

GEOCHEMICAL REPORT
LAR & CHUCK GROUPS OF MINERAL CLAIMS

MOREHEAD LAKE, QUESNEL LAKE AREA
CARIBOO M.D., B.C.

^{52°}
(51° - 121° NW) 93A/12E
by
A.G. HODGSON P.ENG.

SURVEY BETWEEN DEC. 8, 1966 & FEB. 4, 1967
for

MOLLUSCA OILS LTD

from following optionees

<u>LAR GROUP:</u>	LAR 1-6	H.C. MacDonald
	CHUCK 21-28	R.R. Keefe
	DOLL 3-7	R.R. Keefe
<u>CHUCK GROUP:</u>	CHUCK 1 & 2	Lloyd Harper
	CHUCK 5-10	T. MacDonald
	CHUCK 11-16	S.R. Bjornson
	CHUCK 17-30	Fred Baxter
	CHUCK 31-36	Lance Lea
	CHUCK 37&38	Fred Baxter

924

924

GEOCHEMICAL REPORT

ON

LAR & CHUCK GROUPS
OF
MINERAL CLAIMS

CARIBOO MINING DIVISION, B.C.

(51²° - 121° N.W.)

by

A.G. Hodgson P.Eng.

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Accompanying Map in pocket at back

Geochemical Survey Map # 1

(i)

LAR GROUP
SUMMARY OF EXPENSES

(A) FIELD WORK (laying out grid, running lines, collecting samples and establishing claim boundaries)

Cariboo Claimstakers (S. Bjornson & T. MacDonald)
Box #64, Quesnel, B.C.

December 8,13,16,17,18,19,20,21 and 22
26 man-days @ \$35.00

\$910.00

T. MacDonald (soil sampling) 8 days-	\$280.00
S. Bjornsen(soil sampling) 8 days-	\$280.00
C. MacDonald(lines & claims) 5 days-	\$175.00
R. Spooner " 5 days-	\$175.00
	\$910.00

(B) EQUIPMENT RENTAL

From Cariboo Claimstakers

(a) Bronco 4-wheel drive 9 days @ \$10.00

90.00

560 miles @ 0.12

67.20

(C) ASSAYING

TSL Laboratories Limited, 325 Howe St,Vancouver
376 samples @ \$1.20

451.20

(D) ENGINEERING & SUPERVISION

A.G. Hodgson P. Eng., 1338 Walnut Street,Vancouver

1 January, 1967 - \$125.00

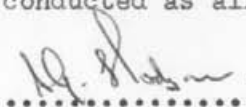
475.00

31 January, 1967 350.00

Total:

\$1993.40

I hereby certify that to the best of my knowledge the above expenditures were paid by Mollusca Oils Limited to the above indicated recipients to discharge expenses incurred for a geochemical survey on the LAR Group of claims, and that to the best of my knowledge the said survey was conducted as alleged in this report


.....
A.G. Hodgson P. Eng.

15 February, 1967

CHUCK GROUP
SUMMARY OF EXPENSES

(A) <u>FIELD WORK</u> Laying out grid, running lines, collecting samples and establishing claim boundaries)			
Cariboo Claimstakers, Box #64, Quesnel, B.C.			
January	9,10,11,12,13 and 14		
	30 man-days @ \$35.00	\$1050.00	
January	16,17,18,19,20,21,22,23,24		
	50 man-days at \$35.00	1750.00	
January	27,28,30 & 31		
	12 man-days @ \$35.00	420.00	
February	1,2,3 and 4		
	16 man-days @ \$35.00	560.00	\$3780.00
(B) <u>DATA COMPILATION</u>			
January	12,19 & 20		
	3 man-days @ \$35.00	105.00	3885.00
<u>Personnel:</u>			
T. MacDonald, Box 2125, Quesnel			
S. Bjornson, Box 64, Quesnel			
J. Uhrich, Quesnel			
R. Thibeault, Quesnel			
T. Spooner., Likely, B.C.			
K. Vincent, Likely, B.C.			
(C) <u>EQUIPMENT RENTAL</u>			
(a)	Bronco 4-wheel drive 23 days @ \$10.00		230.00
	1630 miles @ 0.12 = 195.60		4310.60
(b)	SkiDoo 12 days @ 20.00 = 240.00		
(c)	12 rolls ribbon(flagging) = 15.62		4566.22
(D) <u>ASSAYING</u>			
TSL Laboratories Limited, Vancouver			
January	24	306.00	
January	30	273.60	
February	3	232.80	
February	13	154.90	967.30
			5533.52
(E) <u>Engineering & Supervision</u>			
A.G. Hodgson P. Eng.			
	February 15, 1967	250.00	<u>\$5783.52</u>

I hereby certify that to the best of my knowledge the above expenditures were paid by Mollusca Oils Limited to the above indicated recipients to discharge expenses incurred for a geochemical survey on the CHUCK group of claims, and that to the best of my knowledge the said survey was conducted as alleged in this report.

.....
A.G. Hodgson P. Eng.

1338 Walnut Street
Vancouver, B.C.
15 February, 1967

GEOCHEMICAL REPORT
ON
THE LAR AND CHUCK GROUPS OF MINERAL CLAIMS
CARIBOO MINING DIVISION, B.C.

(51° - 121° N.W.)

by

A.G. Hodgson P. Eng.

February 15, 1967

INTRODUCTION

This report outlines the methods used, results and conclusions of a pedogeochemical survey of the LAR and CHUCK groups of mineral claims south of Morehead Lake in the Quesnel Lake district, Cariboo Mining Division, B.C.

The claims are held under option by Mollusca Oils Limited, 215 Maclean Block, Calgary, Alberta, on whose behalf the work was carried out.

The survey was undertaken as a preliminary means of surface exploration to determine if the dispersion pattern of trace copper in the surface mantle would point to favorable mineral exploration targets for more intensive investigation. Samples from the soil cover were collected on a controlled grid, assayed in the laboratory for their copper content, and the results compiled on the accompanying geochemical plan.

This report is concerned primarily with the application of geochemistry to the property, and other aspects are discussed only insofar as they affected the conduct or results of the survey.

THE PROPERTY

The LAR group of 19 claims is as follows:

<u>Claims</u>	<u>Registered Nos.</u>	<u>Anniversary Date</u>
LAR #1 - #6	32012 - 32017	February 4, 1966
CHUCK #21 - #28	32820 - 32827	February 21, 1966
DOLL #3 - #7	35906 - 35910	May 26, 1966

The CHUCK group is comprised of the following claims:

<u>Claims</u>	<u>Registered Nos.</u>	<u>Anniversary Date</u>
CHUCK 1 & 2	32343 & 32344	February 15, 1966
CHUCK 5 - 20	32846 - 32861	February 22, 1966
CHUCK 29 - 38	32862 - 32871	February 22, 1966

The two groups total 47 claims and form an inverted - "U" shaped block south of Morehead Lake and approximately 45 line miles south-east of Quesnel, B.C. The area is readily accessible by highway and logging road from the two main supply centers of Quesnel and Williams Lake.

REGIONAL DESCRIPTION

The climate is humid - continental with wet summers and 3 or more feet of snow-pack in the winter. The area supports a heavy stand of good, commercial timber and logging is its main industry.

The country is a rolling, upland area with elevations ranging from 3000 to 4300 feet above sea level. Rock exposure is not abundant, although in the higher areas outcrop occasionally becomes quite plentiful.

A few low-lying areas are wet and swampy with sluggish drainage.

Principal lithologic units are Mesozoic volcanic rocks, Jura - Cretaceous intrusives and Miocene lavas. These rocks follow north-westerly lines and are disrupted by faulting on a regional scale.

Current mining interest in the region is focused on the exploration of a potentially large tonnage of low - grade copper ore on the Cariboo Bell property which lies immediately east of the CHUCK group. The copper lodes are spatially related to acidic phases of the intrusive rocks, although some copper mineralization is known to occur in minor quantity in the volcanics

CHARACTER OF PROPERTY

No economic mineralization is known to be present on the property; however, it has been neither prospected nor mapped so the chances of finding surface mineralization are not known.

Outcrop is extremely rare on the LAR and western part of the CHUCK groups but becomes more abundant on the eastern part of the latter.

Continental glaciation left till and related deposits covering most of the terrain; derived, in large part, from rocks below and near-by, and consequently varying in composition with the parent rock. Recent stream erosion, surface run-off, frost action etc have modified the local character of the overburden and the heavy vegetation has added a considerable quantity of humus and organic material to its upper layer.

GEOCHEMICAL SURVEY TECHNIQUE

General:

Field work was carried out by Cariboo Claimstakers of Quesnel, B.C. and supervised by the writer. The program commenced on December 8, 1966 and finished on February 4, 1967. The winter conditions prevailing resulted in slower-than-normal progress with attendant higher costs.

Transportation was provided by a 4-wheel drive Bronco vehicle augmented by a Ski-Doo snow toboggan. The latter's usefulness proved limited, and most of the routine field work was carried out on snowshoes.

Ground Control:

Three base lines were established at suitable places, and at 400-foot intervals cross lines were turned off at right angles. Bearings along cross lines were carried by compass, and distances by chaining from station to station. Each 100-foot interval was marked by a ribbon "flag" inscribed with the appropriate line number and footage.

Property boundaries were tied to the grid system by compass and chain. Unfortunately, this work lagged behind the sampling, which resulted in some areas outside the property being gridded and sampled and others within the property being missed.

Sampling Method:

Samples were taken at 200-foot intervals along each cross line. They were obtained by digging through the snow cover and organic layer and attempting to reach below the leached horizon in the soil profile where it could be recognized.

Frost presented little or no problem, but isolated areas of swamp, marsh or black, mucky soil were not sampled, thus resulting in some gaps in the pattern. At a few sites uprooted trees provided easy access to good mineral soil and the bared area was utilized where it was near-by a sample location.

Samples were collected from depths ranging from 10 to 40 inches, with the average probably about 24 inches.

Sample Preparation:

Samples of $\frac{1}{4}$ to $\frac{1}{2}$ lbs. were collected in paper bags designed for the purpose, and each bag was marked with the sample location, depth, and a note on any unusual topographic feature at the site. Bags were stored in boxes and shipped in batches of 2 or 3 hundred to Vancouver for assay.

Assay Technique

Samples received by TSL Laboratories Limited in Vancouver were dried, screened on nylon mesh to -80 and the oversize rejected. One gram of the -80 was digested in hot nitric acid and the solution tested by atomic absorption for copper content. Results were reported in parts per million copper for each sample.

Treatment of Results:

The parts per million copper reported by assay were plotted on a plan scaled at 400 feet to one inch. A "background" value was calculated and the plan contoured in multiples of this background.

"Isograds" representing average "background"; 2, 3 and 4 times average "background" were drawn.

The results appear on the geochemical plan that accompanies this report. It will be noted that contours show a pronounced bias in a direction normal to that of the cross lines. This stems from the unequal spacing of samples (200-foot intervals on lines 400 feet apart). However, this should not materially affect the basic results of the survey.

ANALYSIS OF RESULTS

A total of 1197 samples of soil were collected and assayed. Copper content in parts per million (ppm) ranged from a low of 2ppm to a high of 420 ppm.

An average "background" was deduced by rejecting all values over 100 ppm and calculating the arithmetic average of the remainder.

In summary:

- (a) No. of samples less than 100 ppm=1127 - 94%
- (b) No. of samples 100 ppm or more = 70 - 6%

The arithmetic average of (a) works out to approx. 27 ppm.

Assuming 27 ppm to be an average "background" then samples falling above and below this norm are:

- No. of samples 27 ppm or less = 707 - 59%
- No. of samples over 27 ppm = 490 - 41%

An analysis of the frequency distribution of the 1197 samples ranging between 2 and 420 ppm breaks down as follows:

- (1) 59% - 27 ppm copper or less
- (2) 25% - 27 to 54 ppm copper
- (3) 18% - 54 to 81 " "
- (4) 3% - 81 to 108 " "
- (5) 5% - over 108 ppm copper

If 54 ppm or less be considered as a "background" range and 54 to 81 ppm a thresh-hold range then from 81 ppm upwards (i.e. anything over 3 times average background) may be considered to be in the "anomalous" category. The above analysis reveals that 8% of the samples fall in this category.

The 81 ppm "isograd" on the accompanying geochemical plan is accentuated, and areas above 81 ppm (i.e. possible anomalies) are colored in red.

INTERPRETATION OF RESULTS

General Considerations:

With respect to the present survey on the LAR and CHUCK groups the following factors which can have an important influence on the result cannot be properly applied to the interpretation of results at the present time:

- (1) Bed-rock geology, copper content of the rocks and its ease of release for dispersion in the overburden.
- (2) Depth of overburden.
- (3) Types of overburden and their detailed distribution; whether glacial, alluvial, residual etc.
- (4) Localized effects of frost action, run-off, weathering etc.
- (5) Dispersal of mineralized float in the overburden and its possible fortuitous proximity to sample sites.

The influence of the following factors is believed to have been eliminated by sampling technique or allowed for by field observations:

- (1) Contamination
- (2) Uniformity of material sampled i.e. the same horizon in the soil profile in each sample
- (3) Topography, especially as it affects drainage.

Details:

Numerous relatively high areas, many of them "spot" readings, are erratically disposed on the property and, for the most part, show no well-defined pattern; nor are they restricted to any particular area.

Some areas higher than normal are spatially related to low, wet, poorly drained ground; and the copper concentration is likely the result of poor drainage and hence of no significance. The main such areas are:

- (1) North sides of DOLL #6, CHUCK #27 and #28
- (2) LAR #1 and #6 and CHUCK #2
- (3) CHUCK #12
- (4) CHUCK #13, #15 and #17 and ground to the north

Other restricted high areas of minor interest, going from west to east are on LAR #5, CHUCK #23, CHUCK #7 and #9, CHUCK #38, CHUCK #16 and CHUCK #17. Each of these has two or more values exceeding 3 times "background" on one ore more line, and none is obviously related to inferior drainage. However, they are not considered to be attractive targets for further investigation with the information at present available.

On the east side of the CHUCK group, on CHUCK #19, #20 and #29 & #30 a series of higher than normal readings are contained in an area about 3500 feet long (northwesterly) by 1500 feet wide. On these 4 claims over 18% (21 out of 114) of the samples exceed 3 times background (as compared to 8% for the property as a whole) and one reaches 420 ppm, the highest obtained by the survey.

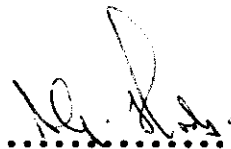
The ground in this area is high and well drained and showed most of the bedrock encountered during the field work. The area is of sufficient interest to merit further investigation, and more work should be undertaken here after the snow has melted and more favorable working conditions prevail.

SUMMARY

A total of 1197 soil samples returned a copper content ranging between 2 and 420 ppm.

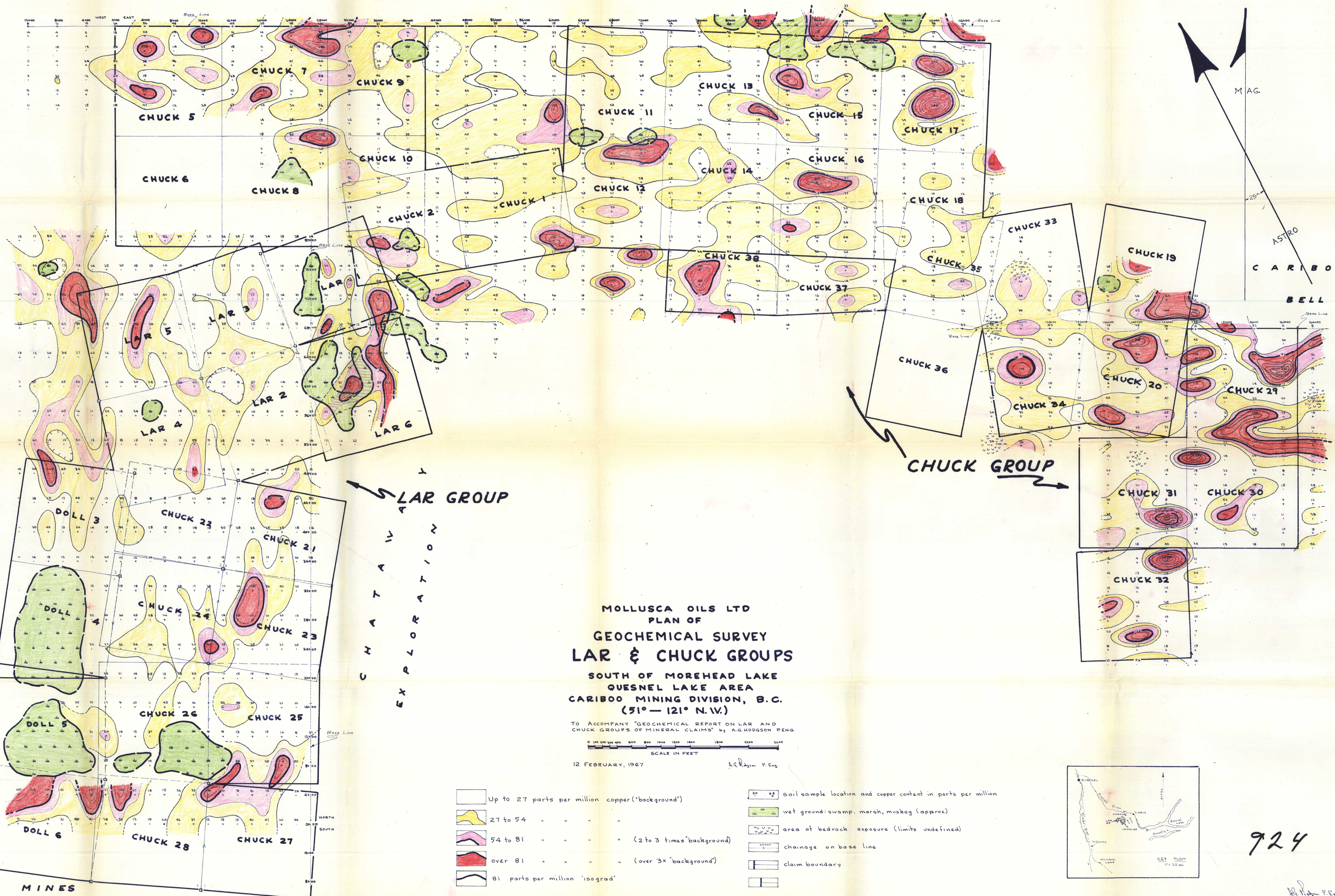
A mean "background" of 27 ppm was calculated. Many random highs with no discernible pattern are likely "erratics" or attributable to poor drainage.

Of seven anomalous or pseudo-anomalous areas identified one, on the east side of the property, shows a sufficiently orderly pattern and is of enough areal extent to justify additional investigation.


.....
A.G. Hodgson P. Eng.



1338 Walnut Street
Vancouver, B.C.
15 February, 1967



MILESTONE
MINES

NEW JERSEY
ZINC

CAREX MINES

MAG.

ASTRO
CARIBOO
BELL

CHAMATAY
EXPLORATION

MOLLUSCA OILS LTD
PLAN OF
GEOCHEMICAL SURVEY
LAR & CHUCK GROUPS
SOUTH OF MOREHEAD LAKE
QUESNEL LAKE AREA
CARIBOO MINING DIVISION, B.C.
(51° - 121° N.W.)

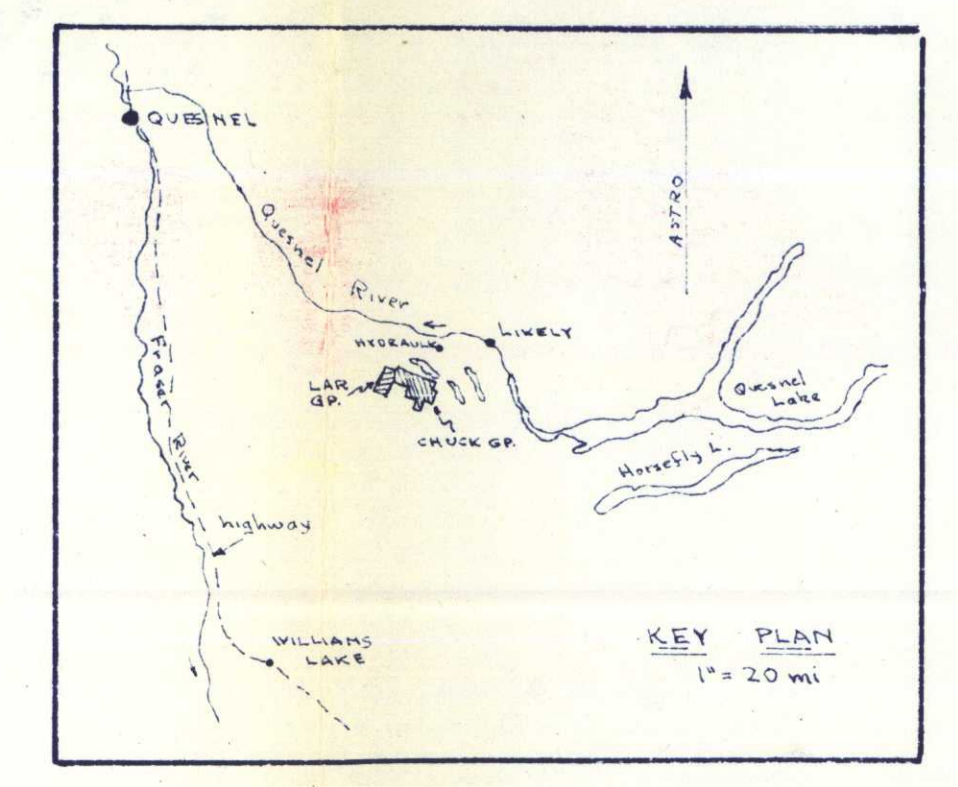
TO ACCOMPANY "GEOCHEMICAL REPORT ON LAR AND
CHUCK GROUPS OF MINERAL CLAIMS" by A.G. HODGSON P. ENG.

0 100 200 300 400 500 600 800 1000 1200 1400 1600 1800 2000 2200 2400
SCALE IN FEET

12 FEBRUARY, 1967

A.G. Hodgson P. Eng.

- | | | | |
|--|--|--|--|
| | Up to 27 parts per million copper ("background") | | Soil sample location and copper content in parts per million |
| | 27 to 54 " " " " | | wet ground: swamp, marsh, muskeg (approx) |
| | 54 to 81 " " " " (2 to 3 times "background") | | area of bedrock exposure (limits undefined) |
| | over 81 " " " " (over 3x "background") | | chainage on base line |
| | 81 parts per million "isograd" | | claim boundary |



924

A.G. Hodgson P. Eng.
12 February 1967