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REPORT ON
GEOCHEMICAL SURVEY
A, C, CLE AND PIN CLAIMS
PINNACLE MINES LTD.
By: Velocity Survey Ltd.
October, 1968

REPORT
on
GEOCHEMICAL SURVEY
A, C, CLE AND PIN CLAIMS
PINNACLE MINES LIMITED (NPL)

VELOCITY SURVEYS LIMITED

October 29TH, 1968

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Maps (2)

In Pocket

PROPERTY

The property consists of some fifty-six contiguous located mineral claims as follows:

A1 - 4 inclusive	47777 - 47780
5A - 8A "	56758 - 56761
A9 - A12 "	47785 - 47788
A13 - A16 "	48071 - 48074
C1 - 3 "	47789 - 47791
C4 - C18 "	47955 - 47960
C1e 1-10 "	47792 - 47801
Pin 1 Fraction	71608
Pin 2 Fraction	71609
Pin 3	71610
Pin 4	71611
Pin 5 Fraction	71612
Pin 6 Fraction	71613
Pin 7 Fraction	71619
Pin 8-12 inclusive	71614 - 71618

The above claims are recorded in the Mine Recorder's Office in the City of Kamloops, Kamloops Mining Division, Province of British Columbia. Internal fractions are currently being staked.

LOCATION AND ACCESS

The property is situated some five miles south of the Village of Knutsford, B.C., whose co-ordinates are 50° 120° N.E. No. 5 Highway passes through the eastern part of the property. The City of Kamloops lies some eight miles to the NNE and is serviced by CPA, CPR, CNR and the Trans

Canada Highway. Access is provided to all parts of the property by means of secondary roads facilitating normal vehicular traffic from No. 5 Highway.

TOPOGRAPHY AND VEGETATION

The surface presented by the property is that of rolling ranchland of low to moderate relief, well glaciated with rounded hills. Overburden, primarily of glacial origin, is fairly heavy. Approximately forty percent of the area of the property is forest covered, i.e., pine and spruce with minor poplar and alder second growth scrub. The open areas support various grasses and sagebrush to qualify as grazing land and minor areas are actively under cultivation. Minor ponds and sloughs occur on the property and offer supplies of water for drilling purposes.

GEOLOGY

The area under consideration is underlain in major part by the southeast extremity of the Iron Mask Batholith. The Iron Mask Batholith is a member of the Coast Intrusives, and is represented by diorites, gabbros, syenites and monzonites. A section through the batholith would show a central core of monzonite flanked by more mafic diorite and gabbro. The syenite would appear to represent an alteration product of the diorite. Making entry along zones of weakness through the monzonitic core of the batholith occur dykes of ultra-basic material locally termed picrite basalt. The latter probably represents a basic differentiate during the latter

part of the intrusive history of the batholith. To the south, east and west of the batholith occur volcanic rocks, members of the Nicola Series and Kamloops Series. Contact is made with these younger rocks within the property boundaries. In general these younger rocks dip away gently from the central core of the Iron Mask Batholith.

MINERALIZATION

The occurrence of mineralization along the margins and within the Iron Mask Batholith is structurally controlled. Along the east margin of the batholith, as shown by the current exploration on the Kimberley Copper Mines Ltd. property some three and a half miles to the north, mineralization may be directly related to three structural lineations, i.e., a series of N.S. joints and faults parallel to the margins of the batholith, a series of WNW faults and joints occurring radically within the batholith and with a series of flat lying shear zones commonly oriented parallel to the contact between the batholithic rock and the Nicola Volcanics. Mineralization observed at several locations within the batholith shows a variable preference for the three named lineations and is usually of greater dimension in one direction.

To the north and west of the property under discussion copper mineralization occurs as chalcopyrite, rarely bornite, lining fracture faces and joint fillings and on occasion narrow lenses of massive sulphides may be found following structural lineations. Pyrite is ubiquitous. The near

surface expression of the copper sulphides is that of a strong development of azurite and malachite.

Within the limits of the property copper mineralization has been observed as calcocite, native copper with minor chalcopyrite. It would appear that the mineralization is related to a series of joints running N/S and flat lying shear zones. Where fracturing is intense, the resulting high surface area presented by the host rock would be conducive to precipitation of copper bearing minerals out of migratory solutions making entry along movement planes. As with other areas the near surface mineralization is usually restricted to the carbonates, malachite and azurite.

HISTORY

The area of the property has been subjected to sporadic exploration since the latter part of the nineteenth century. Earlier efforts were directed towards the search for gold in quartz veins. Later efforts prior to 1930 were directed to the location of high grade copper bearing structures evidenced by the numerous exploration pits and trenches in the area. Such a situation was developed on the Kamloops Copper Consolidated Ltd. property where some few thousand tons of high grade copper ore was mined and milled. Since 1950 several nearby properties have developed tonnages of ore grade material, i.e., Cominco Ltd., Ajax Property - 10,000,000 tons of 0.50% Cu., Galaxy Copper Ltd., 5,000,000 tons of 0.5% Cu., Makno Development Co. Ltd., 250,000 tons of 2.0% Cu. Further, active exploration programmes are in progress on several prop-

erties situate within the area of the Iron Mask Batholith.

The area of the property under discussion has been subjected to sporadic exploration since 1950 with primary attention given to the area between the Joker Adit and Separation Lake. In 1955 Commercial Minerals Ltd. drilled some 5,500 feet of diamond drilling and some bulldozer stripping in the vicinity of the Joker Adit. Several sections of significant mineralization were sectioned, however work was terminated for unknown reasons. Later, parts of the mineralized area were subjected to geophysical surveys but results are not available. In the autumn of 1966 Pinnacle Mines Ltd. acquired the property and conducted magnetometric and induced polarization surveys over the central portion of the property including the Joker Adit. Also some 1,200 feet of diamond drilling was carried out.

During the months of July and August, the entire area of the property was subjected to a geochemical survey. The results of past and current work will be discussed in the following pages.

GEOCHEMICAL SURVEY

Purpose

A programme of geochemical soil sampling was carried out over the area of the property in an attempt to delineate areas where mineralization is known to occur as a result of diamond drilling and to better define geophysical anomalies indicated during the earlier exploration work, especially induced polarization anomalies.

Method

A geochemical survey as related to mineral exploration entails the analysis of soil cover for trace amounts of specific metals on the premise that relative concentrations of the specific metals in the overburden have been derived from deposits of these metals below bedrock surface. In practice, soil samples are derived from a particular horizon at grid intersections over the area being investigated, the samples analysed and the analyses plotted in their correct geographical location on a map. These values are contoured, statistically analysed and thence correlated to the geographical environment.

In particular, a line grid was established over the property with lines at four hundred foot intervals, and two hundred foot stations established on the ground. At each of these stations, a soil sample was obtained by means of a stainless steel auger. Every attempt was made to consistently sample the "B" horizon, i.e., the soil layer immediately below the humus layer. The samples were placed in heavy manila envelopes, labeled and catalogued before submission to Crest Laboratories Ltd. of Edmonton for analysis. Under the direction of Mr. Sawyer, Chemist, the samples were air dried, screened to -80 mesh and subjected to cold acid extraction. These extracted samples were then analysed for copper content and the values expressed in parts per million, i.e., p.p.m. These values were plotted on the attached map on a scale of 1"=500'. Only copper values were considered.

DISCUSSION OF GEOCHEMICAL RESULTS

The geochemical soil sampling programme carried out must be considered successful in that the results may be correlated directly with geophysical information available and has indicated areas of interest not previously known.

Two environmental factors encountered on the property are considered to be critical in the interpretation of the results:

(a) the overburden is heavy and in some areas may exceed 100 feet though the average would be less.

(b) tests conducted indicate that the ph of the soil is in general high, i.e., 8+.

The heavy overburden would tend to mask the presence of mineralization below bedrock surface. Further, the basic character of the overburden would sharply curtail the upward migration of metallic ions. Hence, any concentration of metallic ions detected at ground surface would have added significance.

The average background values encountered on the property is of the order of 60 p.p.m. The results were contoured at intervals of 100 p.p.m. and it will be noted that the higher values are concentrated within the northwest quadrant of the property. It is within this area that previous work has indicated copper mineralization. Further, the magnetometric survey and preliminary geological observations indicate that this quadrant is underlain by the monzonite member of the Iron Mask Batholith, the host rock of copper mineralization.

ZONE 1 - the area of the zone overlies the southeast extremity of the monzonite core of the Iron Mask Batholith. Cupriferous mineralization of ore grade is known to underlie the zone as indicated by diamond drilling. Values of up to nine times background occur as peaks set in higher than normal background.

ZONE 2 - an elongate zone of values up to five times background parallel to and immediately east of the west margin of the Iron Mask Batholith and Cherry Creek Breccia rocks. It would appear the configuration of the area reflects the two structural lineations present, i.e., joints striking NE/SW and NNW/SSE.

ZONE 3 - a poorly defined area with peak values of up to 500 p.p.m. Due to the fact that portions of the area were under cultivation, the contours could not be effectively closed and additional sampling will be required as soon as access is permitted. ?? *That won't help.*

ZONE 4 - this zone overlies the SW margin of the Iron Mask Batholith and is coincident with a high linear magnetic trend. The anomaly is open to the NW and will entail additional sampling at least to the property boundaries.

ZONE 5 - values here approach seven times background. The configuration of the outlined area suggests a point source such as mineralization along the intersecting of two planar joint surfaces.

ZONE 6 - an elongate area within and along the westerly margin of the Iron Mask Batholith. Several peaks occur along its length and its linear character suggests a linear source such as a mineralized shear zone or fault.

ZONE 7 - an apparently linear zone open to the west, in part. Copper mineralization has been observed at surface. The anomaly overlies the west margin of the Iron Mask Batholith.

ZONE 8 - this zone consists of several closely spaced peaks lying within the Iron Mask Batholith. The northerly portion is associated with known copper mineralization as indicated by diamond drilling.

ZONE 9 - an area similar to Zones 4 and 8, and probably represents a similar linear causative effect.

ZONE 10 - a weaker but positive zone with values of three times background. The source of the anomaly is probably percolation from intersecting joints.

ZONE 11 - this zone overlies the contact of the Cache Creek sediments and overlies in part the ultra-basic picrite basalt. Overburden is generally heavy so as to offer no positive correlation with geological observations.

ZONE 12 - overlies a large dyke of picrite basalt. This picrite basalt has been observed to host cupriferous mineralization in other areas, however no evidence of mineralization was observed locally.

ZONE 13 - similar to Zone 12.

ZONE 14 - overlies the contact between the Nicola Volcanics and the Iron Mask Batholith. This linear area is coincident with a strong magnetic trend however extensive overburden and limited outcrop preclude further correlation at this time.

The above-mentioned zones or locations of interest are to be subjected to further investigation in order to determine the causative factors of the high copper values found in the overburden and if possible to locate the sub-bedrock surface source of copper mineralization.

GENERAL DISCUSSION

Previous to acquisition of the property by Pinnacle Mines Ltd., exploration efforts appear to have been sporadic and without co-ordination. Drilling operations were carried out on the basis of surface observations and yielded several sections of ore grade material. Subsequent efforts in the form of a magnetic survey over the central area of the property and induced polarization surveys over small selected areas have yielded significant results. The current geochemical survey has offered corroboration in part of previous work and has indicated additional areas of interest. It is suggested that these investigations be expanded and correlated with the geological environment in a continuing effort to assess the economic potential of the property.

CONCLUSIONS

Significant cupriferous mineralization is known to occur in at least three locations on the property. Previous drilling operations have indicated an estimated 65,000 tons of 0.66% copper ore to exist in the vicinity of the Joker Adit. Current and recent geochemical and geophysical investigations have revealed additional areas worthy of further surface and sub-surface exploration. Further, the anomalous conditions indicated occur within an area underlain by rocks known to host significant bodies of copper mineralization elsewhere within the Iron Mask Batholith. The environmental conditions offered by the property coupled by the presence of copper mineralization at several locations within the property boundaries lend credence to the possibility of locating a mass of mineralized material of such dimensions and grade so as to make extraction of metallic content economically feasible. With the above ultimate end in view, it is in order therefore to pursue an aggressive programme of exploration so that the economic potential of the property may be evaluated.

RECOMMENDATIONS

In order to more fully assess the potential of the property it is recommended that exploration efforts on the property be accelerated and expanded. Such a programme would proceed along the following lines:

- A. The area of the property should be mapped in detail with geological observations to be plotted on a scale of at least 1"=200' in order to correlate the results of previous work to the geological environment.
- B. The areas indicated as anomalous by the geochemical and geophysical surveys should be surveyed in detail using the induced polarization method. Previous I.P. work was executed using broad line intervals so that the anomalies indicated lack definition. Future work should be directed towards delineating these zones with line spacing not to exceed 200 feet.
- C. Where complete closure of geochemical anomalies could not be affected due to lack of access, further sampling should be conducted when conditions permit.
- D. Where conditions of overburden permit, areas indicated as anomalous should be trenched to expose bedrock and thereby determine the causative factors of the anomalies and permit sampling of same.
- E. Areas of interest indicated by previous techniques should be investigated at depth by means of diamond drilling.

Estimated costs of carrying out the above recommendations are as follows:

PHASE I

1. Geological Mapping on scale 1"=200'	-	\$5,000.00
2. Induced Polarization Survey 20 miles @ \$425/mile	-	8,500.00
3. Detailed Geochemical Survey	-	2,000.00
4. Bulldozer Stripping (HD-25 with rippers) 500 hours @ \$35/hour	-	17,500.00

5. Diamond Drilling - 4000 feet B.Q. Wireline Core @ \$10/foot	- \$40,000.00
6. Engineering Supervision and Consulting	- 6,500.00
7. Assays and Misc. Supplies	- 5,000.00
8. Contingency	- <u>8,000.00</u>
Total	<u>\$92,500.00</u>

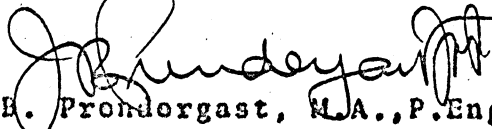
Contingent upon the results of the investigations outlined above, the programme may be expanded and continued.

PHASE II

1. Diamond Drilling - 6,000 feet B.Q. Wireline Core @ \$10/foot	- \$60,000.00
2. Bulldozer Stripping 500 hours @ \$35/hour	- 17,500.00
3. Detailed Geophysics - I.P.	- 10,000.00
4. Engineering Supervision and Consulting	6,000.00
5. Assays and Sampling	- 7,000.00
6. Contingency	- <u>10,000.00</u>
Total	<u>\$110,500.00</u>

Respectfully submitted,

VELOCITY SURVEYS LIMITED


J.B. Prondorgast, M.A., P.Eng.

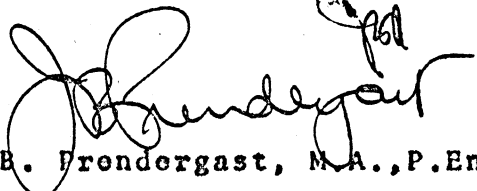
CERTIFICATION

TO WHOM IT MAY CONCERN:

I, Joseph B. Prendergast of the City of Calgary,
Province of Alberta, hereby certify:

1. THAT I am a geologist-geophysicist and reside at 1720 -
110 Avenue S.W., Calgary, Alberta.
2. THAT I am a graduate of the University of Toronto (1950)
with a Bachelor of Arts degree, Physics and Geology and
Master of Arts degree, Geophysics, and that I have been
practising my profession as a geologist-geophysicist for
seventeen years.
3. THAT the report is based on work carried out under my
direction by Clemens T. Pasioka, who made a personal
examination of the property and also on results obtained
from geochemical reports on the property, and from gov-
ernment publications relevant to the area.
4. THAT I do not have, nor do I expect to receive, either
directly or indirectly, any interest in the property
discussed or in the securities of Pinnacle Mines Limited
(NPL).

DATED this Twenty-Ninth day of October, 1968.


J.B. Prendergast, M.A., P.Eng.

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Huntec Limited - A.R. Dodds, B.Sc.

February 1966.

2. Report on Induced Polarization Survey
on Pinnacle Claim Group

McPhar Geophysics Limited
- Philip G. Hallof, Ph.D.
- Robert A. Bell, Ph.D.

January 18, 1967

3. Report on Exploration Programme
Pinnacle Mines Limited

- L.G. Phelan, M.A.Sc.

June 12, 1967

4. Summary Report on A, C and Cle Claims

- C.F. Millar, B.A.Sc.

5. Geology and Mineral Deposits of Nicola Map Area,
British Columbia. Geological Survey of Canada
Memoir 249 - W.E. Cockfield

1961

6. B.C. Minister of Mines Annual Reports
1908, 1909, 1911, 1913, 1924, 1929

- J.M. Carr - 1956
- J.M. Carr - 1966

LIST OF PERSONNEL

<u>Name</u>	<u>Position</u>	<u>Salary</u>	<u>Period Worked</u>
B. Stevenson	Technician	\$350/Month	July 5-Aug. 30/68
B. Reagan	Technician	350/month	July 5-Aug. 28/68
P. Krause	Technician	400/month	July 8-10, 12-16 Aug. 3-30 Sept. 6-16
M. Mitchell, B.Sc.	Geologist	600/month	July 6 Aug. 4-9, 15-17, 22-24, 28, 29
C.T. Pasioka, B.Sc.	Supervisor	850/month	July 5, 6, 14, 26 Aug. 6, 7, 15, 25 Sept. 6, 9, 16
J.B. Prendergast, M.A., P.Eng.	Consultant	150/day	July 5, 6 Sept. 29, 30 Oct. 27, 28, 29

ADDENDUM TO REPORT

PINNACLE MINES LIMITED (NPL)

J.B. Prendergast, M.A., P.Eng.

November 5, 1968


Preliminary results from the geological mapping programme now in progress on the property indicate additional areas underlain by the monzonitic rocks comprising the core of the Iron Mask Batholith. It is these acidic rocks that host cupriferous mineralization in the area. Further, disseminated chalcopyrite and malachite has been noted in areas previously unknown on the property. These findings dictate that the programme outlined in the attached reports be expanded so that the recent geological findings may be more fully investigated.

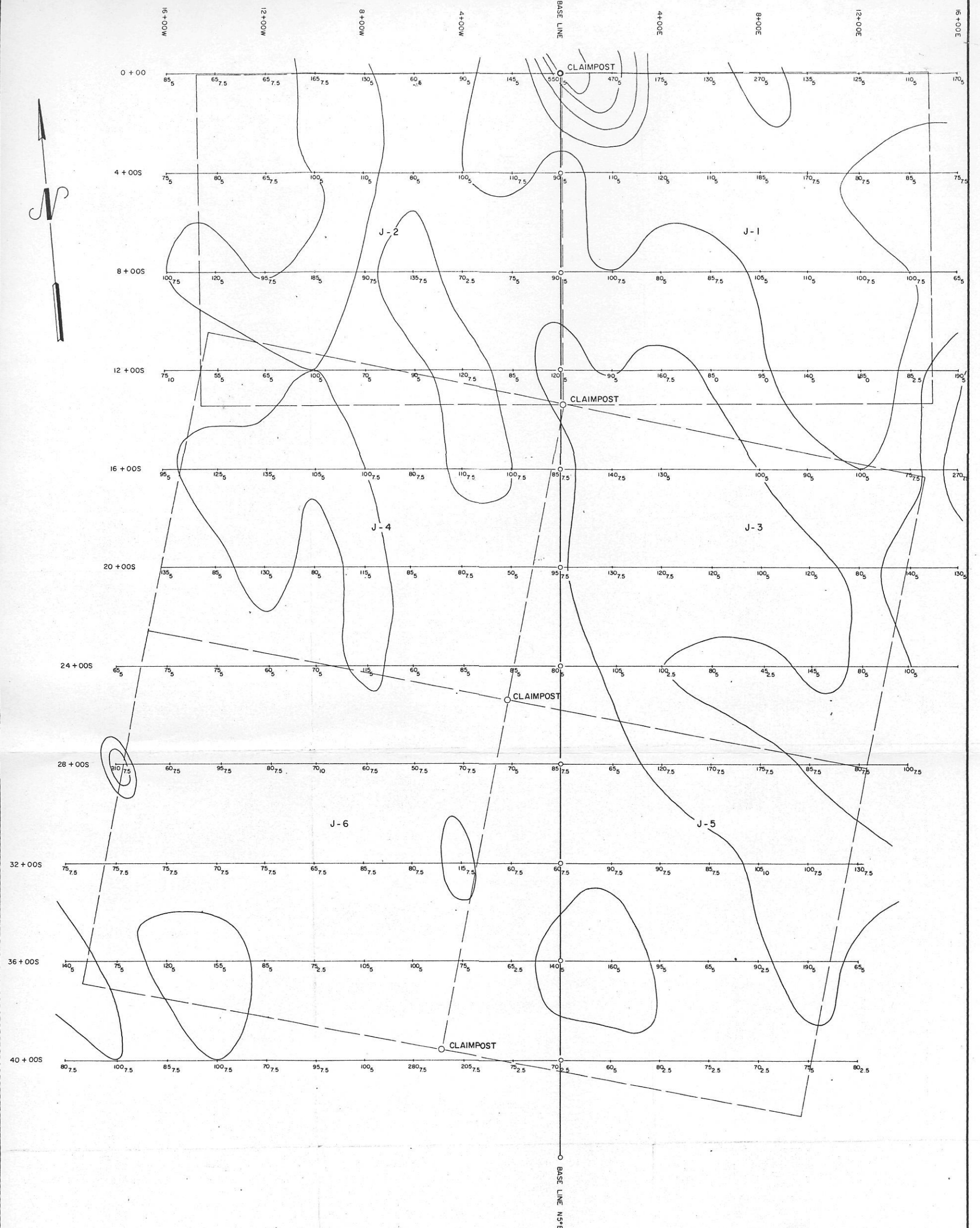
The extension of the programme should incorporate the following:

1.	10 Miles I.P. Survey @ \$425/mile	\$4,250.00
2.	15 Miles Magnetometric Survey @ \$100/mile	1,500.00
3.	50 Hours Bulldozer Stripping @ \$35/hour	1,750.00
4.	1500 Feet Diamond Drilling B.Q. Wireline @ \$10/foot	15,000.00
5.	Sampling and Assays	1,500.00
6.	Engineering Supervision and Consulting	3,500.00
7.	Transport and Accommodation	4,000.00
8.	Contingency	<u>3,500.00</u>
	Total	<u><u>\$35,000.00</u></u>

Respectfully submitted,

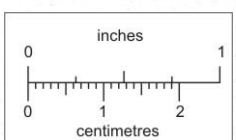

J.B. Pröndergast, M.A., P.Eng.





LEGEND:
 COPPER AND MOLYBDENUM VALUES SHOWN
 IN PARTS PER MILLION $CU_{MO} - 160_5$
 ONLY COPPER VALUES CONTOURED.

TO ACCOMPANY REPORT BY C. T. PASIEKA
 AND J. B. PRENDERGAST - JULY, 1968



F. SENFT. PROPERTY
 J GROUP OF MINERAL CLAIMS
 KAMLOOPS AREA, B. C.
GEOCHEMICAL SURVEY
 SCALE: 1" = 200'
 VELOCITY SURVEYS LIMITED
 VANCOUVER, B. C.