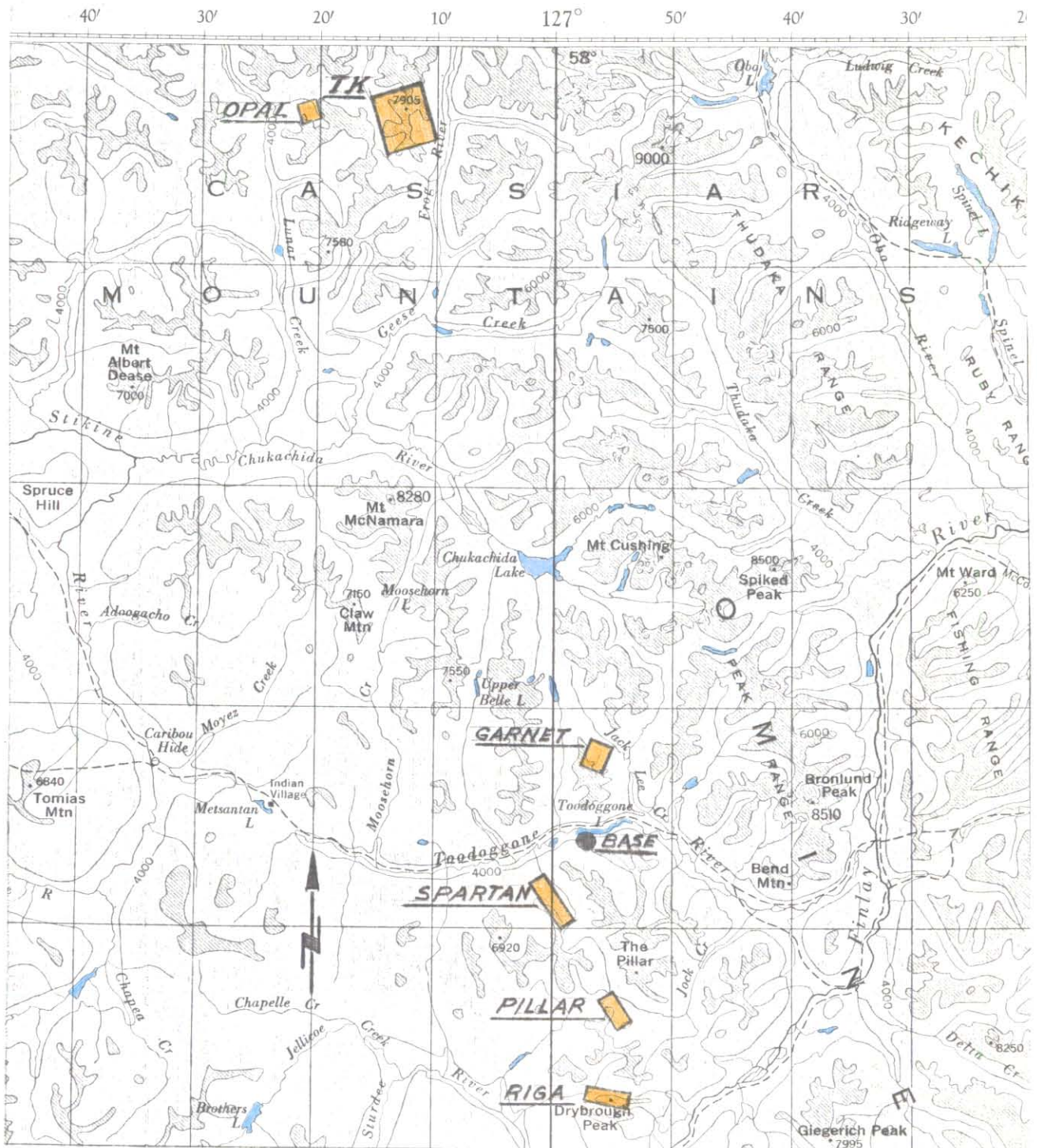


BY

CORDILLERAN ENGINEERING LIMITED

1418 - 355 BARRARD ST.

VANCOUVER 1, B. C.



QUEBEC CARTIER MINING COMPANY
 INDEX MAP OF MINERAL PROPERTIES
 TOODOGGONE RIVER AREA

OMINECA M.D., BRITISH COLUMBIA

Scale: 1 inch = 8 mi.

by

CORDILLERAN ENGINEERING LIMITED
 VANCOUVER, CANADA

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 1802 MAP 2

February, 1969

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INTRODUCTION

Purpose and Scope

This report is based on the results of geological investigation of the Riga copper and molybdenum property conducted between August 12 and September 7, 1968.

The above work is submitted to the British Columbia Department of Mines to fulfill assessment requirements for 24 claims for one year: Riga Nos. 1-24; record Nos. 58850-58873.

Location

The property is located on Drybrough Peak, 57° 12' north latitude and 126° 55' west longitude, in the Toodoggone River area (N.T.S. 94E).

Property

Name and number of claims	- Riga Nos. 1 - 32
Owner	- Cordilleran Engineering Limited
Date recorded	- April 9, 1968, Riga Nos. 1-24. September 16, 1968, Riga Nos. 25-32.
Record Numbers	- 58850-58873 and 62759-62766
Assessment anniversary	- April 9, 1969 and September 16, 1969.

INTRODUCTION (cont'd.)Background

In 1966 and 1967 the ground on Drybrough Peak was covered by 22 "Watt" claims owned by Mr. T. Doubt. Eventual stream sediment sampling in the area by Cordilleran crews indicated anomalous copper and molybdenum values originating from the claims. Subsequent investigation discovered copper and molybdenum mineralization and were marked mineral occurrences Nos. 34 - 36 in the February, 1968 report.* Selected samples assayed up to 5%+ copper and 0.015% molybdenum intermittently deposited over an approximate area of 4500 ft. by 500 ft. The showing appeared interesting and, when the Watt claims were cancelled, the ground was staked by Cordilleran Engineering Limited.

Two caved trenches dug by others were located on the property near the western extreme of the mineralized area.

No physical work was detected near the talus covered "high grade" mineralization on the Watt claim boundary, which indicates that it is a new find.

* Geology and Mineral Occurrences, Project Toodoggone, 1967, Liard and Omineca Mining Divisions, British Columbia, Canada; by Cordilleran Engineering Limited, for Quebec Cartier Mining Company.

INTRODUCTION (cont'd.)Method of Investigation

Geological mapping was done on a 1" = 500' scale, controlled by pace and compass traverses, aerial photographs, Brunton compass survey stations and two chained location lines.

Trenching was done by pick, shovel and blasting.

Acknowledgment

Most of the field work on Riga claims was performed by Wayne Ash.

SUMMARY AND CONCLUSIONS

Thirty-two claims, called the Riga group, have been staked on Drybrough Peak, Toodoggone River area (N.T.S. 94E), to protect a copper-molybdenum prospect.

Geological mapping on 1" = 500' scale and trenching was conducted by 1 - 2 men in 23 days during the 1968 field season.

Triassic volcanic country rocks have been invaded by Jurassic acid to intermediate mineral bearing intrusives.

Two well mineralized areas of 500 ft. by 350 ft. and 500 ft. by 300 ft. are separated by a distance of 1500 ft; smaller occurrences are spread over a wider area.

Copper and molybdenum minerals, grading up to 5.75% Cu. and less than .1% Mo, have been deposited as fracture fillings, replacement in andesite, and disseminations in the intrusive.

There is a real possibility that mineralization extends with depth in this favourable geological setting.

RECOMMENDATIONS

1. Geochemical surveys:

A soil sampling program on a 200 ft. x 400 ft. grid is recommended on the south and west slopes of the central ridge. (The southern slope is overgrown by grass only, but the western slope is wooded; north of the ridge the overburden appears to have been heaved by glaciers.)

2. Geophysical survey:

A magnetometer survey on a 400 ft. x 50 ft. is recommended over all overburden covered claims.

An induced polarization survey is recommended in the area of the disseminated copper.

3. Additional trenching is dependent on the results of the above recommendations.

4. Diamond drilling:

The two mineralized areas should be probed by inclined drilling for continuity at depth:

- a) the Drybrough Peak showing from the south, and
- b) the western showing from the north.

5. Geological mapping:

Geological mapping based on aerial photographs with simultaneous magnetometer spot readings are recommended in an area surrounding the claim group, especially across the limestone horizon south of the claims.

GEOGRAPHY

Topography, drainage and vegetation

Elevation on the property ranges from 4700 feet to 6774 feet above sea level. The south-facing grassy slopes are generally moderately inclined at approximately 20° to 30°, and are covered by rocky overburden. The ridges are sharp and mark the beginning of rock outcrops and fresh talus sloping steeply to the north. The north slopes often contain small patches of glaciers and permafrost.

Numerous creeks drain into the nearby Finlay River at an elevation of 4000 feet.

Alpine fir and brush extend to the 5500 ft. elevation.

GEOLOGY

Stratigraphy and Petrography

The region is underlain by 3 main rock types:

1. Upper Triassic volcanics of the Takla Group includes andesites, basalts, tuffs, breccia and a limestone horizon.
2. Jurassic - Cretaceous granitic Omineca intrusives.
3. Upper Cretaceous and Paleocene sedimentary rocks of the Sustut Group.

The first two rock types only underlie the Riga claim group and are economically significant.

Map Unit A

The Takla volcanics are exposed on the claims as an elongated rock body. Although no differentiation has been made on the map, these rocks are comprised of intermediate andesites, plagioclase porphyries, breccias and tuffs. The variations did not appear to play a significant role in the extent of mineralization. The exposed rock surfaces have been altered and frequently appear rusty brown from oxidation of the enclosed iron sulphides.

Map Unit S

Large syenite-monzonite outcrops of the Omineca intrusive border the volcanic rocks on the east, north and west, connecting dikes (strike E-W, dips 20-35S)

GEOLOGY (cont'd.)

cut through the volcanics.

The intrusive is distributed in the following way:

1. A main body of pinkish-brown equigranular potash feldspar phase.
2. A porphyritic phase near its contact with the volcanics.
3. A greenish and pink aphanitic dike phase found in both the intrusives and the volcanics.

Both rock types have undergone limited alteration. Most altered are the volcanic rocks which frequently contain such metamorphic minerals as epidote, chlorite, specular hematite and pyrite.

Geologic Structure

Three prominent fracture systems on the property are:

1. East-west trending (dip 20 - 35°S.) fractures in the volcanic country rock developed before or at the time of intrusion; this is also the attitude of 2 large dikes.
2. North-east striking post intrusive faults which cut both the volcanics and the intrusives.
3. North-west striking post intrusive faults which cut both rock types.

ECONOMIC GEOLOGY

The syenite-monzonite intrusive is the mineralizing factor on the Riga claim group.

Scattered copper and molybdenum mineralization occurs over a length of 7500 feet. However, the best showings are concentrated in 2 locations:

1. Near Drybrough Peak on Claim #19.
2. 1500 feet west of Drybrough Peak on Claim #15.

1. The Drybrough Peak copper showing has an areal extent of approximately 500 ft. x 350 ft. It consists of a high grade vein surrounded by relatively low grade fracture fillings. The vein is located 150 ft. below the Peak on north side of the ridge, and it has been exposed by Prospect Pit No. 1 (see Fig. No. 1 and Appendix B). To the west the vein terminates at a fault, and to the east it disappears under permafrost. Its maximum width is 7 feet, length 18 feet (uncovered) and the grade is up to 5.75% Cu, 0.01% Mo. Although indistinct, it appears to strike $.035^{\circ}$ and dips 35° south. The vein is composed of a fine-grained, dark-green matrix saturated with chalcopyrite. Epidote, chalcopyrite and malachite extend into the hangwall to a depth of 5 feet. The footwall has a deep talus cover and was not examined.

ECONOMIC GEOLOGY (cont'd.)

Most of the surrounding mineralization occurs in east-west trending (dip 20-35°S.) fractures. The mineralized fractures are 1/2 to 2" wide, (one 12" wide), 2 - 4 ft. apart and contain quartz, epidote, chalcopyrite and some bornite; the grade varies to greater than 5% Cu. The well-fractured rocks between these mineralized veinlets contain secondary copper carbonates.

Sparse galena was found in the volcanic rocks.

No mineralization other than iron sulphides occurs below the lower dike.

2. The western showing has an extent of 500 ft. by 300 ft.; it is mineralized in the following modes:
 - a) Chalcopyrite disseminated in altered intrusive
 - b) Molybdenite disseminated in the intrusive near its contact with the volcanics.
 - c) Molybdenite and/or chalcopyrite disseminated in up to 6" wide syenite dykes cutting volcanics within 40 feet of the contact.
 - d) Chalcopyrite with pyrite disseminated in altered andesite.

ECONOMIC GEOLOGY (cont'd.)

Prospect Pit No. 2, dug at point (A)
 (see Fig. No. 1 and Appendix B), uncovered chalcopryrite with pyrite disseminated through fractured monzonite-syenite. The fractures strike north-east and dip north-west. A chip sample taken over 4 foot width in the eastern part of the pit assayed 1.3% Cu. and 0.01% Mo. A random bulk sample taken in the western part of the pit assayed 0.18% Cu and 0.01% Mo.

At point B - Chalcopryrite and sparse molybdenite are disseminated through fine-grained syenite and in fractures of syenite and andesite.

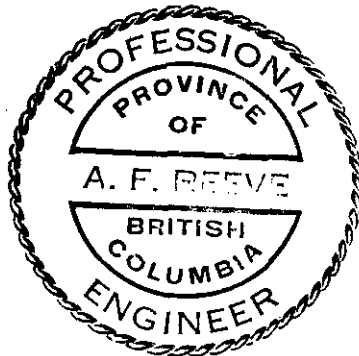
C - Molybdenite (approx. 1%) and sparse chalcopryrite disseminated through fine-grained pink syenite.

D - Molybdenite (approx. 2%) occurs as blebs in pink syenite over a width of up to 30 feet.

E, F, G, H - Chalcopryrite and lesser molybdenite are disseminated in syenite-monzonite rock.

J - Chalcopryrite and lesser molybdenite occur as disseminations and fracture fillings in monzonite.

Other minor occurrences are noted on the geology map.



Respectfully submitted,
 CORDILLERAN ENGINEERING LIMITED,

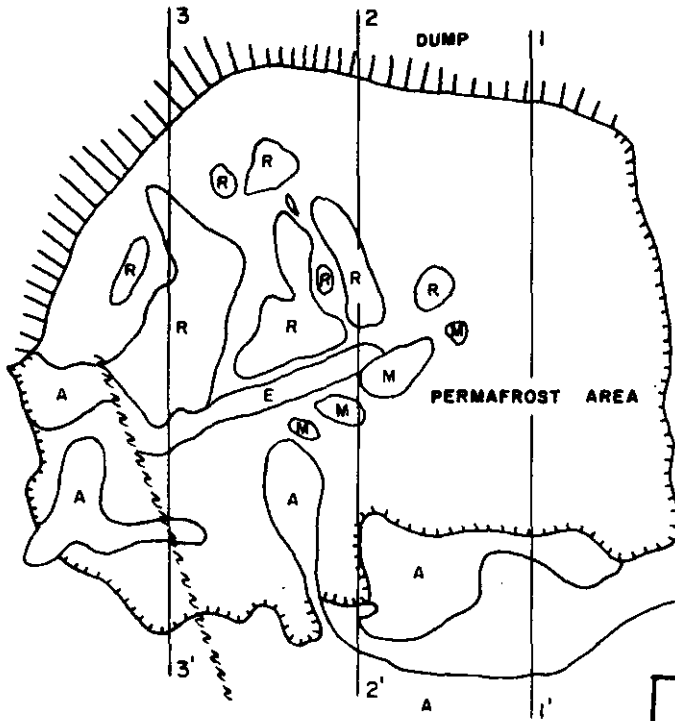
A.F. Reeve, P.Eng. *A. F. Reeve*

T. E. Kalnins

T.E. Kalnins, Project Manager

Vancouver, B.C.
 February, 1969.

PLAN



LEGEND:

- A ANDESITE
- M MALACHITE IN FRACTURED ANDESITE
- E EPIDOTE AND CHALCOPYRITE
- R RICH CHALCOPYRITE IN CHLORITIC MATRIX

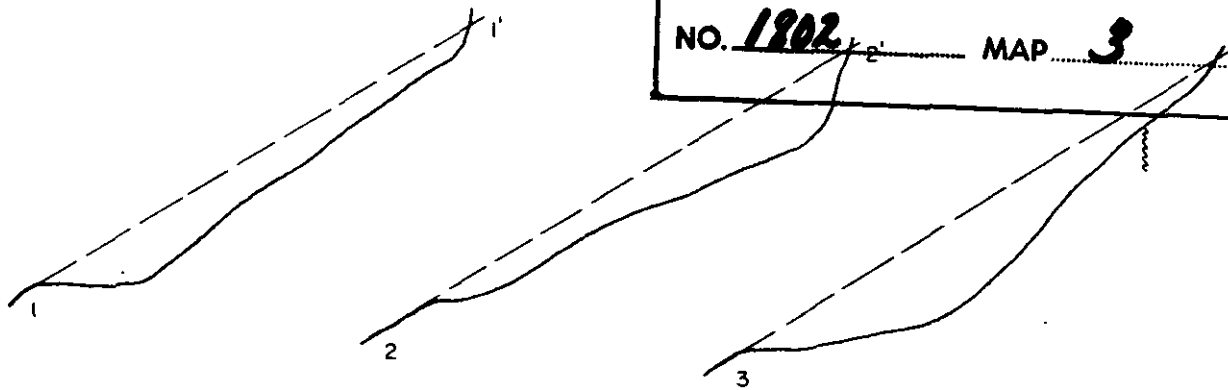
- FAULT
- PIT BOUNDARY

SCALE: 1 INCH = 10 FEET

Department of
Mines and Petroleum Resources

CROSS SECTIONS ASSESSMENT REPORT

NO. 1802 MAP 3



QUEBEC CARTIER MINING COMPANY

PROSPECT PIT No. 1

RIGA CLAIM GROUP

TOODOGGONE RIVER AREA (NTS 94E)

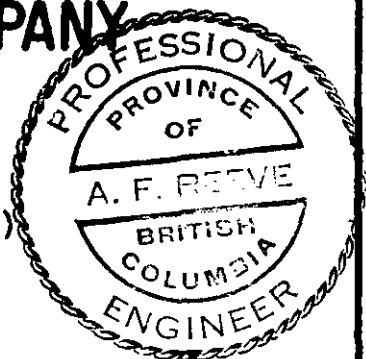
OMINECA M. D. BRITISH COLUMBIA

BY

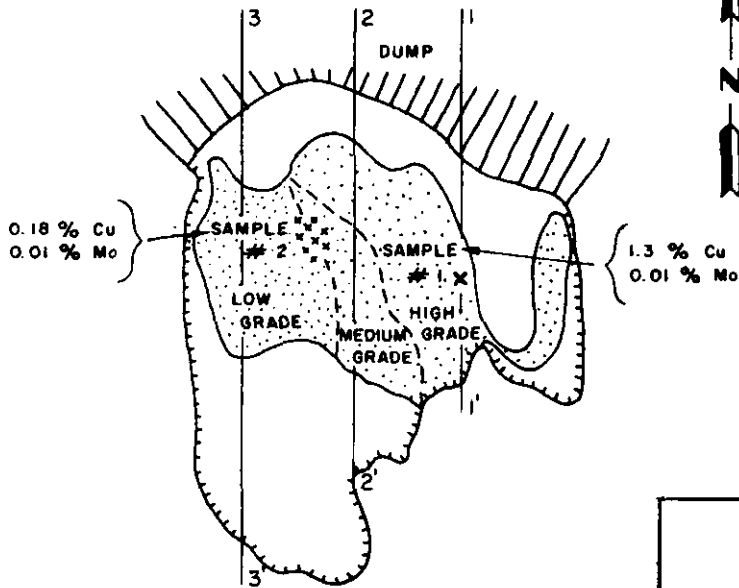
CORDILLERAN ENGINEERING LIMITED

1418 MARINE BUILDING, 355 BARRARD STREET

VANCOUVER, CANADA



PLAN



LEGEND:

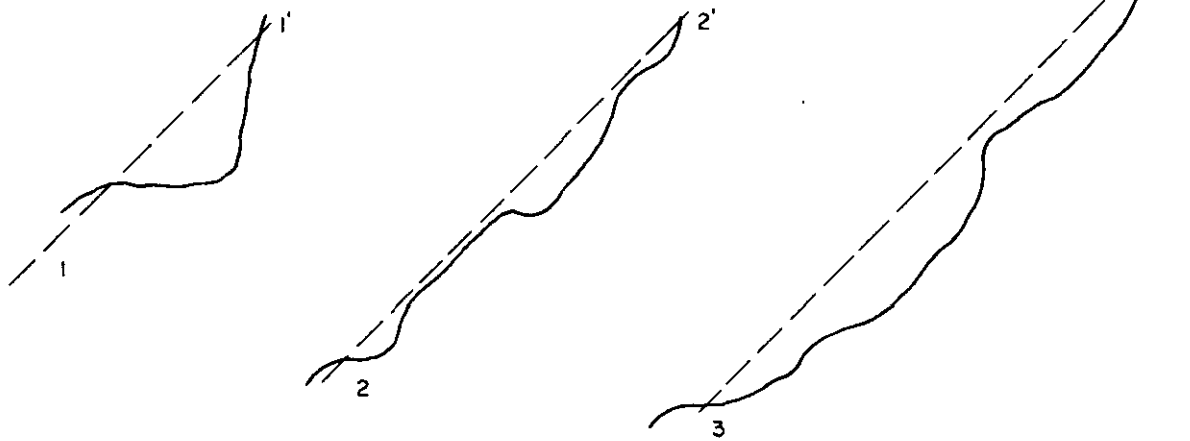
- OUTCROP - CHALCOPYRITE
DISSEMINATED IN
SYENITE - MONZONITE
- PIT BOUNDARY

SCALE : 1 INCH = 10 FEET

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

CROSS SECTIONS

NO. 1802 MAP 4



QUEBEC CARTIER MINING COMPANY

PROSPECT PIT No. 2

RIGA CLAIM GROUP

TOODOGGONE RIVER AREA (NTS 94E)

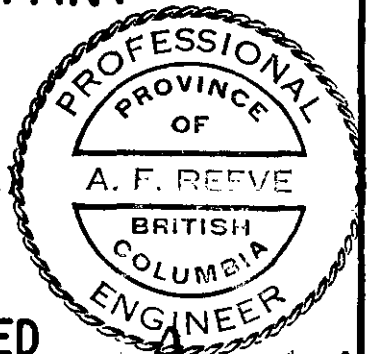
OMINECA M. D. BRITISH COLUMBIA

BY

CORDILLERAN ENGINEERING LIMITED

1418 MARINE BUILDING, 355 BARRARD STREET

VANCOUVER, CANADA



A. F. Reeve

STATEMENT OF EXPENDITURES

Date	Personnel	Rate of Pay (\$ /month)	Cost/day based on 22 w days/mo.	Living Expenses
Aug. 12	T. Kalnins	750	34.10	
	W. Ash	650	29.50	
" 13	W. Ash	650	29.50	
" 14	T. Kalnins	750	34.10	
	W. Ash	650	29.50	
" 15	W. Ash	650	29.50	29 man-days @ \$18/day
" 17	W. Ash	650	29.50	
" 18	W. Ash	650	29.50	
" 19	W. Ash	650	29.50	
" 21	W. Ash	650	29.50	
" 22	W. Ash	650	29.50	
" 23	W. Ash	650	29.50	
" 24	W. Ash	650	29.50	
" 25	W. Ash	650	29.50	
" 27	W. Ash	650	29.50	
" 29	F. Hastings	450	20.50	
	W. Ash	650	29.50	
" 30	F. Hastings	450	20.50	
	W. Ash	650	29.50	
" 31	T. Kalnins	750	34.10	
	W. Ash	650	29.50	
Sept. 1	W. Ash	650	29.50	
2	W. Ash	650	29.50	
3	W. Ash	650	29.50	
4	W. Ash	650	29.50	
5	W. Ash	650	29.50	
6	T. Kalnins	750	34.10	
	W. Ash	650	29.50	
7	W. Ash	650	29.50	
			855.90	522
			<u>SUB TOTAL</u>	<u>\$ 1,377.90</u>

BELL 47G3B-1 HELICOPTER SUPPORT COSTS

Average cost per hour (including fuel)

\$160/hr.

Distance from camp to Rig group (30 mi. return) 30 minutes.

Date	Personnel	Flying time (hrs)		Cost
		Total	On Property	
August 12	T. Kalnins W. Ash	1:10	0:40	106
13	W. Ash	1:00	0:30	80
14	T. Kalnins W. Ash	1:30	1:00	160
15	W. Ash	1:00	0:30	80
17	W. Ash	1:00	0:30	80
18	W. Ash	1:00	0:30	80
19	W. Ash	-	-	-
20	W. Ash	-	-	-
21	W. Ash	1:00	0:30	80
22	W. Ash	0:50	0:20	53
23	W. Ash	0:50	0:20	53
24	W. Ash	-	-	-
25	W. Ash	1:00	0:30	80
27	W. Ash	1:00	0:30	80
29	F. Hastings W. Ash	1:00	0:30	80
30	F. Hastings W. Ash	1:00	0:30	80
31	T. Kalnins W. Ash	-	-	-
Sept. 1	W. Ash	0:50	0:20	53
2	W. Ash	0:50	0:20	53
3	W. Ash	0:50	0:20	53
4	W. Ash	-	-	-
5	W. Ash	0:50	0:20	53
6	T. Kalnins W. Ash	0:50	0:20	53
7	W. Ash	0.50	0.20	53
		Sub Total:		\$1330

MANAGEMENT AND OFFICE COSTS

A.F. Reeve, consulting, 2 days @ \$100	\$ 200
Drafting)	
)	100
Typing)	<hr/>
	\$ 300
Sub total:	

Total Expenditures \$ 3,007.90

Note: Apply \$2400 to cover assessment requirements
on 24 claims for one year.

Canada

Province of British Columbia

To Wit:

In the Matter of

the Statement of Expenditures
for work performed on the Riga
Mineral Claims in the

Omineca Mining Division

, of 1418, 355 Burrard Street,

I, Albert F. Reeve

City of Vancouver in the Province of British Columbia.

Do Solemnly Declare that

1. The geological investigation of the Riga Mineral Claims was carried out under my supervision.
2. The Statement of Expenditures set out in Appendix "B" of my "Geological Report, from August 12th to September 7th, 1968, on the Riga claim group", truly represents the amounts expended on the said claims.

And I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath, and by virtue of the Canada Evidence Act.

Declared before me
at the City of Vancouver
in the Province of British Columbia.

this 21st day of

March ~~February~~ A.D. 19 69

J. T. Lee
A Commissioner for taking Affidavits
in British Columbia

CONTRACTOR AND PERSONNEL

Cordilleran Engineering Limited, 1418 - 355 Burrard Street, Vancouver 1, B.C.	Geological Consultants
A.F.Reeve, P.Eng.	Geological Engineer
T. Kalnins, B.Sc.	Geologist, Project Manager
W. Ash	Assistant Geologist
F. Hastings	Assistant
L. Tanguay	Cook
Leo Lannon Helicopters Ltd., Vancouver, B.C.	Air support on location
P. Bronson	Pilot
R. Zimmerman	Mechanic
Omineca Air Service Ltd. Smithers, B.C.	Fixed Wing air support
Bondar-Clegg and Co. Ltd. Vancouver, B.C.	Geochemists

CORDILLERAN ENGINEERING LIMITED

1418-355 BURRARD STREET

VANCOUVER 1, B.C.

TELEPHONE: 681-8381

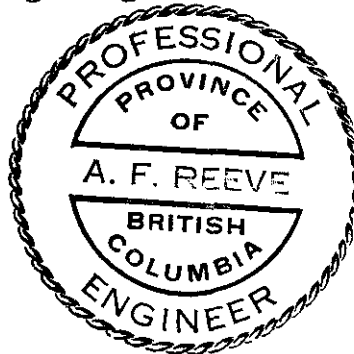
MINERAL EXPLORATION
MANAGEMENT AND
ENGINEERING CONSULTANTS

— ASSOCIATES —
BONDAR-CLEGG & COMPANY LTD.
GEOCHEMISTS

C E R T I F I C A T E

I, Albert F. Reeve, of Vancouver, B.C.,
hereby certify that:

1. I am a geological engineer employed by Cordilleran Engineering Limited of 1418, 355 Burrard Street, Vancouver.
2. I am a graduate of the Provincial Institute of Mining, Haileybury, Ontario, and received a Bachelor of Science degree in Geological Engineering from Michigan College of Mining & Technology, Houghton, Michigan, in 1961.
3. I am a certified member of the Association of Professional Engineers in the provinces of Ontario and British Columbia.
4. This report is based on a personal visit to the property August 15, 1968, and field work conducted under the supervision of T.E. Kalnins, B.Sc., geologist.



Albert F. Reeve, P.Eng.

A handwritten signature in black ink, appearing to read "A. F. Reeve".

February, 1969.

APPENDIX "E"

Certificate

APPENDIX "D"

Contractors and Personnel

APPENDIX "B"

Statement of Expenditures

APPENDIX "A"

Plan and Sections of

Prospect Pit No. 1

Prospect Pit No. 2



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1802 MAP 5



A. F. Reeve

QUEBEC CARTIER MINING COMPANY

GEOLOGY
RIGA CLAIM GROUP
OMINECA MINING DIVISION
BRITISH COLUMBIA

1802

SCALE: 1 INCH = 500 FEET
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