

ASSESSMENT REPORT  
GEOLOGICAL AND GEOCHEMICAL SURVEY  
BEAR CLAIMS

Atlin Mining Division  
Tatsamenie Lake Area, B. C.  
N.T.S. 104K/Tulsequah Street

58°13'N  
132°17'W

OWNER: CHEVRON CANADA LIMITED  
OPERATOR: CHEVRON STANDARD LIMITED

Author : Ken Shannon

November, 1982

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**10,754**

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### LOCATION AND ACCESS

The BEAR Group of claims is situated at approximately 132°17'W and 58°13'N, just to the north of Bearskin Lake (Figure 1). The claims are 170 km southeast of Atlin, B. C. and 75 km northwest of Telegraph Creek, B. C. A helicopter provided access to the property from a base camp at Trapper Lake, 35 km to the northwest.

### CLAIMS

The BEAR claims were staked during August, 1981 as follows (Figure 2):

<u>Claim</u>	<u>Record No.</u>	<u>Record Date</u>	<u>No. of Units</u>
BEAR	1489	August 21, 1981	20
BEAR 1	1549	August 31, 1981	20
BEAR 2	1548	August 31, 1981	10
TOTEM	1488	August 21, 1981	20
POLE	1490	August 21, 1981	20

These claims cover previously unstaked ground.

### REGIONAL GEOLOGY

The BEAR claims are located in a large area of pre-Upper Triassic oceanic sediments and Triassic diorites south of Tatsamenie Lake. The pre-Upper Triassic rocks are comprised of three main rock types including pelagic sediments (mainly argillites and shales), carbonate bank limestone (mainly crinoid debris) and mafic volcanic and volcanoclastic rocks. The Triassic diorite has gradational intrusive contacts with the pre-Upper Triassic



# BEAR GROUP LOCATION MAP

M504

**BEAR  
GROUP**

0 30

**Km  
FIGURE 1**

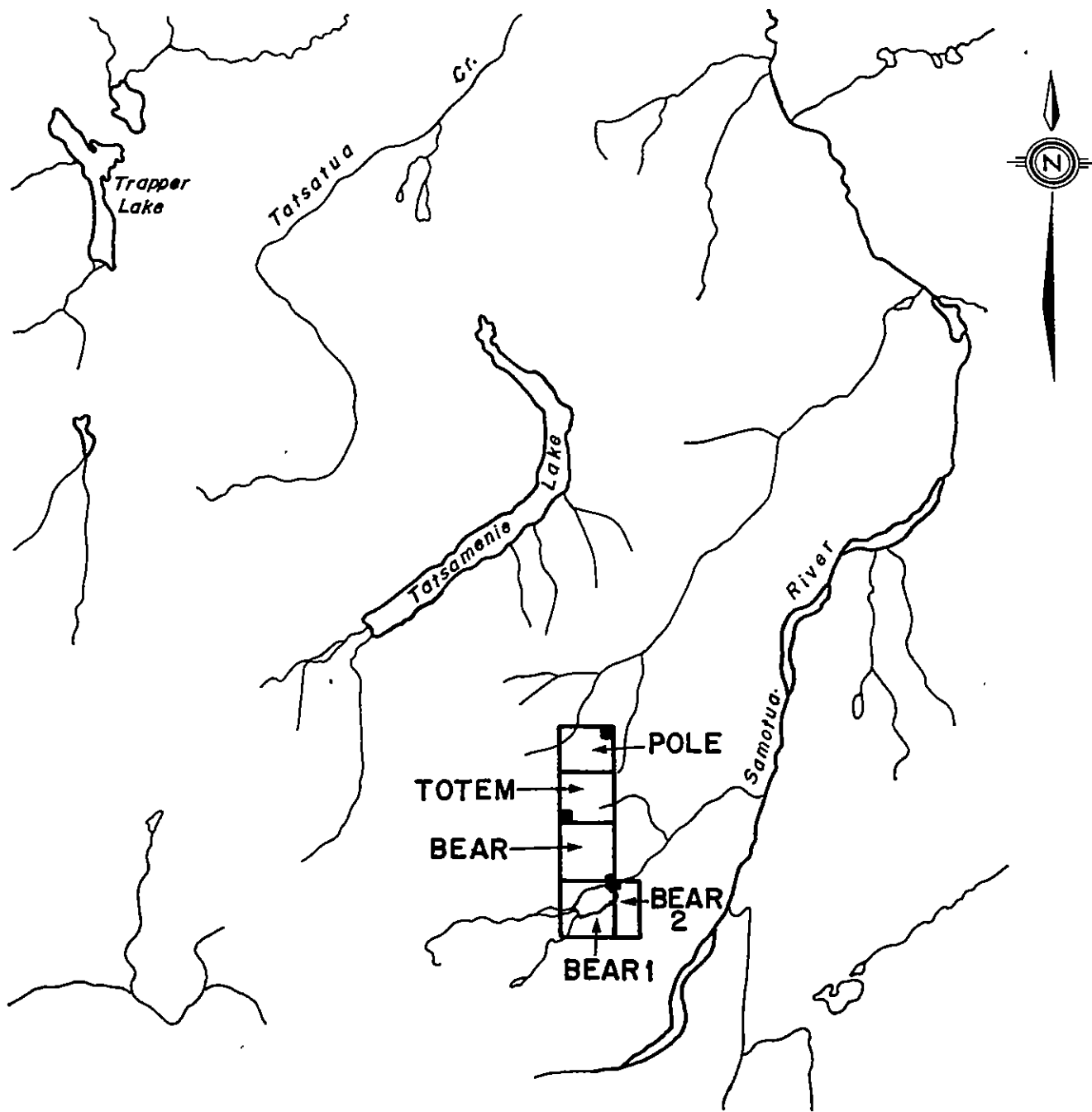


FIGURE 2

# BEAR GROUP CLAIM LOCATIONS



rocks over a distance of several tens of metres. Overprinting of green-schist grade regional metamorphism has made interpretation of primary rock textures and structures difficult.

Regional-scale faulting is common in the area as evidenced by aligned serpentinite pods, long linear geological contacts (i.e. limestone against diorite) and elongate dyke swarms. The two main strike orientations of the regional faulting are northwest-southeast and north-south.

#### GEOLOGICAL SURVEY OF THE CLAIMS

Reconnaissance geological mapping was carried out mainly on the BEAR claim with minor work on the TOTEM and POLE claims (Figure 2). The western third of the BEAR claim is predominantly limestone while the eastern two-thirds is predominantly greenstone and chlorite phyllite (Figure 5). Crossing through the middle of the claims is a north trending fault zone with serpentinite pods, extensive fracturing, abundant slickensides and large alteration zones.

The following is a more detailed geological description of individual units and a summary of structures and alteration on the claims.

#### Limestone Unit (Unit 1)

Usually this unit is a fairly pure limestone in varying shades of grey with some samples ranging to white or black. Colour variation in the limestone is probably due to the presence of organics, samples rich in carbonaceous material are black while those with none are white.

Outcrops of the limestone are typically massive with poorly defined bedding; compositional layering can often better be observed at a distance from the outcrop. Fossils are not abundant in the limestone consisting mainly of crinoids and minor algal laminations. A few samples of limestone with bivalve fossils were observed near station KS-46.

A homogeneous sugary texture is common in most limestone outcrops, grain size is usually fine to moderate. Because of its purity the limestone has almost no secondary minerals and contact metamorphic effects near dykes are limited to recrystallization of the limestone. Primary breccias are found as conformable layers within the limestone section. These monomictic breccias consist of angular to subangular clasts of limestone in a fine-grained carbonate matrix. Large areas of limestone up to 100 m in length have a prominent rusty weathering (Unit 1A). These rusty zones grade into unaltered limestone over a few metres. The cause of the rusty weathering was not determined but may be due to the presence of Fe-carbonate alteration in the limestone.

#### Greenstone Unit (Unit 2)

The greenstone unit includes greenstone, chlorite phyllite, gabbro, augite porphyry, lapilli-breccia tuff, aphanitic tuff and minor limestone and serpentinite. A few outcrops of more felsic quartz-feldspar porphyry were observed in the west-central part of the claims. Extensive greenschist metamorphism has left these rocks a characteristic dark green colour. This metamorphism in conjunction with extensive fracturing of most outcrops of the greenstone unit has made interpretation of rock textures difficult.



The fractures in the greenstone unit are commonly coated with chlorite, hematite and epidote.

Collectively these rocks are typical of an oceanic sequence of mafic volcanic rocks and associated sediments. Areas with limestone pods probably represent shallow water deposition.

#### DYKES

There are several small dykes on the claim which are too small to show on the geological map. These include a light green hornblende porphyry dyke near station KS-47 which is less than 1 m wide. Small black aphanitic basalt dykes (<2 m in width) are found along north striking faults in the central part of the claims. These dykes are usually vesicular and rarely show amygdaloidal infillings of fibrous white minerals (zeolites?). All dykes post-date observed alteration on the claims.

#### ALTERATION

Two major alteration types are found on the BEAR claims. One is a dolomite-quartz assemblage which occurs primarily in the limestone unit, especially where the limestone intersects north striking faults. Alteration is most intense along the fault zone itself and usually consists of massive fine-grained quartz, quartz breccia and minor dolomite. Colour of the altered rocks is usually similar to that of the original limestone, mostly shades of grey. In the interval from 5 - 50 m adjacent to the fault zone the silica becomes depleted and the alteration progresses from massive quartz to vein quartz to stringer quartz in a dolomite matrix. The stringer

quartz-dolomite zone then grades into dolomite-limestone and finally pure unaltered limestone over widths of 5 m and greater.

Original bedding of the limestones can be seen in weakly altered rocks of the dolomite-quartz type. Brecciation is occasionally associated with the quartz-dolomite alteration and is usually composed of variably sized angular clasts in a fine-grained vuggy quartz matrix.

The second alteration type is also associated with north striking faults but is restricted mainly to rocks of the greenstone unit. Quartz, Fe-carbonate and pyrite are characteristic minerals of this alteration type. Bright green chromian(?) mica is commonly found associated with these quartz-carbonate rocks. Permeability of the greenstone unit is variable so the size of these alteration zones is irregular, ranging from 1 to 20 metres in width. Late stage veins of dolomite and calcite commonly cross-cut the Fe-carbonate, quartz alteration zones.

Almost no mineralization other than disseminated pyrite was observed on the claims. A few traces of malachite were noted and a small tetrahedrite vein was found on the TOTEM claim.

#### STRUCTURE

Faults - north striking faults on the claims are defined by linear Fe-carbonate, quartz and quartz-dolomite altered zones, aligned serpentinite pods, areas of intense fracturing with abundant slickensides and air photo lineaments. These faults appear to control development of alteration within the BEAR claims.

Development of the north striking faults is over the entire width of the claims. Rocks between faults are relatively unaltered. Along the fault zones orientation of slickensides is random indicating chaotic movement within the faults.

### Folds

Folds are best delineated by the limestone unit as structures within the greenstone are difficult to see without the presence of marker units. There appears to be at least two generations of folding on the BEAR claims. The earlier deformation produces isoclinal folds with thickened hinges and well developed axial plane cleavage. The second generation of folds refolds the first into open to tight folds with no axial plane cleavage.

### GEOCHEMICAL SURVEY OF THE CLAIMS

Thirty-five rock samples and 863 soil samples were collected on the BEAR claim group. Soil samples were collected mainly on a grid on the 20 unit BEAR claim which was on a 50 m by 50 m basis west of the baseline and 100 m x 100 m basis to the east of the baseline.

On The TOTEM and POLE claims a small north-south baseline was put in with lines running east-west at 100 m intervals. Samples on the line were taken 25 m apart. Soil samples were of B-horizon material where possible, otherwise the C-horizon was used.

Soil samples were placed in kraft wet strength soil bags, air dried and shipped to Chemex Labs, North Vancouver, B. C. The samples were further dried and then sieved, with the -80 mesh portion being retained for analysis. Rock samples were crushed and then pulverized in a ring grinder to -100 mesh. For Au determination, a fire assay - atomic absorption technique is used with the fire assay bead being dissolved in HCl and HNO<sub>3</sub> then analyzed by conventional atomic absorption techniques. For Ag, a mixture of HClO<sub>4</sub> and HNO<sub>3</sub> is used to digest the sample, which is followed by atomic absorption spectrophotometry. The As analyses are done by standard colorimetric techniques following an HClO<sub>4</sub> plus HNO<sub>3</sub> digestion. Antimony analyses are done by digesting the sample in HCl, then adding potassium iodide, extracting with TOPO - MIBK and then analyzing by atomic absorption spectrophotometry.

#### GEOCHEMICAL RESULTS

Results for the rock and soil geochemistry are plotted on Figures 4 to 12. The direct correlation between Au, Ag, As, Sb appears to be quite strong. Most areas with elevated trace metal values can be traced to outcrops of quartz or quartz-carbonate alteration. Outcrops of unaltered limestone and greenstone had no anomalous geochemical values.

#### CONCLUSIONS

Significant gold and silver values are associated with silicified and quartz-carbonate altered structural zones on the BEAR claims. These mineralized zones appear related to large north-south striking faults which cross the central part of the claims.

RECOMMENDATIONS

Follow-up of the gold and silver anomalies is required. A program of trenching, detailed geological mapping and rock-chip sampling should be carried out in 1983 to determine extent of mineralization.

REFERENCES

Monger, J.W.H. (1975). Upper Paleozoic rocks of the Atlin Terrane, Northwestern British Columbia & South-Central Yukon, Geological Survey of Canada, Paper 74-47.

Souther, J.G. (1971). Geology & Mineral Deposits of Tulsequah Map Area, British Columbia, Geological Survey of Canada, Memoir 362.

1982 EXPLORATION PROGRAM

BEAR GROUP CLAIMS

COST STATEMENT

PERIOD: June 11 to August 21, 1982.

1. LABOUR:

	<u>Position</u>	<u>Field Days</u>	<u>Office Days</u>
K. Shannon	Geologist	7.5	4
M. Thicke	Geologist	2	1
D. Madsen	Sampler	2	-
M. Gray	"	4	-
R. Lazenby	"	4	-
J. Hawthorne	"	4	-
J. Armstrong	"	4.5	-
S. Goertz	"	3	-
L. Rowan	"	5	-
F. Wohlgemuth	"	3	-
T. Zanger	"	4	-
	Total man days	43	5
Average cost per field man day	=	\$100.	\$ 4,300.00
Average cost per office man day	=	\$175.	875.00

2. ANALYSES:

Rock: 35 samples @17.40 each	= \$	609.00	
Soil: 863 samples @15.50 each	=	<u>13,376.50</u>	13,985.50

3. CAMP COSTS:

Total man days 43 @\$79.50		3,418.50
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4. HELICOPTER:

43 hrs. @\$510. per hr. including fuel		21,930.00
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5. DRAFTING:

3 man days @\$100. per day		300.00
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6. SAMPLE SHIPMENT:

898 samples @\$0.60 each		<u>538.80</u>
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Total \$45,347.80

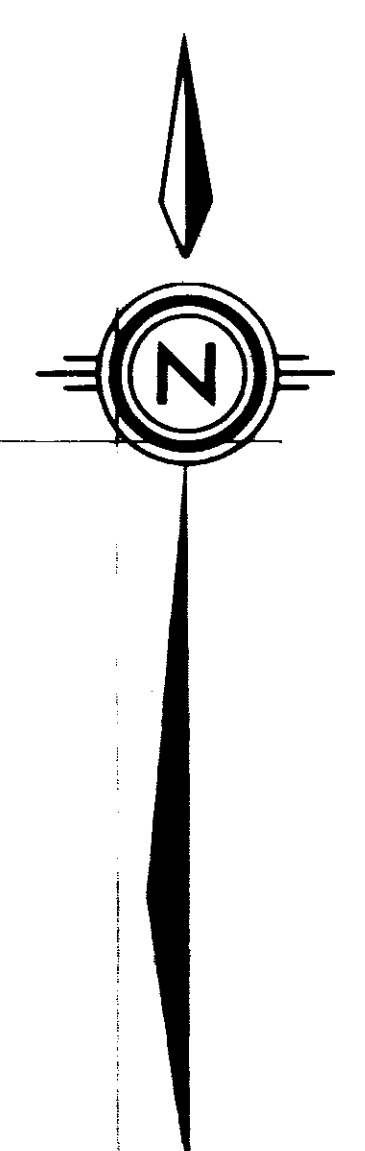
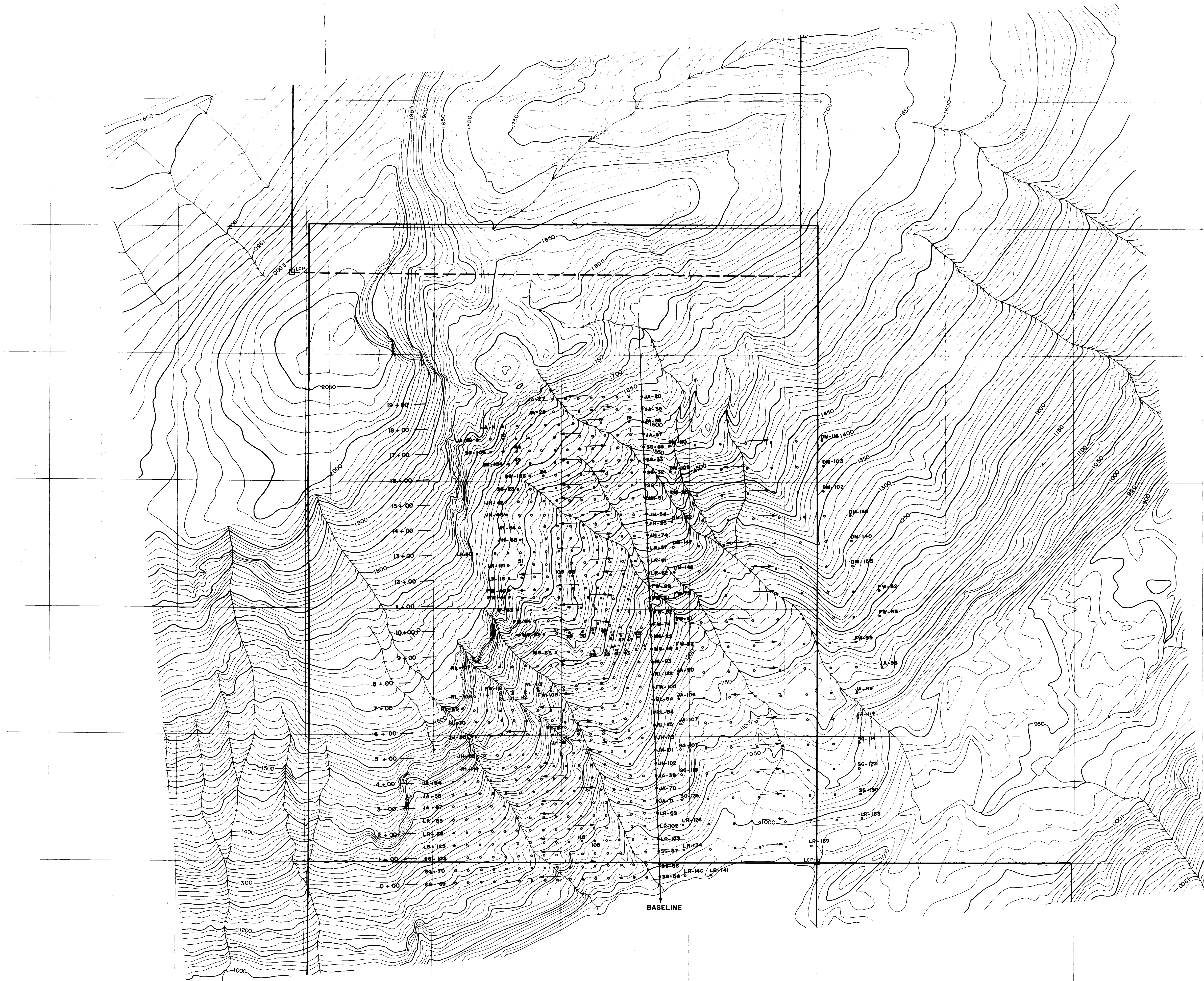
STATEMENT OF QUALIFICATIONS

I, Ken Shannon, have worked as a geologist in B. C. on a seasonal basis since graduation from the University of British Columbia with a B.Sc. (Hons. Geology) in 1975. A M.Sc. degree was awarded from the Department of Geology at U.B.C. in May, 1982. I am employed as a geologist by Chevron Standard Limited of Vancouver, B. C. Work on the BEAR Claims was done under my supervision

A handwritten signature in cursive script that reads "Ken Shannon". The signature is written in black ink and is positioned to the right of the main text block.

KEN SHANNON



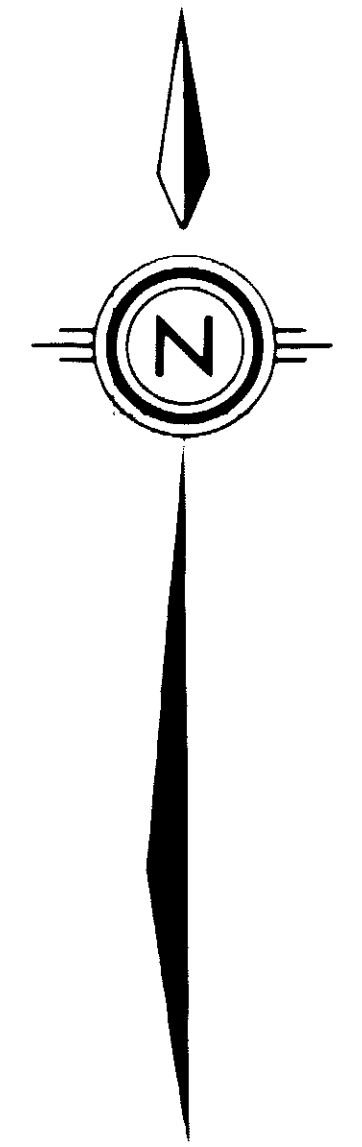
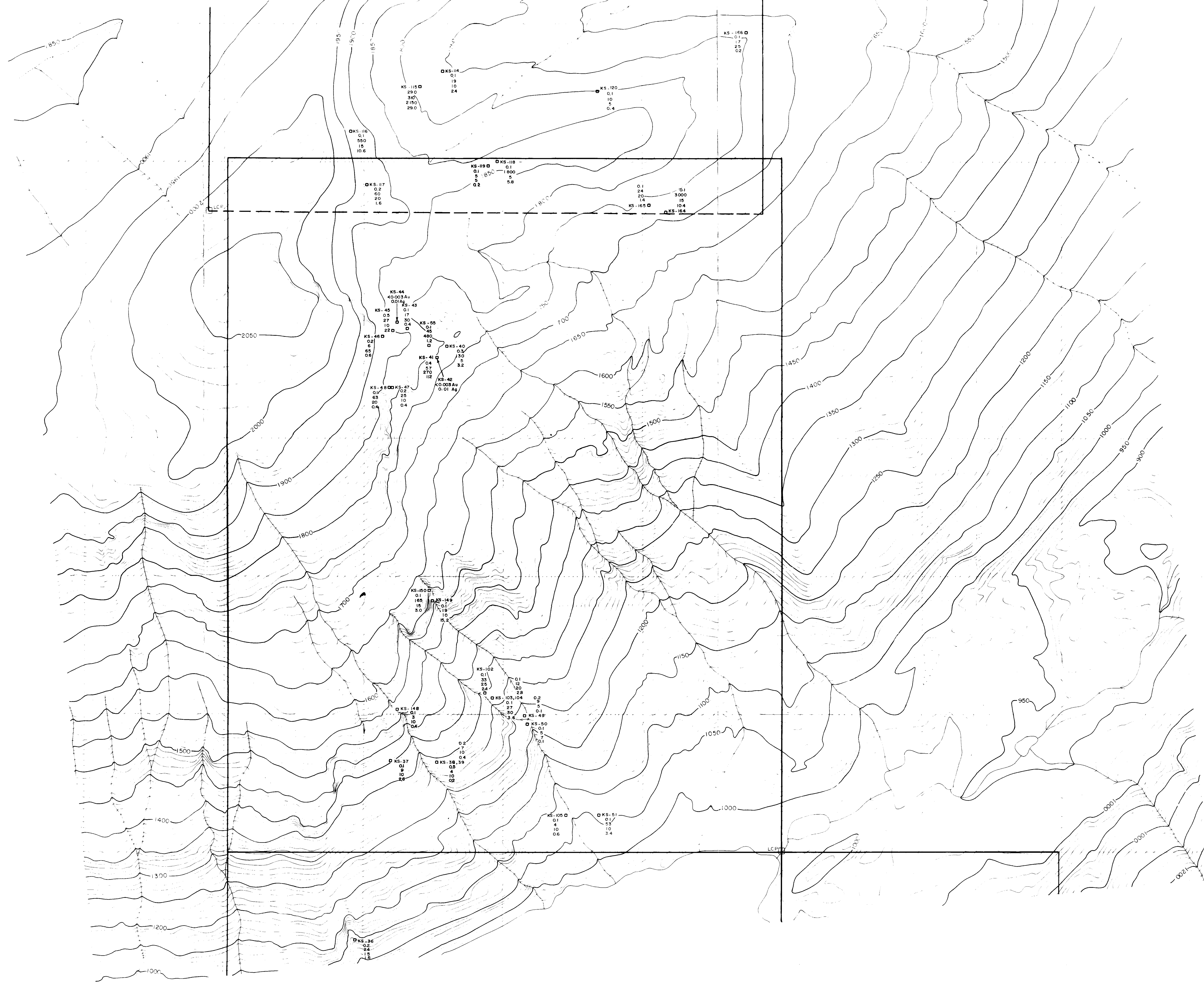


0 200m

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<b>Chevron Standard Limited</b> Minerals Staff	
<b>BEAR CLAIMS</b> SAMPLE LOCATIONS	
FIGURE No <b>3</b>	PROJECT No <b>M 504</b>
DATE NOV. 1982	SCALE 1:5,000
	S - 29



0 200m

**LEGEND**

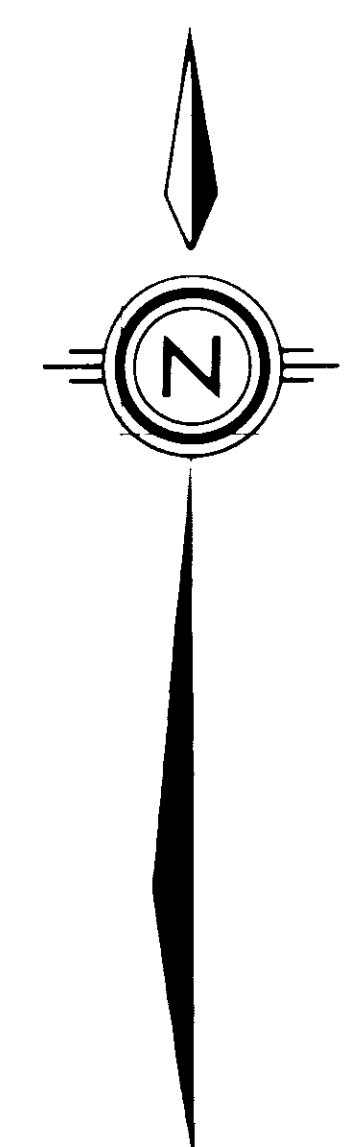
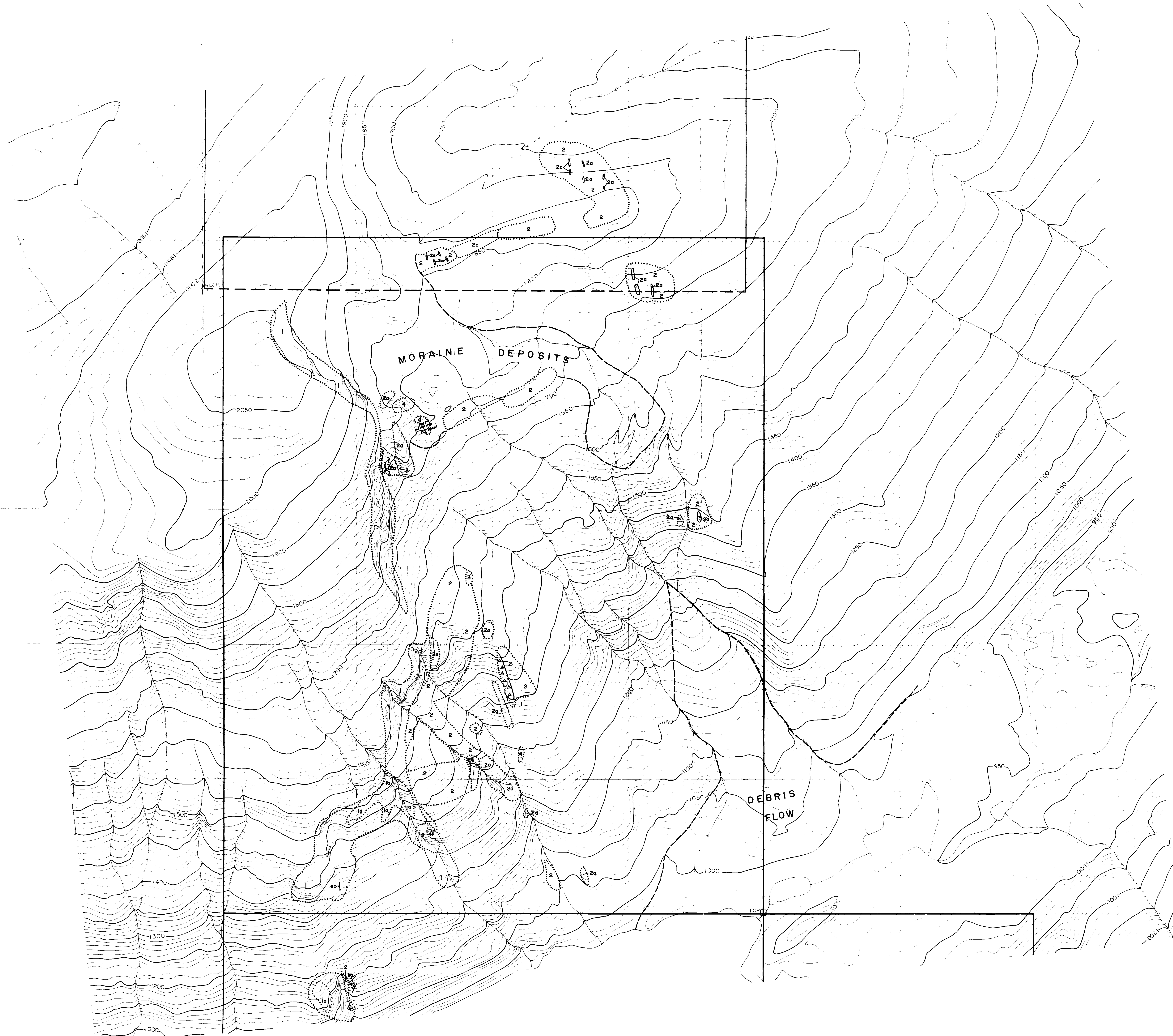
- ROCK SAMPLE
- 0.3 ppm Ag
- 120 ppm As
- 50 ppb Au
- 7.7 ppm Sb
- ROCK SAMPLE ASSAY
- <0.003 - Au (oz/ton)
- 0.01 - Ag (oz/ton)

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<0.003Au <0.003Au  
0.01 Ag 0.02 Ag  
KS-34 □ KS-35

<b>Chevron Standard Limited</b> Minerals Staff	
<b>BEAR CLAIMS</b> <b>ROCK GEOCHEMISTRY</b>	
FIGURE No: <b>4</b>	PROJECT No: <b>M 504</b>
NOV. 1982	1:5,000
<b>C-102</b>	



**LEGEND**

- 1 LIMESTONE UNIT  
(PRE-UPPER TRIASSIC)
- 1a ALTERED LIMESTONE -  
RUSTY WEATHERING
- 2 GREENSTONE UNIT  
(PRE-UPPER TRIASSIC)
- 2a ALTERED GREENSTONE  
QUARTZ-CARBONATE-PYRITE
- 3 SERPENTINITE  
(PRE-UPPER TRIASSIC)
- 4 SILICIFIED ZONES
- 4a BRECCIA ZONES

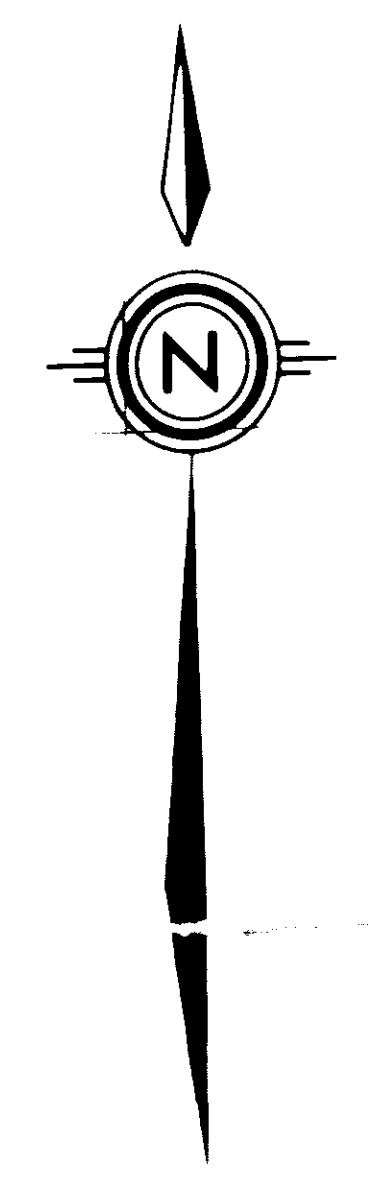
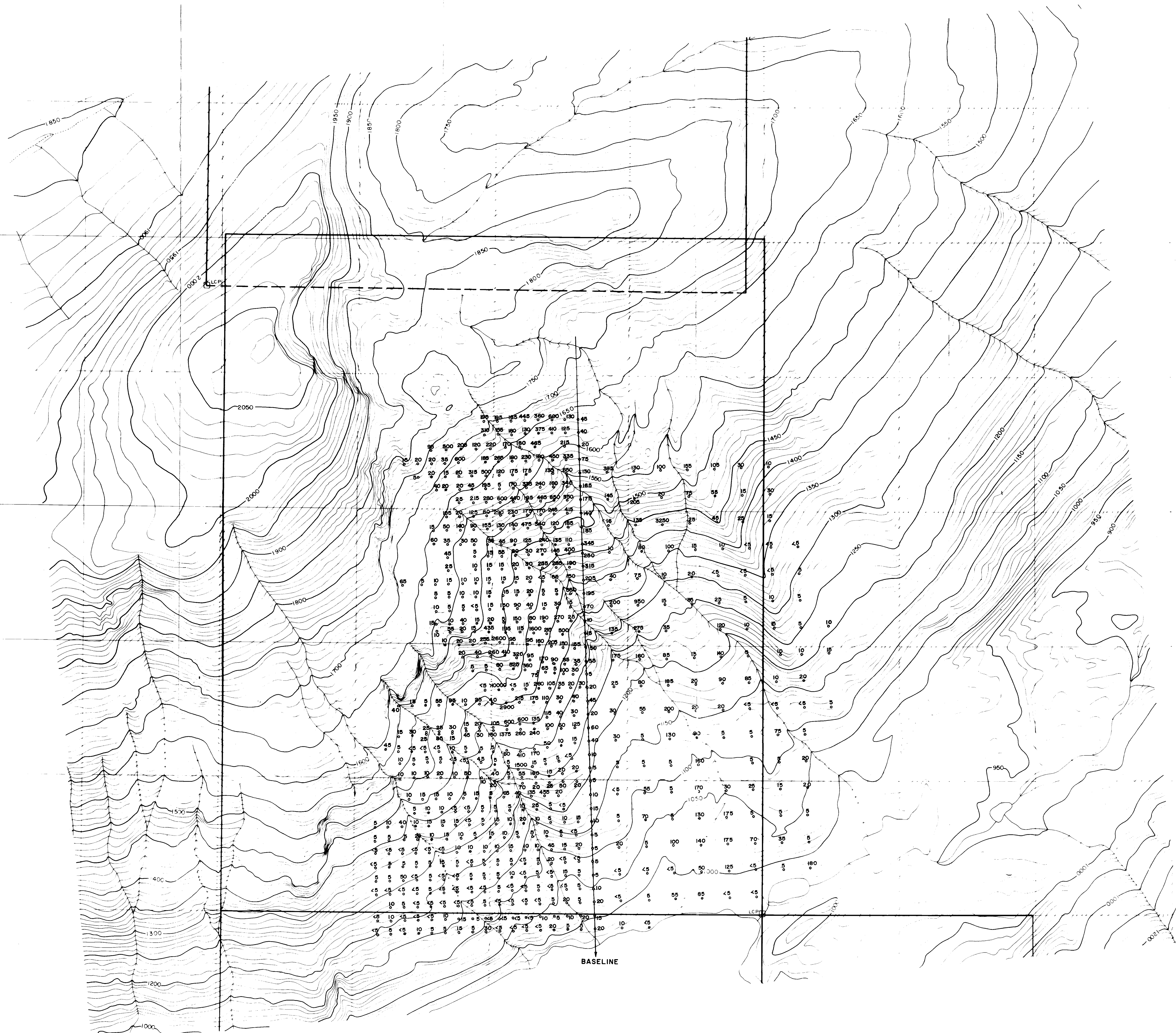
**SYMBOLS**

- 35° STRIKE AND DIP OF FOLIATION
- 40° STRIKE AND DIP OF BEDDING
- 90° STRIKE AND DIP OF FRACTURE
- OUTCROP LOCATION
- GEOLOGICAL CONTACT

GEOLOGICAL BRANCH  
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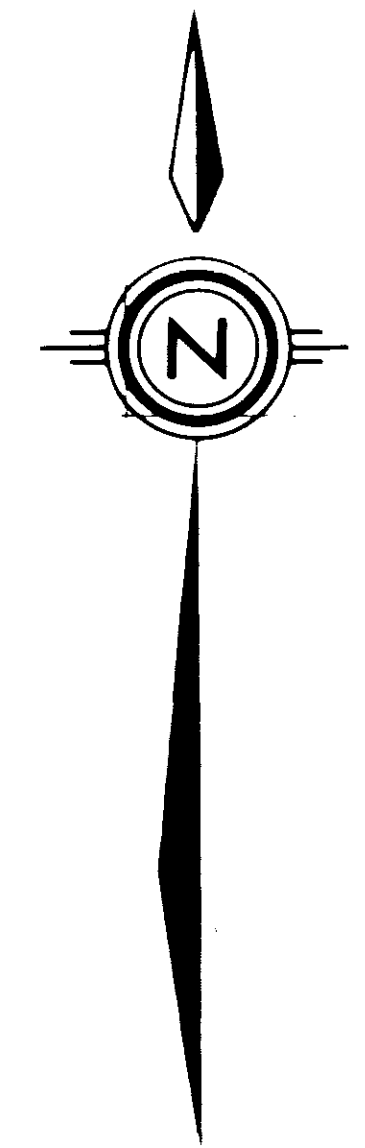
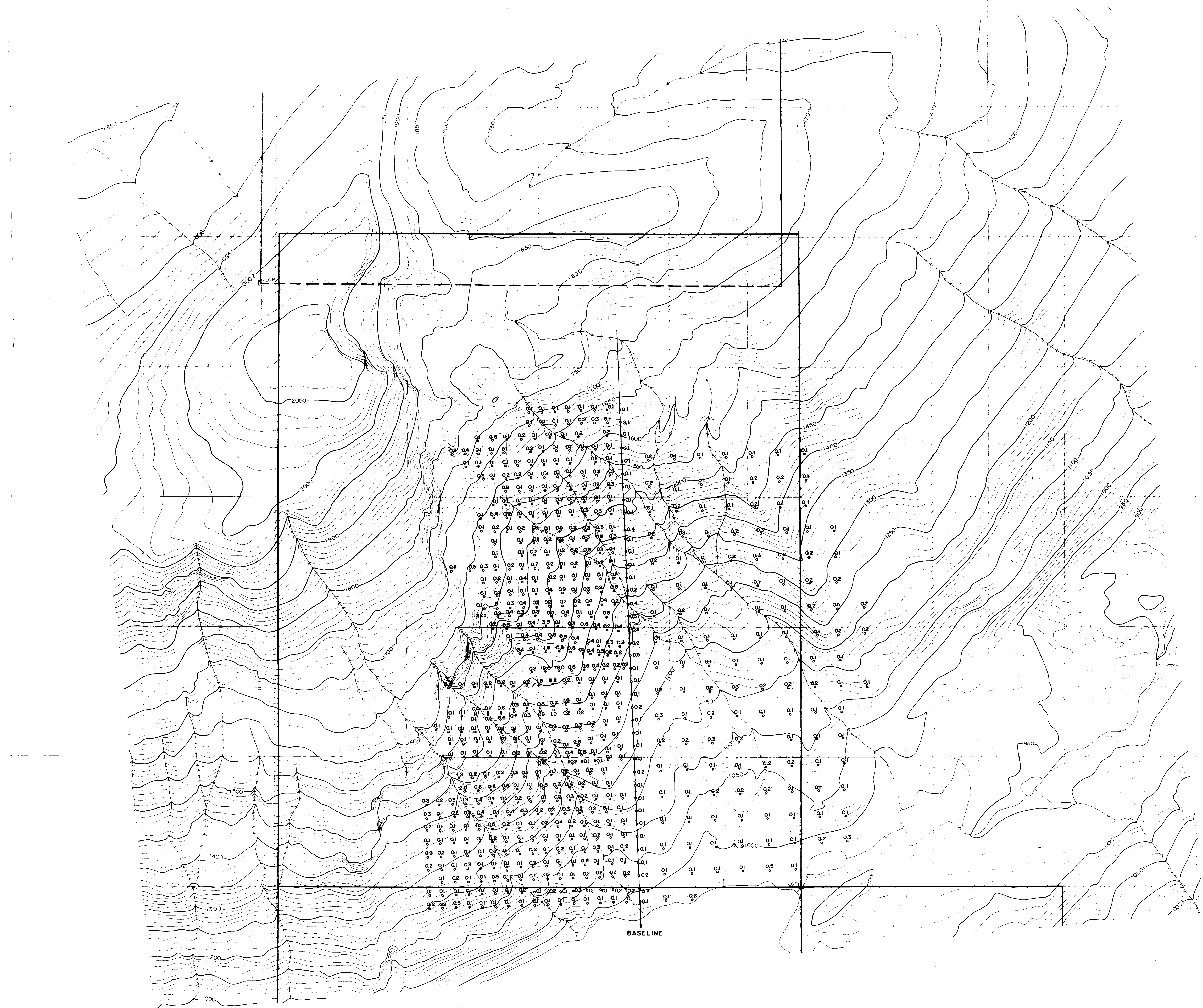
Chevron Standard Limited Minerals Staff	
<b>BEAR CLAIMS GEOLOGY</b>	
FIGURE No. 5	PROJECT No. M 504
NOV. 1982	15.000
G - 13	



0 200m

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 <b>Chevron Standard Limited</b> Minerals Staff	
<b>BEAR CLAIMS</b> SOIL GEOCHEMISTRY Au - ppb	
FIGURE No. <b>6</b>	PROJECT No. <b>M 504</b>
DATE NOV/1982	<b>C-105</b>

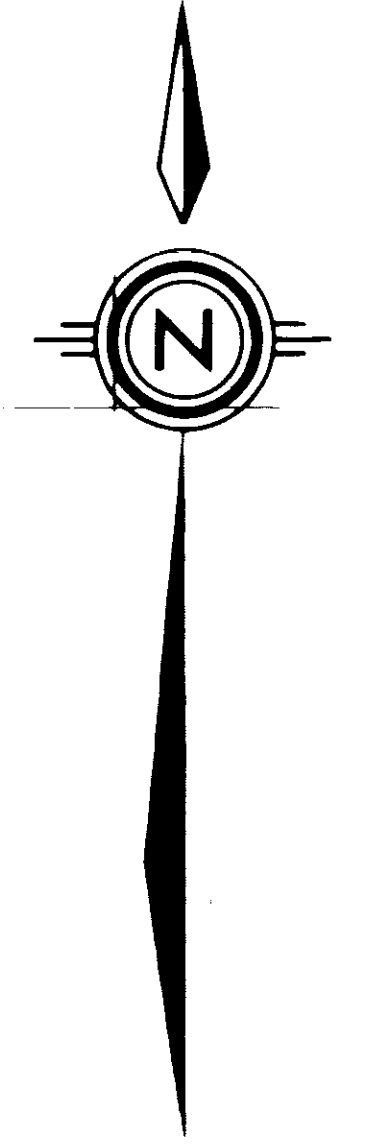
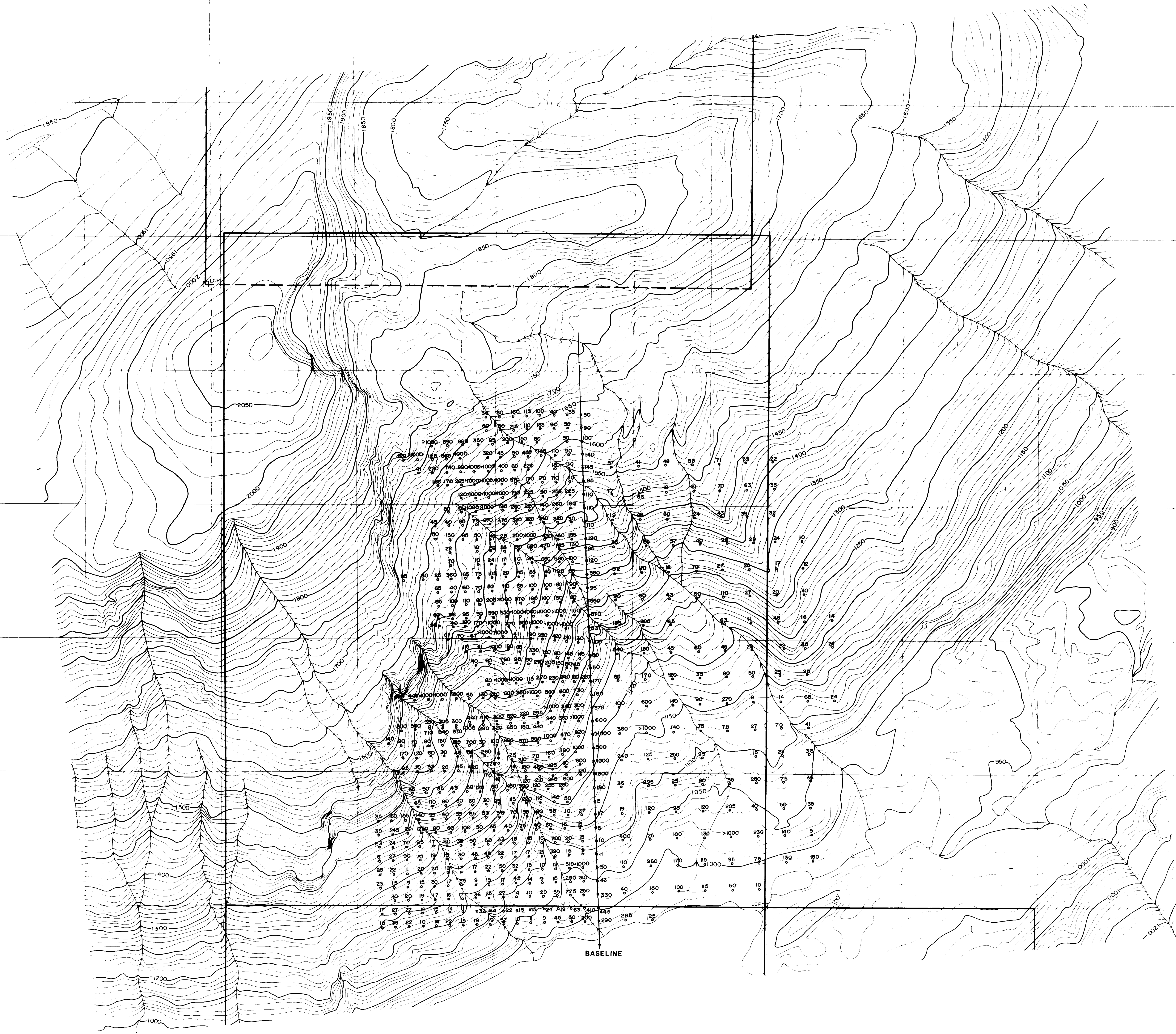


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<b>BEAR CLAIMS</b> SOIL GEOCHEMISTRY Ag - ppm	
FIGURE No. 7	PROJECT No. M 504
DATE NOV. 1982	
	C-106

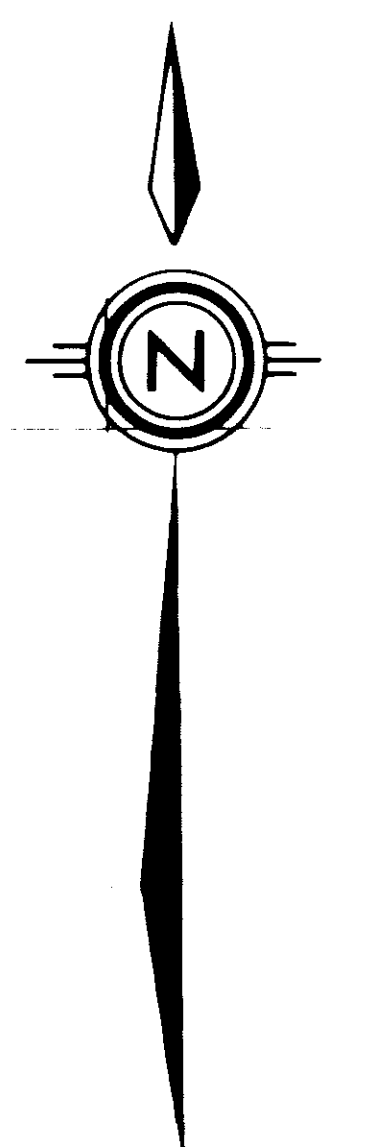
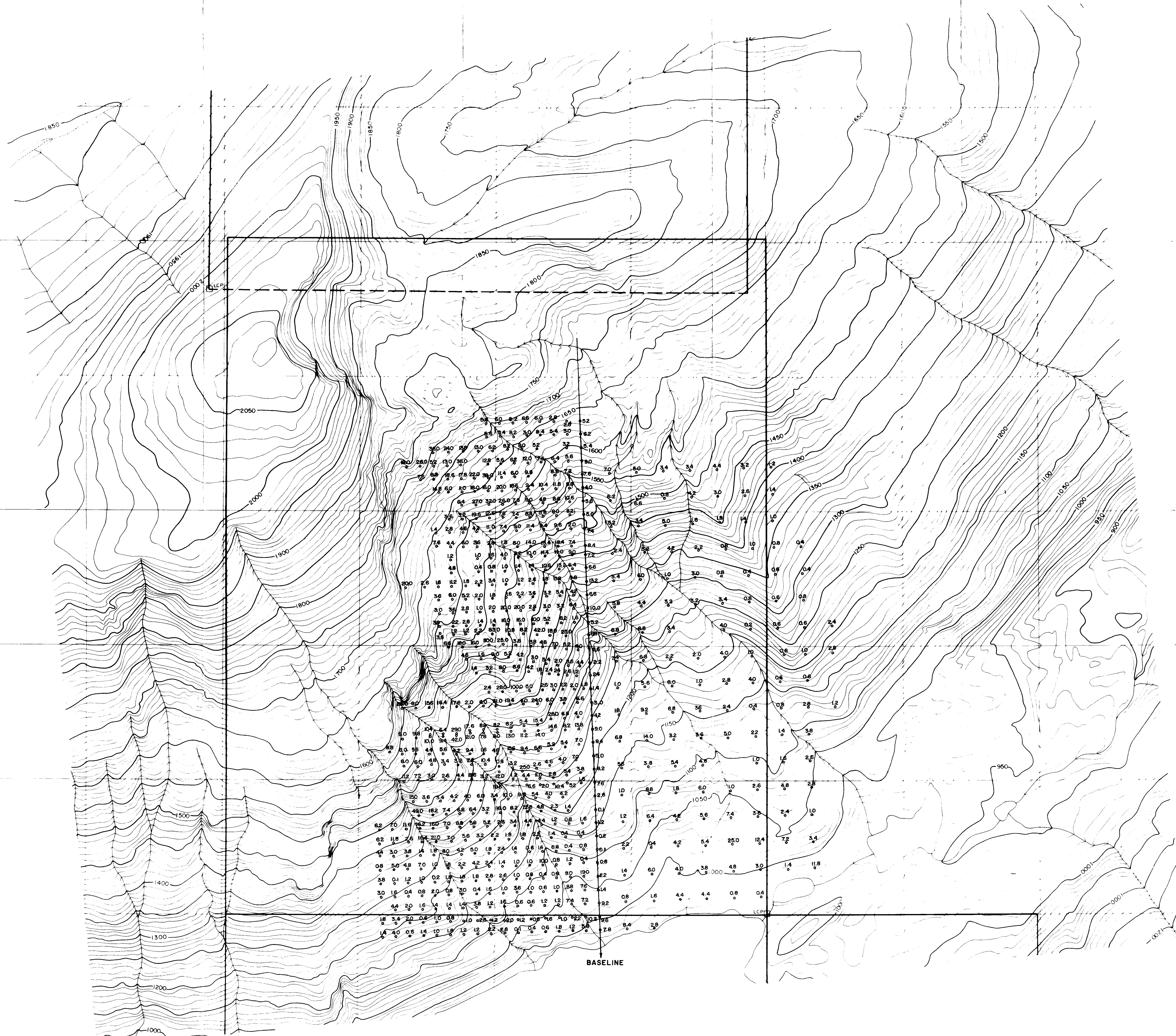


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<b>BEAR CLAIMS</b> SOIL GEOCHEMISTRY As - ppm	
FIGURE No 8	PROJECT No M 504
TE NOV / 1982	
	C-103

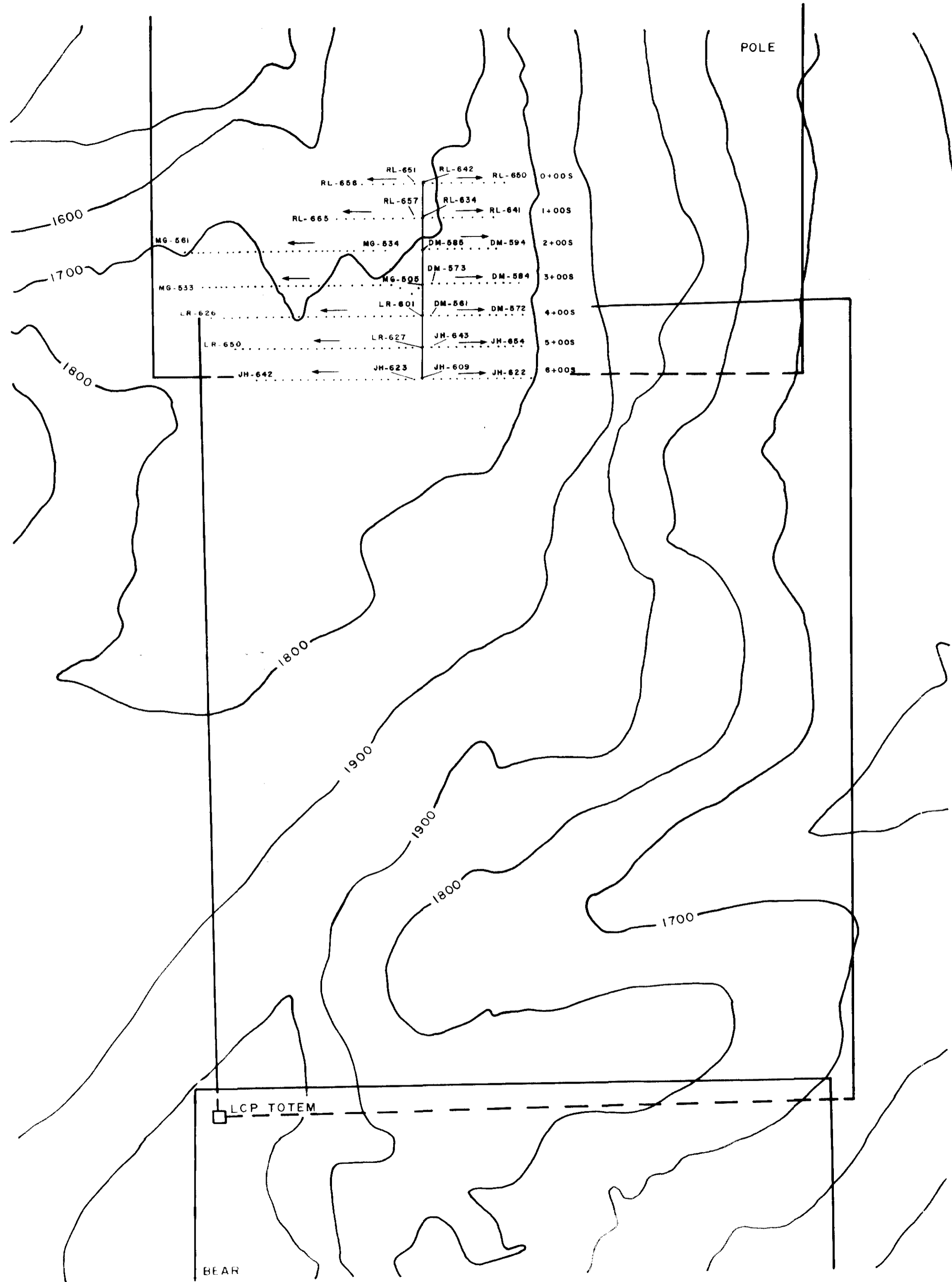


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<b>BEAR CLAIMS</b> SOIL GEOCHEMISTRY Sb - ppm	
FIGURE No <b>9</b>	PROJECT No <b>M 504</b>
11 NOV. 1982	
	<b>C-104</b>



**LEGEND**

• SOIL

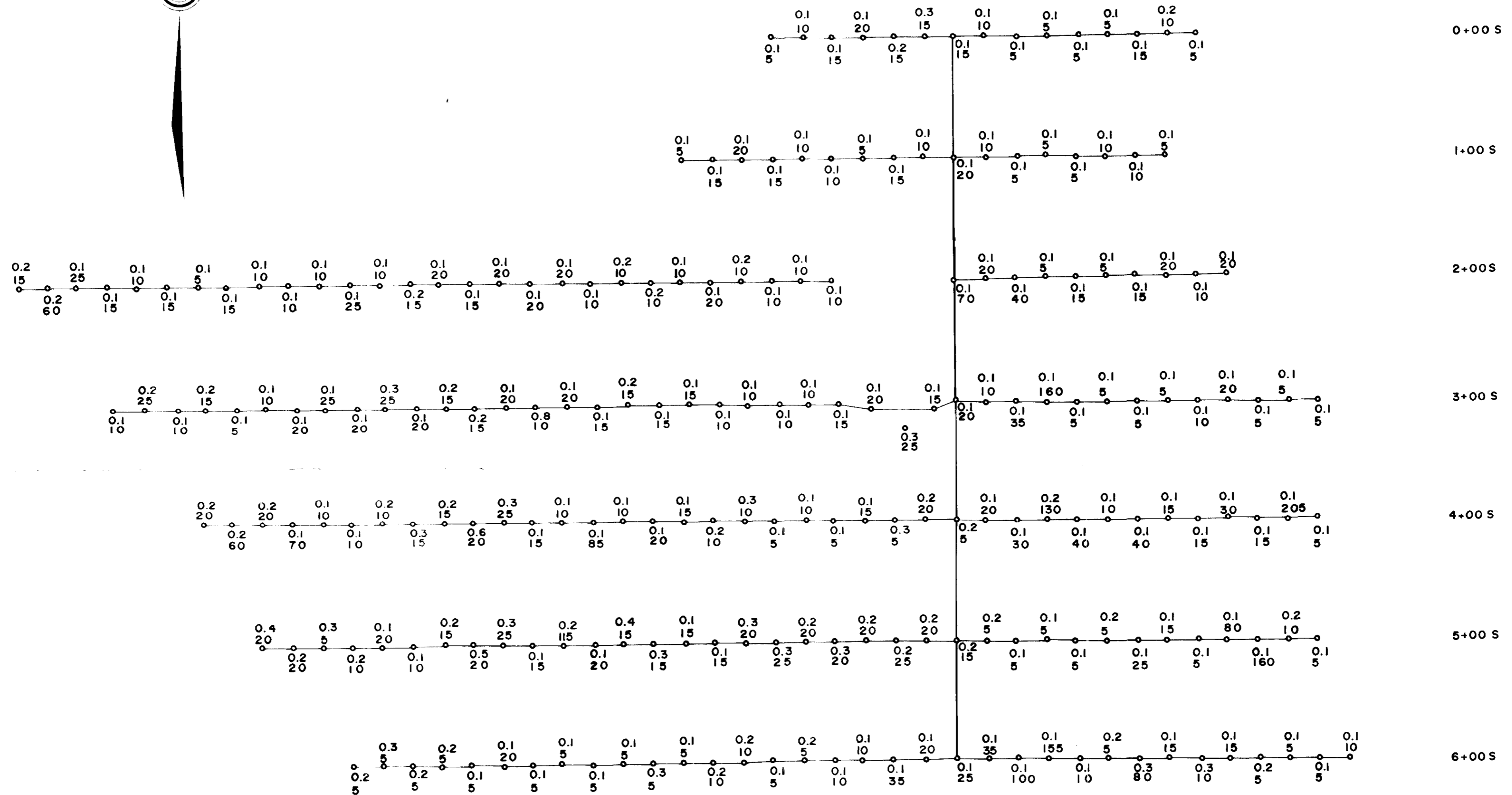
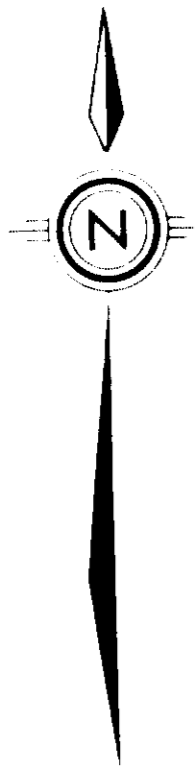
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<b>Chevron Standard Limited</b> Minerals Staff			
<b>TOTEM GRID</b>			
<b>SAMPLE LOCATIONS</b>			
FIGURE No. <b>10</b>	PROJECT No. <b>504</b>		
DATE <b>NOV 82</b>			SCALE <b>1:10,000</b>
			<b>S-30</b>





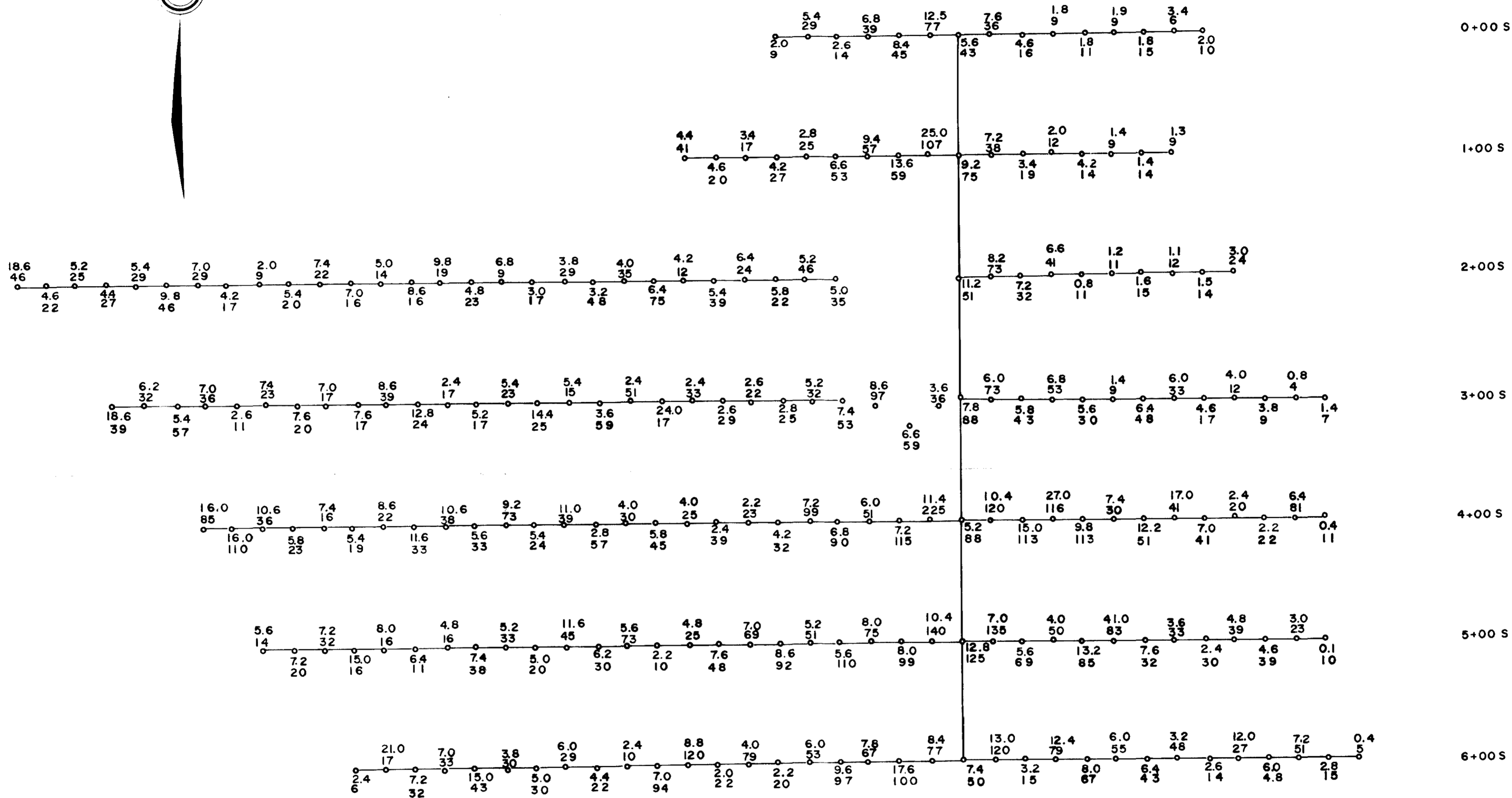
**LEGEND**

- SOIL - Ag ppm
- Au ppb

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<b>TOTEM GRID</b> Ag-ppm Au-ppb	
FIGURE No <b>11</b>	PROJECT No <b>504</b>
DATE <b>NOV 82</b>	SCALE <b>1:2500</b>
	<b>C-107</b>



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**LEGEND**

○ SOIL - Sb ppm  
As ppm

Chevron Standard Limited Minerals Staff	
<b>TOTEM GRID</b> Sb-ppm As-ppm	
Date: <b>12</b>	Project: <b>504</b>
NOV 82	12/80
<b>C-108</b>	