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GEOLOGICAL SURVEY, GEOCHEMICAL SOIL SURVEY, AND ELECTROMAGNETIC (EM-16) SURVEY

on the

GORD 1-40 MINERAL CLAIMS

Record Numbers 128071-128086 129214-129237

Omineca Mining Division N.T.S. 94E/6E 57⁰30' North, 127⁰3' West

	by Alfred A. Burgoyne, P	Department of .Eng. Mines and Petroleum Respurces
		ASSESSMENT REPORT
Work Dates:	Geochemical Soil Survey: EM-16 Survey: Geological Survey:	August 14-30, 1974 August 17, 19, 28, 29, 1974 August 20-25, 1973 August 14-30, 1974

Date: September 30, 1974

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GORD CLAIMS ASSESSMENT REPORT

INTRODUCTION

In the period August 14-30, 1974 a geochemical soil survey for copper, lead, zinc, and silver, EM-16 and geological surveys were completed on the Gord 1-40 mineral claims. In addition, a small geological survey was completed on the Gord 1-16 claims in the period August 20-25, 1973.

The Gord 1-40 claims are located in the Omineca Mining Division, B.C., and lie approximately two miles south of Contact Peak, at latitude 57[°]30'N and longitude 127[°]3'W. Note Figures 1A and 1B. Access to the property is by helicopter.

The claim area is entirely above tree-line in extremely rugged mountainous terrain in the Omineca Mountains where local relief varies several hundreds of feet. The elevations on the property range from 4600 to 6900 feet.

The field work was directed by Mr. C.V. Dyson, P.Eng., who in turn was under the supervision of Mr. A. Burgoyne, P.Eng. Geological mapping was completed by Mr. R. Tolbert, B.Sc. (Geology), Ziff House, and Gary Hawkins and Mr. C. Bowdidge, Ph.D. (Geology). Geochemical surveys were completed by Mario Milics, Paul Osborne, Jim Reid, and Alan Reeves. Electromagnetic surveys were completed by Mr. H. Holm, B.Sc. (Mathematics) and Mario Milics.

GEOLOGY

Detailed mapping of the claims (Figure 2) indicates that the area is underlain by a thick sequence of volcanic rocks consisting of greenish and purplish andesitic flows - typically with 1/4" feldspar phenocrysts - cherty andesites, and porphyritic andesitic pyroclastics that range from tuff to agglomerate in texture. The assemblages can tentatively be correlated to the Upper Division of the Takla Group of rocks of Upper Triassic Age.

Within the claim group and bordering it to the north salmon pink monzonite intrusives were located in northwesterly trending dykes and as small stocks. These intrusives can be correlatic to the Upper Jurassic or Lower Cretaceous Omineca Intrusives. In several locations small basic dykes were noted generally of diabasic composition. These dykes did not appear to show any preferred orientation.

A major fault intersection between north and northwest trending fault zones was defined in the west-central part of the claim area.



Grid and Ground Control

A baseline was established bearing 0° across three areas on the claim block by use of a "Topofoil Chain"¹ and compass. Crosslines were established where possible in the severe topography, at 500 foot intervals in east-west directions using compass and Topofoil Chain and with stations marked with flagging at 50 foot intervals. The grids were tied into the pre-existing claim posts and obvious topographic features.

Ground control was possible also by use of the 1"=800' contoured map which had been prepared by Lockwood Surveys Ltd. (Figure 1B), and by use of pocket altimeters.

Mineralization

Two types of mineralization were found on the claims. The first type is essentially only copper mineralization, which occurs mainly as chalcopyrite, in quartz-carbonate veinlets and in small fractures in volcanics. Several minor occurrences of this type of mineralization was located, mostly in float, and mainly along the main northwest trending fault zone (Figure 2) on Gord claims 9, 10, and 19. The sparse nature of this mineralization and its localization along the fault structure negates any significant economic potential.

The second type of mineralization consists of chalcopyrite, galena, sphalerite and pyrite which occur in quartz veins in bleached, silicified, and carbonated volcanic rocks in pyrited and limonite stained zones.

Two locations of this type of mineralization were located: on the Gord 18 mineral claims a large gossanous area can be traced for several hundreds of feet across a ridge. On the north side of the ridge at locality #1 (Figure 2), a quartz vein two feet wide was located which contained pods of galena and sphalerite, with minor chalcopyrite, and which could be traced over a twelve foot section. A chip sample of this mineralization taken over a six foot width

¹The Topofoil Chain is a "lost" thread measuring device in which a counter accurately records in feet from 0 to 15,000 feet the length of thread unreeling from the unit when measuring a length or distance covered. The operator attaches the end of the thread to a fixed point, the counter is set at zero and the operator moves on foot carrying the Topofoil Chain. As the thread unwinds, the counter records the length. The counter readout is accurate to $\pm 0.2\%$; on completion of a measurement the counter is reset at zero. The biodegradeable thread is cut and abandoned.

assayed 1000 ppm Cu, 3032 ppm Pb, >4000 ppm Zn and 16 ppm Ag.

The second mineral showing (see location number 2, Figure 2) is located on the Gord 9 mineral claim and lies in a gully at the head of a talus slope. It consists of a series of branching zones, two to five feet wide, of rusty carbonated andesite with widespread disseminated pyrite, and scattered clots of galena, chalcopyrite and minor sphalerite. A chip sample across this zone assayed 1075 ppm Cu, 4300 ppm Pb, 19,000 ppm Zn and 30 ppm Ag over 3.0 feet.

GEOCHEMICAL SOIL SURVEY

Methods and Soil Development

In the course of the survey a total of 293 soil samples were collected over 10.78 miles of line grid, with samples spaced at 200 foot intervals, and analysed for copper, lead, zinc and silver. At each soil location a hole was dug with a mattock and where possible 4-6 ounces of well developed C horizon soil sample was taken with a stainless steel trowel. The soil sample was placed in a high wet strength Kraft sample bag and appropriately marked. The soil development for the areas underlain by the claims is:

- Ao: Organic matter, undecayed leaves, twigs, normally 0 1 inch thick but up to two feet in swampy areas.
- Al: Decomposed organic debris, organic-rich humus horizon, black in colour, generally absent from claim area.
- B: Brown to orange in colour, accumulation of clay and/or organic matter. Thickness variable but generally absent from claim area.
- C: Weathered rock fragments mixed with B.

Analytical Treatment of Soil Samples

The soil samples were analysed by Chemex Labs Ltd. in North Vancouver. The samples were dried in their respective sample bags in electric driers at a temperature of 80° C, and then sieved to a -80 mesh through a nylon screen. One-half gram portions of the screened soils were digested for 2 to $2\frac{1}{2}$ hours at 203° C in a 70% perchloric and 30% concentrated nitric acid mixture. The digested samples were cooled and bulked to 25 ml. with distilled water and allowed to settle. The resulting samples were analysed by atomic absorption for copper, lead, zinc and silver. Detection limits of this method are given as 1 ppm for copper, lead, and zinc, and 0.5 ppm for silver. 3

Results

Cumulative frequency versus metal concentrations² have been plotted for copper, lead, and zinc and are illustrated in Figures 3, 4, and 5, respectively. Contoured plots for copper, lead, zinc, and silver on the topographic base map are illustrated in Figures 6, 7, 8, and 9, respectively.

Copper values (note Figure 3) in excess of 75 ppm are probably anomalous, and values in excess of 180 ppm are considered definitely anomalous and are thought to be caused by copper mineralization. Values in excess of 180 ppm (note Figure 6) in the soil are associated mainly with chalcopyrite bearing quartz-carbonate veinlets in the volcanics of Rock Unit 1 along faults and fracturing (note Figure 2) and in the gossan zone of Rock Unit 7. The soil pattern for copper is mostly the result of the great amount of mechanical dispersion of mineralized talus on the property.

Lead values in excess of 60 ppm and 150 ppm are considered to be probably and definitely anomalous and are contoured at these thresholds. The anomalous lead values are thought to be caused by the observed mineralized vein structures in the volcanics and in the gossanous zone and by mineralized float.

Zinc values are considered anomalous in excess of 160 ppm. This interval and the 600 ppm interval have been contoured. The anomalous values are caused by mineralization that is intimately associated with the lead mineralization.

Silver values are considered to be anomalous for values in excess of 1.0 ppm. Higher anomalous values have been contoured at the 3.0 ppm contour interval. The silver is probably tied up in the galena in the quartz veins that contain the poly mineral assemblage of galena, sphalerite, chalcopyrite, and pyrite.

There is a good correlation of probable and definite anomalous values in contour plan on Figures 6, 7, 8, and 9 for copper, lead, zinc, and silver. Geological mapping has defined the source and cause of most of the anomalous metals to be restricted to narrow, erratically, mineralized quartz-carbonate and/or quartz veins/fractures and their respective float that has been mechanically and chemically dispersed.

ELECTROMAGNETIC (EM-16) SURVEY

²Lepeltier, Claude, 1969, A Simplified Statistical Treatment of Geochemical Data by Graphical Representation: Economic Geology, Vol. 64, pp. 538-550.

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Field Procedures and Data Processing

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The ground electromagnetic survey was completed with a Ronka EM-16 VLF electromagnetic unit. The measurement range for the in-phase is +150% and for the out-of-phase +40% with an accuracy of 1%. The EM-16 is a sensitive audio-receiver that uses the signal transmitted by several American military stations in the 15-25 kHz range. For this survey the station NLK/NPG JIM CREEK, Washington 18.6 kHz was utilized. The primary magnetic field generated by the station is considered uniform over the surveyed area. When the primary magnetic fields meet conductive bodies in the ground, there will be secondary magnetic fields emitted. The Ronka EM-16 effectively measures the vertical components of these secondary fields. To take a reading the horizontal coil in the instrument is oriented along the magnetic field lines (here this direction is N76°E) and the vertical coil is tilted to minimize the sound signal and the tilt angle recorded in percentage or degrees. This angle is a measure of the vertical real component (in-phase) of the induced secondary field. A second angle measurement of the minimum signal from the horizontal coil is then taken; this measurement is the quadrature or out-of-phase component. EM-16 in-phase and out-of-phase readings were taken every 50 feet along the cross lines.

In Figure 10 the in-phase and out-of-phase data for the EM-16 survey results have been reproduced in profile with the vertical scale at 1"=20% and the horizontal scale at 1"=200". In Figure 11 the in-phase filtered data has been reproduced in contour form in an effort to reduce the geological noise component (which is generated in the 15-27 kHz frequency range) and to transform zero crossovers and inflections into peaks. The technique and resulting interpretation as used is described by Fraser (1969).³ Basically if four consecutive data points, P_1 , P_2 , P_3 , P_4 , are considered then the function to be plotted is simply: $F = (P_4 + P_3) - (P_2 + P_1)$ and the plotting point falls between stations P_2 and P_3 . Only positive values are contoured.

<u>Results</u>

In Figure 10 the in-phase and out-of-phase EM-16 data indicates several conductors. These conductors have been more lucidly displayed in Figure 11 by

³Fraser, D.C., 1969, Contouring of VLF-EM Data: Geophysics, Vol. 34, No. 6 (Dec. 1969), pp. 958-967.

the "Fraser Filter" method described above. Most, if not all, of the conductors on Figure 11 are apparently related to geologic structures such as major faults and fault zones, shear zones, minor faults, lithologic contacts, and possibly sills, and/or dykes. Reference should be made to Figure 2, the geology map and to Figures 6 to 9 for grid control and geochemical association.

In Figure 11, the westernmost conductor that trends from L125N to L147N directly overlies the major northwest fault indicated on Figure 2. Also, the easternmost conductor between L133N and L143N is probably a fault and is defined geologically as a contact between andesites of Unit 1 and the bleached, pyritised, limonite stained zone of Unit 7. The westernmost conductor that trends from L163N to L170N is characterized by a thin zone of the limonite stained zone of Unit 7.

There are several other conductors on the property in which no definite geological explanation can be given, generally because of overburden cover. However, the explanation for these conductors is probably similar to those described above.

CONCLUSIONS AND RECOMMENDATIONS

Geological mapping, geochemical soil surveys for copper, lead, zinc, and silver, and electromagnetic (EM-16) have been carried out on the Gord claims. Geochemical soil surveys have indicated large areal anomalies for copper, lead, zinc, and silver. Geological mapping has defined that copper/lead/zinc mineralization of non-economic significance is found in small, discontinuous quartz and/or quartz carbonate veins and veinlets. These veins occur within faults and fault zones or at geologic contacts. The electromagnetic survey has helped to define known fault/shear(?) zones and to indicate new faults.

Mineralization from the veins has been dispersed mechanically and chemically downhill from their source and as such gives strong geochemical responses to relatively minor in situ mineralization.

Respectfully submitted,

alfred Q. Burgoyne

Alfred A. Burgoyne, P.Eng.

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APPENDIX I

Detailed Costs of Geochemical Surveys Performed

Labour Costs	
Office: A. Burgoyne, September 20, 1974 1 day @ \$80/day	\$ 80.00
C. Dyson, September 3-4, 1974	
2 days @ \$65/day	\$ 130.00
Drafting: R. Tolbert, September 16-20, 23, 1 6 days @ \$40/day	974 \$ 240.00
Field: C. Dyson, August 14-15, 1974 2 days @ \$65/day	\$ 130.00
M. Milics, August 18, 20-27, 30, 1 10 days @ \$20/day	974 \$ 200.00
A. Reeves, August 22-30, 1974 9 days @ \$20/day	\$ 180.00
J. Reid, August 22-30, 1974 9 days @ \$20/day	\$ 180.00
P. Osborne, August 14-30, 1974	
17 days @ \$25/day	\$ 425.00
Personnel Maintenance:	
47 man days @ \$12/day	\$ 564.00
Transportation Costs:	
2 hours Hughes-500 helicopter	
@ \$200/hour (contract)	\$ 400.00
40 gallons fuel @ \$1.50/gallon at base camp	\$ 60.00
Analytical Costs:	
300 samples for copper, lead, zinc	•
and silver plus sample preparation	L
@ \$2.40/sample	\$ 720.00
Sample shipment costs to Chemex La	bs
in North Vancouver via TPA and PWA	ş 52 . 00
Secretarial, Reproduction and Miscellaneous C	Sosts \$ 120.00
TOTAL	\$3481.00

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APPENDIX II

Detailed Costs of the Electromagnetic (EM-16) Survey

Labour Costs			
Office:	C. Dyson, September 5, 1974 1 day @ \$65/day H. Holm, September 23-27, 1974	\$	65.00
	5 days @ \$36/day	\$	180.00
Field:	H. Holm, August 17, 19, 28, 29, 1974 4 days @ \$36/day	\$	144.00
	M. Milics, August 17, 19, 28, 29, 1974 4 days @ \$20/day	\$	80.00
Personnel	Maintenance: 8 man days @ \$12/day	Ş	96.00
Equipment	Costs: Equipment rental of EM-16 (Ronka Unit) 4 days @ \$10/day	\$	40.00
Transport	ation Costs:		
	1 hour Hughes-500 helicopter @ \$200/hour 20 gallons fuel	\$	200.00
	@ \$1.50/gallon at base camp	Ş	30.00
Miscellan	eous Costs:	\$	50.00
	TOTAL	\$	885.00

APPENDIX III

Detailed Costs of Geological Survey

Labo	ur Costs			
	Office:	A. Burgoyne, September 19, 1974 1 day @ \$80/day	\$	80.00
		C. Dyson, September 6 and 9, 1974		
		2 days @ \$65/day	\$	130.00
	Drafting:	R. Tolbert, September 3-6, 1974		
		4 days @ \$40/day	Ş	160.00
	Field:	C. Bowdidge, August 20-25, 1973		
		6 days @ \$45/day	Ş	270.00
		K. Tolbert, August $14-30$, $19/4$	ò	600 00
		17 days = 3407 day 7 House August 22-30 1974	ş	000.00
		9 days @ \$30/day	Ś	270.00
		G. Hawkins, August 22-30, 1974	Ŧ	270100
		9 days @ \$30/day	\$	270.00
	Personnel 1	Maintenance:		
		41 man days @ \$12/day	\$	492.00
	Transporta	tion Costs:		
		3 hours Hughes-500 helicopter		
		@ \$200/hour (contract)	Ş	600.00
		1 hour Allouette-2 helicopter		
		@ \$215/hour	Ş	215.00
		92 gallons JP-4 fuel	*	100 00
		@ \$1.50/galion at base camp	Ş	138.00
	Secretaria	1, Reproduction and Miscellaneous Costs:	\$	75.00
	Base map p	roduction @ 1"=800' with 50 foot contouring (Lockwood Surveys)		
		(Area of Gord 1-40 Claims)	Ş	400.00
		TOTAL	Ş 3	780.00

Total Survey Costs, Appendix I to III

\$8146.00

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