

August 31, 1970

BROWN-OVERTON MINES LTD. (N.P.L.)

(Supplementary report on geochemical and magnetometer survey.)

On January 20, 1970, a detailed report on the Vernon property belonging to Brown-Overton Mines Ltd. (N.P.L.) was written. Since this report, some additional work has been carried out and the following report primarily deals with the results of the work so far carried out on the property.

The location, access, topography and geology of the property has been described in the previous report. Since same is accompanying the present report, these aspects of the property will not be commented again.

#### GEOCHEMICAL SURVEY

Individual geochemical specimens were extracted along the previously cut grid lines by means of a stainless steel auger. These samples were obtained from a depth of one foot in order to sample the "B" horizon consistently. This would minimize the abnormal concentration effects of vegetative material. Samples were taken at 100 feet intervals on the grid lines and placed in manila bags, air dried and dispatched to Crest Laboratories in Vancouver for analysis. Total copper content of these samples were determined and the results were plotted and contoured on the enclosed map.

...2

At the time of writing this report, the geochemical survey was not completed and the report deals with the work so far carried out. Several distinctive but small geochemical anomalous areas were revealed by this survey. These zones have a definite northwest-southeast trend and they vary in strength from twice to four times the general background, with an average intensity of about three times background. The slopes of the ground on which the survey was carried out is very moderate.

It is recommended that the geochemical survey should be completed over the existing grid lines to acquire more detailed information on this property.

#### MAGNETOMETER SURVEY

A magnetometer survey was carried out over the grid lines and the results were plotted, contoured and submitted to Mr Richard O Crosby, geophysicist, of Seigel Associates Ltd. for interpretation. This report, dated June 19, 1970, reads as follows:

#### "INTRODUCTION

A magnetometer survey was conducted over a portion of the MAY Claim Group, Vernon Mining Division, British Columbia. Data were obtained along lines separated every 400' and oriented N25° E. Stations were occupied at 100' intervals. Measurements of the vertical component of the earth's magnetic field were taken with a Scintrex MF-1 vertical force, fluxgate magnetometer. Nine traverse lines and one baseline were surveyed for a total of about 11 line miles. The inclination of the earth's total field vector in the survey

...3

area is approximately 73 degrees. The value of the vertical component of the earth's field is about 55,600 gammas.

#### DISCUSSION OF RESULTS

The total magnetic relief of the survey area is about 2500 gammas and occurs primarily as a lineal trend of magnetic anomalies along the eastern half of the grid. West of the baseline the field is quite gentle except for a pronounced regional increase northward.

Analysis of the 2000 gamma anomaly centred at 19 + 00 N on Lines 52 + 00 W reveals that its source is a near vertical, dike like feature having a minimum susceptibility contrast of 0.03 and coming to within 50 feet of the surface of the ground.

A comparison of the results of the geochemical survey with the magnetic survey shows coincident magnetic and copper anomalies at 14 + 00 N on L 24 + 00 W, however this is the only place such correlation occurs and therefore no relation between the magnetic anomalies and the distribution of copper exists.

A programme of geological field mapping is recommended in order to determine the cause of the magnetic disturbances."

#### CONCLUSION AND RECOMMENDATIONS

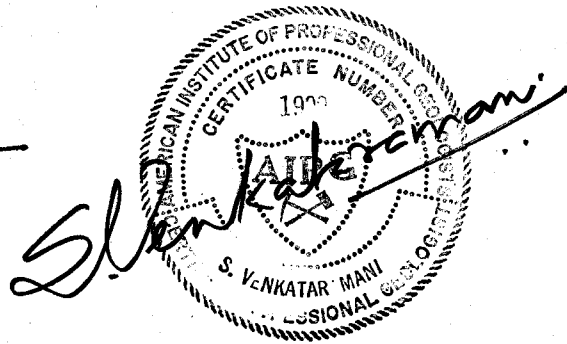
As mentioned in the previous report, dated January 20, 1970, it is recommended to carry out detailed geological mapping and electromagnetic survey over the property to

assess its economical potential. Depending on the results of the electromagnetic survey, a drilling programme may be contemplated.

Respectfully submitted,

*S. Venkataramani*

S Venkataramani, M.Sc.CPG.  
Consulting Geologist



2552

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2552 MAP

GEOLOGICAL REPORT  
MAY AND RED HAWK CLAIMS  
VERNON AREA

*No. 2552*

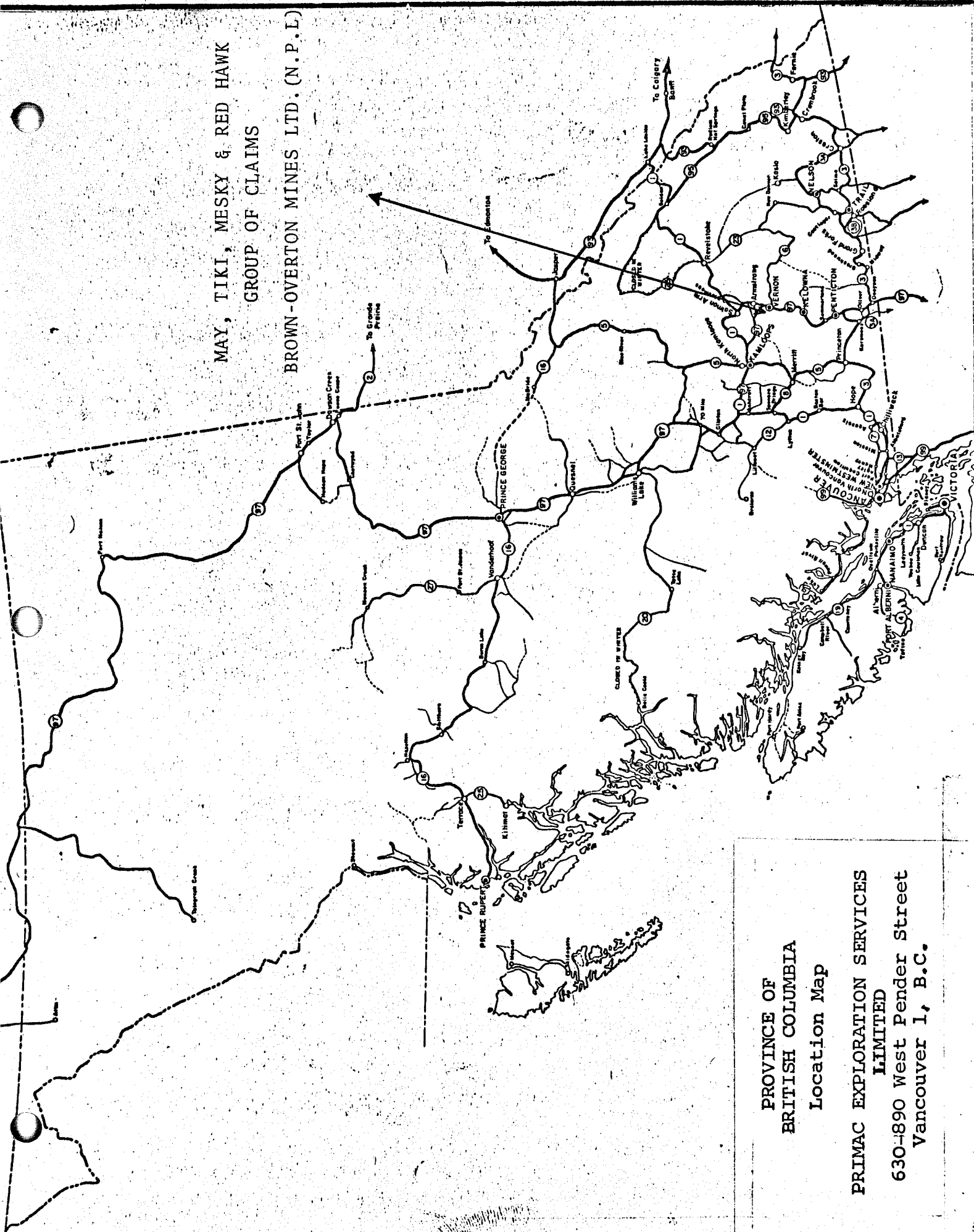
BROWN-OVERTON MINES LTD. (N.P.L.)  
824 / 6 W  
630 - 890 WEST PENDER ST.  
VAN. 1

MAPS:

Map No. 1	Location Map.....	Front
Map No. 2	Claim Map, 1"=1 mile.....	Rear
Map No. 3	Claim Map, 1"=2000'.....	Rear
Map No. 4	Grid Location.....	Rear
Map No. 5	Red Hawk Claims, 1"=2000'.....	Rear
Map No. 6	Magnetometer Survey Map.....	Rear Pocket
Map No. 7	Geochemical Survey Map.....	Rear Pocket
Map No. 8	Geology, Vernon Area.....	Rear
	1"=4 miles	

MAY, TIKI, MESKY & RED HAWK  
GROUP OF CLAIMS

BROWN-OVERTON MINES LTD. (N.P.L.)



PROVINCE OF  
BRITISH COLUMBIA  
Location Map  
PRIMAC EXPLORATION SERVICES  
LIMITED  
630-890 West Pender Street  
Vancouver 1, B.C.

# PRIMAC EXPLORATION SERVICES LIMITED

630 NESBITT THOMSON BLDG.,  
890 WEST PENDER STREET, VANCOUVER 1, B.C.



January 20, 1970

TO: BROWN-OVERTON MINES LTD. (N.P.L.)

## INTRODUCTION

On September 6, 1969, a property examination was carried out on the May and Red Hawk group of claims owned by Silver Post Mines Ltd. (N.P.L.), now known as Brown-Overton Mines Ltd. (N.P.L.). During this visit a few mineralized showings were examined on this property. The details of the geological examination are summarized below.

## PROPERTY

The property consists of two groups of mineral claims as follows:

- Group I : Red Hawk #1-10, Record #11569-11578, (incl.)
- Group II: May #7-29, Record #11380-11402 (incl.)
  - Tiky #1-10, Record #13639-13648 (incl.)
  - Mesky #1-10, Record #13649-13658. (incl.)

The above claims were recorded at the Mining Recorder's Office of the Vernon Mining Division in the Province of British Columbia. The distance between these two groups of claims would be approximately four air miles. Since they are not directly connected by road, the access from one group to the other would involve a travel of ten miles by road along the valley and the mountain slopes. The Red Hawk



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group is situated on the northwest slope of the mountain, while the May group of claims is located on the southeastern slope.

## LOCATION AND ACCESS

The property is situated approximately two miles from the northwest shore of the Okanagan Lake along the Newport Creek. The May claim group would be approximately fourteen miles by road from the town of Vernon, British Columbia. It is readily accessible by paved and dirt road, which leads right up to the main showing. As mentioned earlier in this report, the Red Hawk claims are situated approximately twenty-two miles by road from Vernon, British Columbia.

Vernon, British Columbia, is situated on the main Highway 97, between Kelowna and Armstrong, British Columbia, and approximately threehundred miles from Vancouver, British Columbia. A spurline of the Canadian Pacific Railway runs through Vernon and the nearest Airport, with limousine facilities, is in Kelowna, which is serviced by many daily flights by British Columbia Airlines and by Pacific Western Airlines from Vancouver and Calgary.

## TOPOGRAPHY AND VEGETATION

The property lies mainly in the interior plateau of British Columbia and the hills range up to 3000 feet above the valleys and attain elevations of 2500 feet to 4000 feet above sea level. The hills have gentle slopes, broad valleys and they resemble the low rolling topography. The vegetation complex



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PAGE THREE

consists mostly of evergreen trees with some heterogeneous assemblage of trees consisting of subcommercial cedar, pine and fir. Frequent, open areas are supported by buck brush. The supply of timber would be adequate for mining purposes. There is an ample source of electric power supply available in the vicinity of the town of Vernon, British Columbia. Water supply for the drilling and other mining purposes is adequate from the creeks on the property that run all year round.

## REGIONAL GEOLOGY

Most of the areas in the vicinity of Vernon, British Columbia are underlain by the rocks of Shuswap Terrane, Cache Creek group, tertiary lavas and late mesozoic granite intrusions. Among these rock types, Shuswap Terrane is very predominant in this area. This Shuswap Terrane mainly consists of highly metamorphic rocks of precambrian age. The area just around Vernon is mostly occupied by the rocks of Cache Creek formation, believed to be of Permian age. This Cache Creek group consists of argillites volcanic rocks, quartzite and minor limestones and conglomerates. Most of these rocks unconformably overlies by Kamloops group of tertiary age and by unconsolidated debris. These Cache Creek rocks exhibit many structural disturbances and one major stage of deformation has produced many faults. These faults strike northwest along the main belt of Cache Creek rocks. Minor folds and joint systems are prevalent over most of these rock types.

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PAGE FOUR

## GEOLOGY OF THE PROPERTY

The area of the property is underlain by highly metamorphosed rocks of paleozoic era and it is believed to be of Cache Creek formation. On this property, the Cache Creek formation mainly consists of argillites, quartzites and some minor andesite lava, tuff and limestone.

The argillites range in color from brownish-grey to dark grey and mostly they are slaty. In general they are highly brittle, but blocky fractures are not uncommon. In places, sedimentary banding is prominent in these argillites. The principal mineral content of this rock type is quartz, sericite, biotite and feldspar. Sericite gives the argillites the lustrous appearance and their percentage is quite high. Angular fragments of quartz, chlorite, epidote and minor magnetite are present within the tuffaceous phases.

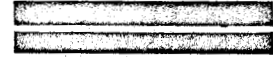
The fine grained quartzites, with subconchoidal fracture, are brown in color and they are primarily argillaceous, with some intercalations of calcareous sections.

There are some sporadic outcrops of volcanic tuffs on this property. They are fine grained rocks varying from intermediate to basic variety, mostly of andesitic nature.

There are two major fault systems striking northwest on either side of this property. These faults may be the causative factor to develop secondary fractures at an angle to them, and these fractures seem to host the latter intrusions mainly the quartz veins with mineralization.

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PAGE FIVE

## MINERALIZATION

The argillites have been intruded by several irregular quartz veins and one of them with mineralization has been exposed by trenching to an average depth of three feet. The quartz vein is five to six feet wide and it has a west-northwest, east-southeast strike with a gentle dip to northwest. The vein seems to be highly oxidized and considerable leaching is evident. This vein has been exposed over a length of approximately one hundred feet with patchy mineralization. The economic minerals present are galena, argentite, sphalerite, and minor chalcopryrite. The overburden so far removed to expose this vein is about three feet to five feet and it appears to increase along the northwest direction, where the overburden presumably could be twenty-five to thirty-five feet. Two other small outcrops of mineralized quartz veins are present in the vicinity of this main showing. No work has been done on these outcrops, but they seem to have a similar structure to that of the main showing. It is possible that there are several parallel quartz veins running northwest or they could be the result of minor fault systems of one vein with lateral displacement.

About one half mile northeast of this main showing in the uphill direction a shear zone with mineralized quartz veins has been noticed. There the mineralization is primarily malachite, azurite, with minor amount of galena and argentite. The above showing is about five feet wide and ten feet long and the vein disappears into the overburden.

former  
OCTAGON ?

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PAGE SIX

The rock exposure on this property would be approximately sixty percent and the rest is covered with recent debris and glacial gravels. The thickness of the overburden on this property varies considerably and the indications are, it would range from five feet to thirty-five feet.

On August 10, 1968, Mr James J Doherty, Professional Engineer, British Columbia, made a preliminary report on the May claims and in that report he had mentioned:

"Hand picked grab samples have assayed from 1.38 to 32.60 ounces Ag; from 0.17 to 33.20 percent Pb; from trace to 34.80 percent Zn; a trace of Au is also evident in most samples."

Few more grab samples were taken by the writer on the showings and their assays are as follows:

Ag	Pb	Zn	Cu	Cut Length
3.6 oz/ton	2.82%	0.28%	0.01%	4 feet
2.7 oz/ton	3.27%	0.33%	0.01%	4 feet

Float materials on the slope of the mountain consisting of malachite, azurite and argentite were noticed in few places on this property. These are angular quartz rich argillites and these "floats" were subjected to chemical analysis and the assays are as follows:

Ag	Pb	Zn	Cu
185.2 oz/ton	0.87%	0.18%	2.01%
370.0 oz/ton	1.09%	0.51%	3.67%

The exact origin of the float could not be determined, but it is reasonable to assume that they have suffered south-easterly migration, presumably from the peak of the mountain.

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PAGE SEVEN

## PREVIOUS WORK PERFORMED

On August 10, 1968, Mr James J Doherty, Professional Engineer, British Columbia, visited the May claims and submitted a preliminary report. He had recommended a total of \$126,000.00 through two stages of exploration programme. Subsequent to his report, stripping was carried out on the main showing on the May claims. A trench of about fifty feet long, five feet wide and three feet deep was made to expose the mineralized zone.

On the Red Hawk claims, about three miles of road was built. An old adit was examined on this claim group. It is understood that this adit was driven a long time ago and it is completely caved down. It appears that the adit was driven within a shear zone and only about six inches of mineralized quartz vein can be seen at the top of the adit entrance.

GRAND  
TIMES

## WORK PERFORMED

In late October 1969, a crew was sent into the property to lay out the grid lines. By the end of November 1969, about fourteen line miles consisting of one base line and twenty-two cross lines were cut.

Some ground magnetometer survey was conducted over these lines but the work could not be completed because of the weather conditions. This reconnaissance magnetometer survey has indicated several northwest trending potential anomalies with readings three to four times about the background, as can be seen from the enclosed map. In any case, all these lines should be subjected to magnetometer survey to obtain more information about these anomalies.

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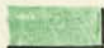


PAGE EIGHT

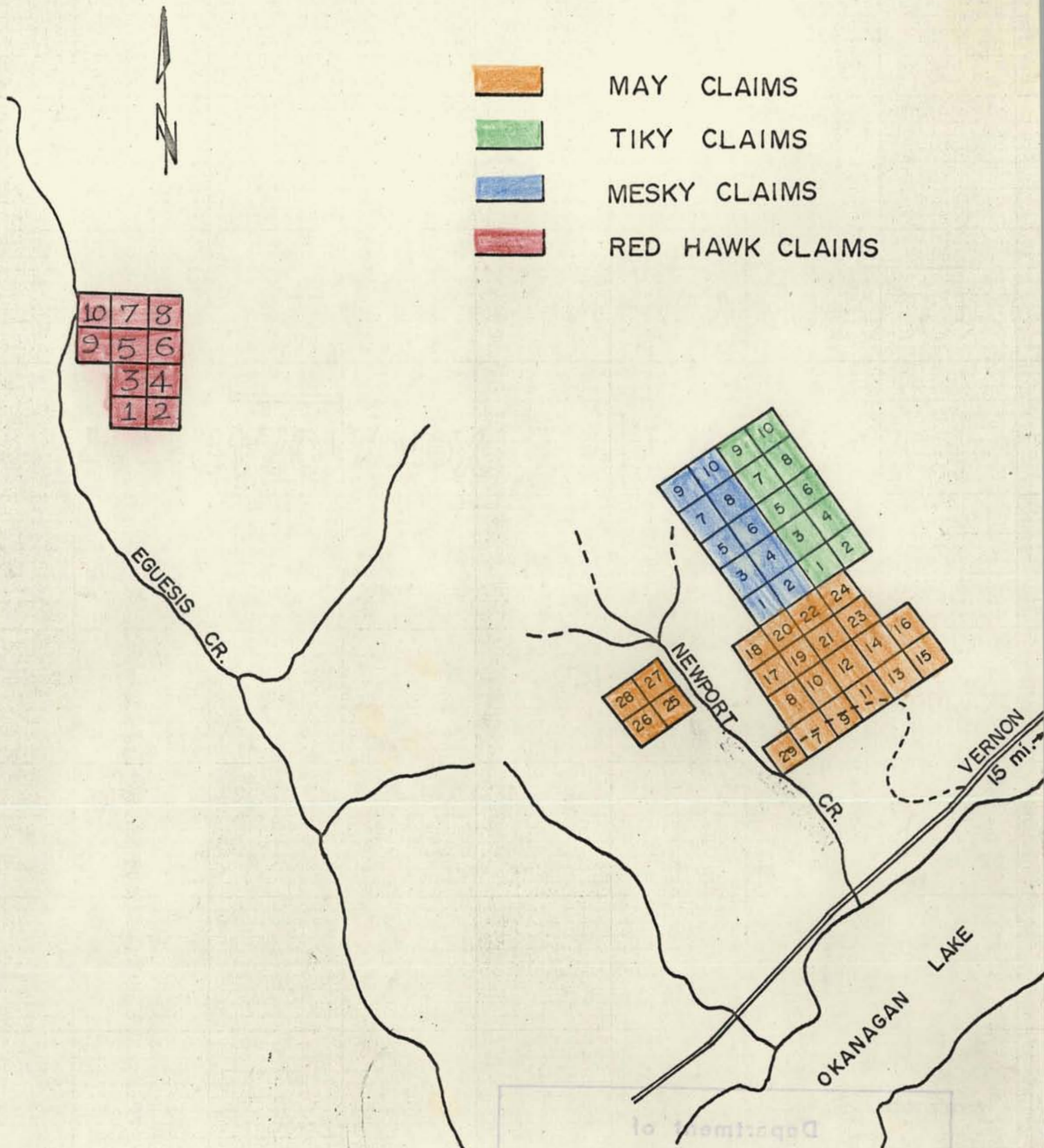
## CONCLUSION AND RECOMMENDATIONS

It has been attributed that the Cache Creek formation has been favourable for mineral deposits due to temperature and pressure conditions. The formation on this property appears to be favourable both lithologically and structurally. The mineralization is closely associated with the quartz veins on this property and these veins are structurally controlled. It is reasonable to obtain structural information on this property by geophysical methods and geological mapping. More bulldozer stripping and trenching have to be done to assess the lineal extension of these veins and all these exposed zones should be carefully sampled and assayed. Grid line should be laid out to have good control for the exploration purposes. An intensive exploration diamond drilling may be carried out to assess its economical potential.

The estimated cost for the immediate exploration programme would be as follows:

30 miles line cutting	\$ 4,500.00
30 line miles geochemical survey @ \$125.00 per mile (includes field personnel, assaying, supervision, geochemist's interpretation & report).	\$ 3,750.00
30 line miles magnetometer survey @ \$125.00 per mile	<u>\$ 3,750.00</u>
CARRIED FORWARD	\$12,000.00

-  MAY CLAIMS
-  TIKY CLAIMS
-  MESKY CLAIMS
-  RED HAWK CLAIMS



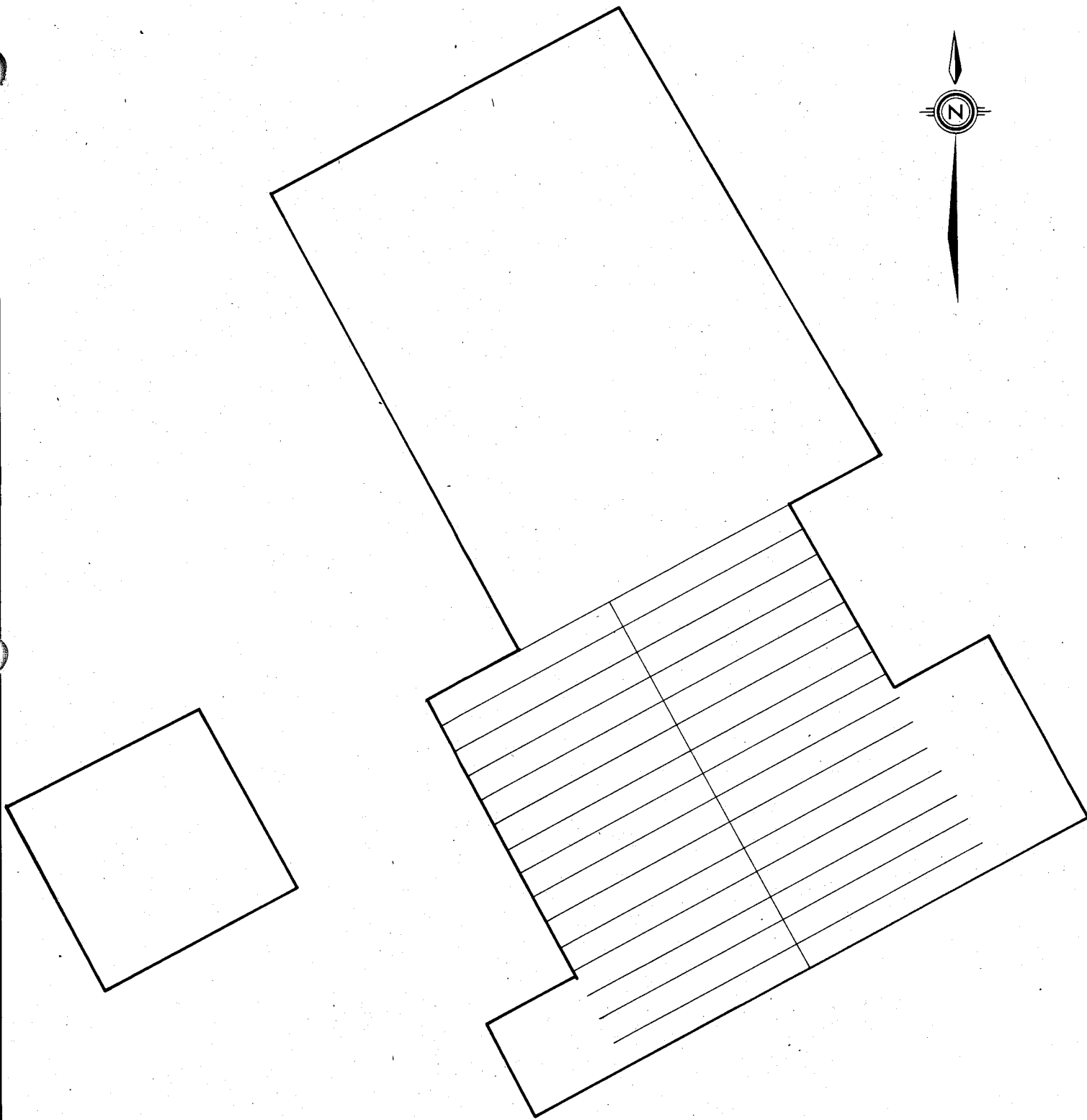
SCALE: 1" = 1 mi.

MAY, TIKY, MESKY, & RED HAWK

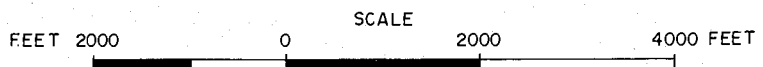
GROUP OF CLAIMS

BROWN OVERTON MINES LTD. (N.P.L.)

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BROWN OVERTON MINES LTD. (N.P.L.)  
MAY, TIKY, MESKY, CLAIMS  
**GRID LOCATION**



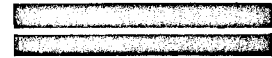
PRIMAC EXPLORATION SERVICES LTD.

AUGUST, 1970



# PRIMAC EXPLORATION SERVICES LIMITED

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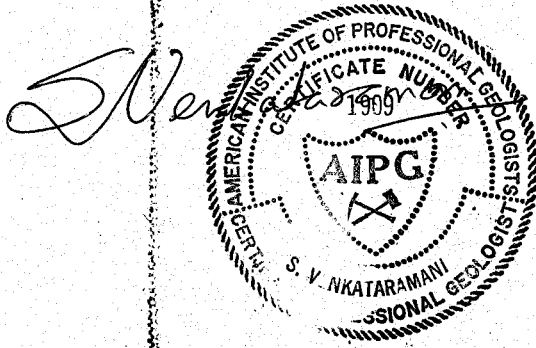
PAGE NINE

	CARRIED FORWARD	\$12,000.00
Bulldozer stripping 125 hours @ \$45.00 per hour		
Trenching, blasting and assaying		\$10,000.00
Geological mapping		\$ 5,000.00
30 line miles electromagnetic survey		\$ 5,000.00
Camp supplies and equipment		\$ 3,000.00
Engineering supervision		\$ 3,500.00
Transportation and Communication		\$ 2,500.00
Contingency		<u>\$ 3,500.00</u>
		\$44,500.00 =====

Respectfully submitted,

S Venkataramani, M.Sc.CPG.

Toru Kikuchi, Ph.D., P.Eng.  
Consulting Geological Engineer




SV/gk

STATEMENT OF QUALIFICATION

I, Toru Kikuchi of the City of Vancouver, B.C., hereby certify that:-

1. I am a graduate of the Hokkaido University, Japan (B.Sc., Geology and Mineralogy, 1946) and of the Tohoku University, Japan (Ph.D., Economic Geology, 1963).
2. I am a "GIJUTSUSHI" (a qualification for a consulting engineer authorized by the Japanese Government) and a member in good standing of The Association of Professional Engineers of the Province of British Columbia and of the Yukon Territory.
3. I am a member of The Society of Mining Geologists of Japan, and of The Canadian Institute of Mining and Metallurgy and of The Engineering Institute of Canada.
4. I have been practising my profession continuously for the past twenty-three years, and am an independent Consulting Geological Engineer with my office at Room 702 - 402 West Pender Street, Vancouver 3, B.C.
5. I have no direct or indirect interest in the property, nor do I anticipate receiving any such interest.
6. As a co-signer, I have read the previous report on this property by James J Doherty, P.Eng. (August 16, 1968): Report on Silver Post Mines Ltd.(N.P.L.), and have discussed with Mr S Venkataramani, the writer of this report, the geological engineering technical aspect of the property, in Vancouver, B.C., without having visited the property myself.

Vancouver, B.C.  
January 20, 1970

  
Toru Kikuchi, P.Eng.

# PRIMAC EXPLORATION SERVICES LIMITED

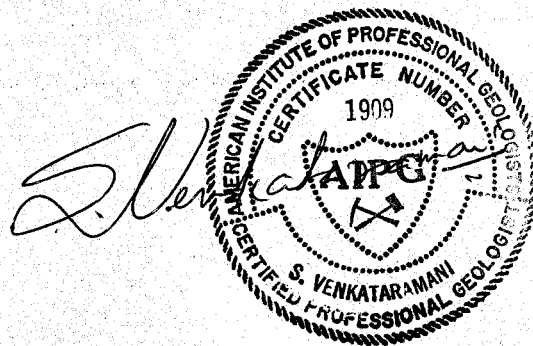
630 NESBITT THOMSON BLDG.,  
890 WEST PENDER STREET, VANCOUVER 1, B.C.

## C E R T I F I C A T E

I, S Venkataramani, of Vancouver, British Columbia, do hereby certify that:

1. I am a geologist with my office located at #630-890 West Pender Street, Vancouver 1, B.C.
2. I am a graduate geologist with a Master of Science Degree from the University of Madras, India.
3. I am a certified professional geologist belonging to The American Institute of Professional Geologists, Golden, Colorado, U.S.A.
4. I have been practising my profession for over eight years.
5. I have no direct or indirect interest, nor do I expect to receive any interest directly or indirectly in this property or securities of Brown-Overton Mines Ltd.(N.P.L.).
6. This report is based on my personal visit to the property and from the published geological literature.

Vancouver, B.C.  
January 20, 1970



MESKY 9	MESKY 10	TIKY 9	TIKY 10
MESKY 7	MESKY 8	TIKY 7	TIKY 8
MESKY 5	MESKY 6	TIKY 5	TIKY 6
MESKY 3	MESKY 4	TIKY 3	TIKY 4
MESKY 1	MESKY 2	TIKY 1	TIKY 2



MAY 28	MAY 27
MAY 26	MAY 25

MAY 18	MAY 20	MAY 22	MAY 24
MAY 17	MAY 19	MAY 21	MAY 23
MAY 8	MAY 10	MAY 12	MAY 14
MAY 29	MAY 7	MAY 9	MAY 11
			MAY 13
			MAY 15
			MAY 16

MAY, TIKY, MESKY, CLAIMS

SCALE: 1" = 2000'

BROWN OVERTON MINES LTD.(N.P.L.)

PRIMAC EXPLORATION SERVICES LTD.



10	7	8
9	5	6
	3	4
	1	2

Department of		
Mines and Petroleum Resources		
ASSESSMENT REPORT		
NO.	2552	MAP #5

RED HAWK CLAIMS

SCALE: 1" = 2000'

BROWN OVERTON MINES LTD.(N.P.L.)

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# LEGEND

## QUATERNARY - PLEISTOCENE & RECENT

21 Glacial, lacustrine and fluvialite gravel, sand, silt & clay

## TERTIARY - OLIGOCENE OR MIOCENE

20 KAMLOOPS GROUP  
Basaltic lava and flow breccia, minor rhyolitic lava and breccia local sandstone, shale, congl., coal

## CRETACEOUS OR TERTIARY

19 Pink to red syenite and quartz syenite, pink and white mottled granite

## JURASSIC AND/OR CRETACEOUS

18 COAST INTRUSIONS  
Granite, granodiorite & allied rocks

## CARBONIFEROUS (?) & PERMIAN

CACHE CREEK GROUP  
15 DIVISION C - mainly limestone, minor argillite, quartzite & andesitic lava, breccia and tuff

14 DIV. B - mainly andesitic lava and tuff, minor arg., quartzite & limestone

13 DIV. A - mainly argillite

## SHUSWAP TERRANE

MOUNT IDA GROUP  
4 Tsalkom Formation - green andesite and agglomerate, chlorite schist, slate

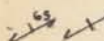
3 Silver Creek Formation - slate sericite schist, garnetiferous qtz.-mica schist

2 Chase Formation - quartzite calc. quartzite

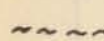
MONASHEE GROUP  
1 Granitoid gneiss, augen gneiss, mica-sillimanite-garnet schist, quartzite, marble, hornblende gneiss, slate phyllite


1a. Limestone  
1b. Quartzite

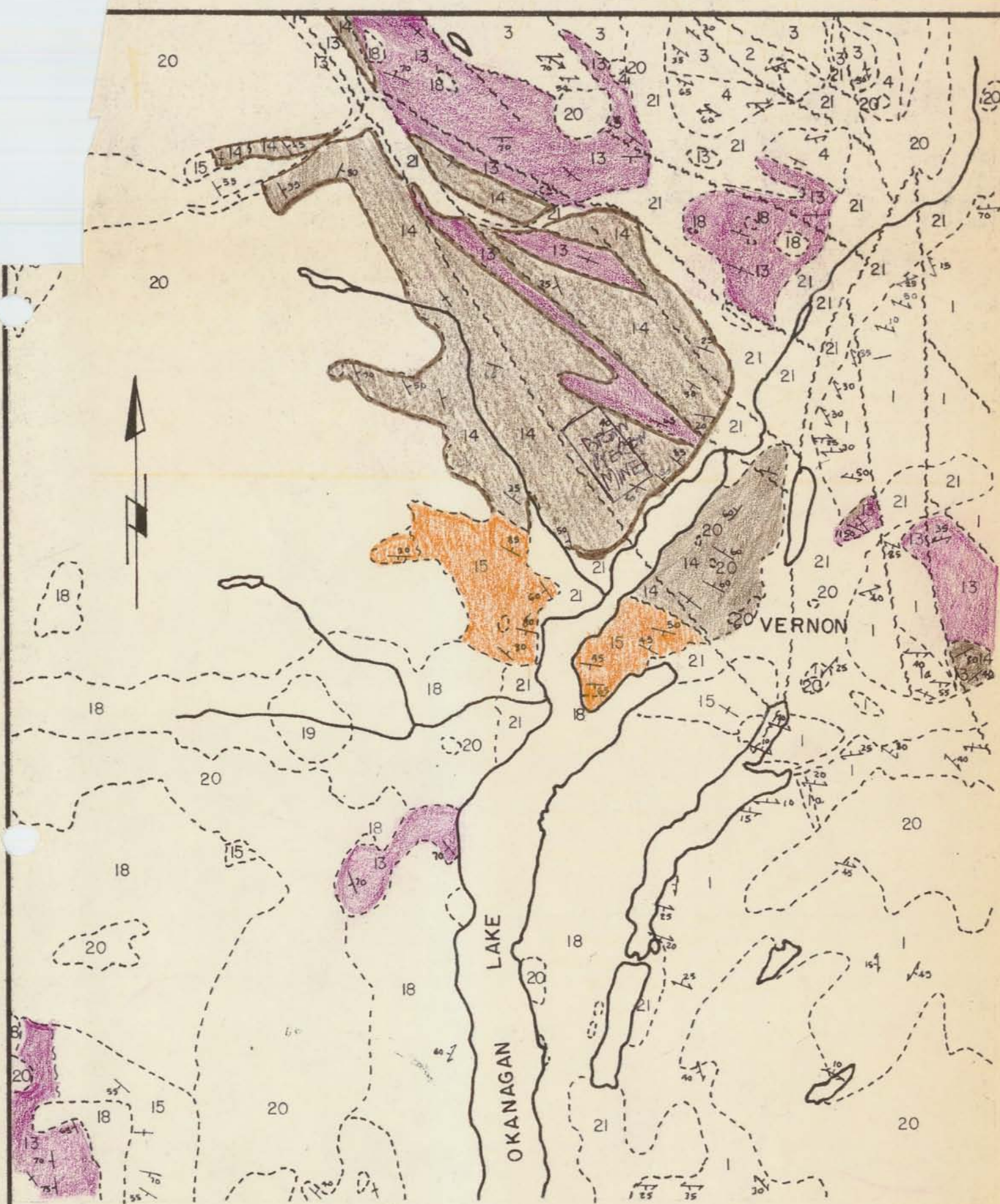
 Bedding

 Foliation

 Lineation

 Fault

 Geological contact

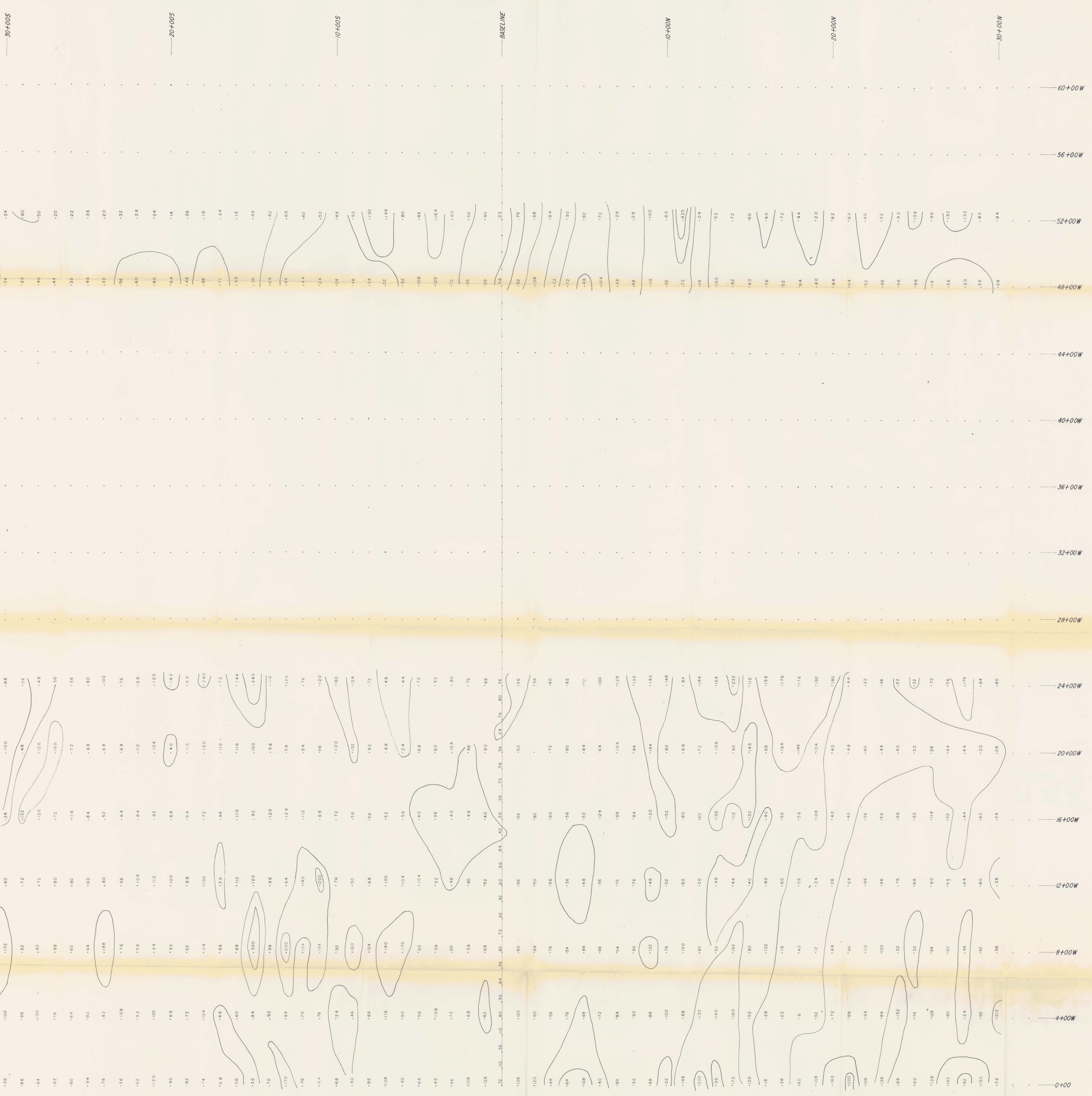


## GEOLOGY

VERNON AREA

PRIMAC EXPLORATION SERVICES LTD

Scale: 1" = 4 Miles



30+00S

20+00S

10+00S

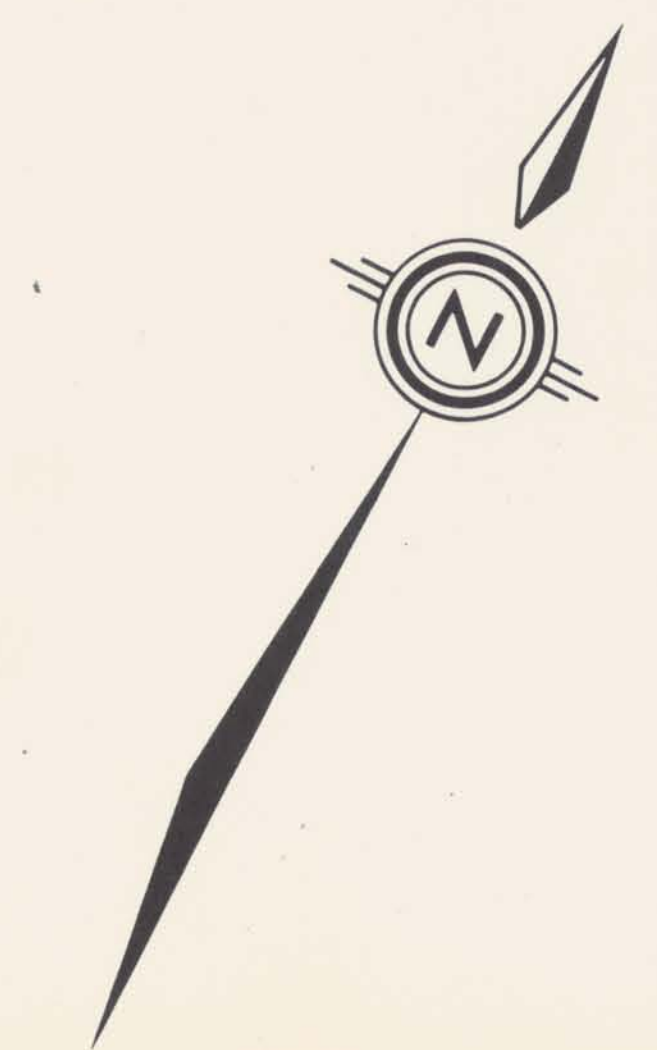
BASELINE

10+00N

20+00N

30+00N

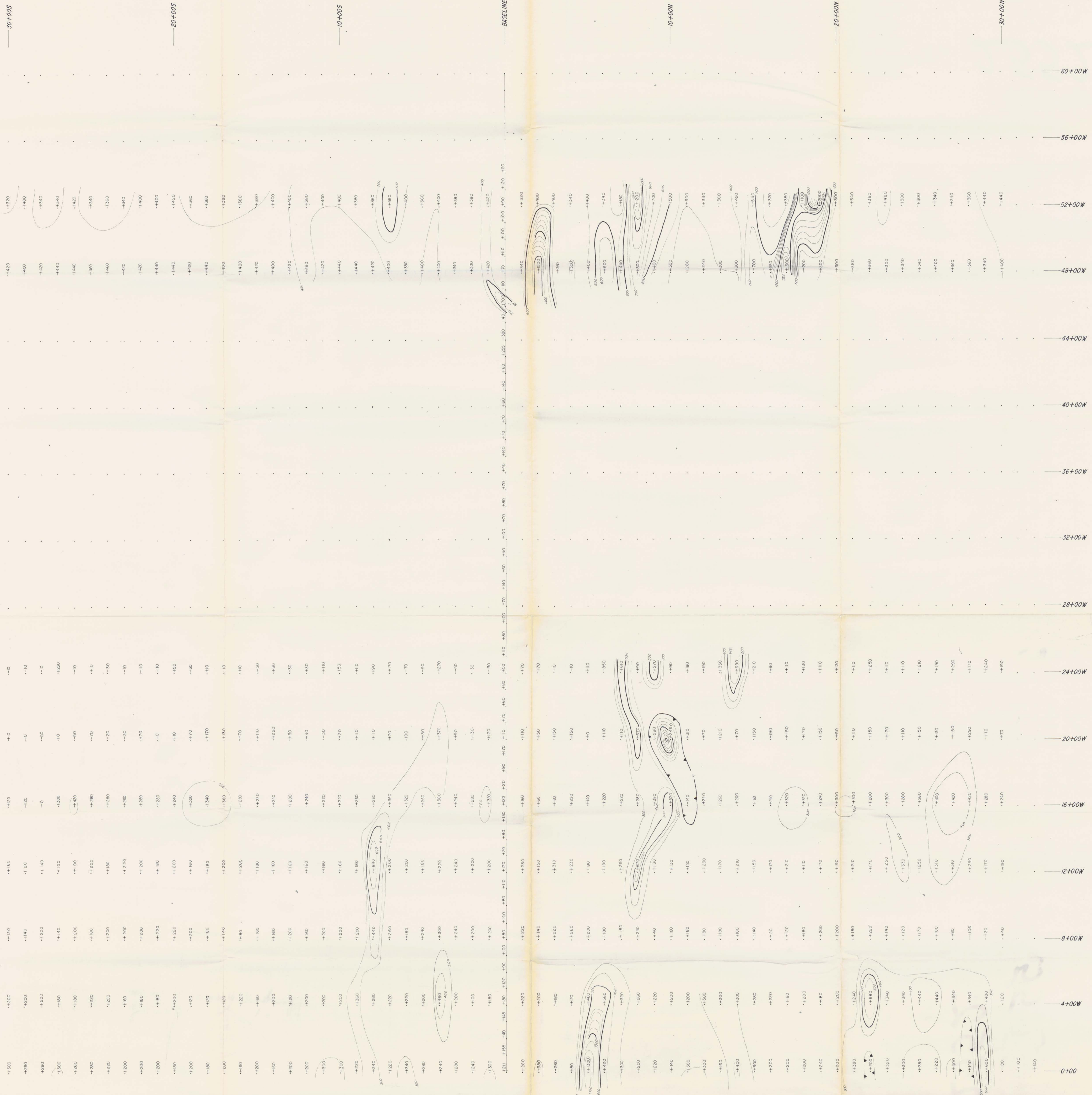
60+00W  
56+00W  
52+00W  
48+00W  
44+00W  
40+00W  
36+00W  
32+00W  
28+00W  
24+00W  
20+00W  
16+00W  
12+00W  
8+00W  
4+00W  
0+00



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2552 MAP #1

LEGEND  
Copper Value PPM  
50-130 PPM Cu  
130-200 PPM Cu  
200+ PPM Cu

2552  
TOTAL COPPER  
(PPM)  
BROWN OVERTON MINES LTD.  
GEOCHEMICAL SURVEY MAP  
MAY CLAIM GROUP  
VERNON M.D., B.C.  
SCALE  
0 200 400 600 800 Feet  
PRIMAC EXPLORATION SERVICES LTD.  
APRIL, 1970



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. **2552** MAP #6

LEGEND  
— Magnetometer reading  
NOTE: Contour interval 100 gammas

**2552**  
BROWN OVERTON MINES LTD.  
MAGNETOMETER SURVEY MAP  
MAY CLAIM GROUP  
VERNON M.D., B.C.  
SCALE  
0 200 400 600 800 Feet  
PRIMAC EXPLORATION SERVICES LTD.  
APRIL, 1970