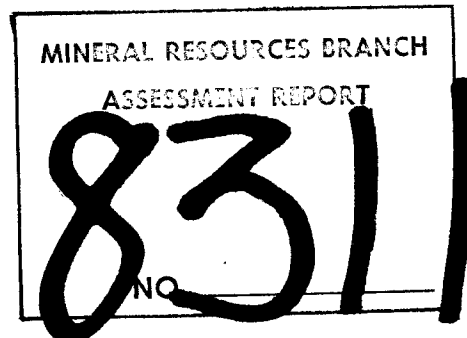


REPORT ON THE  
GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL EXPLORATION  
of the  
TAMARACK GROUP  
for  
POLARIS ENERGY CORP.

SLOCAN M.D  
82F/14W

July 17, 1980  
Vancouver, B.C.

E.D. CRUZ, P. ENG  
D.M. BASCO, CONSULTING GEOLOGIST



## CONTENTS

	<u>Page</u>
SUMMARY AND CONCLUSION	1
INTRODUCTION	3
PROPERTY	
LOCATION AND ACCESS	
PHYSIOGRAPHY	4
GEOLOGY	
MINERALIZATION	5
ELECTROMAGNETOMETER SURVEY	6
GEOCHEMISTRY	7
RECOMMENDATIONS	8
ESTIMATED COST OF RECOMMENDED PROGRAM	9
CERTIFICATE	10
STATEMENT OF QUALIFICATIONS	11

SUMMARY AND CONCLUSION:

The writers conducted a program of geological mapping, geochemical soil sampling and VLF electromagnetometer surveys on the Tamarack mineral claim group on June 29 to July 5, 1980.

Geological mapping of the property showed the area to be underlain by porphyritic granite of Cretaceous age belonging to the Nelson plutonics. The rock is in places, observed to contain relicts of quartzites, phyllites, black schists and argillites indicating that the porphyritic granite in the area are granitized portion of the Slocan Series.

Mapping and sampling of the upper most adit showed an E-W trending mineralized shear zone, 13 to 79 centimeters wide and 68 meters long, at which point a normal fault 1.5 meters wide cut off the zone. The zone dips 30 to 35 degrees south. This zone was partially stoped from a raise driven from the lower adit, now inaccessible, which raise was driven another 12 meters beyond the upper adit. Remnants of high grade vein material is still present in places.

Mineralization, confined within the shear zone, is made up of quartz with lesser calcite and barite carrying varying amounts of galena, sphalerite, pyrite, chalcopvrite and tetrahedrite forming discontinuous veins, stringers and lense-like bodies. Sampling of the mineralized zone showed assays ranging from 0.10 to 55.9 oz/ton in Ag, 0.08 to 2.23% Pb and 0.03 to 2.92% Zn.

VLF - electromagnetometer survey outlined several conductors, the most significant of which is located on 3+00E, 1+50N. This significant conductor should be verified by trenching. This conductor is 180 meters long and trending northeasterly.

The economic mineral potential of this property lies on the mineralized shear zone outlined by the upper and middle adits as well as the extent of its downfaulted continuation. Other mineralized shear zone of this nature maybe present in the property possibly the conductive zones outlined by the VLF - EM survey which are in part roughly coinciding with the silver, lead and zinc anomalies.

A program of trenching, diamond drilling and rehabilitation of the middle adit is recommended. This work program is estimated to cost approximately \$42,000.00.

Should encouraging results be obtained from the above program, a second stage work of further diamond drilling and aditing should follow.

INTRODUCTION:

This report presents the economic mineral potential of the Tamarack mineral claim group of Polaris Energy Corporation based on the geological, geochemical and geophysical surveys performed by the writers on June 29 to July 5, 1980. The fieldwork was conducted at the request of Polaris Energy Corporation.

The informations presented are based mainly on this fieldwork and partly from published reports.

PROPERTY:

The mineral property consist of two reverted crown grants and one located mineral claim as follows:

<u>Claim Name</u>	<u>Lot No.</u>	<u>Record No.</u>	<u>Expiry Date</u>
Biloxie	6929	1694	Jan. 29, 1981
Tamarack No. 2	6054	550	Oct. 3, 1980
Tamarack No. 3 Fr.		1749	Feb. 18, 1981

LOCATION AND ACCESS:

The property is situated about 8 kilometers northeast of Slocan at the following geographic position: 49°48' N Latitude and 117°22' E Longitude. The claims straddle the upper reaches of Algiers Creek, a tributary of Springers Creek, and adjoins the Ottawa Silver mine to the east.

Access from Slocan is by following the Springer Creek road leading to Ottawa Mine then by foot trail for a distance of approximately 600 meters.

Slocan, a small logging and mining community situated on the South

end of Slocan Lake, is reached from Vancouver via highway No. 3 up to Castlegar thence via highway No. 6 a total highway distance of approximately 700 kilometers.

PHYSIOGRAPHY:

The claim area is situated on the steep southern slope of Ottawa Hill with elevation ranging from 1300 meters rising steeply to 1650 meters above sea level. The claims are centrally dissected by the deeply incised Algiers Creek and its tributaries forming steep valleys and cliffs. Vegetation consist of stands of commercial timbers with dense underbrush.

Abundant water is available from Algiers Creek for drilling operation.

GEOLOGY:

The area covered by the Tamarack claims belonging to the Polaris Energy Corporation is underlain by the predominant porphyritic granite, which forms part of the Nelson batholith. On closer examination, the granite clearly shows visible relicts of such country rocks as quartzites, phyllites, black schists and argillites belonging to the Slocan group. Also, large phenocrysts of potash feldspar metacrysts, abundant hornblende, more or less altered to biotite, are contained for the most parts in the porphyritic granite. The porphyritic granite may then represent the granitized portion of the contact zone between the intrusive Nelson batholith of Upper Cretaceous age and the Slocan group of Triassic age, the rest of the latter having been eroded away in this particular area under discussion.

MINERALIZATION:

To explore and develop the property, three adits were driven in the upper reaches of Algiers Creek over which it astrides on the east side of the steeped slope valley, with vertical distances of 25 meters, offset horizontally following the southerly dip of the east - west striking mineralized shear zone in the porphyritic granite. Only the uppermost adit, 93 meters long at elevation of 1,400 meters was mapped as the two other lower adits were either caved-in or were clogged-up with debris.

The mapped adit shows that it was drifted on an east-west striking mineralized shear zone in the porphyritic granite, 13 to 79 centimeters wide and 68 meters long at which point a normal fault 1.5 meters wide with a strong gouge cut off the zone, the last of the 25 meter extension of the drift being in barren ground. The shear zone dips  $30^{\circ}$  to  $35^{\circ}$  to the south.

The mineralization in the shear zone is made up of quartz with lesser calcite and barite, carrying varying amounts of galena, sphalerite, pyrite, chalcopyrite and tetrahedrite, forming discontinuous veins, stringers, and lense-like bodies with thin sheets and/or slivers of altered country rock. Notable sulphide replacements of both the hanging and the footwall rocks were met with in places.

At 57 meters from the portal a raise (12 meters) and a winze (25 meters) were driven to stope out a rich vein, the remnant of which is still in place, 10 to 30 centimeters, on the east side of the raise where visible galena, sphalerite, and chalcopyrite in quartz-calcite vein has been sampled.

Cursory examination of the structure on the surface, as well as in the

underground, appears to indicate that the shearing which localized the mineralization might have occurred along the relict bedding plane of the granitized sediments of the Slocan group. The possibility of more than one such shearing could have taken place somewhere in the property.

#### ELECTROMAGNETOMETER SURVEY:

This survey was carried out using a Ronka EM-16 V.L.F. Electromagnetometer. This instrument utilizes the primary electromagnetic fields generated by very low frequency marine communication stations which are operating at frequencies between 15 and 25 KHZ. The instrument measures the dip angle of the secondary field induced in a conductor.

Readings were taken at 30-meter intervals and the data filtered using D.C. Fraser's method (Geophysics, Vol. 34, No. 6, Dec. 1969). This method transforms or phase shifts the dip angle data by 90 degrees so that cross overs and inflections are transformed into peaks to yield contourable quantities.

Several conductors trending generally to the northeast were delimited by the electromagnetometer survey. The strongest and most significant, being of high magnitude with filtered reading of up to 34 degrees, is 180 meters long and still open to the northeast. It is centered at station 3+00E, 1+50N. Another conductor with a peak value of 23 degrees and still open to the west is starting to develop from station 1+80E, 2+70N. A conductor, less significant than the first two, centered on station 3+60E, 0+60N, maybe attributed to a conductive overburden on account of its almost circular shape.



On the south of the baseline, a weak but continuous conductive zone outlined by the 5 degrees dip angle with peak values of 22 and 17 degrees to the southwest may represent a geological structure i.e. fault or shear zone. The southernmost conductor trending southwest to due north maybe indicative of the strong fault zone that have displaced the mineralized shear zone.

GEOCHEMISTRY:

A geochemical soil survey was conducted along a grid system. The grid system covering the claims consists of an E-W central base line from which N-S cross lines spaced at 60 meters apart were run and stations marked every 30 meters.

A total of 171 samples were collected from the grid. Soil samples were collected by grabhoe and trowel from the enriched B-horizon and placed in soil bags then delivered to Min-En Laboratories in North Vancouver. There, the samples were dried and seived to minus 80 mesh, digested in a nitric perchloric acid mixture and analysed for silver, lead and zinc by atomic absorption.

Four geochemical anomalies in lead, zinc and silver were outlined. Such anomalies show close correspondence with one another.

These anomalies are depicted on the accompanying geochemical maps as figure numbers 6, 7 and 8.

The anomaly centered on station 3+60E, 1+20N on the southeast corner of Tamarack No. 3 Fr. appear to be of significance on account of its close coincidence to the strong VLF EM conductor.

The other three anomalies lie on Tamarack No. 2, the central one being located in the vicinity of the adit outlining the known mineralized shear structure. This anomalous zone is located to the south of a weak but continuous conductor trending easterly. The mineralized shear zone appear to respond poorly to VLF EM possibly due to the lack of massive sulfide concentration within the shear structure. Although the silver is not fully associated with the lead or zinc sulfides within the shear zone they may occur in finely divided silver minerals unevenly distributed within the same zone.

The two anomalies to the north and south of the above are likewise not associated with strong VLF EM conductors.

RECOMMENDATIONS:

On the basis of the result of the present survey, the property warrants further investigation to consist of trenching, diamond drilling and related works to test the anomalies and the continuity of the mineralized shear zone along its dip as well as to find its continuity beyond the fault zone. Details of the work program is as follows:

1. Construct an access road from the existing Ottawa mine road to the target areas within the claims.
2. Trench the anomalies.
3. Clean adit walls and rehabilitate middle adit to gain access for mapping and sampling.
4. Diamond drill 2 to 3 short holes with an estimated total footage of 500 feet.
5. Further detailed geological mapping, sampling and prospecting and other related works.

PROGRAM COST:

WAGES:

E.D. CRUZ - 7 days @ 300.00/day	\$2,100.00
D.M. BASCO - 7 days @ 150.00/day	1,050.00
J.P. CRUZ - 7 days @ 75.00/day	525.00
Subsistence & Lodging - 7 days @ \$35/Man/day	735.00
Supplies	65.00
Transportation	679.00
Geochem Analyses - analysed for Pb-Zn-Ag 171 Soil Samples @ 3.85/Sample	658.35
Rock Assay - for Pb-Zn-Ag 12 Samples @ \$20.50/Sample	246.00
Instrument Rental - VLF-EM-16 10 days @ \$30.00/day	300.00
Report Preparation	<u>1,200.00</u>
TOTAL	\$7,558.35



Submitted by:

*E. D. Cruz*  
E.D. CRUZ, P. Eng.

CERTIFICATE

I, Ernesto D. Cruz, DO HEREBY CERTIFY AS FOLLOWS:

1. That I am a consulting mining engineer-geologist and reside at 7734 Garrett Drive, Delta, B.C.
2. That I am a graduate mining engineer of Mapua Institute of Technology, Philippines (BSEM), Missouri School of Mines and University of Washington (MSEM)
3. That I have been engaged in mineral exploration for the past nineteen years (6 years in the Philippines, 13 years in North America).
4. That I am registered with the Association of Professional Engineers of British Columbia.
5. That I have no interest directly or indirectly in the Tamarack Mineral Claims or the securities of Polaris Energy Corp. nor do I expect to acquire or receive any.

Vancouver, B.C.

July 17, 1980



*E. D. Cruz*  
E. D. CRUZ, P. Eng.  
Consulting Engineer



Slocan

Gwiliem Cr.

Slocan R.

Popoff Cr.

Dwyler Cr.

Heath Cr.

John Cr.

William Cr.

OTTAWA HILL

RS 616(5)

PAYROCK I 1515 (10)

CROW 1 GROUP 1616(2)

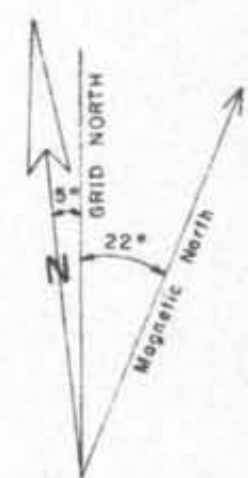
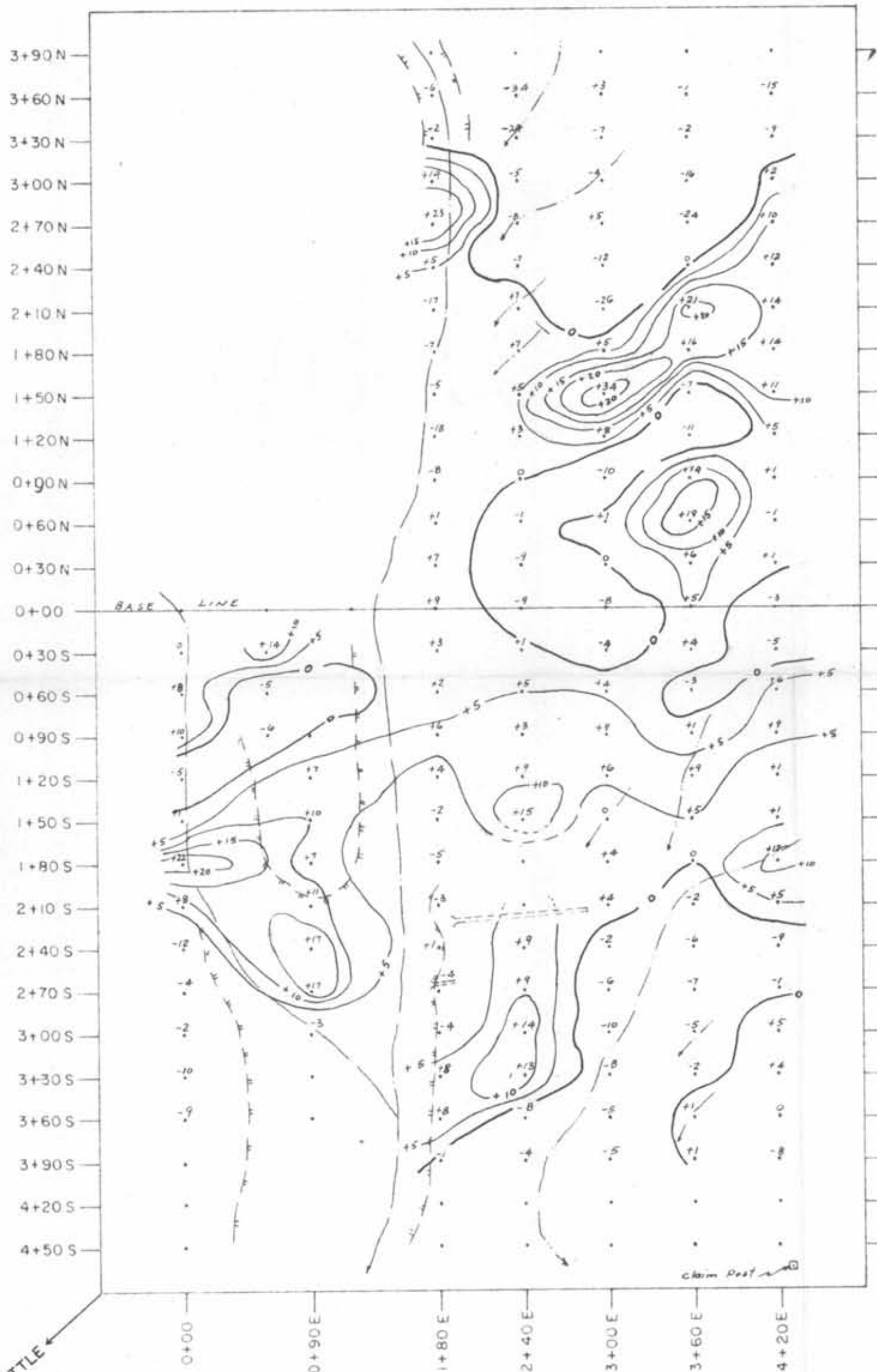
CROW 2 GROUP 1617(2)

TO SOUTH SEE MAP BY 100

DEPARTMENT OF MINES AND TECHNICAL SURVEYING

82 F/14 W

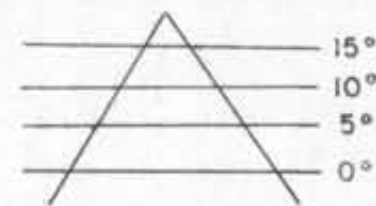




**LEGEND**

- GULLEY
- CREEK
- STEEP SLOPE / CLIFFS
- ADIT

**DIP ANGLE KEY**



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ASSESSMENT REPORT

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No.

**POLARIS ENERGY CORP.**

VANCOUVER, B.C.

CANADA

**TAMARACK GROUP**

SLOCAN, M.D.

**VLF - EM MAP**  
(FRASER FILTERED)

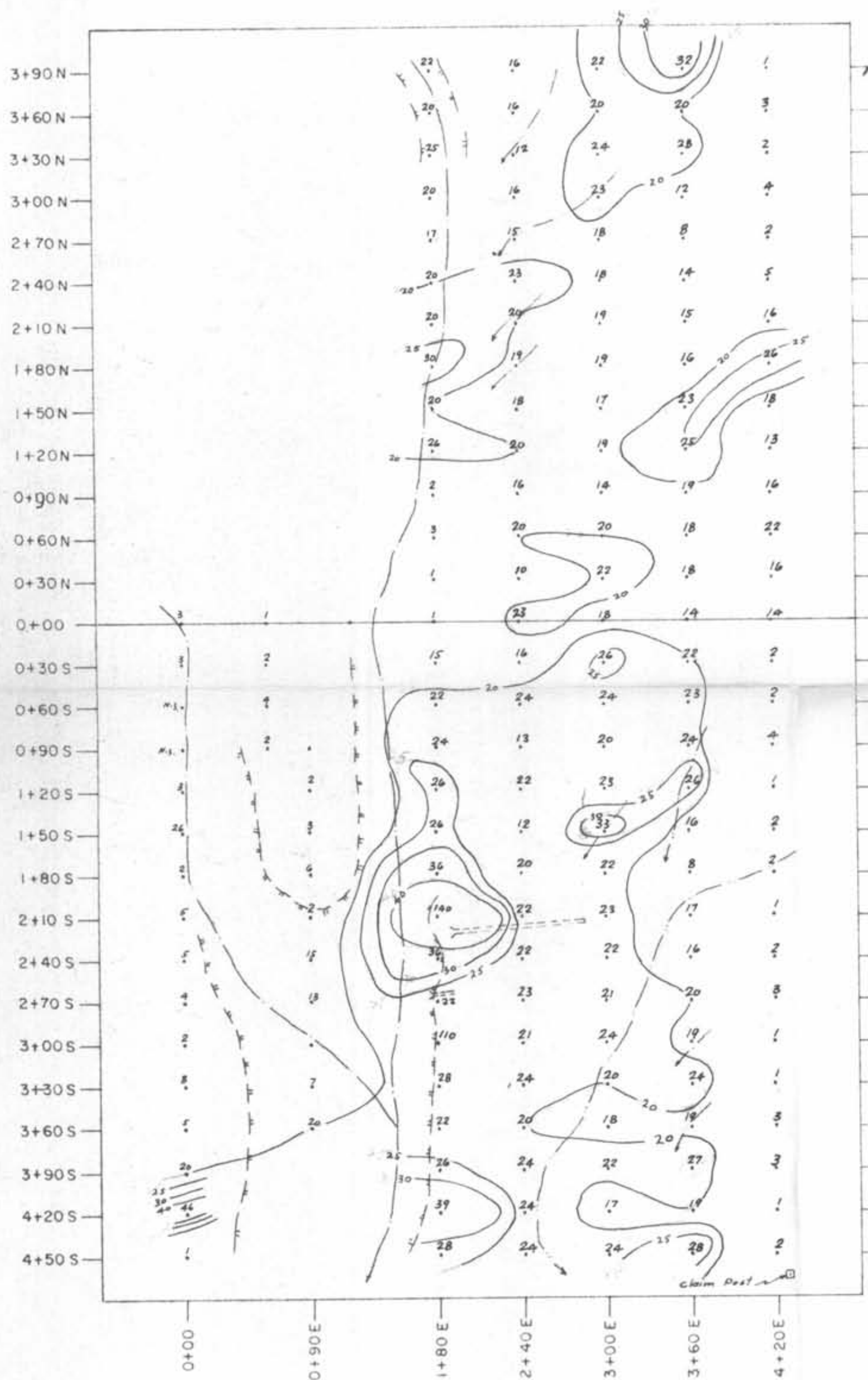
To Accompany Report of  
E. D. Cruz, P. Eng. &  
D. M. BASCO, Geologist

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FIG No.

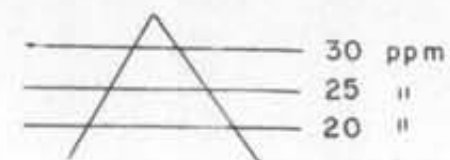
SEATTLE



### LEGEND

- GULLEY
- CREEK
- STEEP SLOPE / CLIFFS
- ADIT

### LEAD KEY

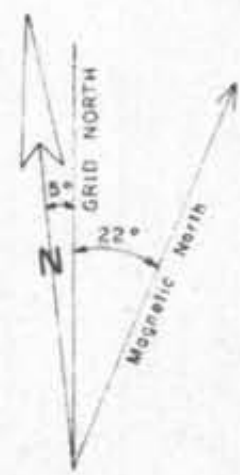
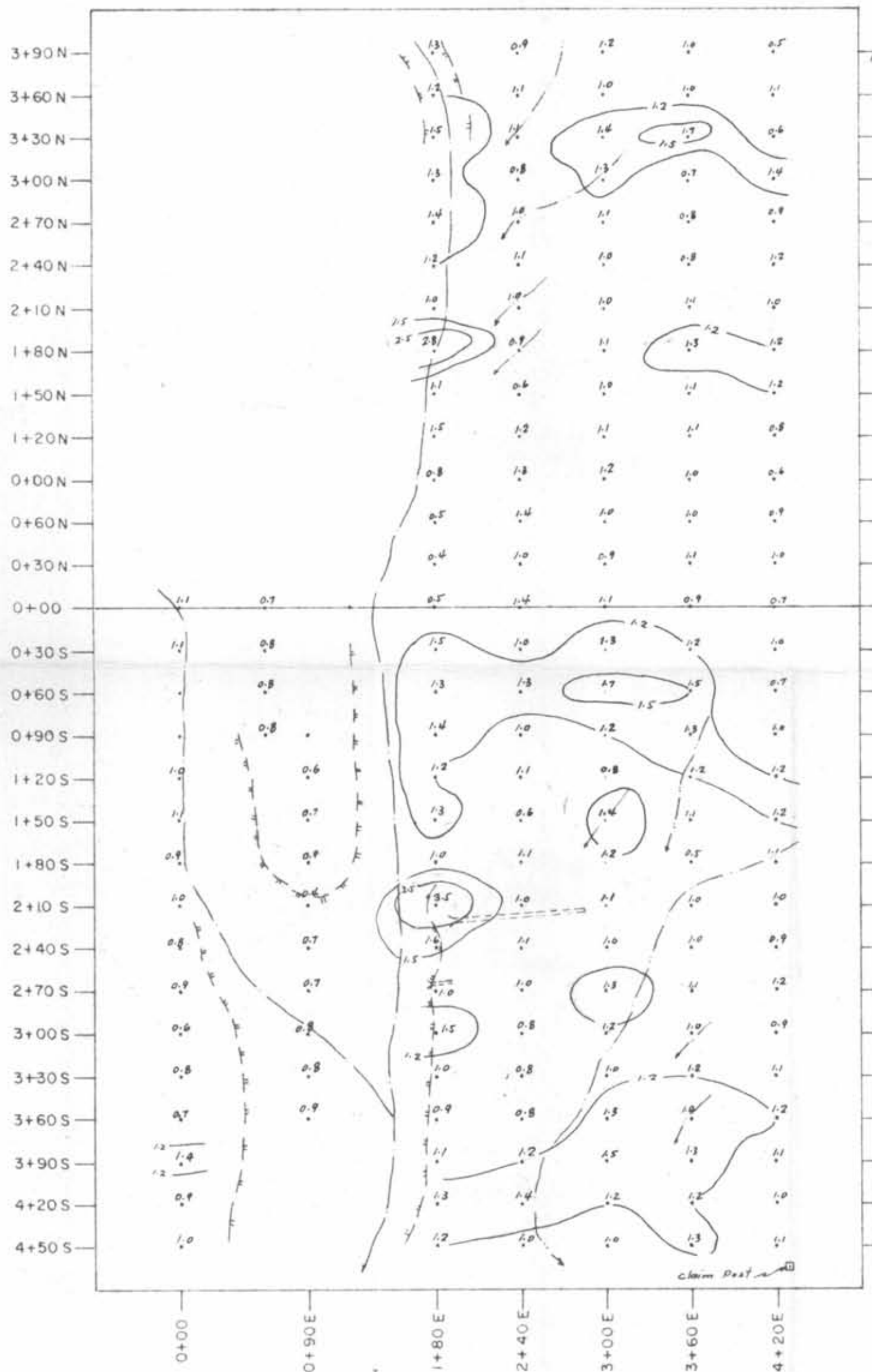


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GEOCHEMICAL MAP - LEAD	
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SCALE 1 5000	FIG No





**LEGEND**

- GULLEY
- CREEK
- STEEP SLOPE / CLIFFS
- ADIT

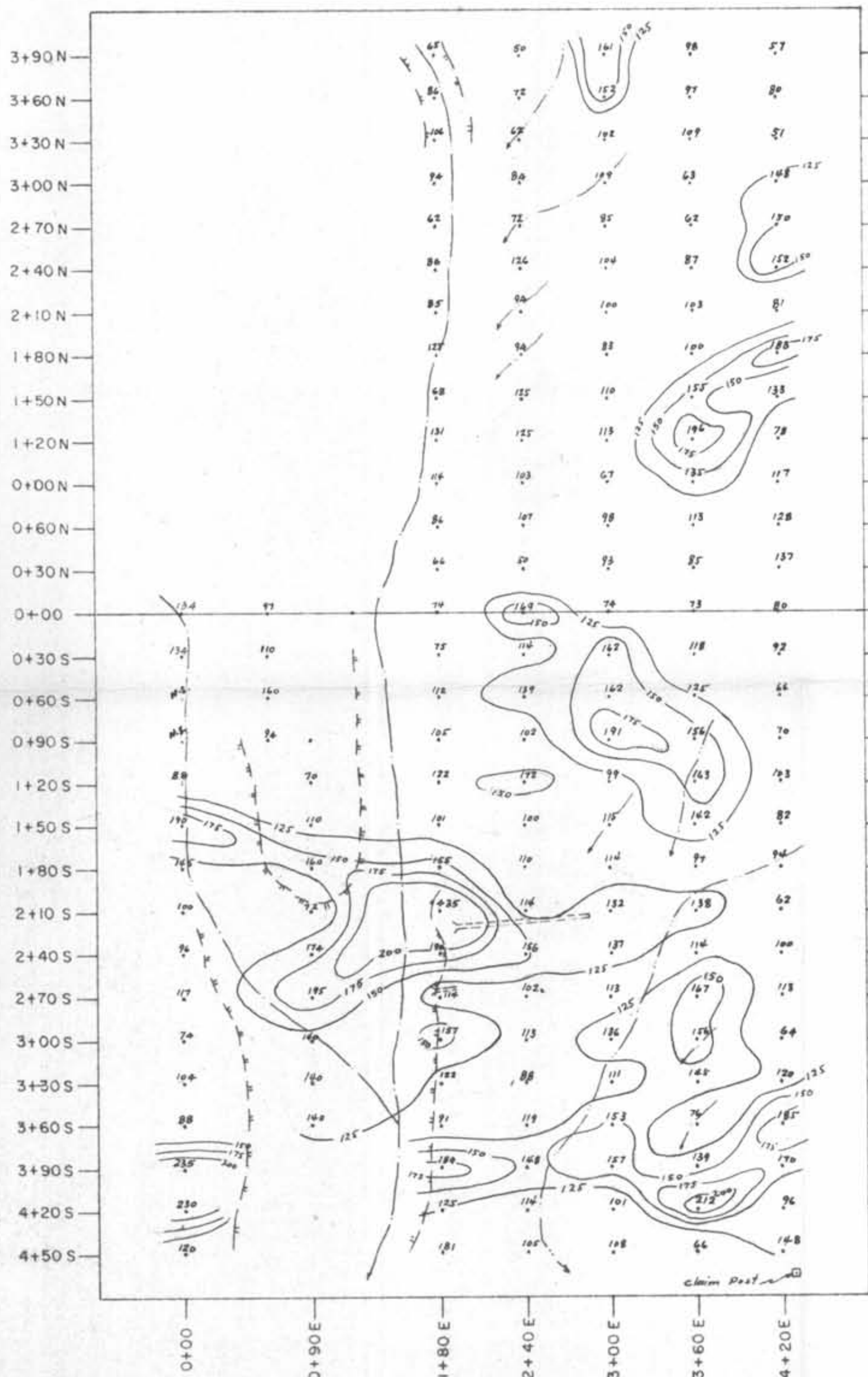
**SILVER KEY**

- 2.5 ppm
- 1.5 "
- 1.2 "

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<b>GEOCHEMICAL MAP - SILVER</b>	
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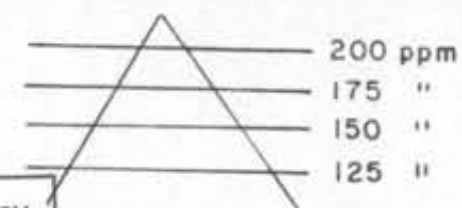




### LEGEND

- GULLY
- CREEK
- STEEP SLOPE / CLIFFS
- ADIT

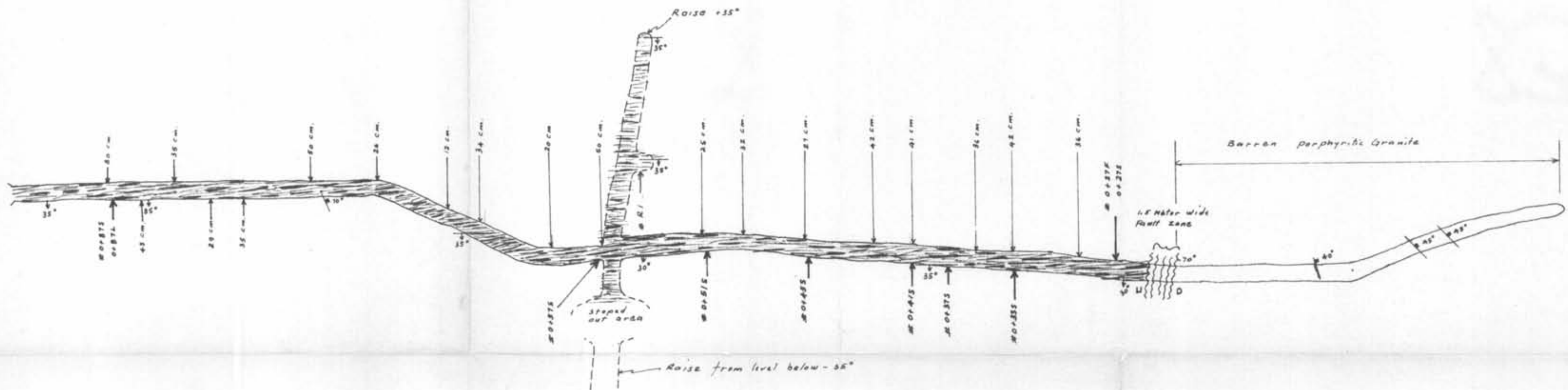
### ZINC KEY



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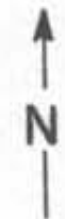
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TAMARACK GROUP	
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GEOCHEMICAL MAP - ZINC	
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SCALE: 1:3000	FIG No



Sample No.	A S S A Y			D E S C R I P T I O N
	Pb %	Zn %	Ag. g/t	
0+27F	0.42	0.70	0.56	28 cm. of silicified footwall with sulphides
0+27S	0.08	0.03	0.10	36 cm. across mineralized shear zone
0+33S	0.73	2.12	0.40	33 cm. across shear zone with PbS, ZnS in qtz-calcite-barite
0+37S	0.93	1.59	1.66	40 cm. across shear zone
0+41S	0.40	0.10	0.66	45 cm. across shear zone
0+45S	0.03	0.05	0.49	30 cm. across shear zone
0+51S	0.31	2.92	2.33	40 cm. across shear zone with visible PbS and ZnS in qtz-calcite gangue
0+57S	0.45	0.37	7.95	45 cm. across shear zone carrying high grade material of qtz with little calcite and barite. Visible PbS, ZnS.
0+87S	0.28	0.49	4.67	45 cm. across shear zone
0+87L	2.10	2.73	55.90	Across 12 cm. wide mineralized lense of qtz in shear zone
R1	2.23	1.84	38.9	Across 15 cm. wide mineralized qtz-calcite vein from raise above adit
D1	11.5	5.84	89.80	Grab sample of ore material from dump

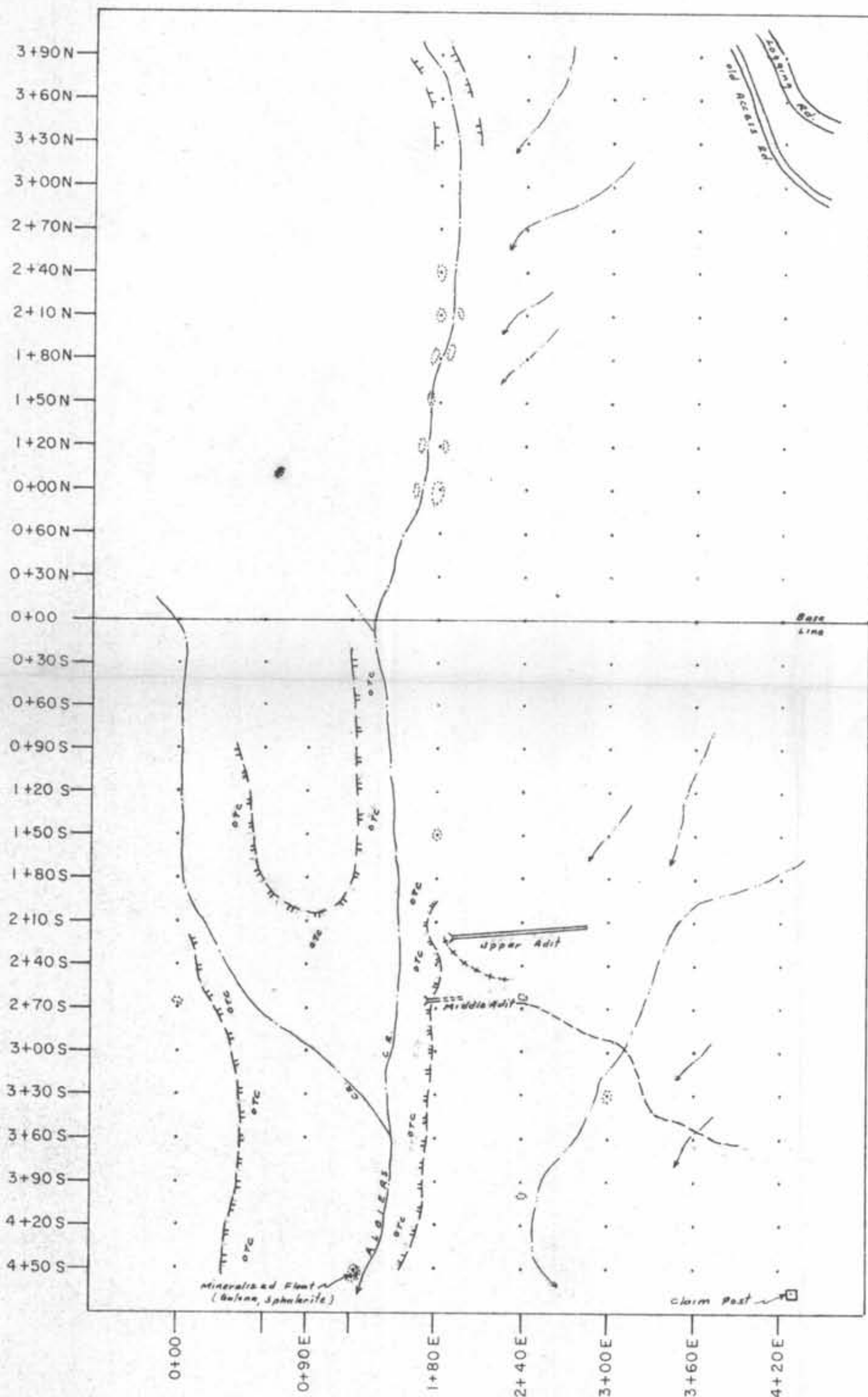
LEGEND

- Mineralize shear zone with strike and dip
- 70° Fault
- 45° Slip
- 50 cm Thickness of shear zone
- #0+51S Sample no.



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GEOLOGICAL MAP : Upper Adit	
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SCALE : 1 : 200	FIG. No.



LEGEND

- Outcrop porphyritic granite
- - - Trail
- Gulley
- Creek
- ▨ Steep Slopes/Cliffs
- etc. Outcrop Area
- - - RR Track

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SLOCAN M.D.	
<b>GEOLOGICAL MAP</b>	
To Accompany Report of E.D. Cruz, P. Eng. & D.M. BASCO, Geologist	DRAWN BY : CHECKED BY : Date:
Scale 1:3000	FIG. No.