North Lodge Copper Mines, L'td.

Report on Geochemical Survey Performe During March, April, and May, 1956 on Lodge Claims, Situated 18 Miles SE of Ashcroft, B.C. (50°, 120°, NW).

92I/10W

by
Willem O.J. Groeneveld Meijer
McPhar Geophysics Limited

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McPHAR GEOPHYSICS LIMITED
PHONE: TORONTO HICKORY 4-4451
139 BOND AVENUE, DON MILLS, ONTARIO

Highland Valley, June 18, 1956.

Chief Gold Commissioner,
Department of Mines,
Victoria, B.C.

Dear Sir:

Under the provisions of the Mineral Act and Regulations, chapter Geochemical Work as Assessment Work, paragraph 4, I herewith file a statement of my qualifications as a geologist and geochemist.-

1) I obtained the degree of Ingénieur Geologue (=Masters' Degree of Science) at the Swiss Federal Institute of Technology, Zürich, Switzerland in the year 1950.

2) I obtained the degree of Doctor of Philisophy at the Department of Geological Sciences, Queen's University, Kingston, Ontario in the year 1955.

3) I have been actively engaged in geology at university or in the field, for the past nine years.

4) I have been actively engaged with the development of geochemical procedures and with their application in the field for the past 18 months.

5) I am a member of the following professional organizations:
   a) Royal Institute of Dutch Professional Engineers, member,
   b) Geological Society of America, member,
   c) Canadian Institute of Mining and Metallurgy, junior member,
   d) American Geophysical Union, member.

6) I have published the following papers:
   a) "Synthesis, Structures, and Properties of Platinum Metal Tellurides", American Mineralogist, v.40, pp. 646-657, 1955.
   b) "Niggliite, a Platinum Di-telluride?", American Mineralogist, v. 40, 2 pp, 1955.

and have written the following theses:
   a) The Geochemistry of the Platinum Metals, with Particular Regard to their Occurrence in Sudbury Sulphides. 450 pp, Queen's University; Ph.D. thesis, 1954.
   b) The Economic Geology of Certain Siderite Deposits in the Swiss Alps, 150 pp. Swiss Federal Institute of Technology, Masters' thesis, 1950.

Respectfully yours,

Wm. Groeneveld Meijer

Willem O.J. Groeneveld Meijer,
Geologist and Geochemist.

North Lodge Copper Mines Ltd. June 22/56

Recapitulation of Geochemical Survey Costs on North Lodge Claims:

Copper Determinations:			
	551 @ $ .40	220.40	
Geochemist:			
	5 dys @ 35.00	175.00	
Technician:			
	25 dys @ 15.00	375.00	
Helpers:			
	25 dys @ 14.00	350.00	
Line Cutting:			
	per B.C.L.S.	555.00	
Control Survey:			
	12 claims @ 50.56	606.72	
			$2282.12
			$2282.12

Cost per Determination

$4.14

Cost Distribution to Claims Groups:

Lodge # 30 Group:		Determinations:		Cost:
Lodge	#30	20		
"	#31	42		
"	#32	21		
"	#26	79		
"	#29	50		
"	#28	67		
KB	# 2	60	339	$1403.46
Lodge # 20 Group:				
Lodge	#17	45		
"	#19	38		
"	#21	2	85	$351.90
Lodge #25 Group:				
Lodge	#25	9		
"	#24	8		
"	#27	49		
"	#34	2		
KB	# 1	44		
KB	# 3	1		
KB	# 4	14	127	$525.78
		551		$2281.14

NORTH LODGE COPPER CORPORATION LIMITED

Report on Geochemical Survey Performed During March, April, and May, 1956 on Lodge Claims, Situated 18 Miles SE of Ashcroft, B.C..

(50°, 120°, NW)

Willem O.J. Groeneveld Meijer

Table of Contents

		page
1)	Introduction.....	2
2)	Outline of Geochemical Procedure.....	3
3)	Preliminary Work.....	5
4)	Discussion of Results.....	6
5)	Summary, Conclusions, and Recommendations...	8

In the envelope pocket on the inside of the back cover:

#1 Geochemical Map # C-4271: North Lodge Copper Mines Limited, Scale 1" = 200'.

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1) Introduction

At the request of Dr. A. Bateman, a geochemical survey of a portion of the Lodge Claim group of North Lodge Copper Mines Limited has been undertaken. For this survey, the newly developed McPhar Geochemical Soil Test Kit for Copper has been used.

The work was performed during the months of March, April, and May of 1956 by M. Chessman, technician, under the supervision of J. Shivas, geochemist, both of McPhar Geophysics Limited. The author has recently revisited the area to check on certain results; he is familiar with the local geology and with the possibilities and limitations of the geochemical methods employed.

Throughout their sojourn in the Highland Valley area, the members of McPhar Geophysics Limited have been assisted by the staffs of North Lodge Copper Mines Limited, Beaver Lodge Uranium Mines Limited, and Farwest Tungsten Copper Mines Limited. Their hospitality and co-operation are gratefully acknowledged.

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2) Outline of Geochemical Procedure

The McPhar Geochemical Soil Test Kit for Copper has been developed to estimate the amount of copper in a soil sample. The reagents employed are specific for copper only; no other metallic ions, present in the soil, will affect the test.

The soil test kit consists of a field kit and a reserve of chemicals which are kept at the base camp. The field kit consists of a wooden case containing two polyethylene bottles, a supply of filter papers, and a polyethylene funnel. The front of the case is provided with a sample loading port and brief field instructions. A set of standards for estimating the parts per million of copper, a stainless steel spatula and plunger-type sampler, and a mixing tube shaker are used for individual tests. Two solutions are used in the test: EXTRACTOL extracts copper from the soil and INDICATOR develops the colour, indicative of the extracted copper; these liquids are immiscible with each other. The solutions are transferred to the polyethylene bottles in the field case from where they are used for each test.

Using the plunger-type sampler and the spatula, a fine grained fraction of the soil is selected. Two of such sample aliquots (total of approximately 0.2 gram soil) are transferred to one glass mixing tube (A). This mixing tube

is inserted uncapped into the loading port on the front of the field case and is filled with 2 ml of EXTRACTOL from the polyethylene siphon bottle, after which it is capped and shaken vigorously for one minute. A second mixing tube (B) is now placed into the loading port and one ml from the first tube (A) is filtered through a polyethylene funnel into it. To this filtered one ml portion, one ml of INDICATOR is added after which the tube is capped and shaken for 30 seconds. Upon standing for a few seconds the immiscible liquids will break into two separate phases and the colorimetric comparison against the set of standards can be made. Standards allow for direct visual estimation between 5 and 120 parts per million (ppm) of copper. The upper limit of the sensitivity range can be extended easily by:

1) adding additional one ml portions of INDICATOR, or by
2) halving the original sample.

The colours of the standards are very stable; they will last for an indefinite period.

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3) Preliminary Work

Before commencement of work on the North Lodge Copper Corporation Limited claim group, preliminary work was undertaken by McPhar Geophysics Limited oven known mineralized areas on the property of Bethlehem Copper Mines Limited. The detailed results of this work are contained in:

"A Progress Report - On the Copper Geochemical Survey being Conducted for Beaver Lodge Uranium Mines Limited and Farwest Tungsten Copper Mines Limited; author J. Shivas, geochemist , McPhar Geophysics Limited, dated: March 12, 1956."

The aforementioned work establishes the three areal geochemical parameters: sample depth, sample spacing, and background and it furthur shows that the chemical procedure and sensitivity allow for the detection of copper mineralization under 20 to 25 feet of overburden. On the basis of these results all subsequent work has been carried out on samples taken at one foor depth with a maximum sample interval of 200'. Background was established at 0-10 ppm.

Under the heading "Limitations of Geochemical Methods", the following factors are mentioned:

1) Excessive depth of barren overburden can prevent ionic transport of copper to near surface levels.

2) Fluvial or glacial overburden might give erratic results,

not correlatable with bedrock observations due to its non in-situ origin.

3) In hilly terrain geochemical anomalies tend to be displaced downhill with respect to their parent mineralized zone due to soil creepage and ground water movement.

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4) Discussion of Results

The sampled area comprises fifteen surveyed claims of the northern portion of the Lodge claim group. Over five hundred samples were taken at 200 foot intervals (locally at 100 foot intervals) on six surveyed lines and at stations, tied onto these lines by pace and compass survey. All sample locations, shown on the accompanying map, have been marked in the field for possible future reference.

At the time of sampling deep snow, ranging from five to two feet in thickness, covered the area. This not only proved hindersome during the actual sampling operation but also prevented a check on outcrop, overburden, and swamp conditions. In effect, the area is now recognized as being covered by a mantle of glacial or fluvio-glacial material which is estimated at being in places 70 feet thick or more. A few small barren outcrops have been observed. Maximum relief of the area examined is about 900'. The land

slopes towards the south and south east, is dissected by many creeks, and beset with occasional swampy regions.

From the foregoing it is evident that the area is a priori not ideally located for a geochemical survey since heavy mantles of transported material are be be avoided in geochemical work on soils. Those large areas of the map which are underlain by soils containing 0 to 10 ppm Cu (=background) are not to be considered devoid of mineralization at depth until other methods of prospection have been exhausted.

The majority of anomalies (more than 10 ppm Cu) occur in swampy areas. These are characterized by deep, brown-black humic soils which are apt to adsorb any copper from creek water by virtue of their evidently high base exchange capacity. In the experience of the author such areas are at best avoided altogether from sampling, as they quite generally yield anomalous results. Nevertheless, these results do tend to indicate the possibility of a source of copper ions, lying in a north to north easterly direction (uphill). Some substantiation to this is afforded by the very weak but interesting anomalous areas A, B, and C which border the north east boundary of the property.

The following soil samples, yielding high analytical results, occur erratically over the map area: # 503

(120 ppm), # 471 (90 ppm), # A219 (80 ppm), # 266 (40 ppm), and # 461 (40 ppm). At present their significance is dubious and they might be attributed to mineralized float (as has been observed in the general area). However, the value of such scattered points would immediately gain in perspective if an independent method of prospecting, i.e. geophysical work, would indicate similar anomalous conditions. The same applies to the remainder of the higher-than-background analytical results. At present they may easily be discredited as being either:

a) too low to command serious attention, or

b) too scattered to be of immediate significance, or

c) too closely associated with swampy areas to merit consideration.

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5) Summary, Conclusions, and Recommendations.

The McPhar Geochemical Soil Test Kit for Copper has been used for a systematic geochemical survey over an area of fifteen claims. The geochemical equipment, chemical procedure and the results of preliminary work are discussed. The limitations of the application of geochemical methods are briefly reviewed.

The area of the survey was ill-chosen for geochem-

ical work because of the prevailing thick cover of glacial debris. Unfortunately, this was not recognized at the time of sampling: the area was covered with snow while the work was done. The majority of the negative results are therefore, strictly speaking, inconclusive. Swampy areas yield high analytical results which cannot be trusted. However, when these are viewed in conjunction with weak geochemical anomalies along the north west boundary of the property, the impression is gained that this boundary area, and the area located immediately uphill from it, might be of some interest.

The attention is drawn to the fact that an independent method of prospection might easily bring much of the geochemical work performed into its proper perspective. As such, this work has definite value in being able to affirm possible subsequently to be found anomalous areas.

No furthur geochemical work is recommended at present for this particular claim group in view of the problems brought on by the excessive thickness of overburden. It might be that the analysis of the leaves of certain species of trees can yield more definite results. It is well-known that heavy metal ions, occurring in the ground water, are drawn up through deep roots and accumulated in the leaves, where most of the evaporation takes place. However, such work would require much research and experimentation before

results could be expected on a routine basis. Much more hopeful appear to be the preliminary results of certain geophysical tests which recently have been performed by McPhar Geophysics Limited over known mineralized zones in the Highland Valley area.

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Willem O. S. Groeneveld Meijer

Willem O.J. Groeneveld Meijer,
Geologist and Geochemist.

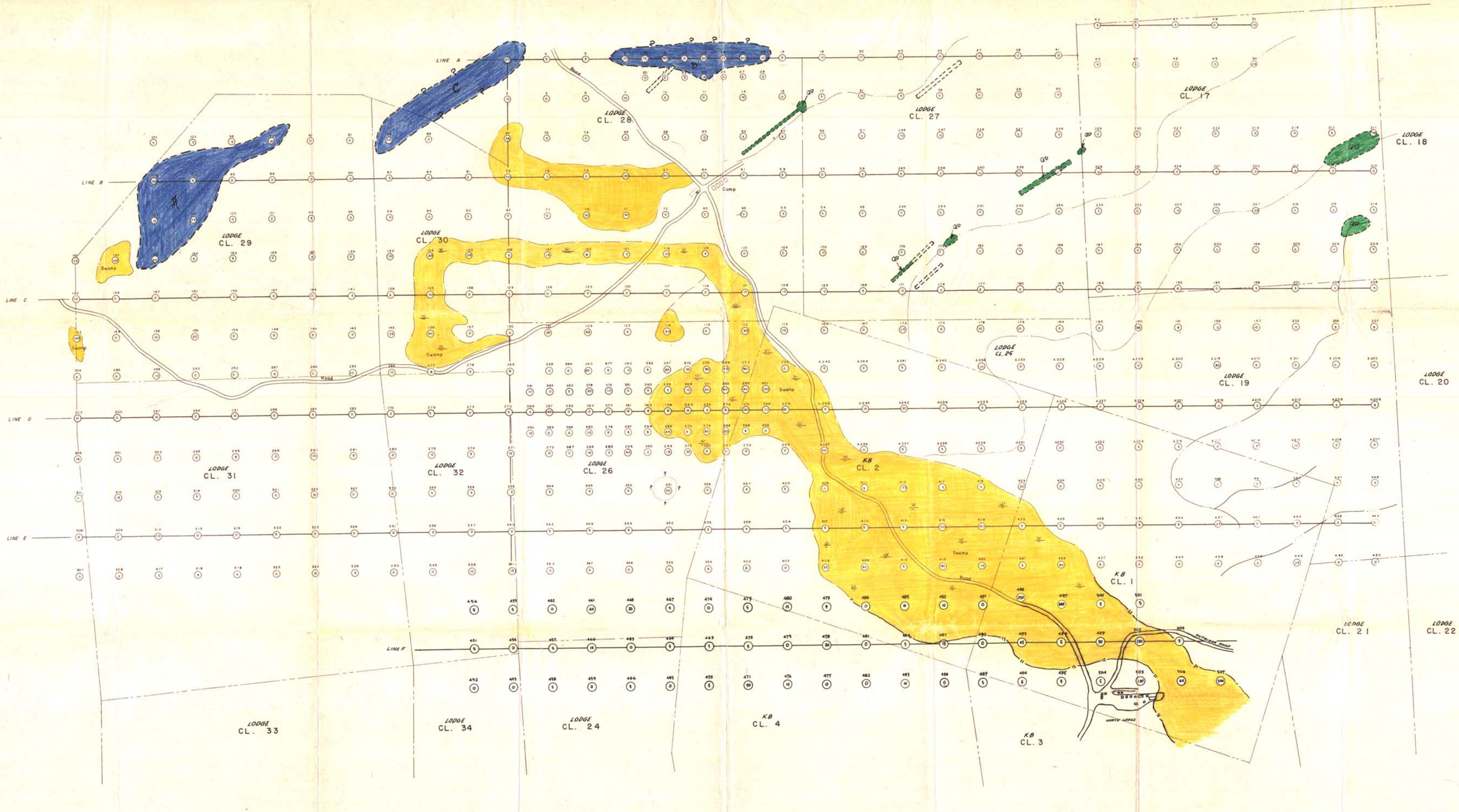
McPHAR GEOPHYSICS LIMITED.

Dated: June 13, 1956.

120

McPHAR GEOPHYSICS LIMITED

GEOCHEMICAL SURVEY



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 120 MAP #1

NORTH LODGE COPPER MINES LIMITED

HIGHLAND VALLEY SECTION BRITISH COLUMBIA

SCALE

200 100 0 200 400 600 800 1000 FEET

ONE INCH = TWO HUNDRED FEET

SYMBOLS

- DRY RIVER GULLY
- ROCK OUTCROP, QUARTZ DIORITE
- SWAMP
- SWAMP BOUNDARY
- CLAIM BOUNDARY
- TRENCHES
- WEAK ANOMALY (A, B, C)
- SAMPLE NUMBERS AND PARTS PER MILLION OF COPPER

#120
MAP 1

DRAWN J. FAIR
DATE MAY 56
APPROVED
DATE

DWG C 4271