

1823

GEOLOGICAL AND GEOCHEMICAL REPORT

FROM JUNE 16TH TO JULY 1ST, AND
FROM AUGUST 12TH TO SEPTEMBER 8TH, 1968

ON

THE SPARTAN CLAIM GROUP

OMINECA MINING DIVISION, BRITISH COLUMBIA

TOODOGGONE RIVER AREA (N.T.S. 94E)

^{57° 22'}
~~57° 00'~~ N. latitude, ^{127° 01'}
~~126° 00'~~ W. longitude, S.W.

THREE MILES SOUTHWEST OF TOODOGGONE LAKE

for

QUEBEC CARTIER MINING COMPANY

by

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

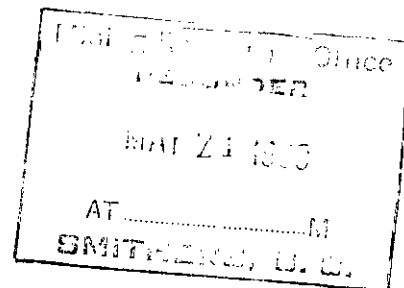
CORDILLERAN ENGINEERING LIMITED

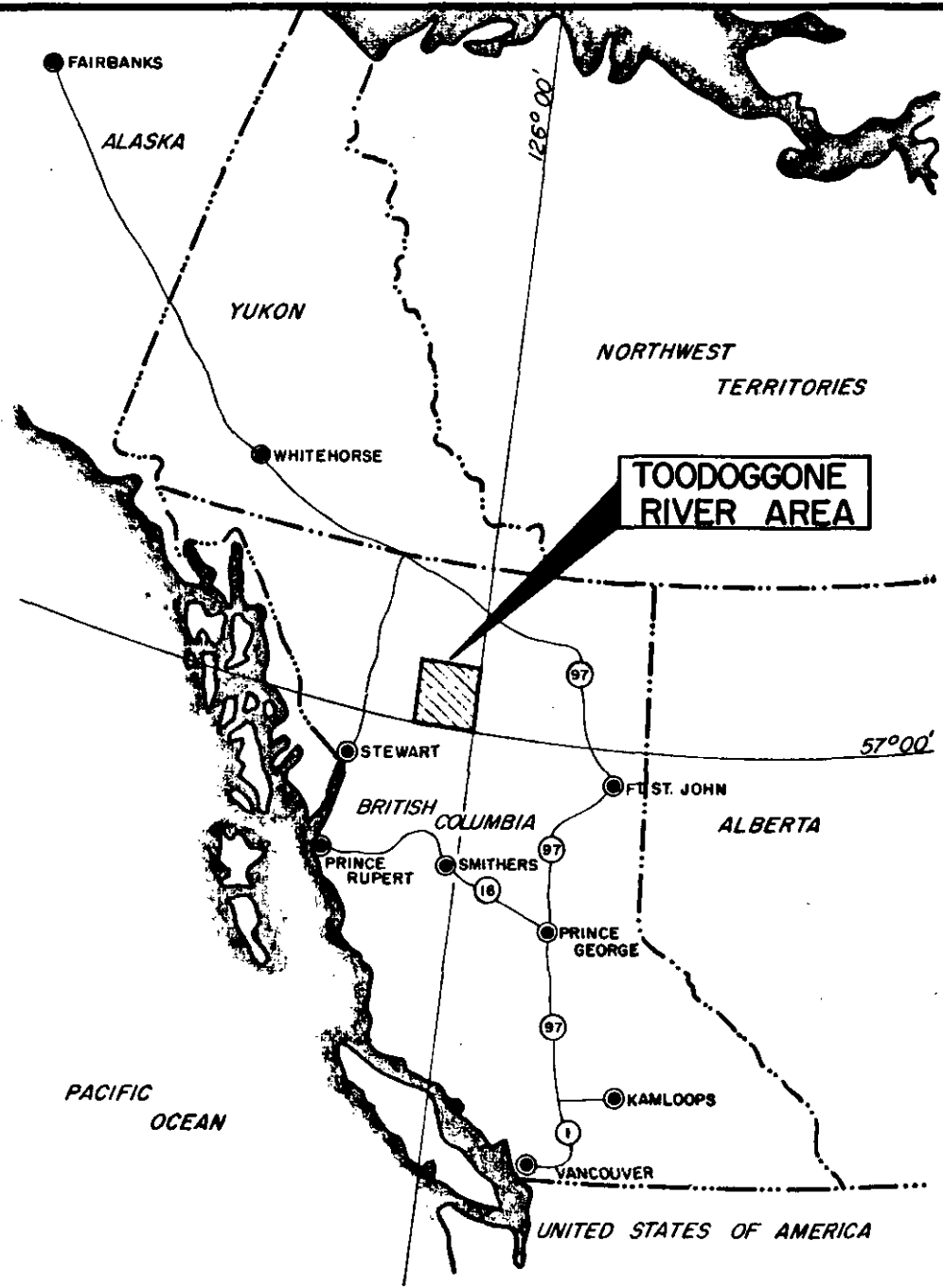
1418 - 355 Burrard Street,
Vancouver 1, B.C.



A. F. Reeve

February, 1969

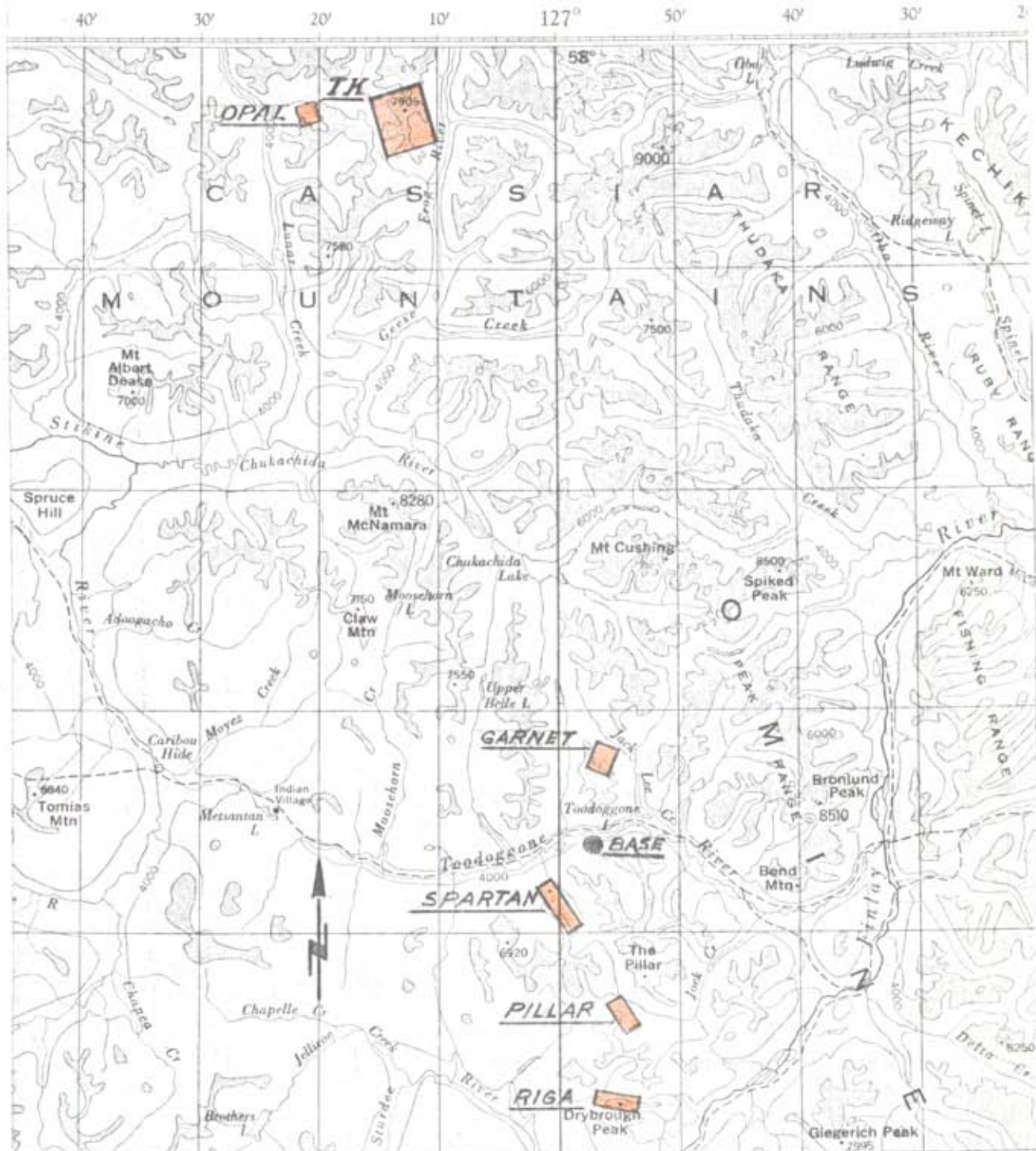




QUEBEC CARTIER MINING COMPANY
LOCATION MAP
TOODOGGONE RIVER AREA (94E)
LIARD AND OMINECA MINING DIVISIONS B.C.



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

February, 1969

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Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1823 MAP.....

INTRODUCTION

Purpose and Scope

This report is based on the results of follow-up work instigated by anomalous copper and molybdenum concentrations in stream sediments.

The work was conducted between June 16th to July 1st and August 12th to September 8th, and is hereby submitted to the British Columbia Department of Mines to fulfill assessment requirements for 48 claims for one year.

Location

The Spartan claims are located at 57° 22' N, 127° 00' W, immediately west of a stream 3 miles southwest of Toodoggone Lake, (NTS 94E), Omineca Mining Division, British Columbia.

Property

Name and number of claims: Spartan Nos. 1 - 48
Owner: Cordilleran Engineering Limited
Date recorded: June 27, 1968, Spartan Nos. 1 - 42
September 25, 1968 Spartan Nos. 43 - 48
Record numbers: 60217-60258 and 63534-63539 respectively
Assessment anniversary: June 27 and September 25, 1969

INTRODUCTION (cont'd.)Background

The area was geochemically surveyed during the 1967 field season. Stream sediment samples contained high concentration of Cu. (up to 3200 parts per million), molybdenum (up to 40 ppm) and zinc (up to 330 ppm). An immediate prospecting traverse did not disclose any trace of economic minerals; however, in 1968 the ground was staked on the strength of the geochemical anomaly.

Method

Geological mapping was conducted in conjunction with geochemical sampling on a 300 ft. by 300 ft. grid pattern established by chain, compass, pacing and aerial photographs.

Soil samples were taken from the B horizon at an average depth of 1 foot.

SUMMARY AND CONCLUSIONS

The 48 Spartan claims, located 3-1/2 miles southwest of Toodoggone Lake, British Columbia, were staked on the basis of high copper and molybdenum concentrations in stream sediments detected during the 1967 work season. Geological and geochemical follow-up work was performed during the 1968 season.

The property is underlain by the acidic Omineca intrusives, andesite dikes and feldspar porphyries. Light copper mineralization is usually associated with the altered andesite dikes and accounts for the geochemical anomalies. One important copper showing (malachite in well fractured rock) occurs over an area of 200 feet by 300 feet near station 139N 6W.

The relatively widely spread geochemical anomalies can be attributed to:-


- a) copper showings
- b) percolation of copper rich waters, and
- c) slide material from cirques where scattered copper values have been noted.


RECOMMENDATIONS

1. Mechanical stripping and sampling of the most promising copper showing on claim 19 and other anomalous areas.
2. A portable magnetometer survey.
3. Very careful examination of each geochemical anomaly. Nearby outcrops should be sampled and assayed for Cu. and Mo. particularly since one rusty sample with no apparent copper mineralization contained 0.18% Cu.
4. Diamond drilling contingent on the results of the above recommendations.



Respectfully submitted,
CORDILLERAN ENGINEERING LIMITED


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


T.E. Kalnins, B.Sc.,
Project Manager

Vancouver, B.C.,
February, 1969.

GEOGRAPHY

The Spartan claims extend along the west side of a north-flowing stream, including its origin and several cirques contributing small streams. The elevation ranges from 4500 feet to 6000 feet.

Most of the property lies above the alpine fir treeline and the topography is less rugged than in most adjacent areas. Secondary ridges are rounded, covered by finely broken overburden and invariably show a bright, rusty color.

Limited rock outcrops occur mainly in the upper parts of cirques, steep slopes, or creek beds.

GEOLOGY

Stratigraphy and Petrography

The Spartan claims and adjacent area are situated in a contact zone between the upper Triassic Takla volcanics and the Jurassic-Cretaceous Omineca acidic intrusives.

East of Base Line #1 the few outcrops are composed of a monzonite intrusive. West of Base Line #1 the increasing number of outcrops are composed mainly of syenite, andesite dikes and feldspar porphyries. Altogether five rock variants were recognized in the field and are described below as map units.

1. SYENITE: Medium to coarse grain, occasionally porphyritic, brownish orange color; contains approximately 90% K feldspar and 4% dark minerals.
2. TRACHYTE: Fine grain, dense, brownish orange color, occasionally porphyritic; contains up to 1% hornblende.
3. MONZONITE: Pinkish color medium to coarse grain, often porphyritic; contains slightly more K feldspars than plagioclase and approximately 5% dark minerals.

GEOLOGY (cont'd.)

4. ANDESITE: a) Altered, fine grain, grayish white, always pyritiferous and siliceous, weathers to a rusty yellow color, it may contain small amounts of chalcopyrite.
- b) Fine grain, dark green, often includes quartz phenocrysts.
- c) A dark feldspar porphyry
5. An orange feldspar porphyry set in a light green matrix outcrops on claim 21.

In addition there are rhyolitic (Ry) dike outcrops on claims 7 and 33; these could possibly be strongly altered and silicified andesite dikes.

GEOLOGY (cont'd.)Geologic Structure

Rock associations and contacts indicate an original syenite-trachyte intrusive mass subsequently cut by a body of monzonite and smaller intrusions of andesite and rhyolite.

One strong fracture system trends northwest - southeast and dips 45° to 85° NE; two lesser fracture systems trend east-west, northeast - southwest, dip 60° to vertical south and 22° to vertical northwest respectively.

Majority of the dikes either strike or dip south-westerly which appears to indicate their magmatic source in that direction.

ECONOMIC GEOLOGY

One important discovery and several minor copper showings were discovered on the property by follow-up of geochemical soil survey anomalies.

Copper mineralization appears to be associated with the altered andesite dikes mapped as unit 4a; such dikes have always been located at or near copper showings and high copper concentration in soil samples.

Although not readily visible, copper is contained within this rusty rock; a sample picked near station 138N, 7W on claim 19 assayed 0.18% Cu, 0.005% Mo and 0.01 oz. Au. Copper bearing rock may extend up to 30 feet outward from a pyritic andesite dike.

The best showing occurs near station 139N, 6W on a steep northerly slope on claim 19 (trace showings are indicated on the geology map). Copper carbonate (malachite) occurs as surface coatings of finely fractured syenite in an area of approximately 200 x 300 feet traced by 200 feet of preliminary trenching. The mineralization diminishes in a northerly direction, but disappears under overburden south-southwesterly. A surface sample assayed 0.23% Cu and 0.01% Mo.

ECONOMIC GEOLOGY (cont'd.)

The soil, outcrops and creek-beds show an abundance of iron oxide, dense red solutions ooze out of the nearby talus slopes.

GEOCHEMISTRY

A total of 893 soil samples were collected on a 300 foot by 300 foot grid. Approximately 75% of the property was sampled; the remaining 25% of the area includes outcrops, fresh talus or ground acquired late in the season (claims 43 - 48).

The samples were taken from the rusty brown B₁ horizon at an approximate depth of 1 foot. The cuts were made utilizing a prospector's mattock. The finest, organic-free soil available was collected by hand and placed in heavy paper sample bags. Each sample was assigned an identification number in the field and returned to camp at the end of each working day to be dried in a heated tent and sieved to -80 mesh fraction.

The samples were analyzed for total heavy metals in the field, and for copper and manganese in the laboratory of Bondar-Clegg and Co. Ltd. of North Vancouver. However, analysis for manganese was discontinued when it became apparent that Mn concentrations were low and did not suggest abnormal enrichment of copper in soils.

Copper was determined directly by atomic absorption methods after leaching the sample with a mixture of 1.5 mls. concentrated nitric acid and 0.5 ml. concentrated hydrochloric acid in a hot water bath for 2.5 hours and adjusting the final volume to 10 mls.

GEOCHEMISTRY (cont'd.)

The soil survey indicated a number of widely separated anomalous areas. The anomaly in the vicinity of line 139N - 6W has its source in malachite coated, fractured and rusty rock. No evidence of copper mineralization is shown on surface. However, immediately below the surface, copper mineralization is estimated to run up to 1.0% Cu. According to W. Bondar, geochemist, the anomaly in the vicinity of stations 151N - 6W and 154N - 9W is in an area of moderately heavy overburden cover in a stream valley and may consist of possible lateral moraine material containing Cu from a cirque further upstream (to the south) which appears to line up with the copper mineralization described above.

Anomalous copper concentrations in the valley bottom at line 30N are probably derived from (1); percolation of Cu - rich waters through fractures from topographically higher places on either side of the vally, or (2); slide material from cirques and gulleys to the west, where scattered high values for copper were noted.

In summary, the significance and source of stream sediment anomaly 11 has been adequately explained and additional work is now required to further delimit the extent of known copper mineralization in the vicinity of 139N - 6W.

A P P E N D I X "A"

STATEMENT OF EXPENDITURES

STATEMENT OF EXPENDITURES

Date	Personnel	Rate of Pay (\$/mo.)	Cost/day based on 22 w. days/mo	Living Expenses
June 16	W. Ash	650	29.50	
	F. Pelletier	550	25.00	
	B. Kromhout	475	21.50	
	G. Smiley	350	15.50	\$18
" 17	"	"	"	per man per day
" 18	"	"	"	
" 19	F. Pelletier	550	25.00	
	G. Smiley	350	15.50	
" 20	"	"	"	
" 21	F. Pelletier	550	25.00	
	B. Kromhout	475	21.50	
	G. Smiley	350	15.50	
" 22	"	"	"	
" 23	F. Pelletier	550	25.00	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 25	"	"	"	
" 26	F. Pelletier	550	25.00	
	B. Kromhout	475	21.50	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 29	F. Pelletier	550	25.00	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 30	"	"	"	
July 1	F. Pelletier	550	25.00	
	R. Ritchie	450	20.50	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
August 12	F. Pelletier	550	25.00	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	

STATEMENT OF EXPENDITURES (cont'd.)

Date	Personnel	Rate of Pay (\$/mo.)	Cost/day based on 22 w. days/mo	Living Expenses
August 13	T. Kalnins	750	34.00	
	F. Pelletier	550	25.00	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	\$18
" 14	F. Pelletier	550	25.00	per man per day
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 15	"	"	"	
" 16	"	"	"	
" 17	"	"	"	
" 19	"	"	"	
" 21	"	"	"	
" 22	T. Kalnins	750	34.00	
	F. Pelletier	550	25.00	
	F. Hastings	450	20.50	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 23	F. Hastings	450	20.50	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 25	A. Reeve	Part of consulting fee		
	F. Pelletier	550	25.00	
	R. Ritchie	450	20.50	
	F. Hastings	450	20.50	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 26	W. Ash	650	29.50	
	F. Pelletier	550	25.00	
	R. Ritchie	450	20.50	
	F. Hastings	450	20.50	
	G. Smiley	350	15.50	
	R. Deakin	350	15.50	
" 27	F. Pelletier	550	25.00	
	B. Kromhout	475	21.50	
	G. Smiley	350	15.50	

STATEMENT OF EXPENDITURES (cont'd)

Date	Personnel	Rate of Pay (\$/mo.)	Cost/day based on 22 w. days/mo	Living Expenses
August 29	F. Pelletier	550	25.00	
	B. Kromhout	475	21.50	
	G. Smiley	350	15.50	\$18
" 30	"	"	"	per man per day
" 31	"	"	"	
September 1	F. Pelletier	550	25.00	
	G. Smiley	350	15.50	
" 2	"	"	"	
" 3	"	"	"	
" 4	"	"	"	
" 5	"	"	"	
" 6	"	"	"	
" 7	F. Pelletier	550	25.00	
" 8	"	"	"	
			\$2306.00	\$2016.00
Sub Total:			\$4322.00	

BELL 47G 3B-1 HELICOPTER SUPPORT COSTS

Average cost per hour (including fuel) \$ 160.00
 Distance from camp to the Spartan claim group . . . 10 min.
 (return, 1 - 2 passengers)

Date	Flying Time		Cost (\$)
	Total	On Property	
June 16	1:40	1:00	160
" 17	0:50	0:10	27
" 18	1:00	0:20	53
" 19	0:40	0:20	53
" 20	0:30	0:10	27
" 21	1:00	0:20	53
" 22	1:00	0:20	53
" 23	1:05	0:25	66
" 25	1:05	0:25	66
" 26	1:00	0:20	53
" 29	1:00	0:20	53
" 30	1:10	0:30	80
July 1	1:10	0:30	80
August 12	0:50	0:10	27
" 13	1:35	0:55	147
" 14	0:50	0:10	27
" 15	0:50	0:10	27
" 16	0:50	0:10	27
" 17	0:50	0:10	27
" 19	-	-	-
" 21	0:50	0:10	27
" 22	1:30	0:30	80
" 23	0:50	0:10	27
" 25	2:30	1:30	240
" 26	2:05	1:05	173
" 27	1:20	0:40	133
" 29	1:40	1:00	160
" 30	1:10	0:30	80
" 31	-	-	-
Sept. 1	0:30	0:10	27
" 2	0:30	0:10	27
" 3	0:30	0:10	27
" 4	-	-	-
" 5	0:30	0:10	27
" 6	0:30	0:10	27
" 7	0:40	0:20	53
" 8	0:30	0:10	27

Sub total cost: \$2241.00

EXPENDITURES (cont'd.)

Geochemical analysis (copper)	
893 samples @ \$1.00	\$893
Consulting, 3 days @ \$100	300
Drafting and typing	300
Total expenditures:	<u>\$ 8,056.00</u>

NOTE: Apply \$4800 to cover assessment requirements
on 48 claims for 1 year.

(\$2400 on 24 claims in GROUP "A")

(\$2400 on 24 claims in GROUP "B")

A P P E N D I X "B"

AFFIDAVIT IN SUPPORT OF EXPENDITURES

Canada

Province of British Columbia

To Wit:

In the Matter of

the statement of expenditures for work performed on the Spartan Mineral Claims in the Omineca Mining Division

I, Albert F. Reeve, of 1418, 355 Burrard Street, City of Vancouver in the Province of British Columbia.

Do Solemnly Declare that

- 1. The geological investigation of the Spartan Mineral Claims was carried out under my supervision.
2. The Statement of Expenditures set out in Appendix "B" of my "Geological and Geochemical Report from June 16th to July 1st, and from August 12th to September 8th, 1968, on the Spartan 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. 1969

Handwritten signature of Albert F. Reeve

Handwritten signature of J. T. Lu and printed text: A Commissioner for taking affidavits in British Columbia

A P P E N D I X "C"

CONTRACTORS AND PERSONNEL

CONTRACTORS 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. Pelletier	Assistant Geologist
B. Kromhout	Technician
F. Hastings	Assistant
R. Ritchie	Assistant
R. Deakin	Assistant
G. Smiley	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

A P P E N D I X "D"

CERTIFICATE

CORDILLERAN ENGINEERING LIMITED

1418-355 BURRARD STREET

VANCOUVER 1, B.C.

TELEPHONE: 681-8381

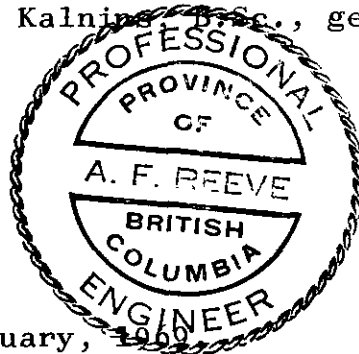
MINERAL EXPLORATION
MANAGEMENT AND
ENGINEERING CONSULTANTS

- ASSOCIATES -
BONDAR-CLEGG & COMPANY LTD.
GEOCHEMISTS

C E R T I F I C A T E

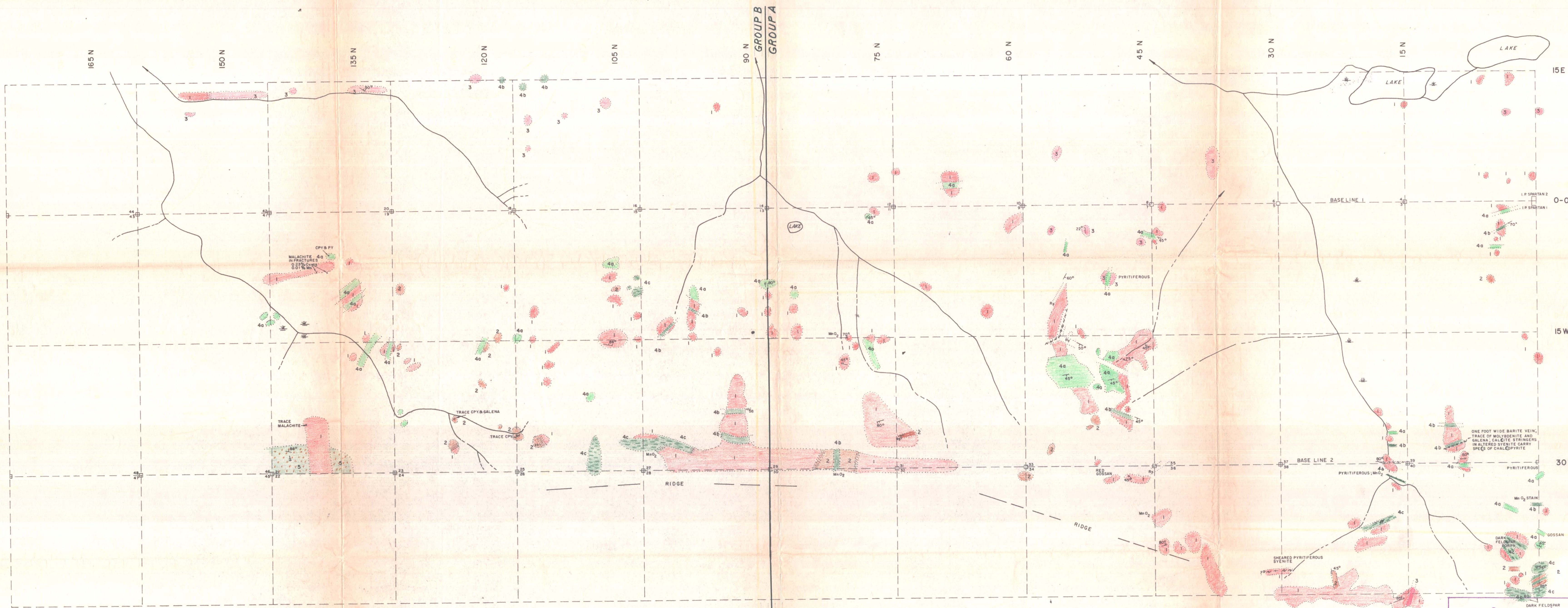
I, Albert F. Reeve, of Vancouver, B.C.,
hereby certify that:

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 25, 1968, and field work conducted under the supervision of T.E. Kalnins, B.Sc., geologist.




Albert F. Reeve, P.Eng.

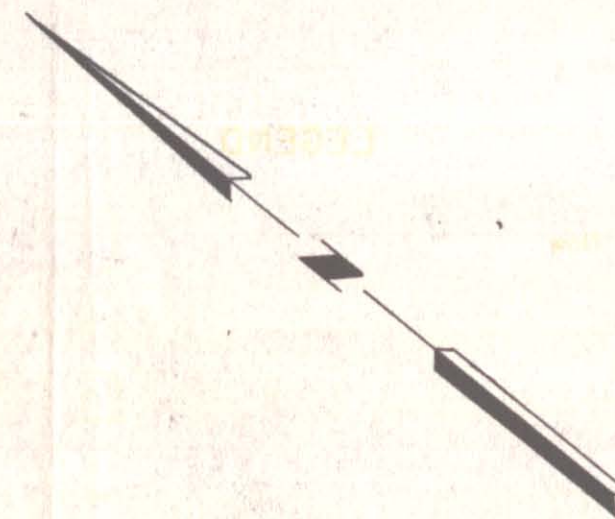
February, 1968



- CPY&PY Chalcopyrite & Pyrite
- Creek and direction of flow
- Marsh
- Lake
- Rock outcrop
- Fault
- Bedding, fractures inclined
- Claim post and claim number

LEGEND

- Syenite: medium to coarse grain, occasionally porphyritic, brownish orange color.
- Trachyte: fine grain, dense, brownish orange color, occasionally porphyritic.
- Monzonite: medium to coarse grain, pinkish color, often porphyritic.
- Andesite: altered, fine grain, grayish white, pyritiferous.
- Andesite: fine grain, dark green, often includes quartz phenocrysts.
- Andesite: a dark feldspar porphyry.
- Orange feldspar porphyry with a light green matrix.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1823 MAP # 8



A. F. Reeve

QUEBEC CARTIER MINING COMPANY

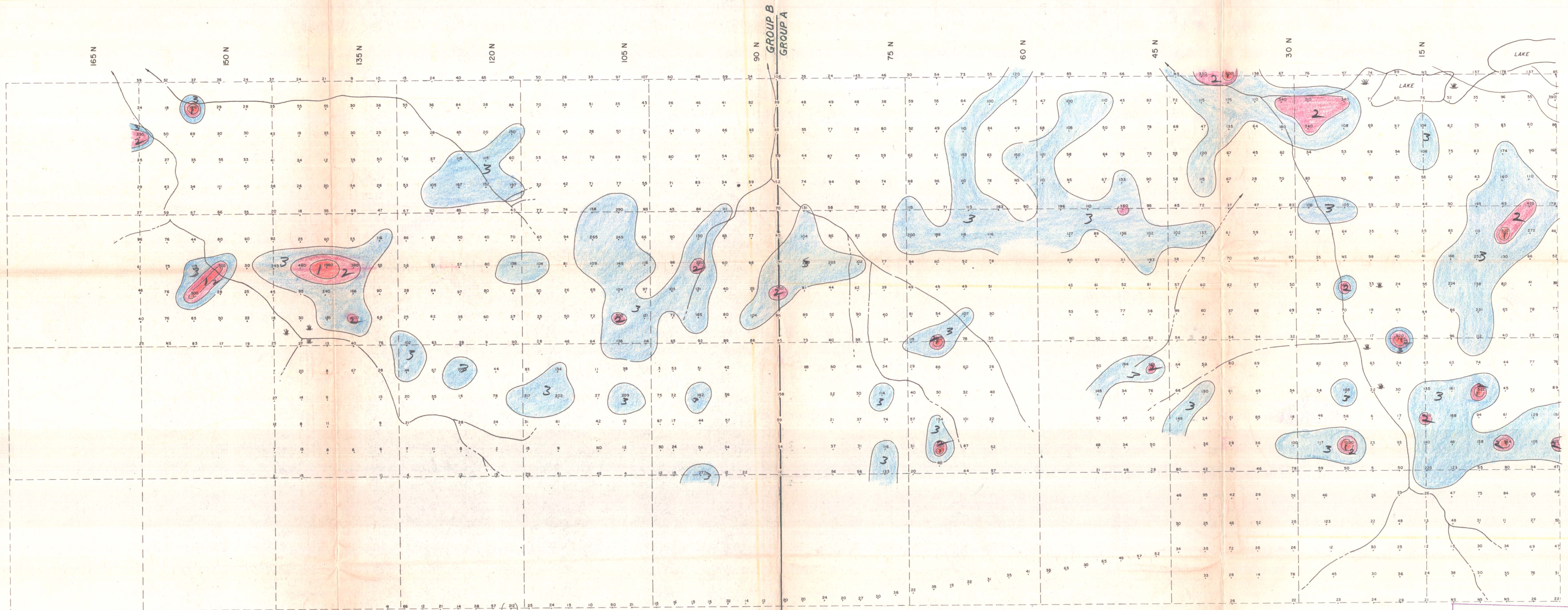
GEOLOGY
SPARTAN CLAIM GROUP
TOODOGGONE RIVER AREA (NTS 9E)
OMINECA MINING DIVISION, BRITISH COLUMBIA

SCALE: 1 IN. = 500 FT.

BY
CORDILLERAN ENGINEERING LIMITED
VANCOUVER CANADA
FEBRUARY, 1969.

1823

TO ACCOMPANY GEOLOGICAL AND GEOCHEMICAL REPORT ON THE SPARTAN CLAIM GROUP, FEBRUARY, 1969, BY A. F. REEVE P. ENG.



LEGEND

0 to 99 parts per million - Background

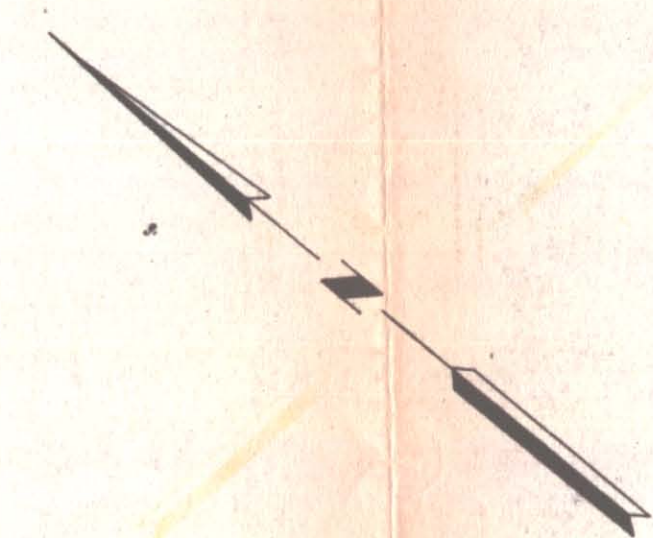
3 100 to 299 ppm

2 300 to 499 ppm

1 500 and over ppm - Anomalous

— Creek and direction of flow

• Sample point and copper content in ppm



GROUP B
GROUP A

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1823 MAP #4



QUEBEC CARTIER MINING COMPANY
COPPER CONTENT OF SOIL SAMPLES
SPARTAN CLAIM GROUP
TOODOGGONE RIVER AREA (NTS 94 E)
OMINECA MINING DIVISION, BRITISH COLUMBIA

SCALE: 1 IN. = 500 FT.

BY
CORDILLERAN ENGINEERING LIMITED
VANCOUVER CANADA
FEBRUARY, 1969.

1823

2

Fig. No. 2