

NO  
11E

INDUCED POLARIZATION, RESISTIVITY  
AND MAGNETIC SURVEY  
TIP GROUP OF CLAIMS, HIGHLAND VALLEY, B.C.  
FOR 9211E  
GREAT NORTHERN PETROLEUMS AND MINES LIMITED

PREPARED BY:  
BARRINGER RESEARCH LIMITED  
304 CARLINGVIEW DRIVE  
REXDALE, ONTARIO.

SEPTEMBER 1969

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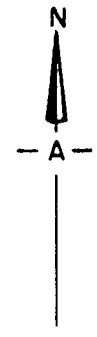
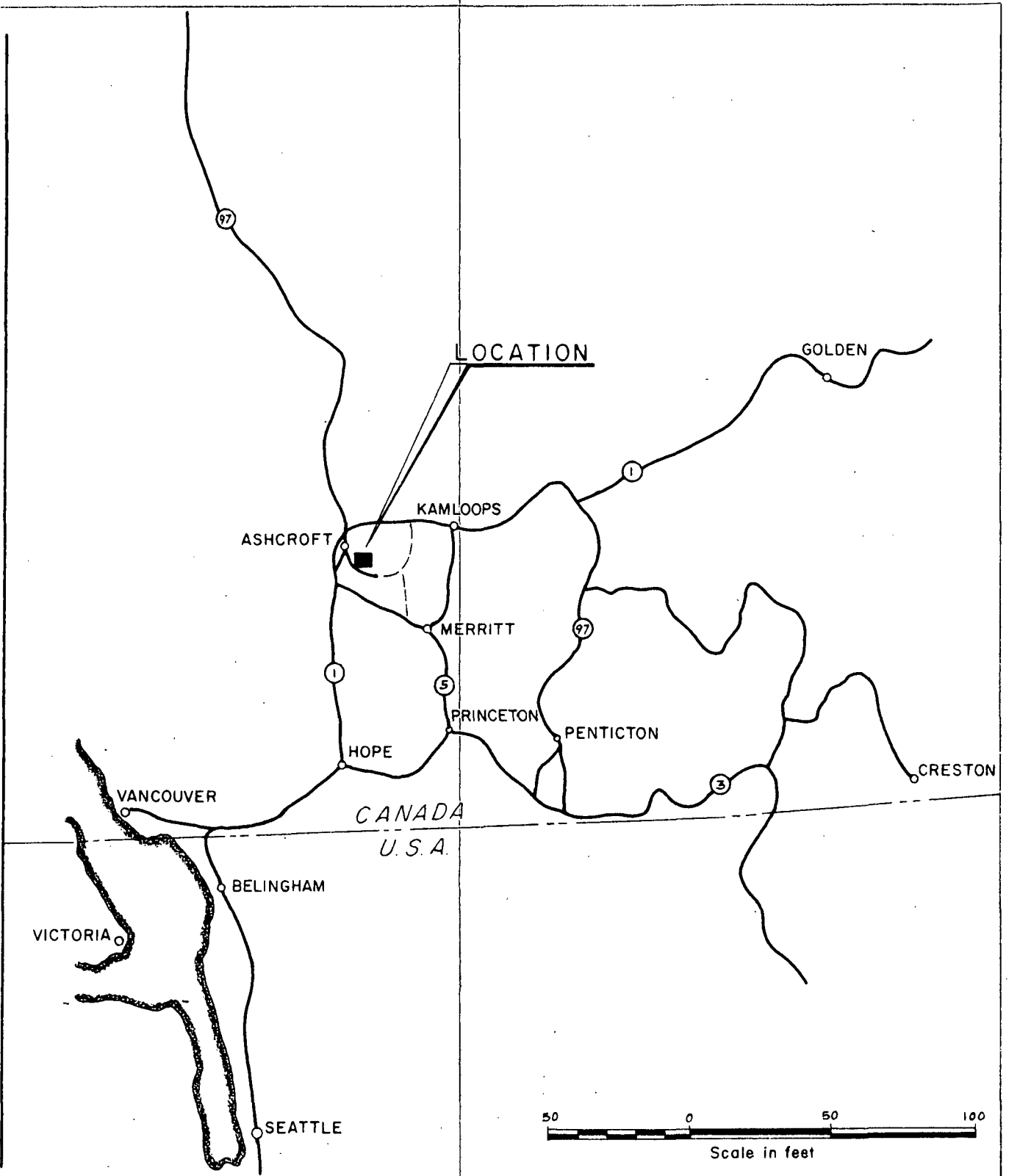
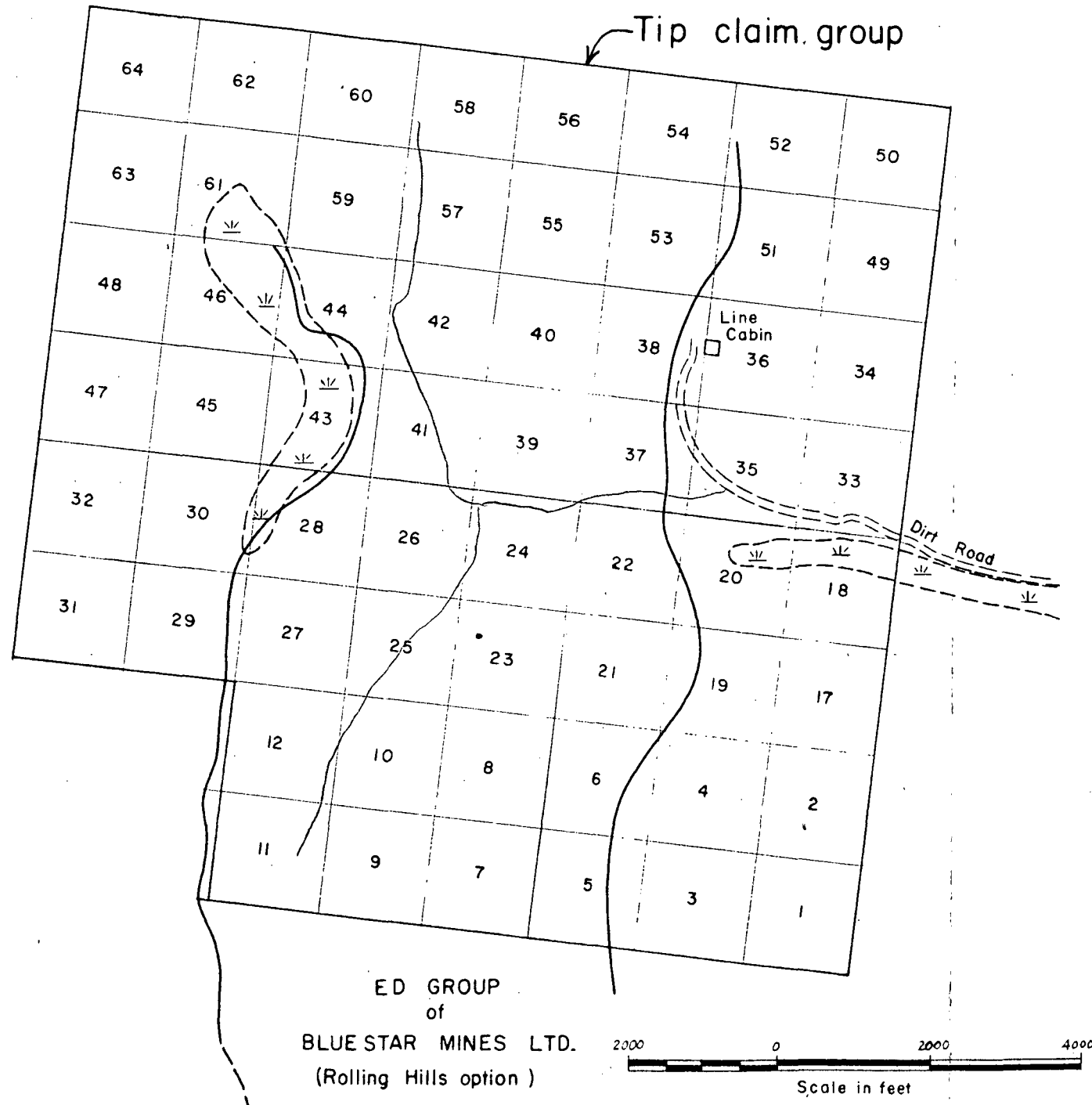
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. **2025** MAP.....

## INTRODUCTION

The Tip group of claims, held by Great Northern Petroleum and Mines Limited, are situated on the south slope of Glossy Mountain in the Highland Valley area of B.C. During the time from July 11th to August 15th, 1969 a combined geophysical and geochemical survey was conducted on the claims group in order to help assess its economic potential. The geophysical work consisted of an induced polarization, resistivity survey and a ground magnetic survey. The survey was supervised and carried out by Barringer geophysicist, Roger Caven, P. Eng.

LOCATION AND ACCESS

The property is located in the Highland Valley, Kamloops mining division, B.C. SE of Ashcroft, on the south slope of Glossy Mountain, at an elevation of approximately 6,000 feet above sea level. (dwg. no. 5-225-1) Access to property is by road from Ashcroft, first by paved highway, and then 6-7 miles along forestry access road and newly opened access to claims group. N.T.S. map: Ashcroft 92 I/11 East, with SE corner coordinates: longitude  $121^{\circ}$  W, and latitude  $50^{\circ} 30'$  N.



Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. **2025** MAP **#1**

Work undertaken by  
**BARRINGER RESEARCH LTD**, Toronto, Canada.

GREAT NORTHERN PETROLEUM & MINES LTD.  
TIP GROUP, HIGHLAND VALLEY, B.C.  
**CLAIMS &  
LOCALITY PLAN**  
Sept. 1969 DWG. 5-225-1

## GEOLOGY

Geologically the property is situated on the Guichon Creek batholith of Lower Jurassic age, at the contact with volcanic rocks belonging to the Kamloops group of Tertiary age. During the course of the survey, numerous outcrops were observed, particularly in the north-central part. Towards the south and west the overburden apparently increases in thickness. In the N.E. corner of the property moraine-like ridges occur. The detail geology of the area is not known.

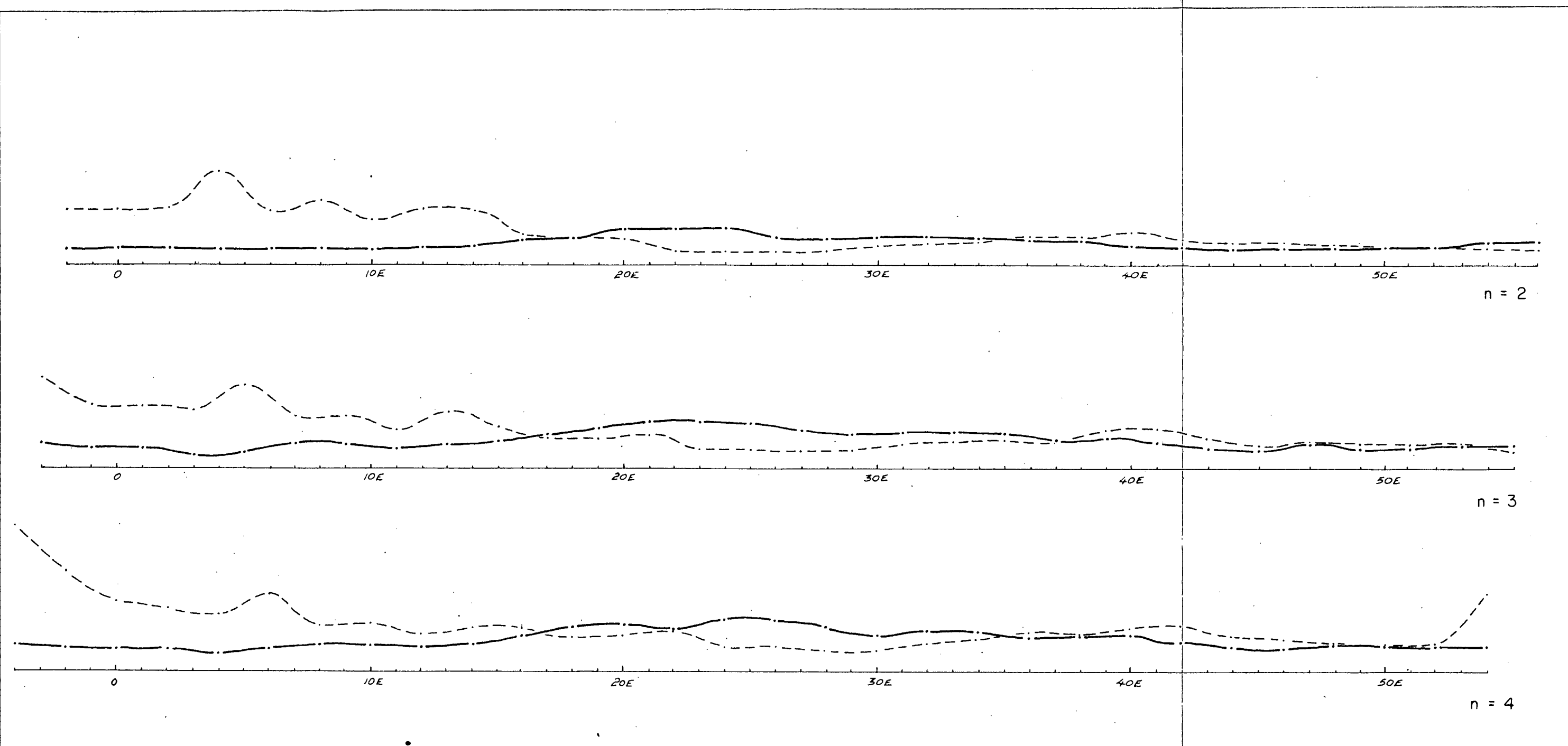
## SURVEY AND EQUIPMENT

The work was carried out on a grid laid out and cut by Amex Exploration Services, of Kamloops, with grid lines 800 feet apart.

The ground magnetic survey used a Barringer Nuclear Precession magnetometer GM-102A, which is a total field instrument of  $\pm 10$  gamma accuracy over the whole range. Readings were taken every 100 feet, or less where necessary.

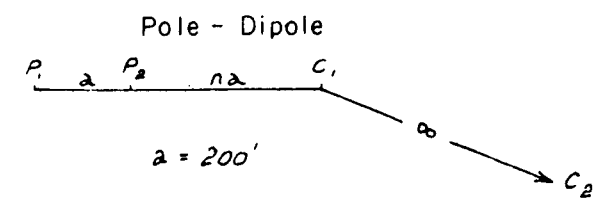
The induced polarization survey employed a Hunttec 7.5 KW pulse type transmitter, and a 200 series receiver. Readings were taken at 200 foot station intervals. The electrode array used was a pole-dipole with an 'a' - spacing of 200 feet and  $n=2$  for a distance of 400 feet between current and the near potential electrodes. The direction of traversing was from east to west with the potential dipole leading. The electrode spacings were determined from an orientation survey carried out on line 16N, using  $n=2, 3$ , and 4 respectively. (dwg. no. 5-225-8) The spacing with  $n=2$  was chosen as the one providing sufficient depth penetration combined with good resolution.  $n=1$  was not attempted because of its lesser penetration.

The geochemical survey consisted of soil sampling at 400 foot station intervals on the grid. The assessment of the soils and data was provided by Barringer geochemical consultant Dr. Peter Bradshaw.



LINE 16N

LEGEND



- (a = 200) Chargeability - Scale 1" = 10 milliseecs
- - - - (a = 200) Resistivity - Scale 1" = 1000 ohm metres

Work undertaken by  
**BARRINGER RESEARCH LTD, Toronto, Canada.**

GREAT NORTHERN PETROLEUM & MINES LTD.		
TIP GROUP, HIGHLAND VALLEY, B.C.		
<b>INDUCED POLARIZATION &amp; RESISTIVITY ORIENTATION</b>		
POLE - DIPOLE		
SEPT. 1969	Scale 1" = 400'	DWG. 5-225-8



## GEOPHYSICS

### General

The geophysics suggests that most of the property is on the quartz diorites of the Guichon batholith. There is a suggestion that tongues of the overlying volcanics fork down into the property from the north. The resistivities suggest that the rocks are quite shallow to the north with increasing cover to the south.

### Magnetics

Looking at the magnetic profiles (dwg. no. 5-225-5) a number of zones of erratic magnetics may be seen. These occur as broad zones along the west side of the property, in the south-east and in the north-east. As well narrower zones of north-south trending magnetics are seen.

The magnetics of the diorites can be quite erratic and their presence is inferred here. The strong north-south magnetic lineation relates to the general north-south fracturing of the batholith.

A number of zones of comparatively level magnetics appear. One trends NNE from L46<sup>N</sup>S, 30E while another trends north along the base line from L40S. While these could relate to the overlying volcanics, they may simply be less magnetic zones in the diorite or deep troughs filled with glacial till.

The large zone of smooth magnetics seen entering the property at L64N, 20E is more likely of volcanic origin. This zone moves south to about L24N to cover much of the east extensions of lines 24N to 8N. These inferred volcanics may extend in a narrow zone to L40N at 12E. If volcanics do exist here they must be fairly thin as occasional smoothed erratic magnetics from the diorites show through.

## Resistivity

The resistivity profiles (dwg. no. 5-225-2) show similar zoning to the magnetics with the implied north-south fractures being more resistive than their surroundings. The larger areas of erratic magnetics are also more resistive and characteristic of the expected quartz diorite.

A north-west trending structure is indicated by the strong resistivity zone to the north about 30 west. This tendency of the structure to strike to the north-west is evident over much of the northerly part of the grid.

## Chargeability

Several high chargeability zones occur on the property as well as a number of weaker zones. (dwg.no. 5-225-2 & 3) All of these are found in areas of resistivity and magnetic activity suggesting that chargeabilities are found in the rocks of the Guichon batholith. Magnetite causing the erratic magnetics is insufficient to explain the anomalous chargeability response. Low grade metalics such as pyrite localized by faulting is at times inferred. This is notable in the very weak response on the N-W trending structure seen to the N-W in the resistivities; its stronger companion to the west and in the N-S trend of the chargeabilities east and west of the BL to the south.

Three chargeability zones stand out. These are the high on the north end of the base line, the large zone to the north-east and the lower response to the south-east. Their setting is quite clearly quartz diorite although the source is less clear, sulphides, probably pyrite, is the most likely source. In places it must be fairly concentrated as on the north base line response and the north-east response. It is interesting that the peak of this second anomaly trends slightly north-west or with the regional faulting while the main trend of the anomalous zone is north-east, some fault concentration must occur here.

None of these responses has geochemical definition. The north base line response is in an area of known quartz diorite outcrop and is therefore diminished in interest by the lack of geochemical response.

The north-east anomaly may be under some cover; possibly a thin sheet of volcanics; as the magnetics are more subdued. The resulting lack of geochemical response would not hurt its economic potential.

The two anomalous responses may, on magnetic evidence, come to surface although the resistivities suggest otherwise. Without geochemical sampling the source of this response remains in doubt although the similarities between this and the two previous anomalies suggests a common source.

## GEOCHEMISTRY

### Introduction

The whole region dips topographically to the south (Ashcroft - Bethlehem Copper) road and is generally rolling with a local relief of 200-300 feet.

There is good outcrop in the north central part of the property and in the south east corner, but elsewhere the soil cover is continuous. The soil is of two types: (1) In local, but fairly common areas of impeded drainage, the soil is black and organic rich and is generally greater than 2' thick, grading directly into the underlying till or C horizon. (2) The remainder of the area shows a moderate to good podzolic soil development with:-

Well developed, brown-black	A <sub>o</sub> 1" - 6"
Moderate to well/developed, dark brown, sometimes with pebbles and rock fragments	B 3" - 9"
Rock rubble and/or glacial till depending on locality	C 0' - 200'

The soil is generally thin in, or near, areas of rock outcrop but thickens considerably to the south where it reaches an estimated thickness of 200'. In addition, there appears to be one or two deep till-filled troughs crossing the property.

In the north central and south east part of the property the soil is largely residual and the C horizon composed of angular rock fragments. In the south west and south central part of the property the C horizon is a well sorted till containing many well rounded boulders, and is of a transported origin. This till is generally absent in the northern part of the property, but increases in thickness considerably to the south.

## Results

From an examination of the data the following threshold and anomalous values are calculated:-

	<u>Copper PPM</u>
Background	0 - 30
Threshold	30
3rd Order Anomaly	31 - 60
2nd Order Anomaly	61 - 120
1st Order Anomaly	>120

The strongest anomaly is on line 16S from 50W to 20W. (dwg.no. 5-225-7). This anomaly is open to the south but the line immediately to the north shows no values above background. The terms of the contract only allowed sufficient time to supervise the collection of the geochemical samples and therefore it was not possible to examine this specific area after the samples had been analysed. However, in general terms the transported till material is thickening in this direction, and unless a detailed examination of this area shows the till to be locally much thinner at this location, this anomaly is undoubtedly of transported origin, and its source should be sought up slope after a careful examination of the local soil, till and topographic conditions.

The other anomalies generally occur in the north central and north west part of the property where the soil is much thinner and of more local origin. None of these anomalies are particularly significant by themselves, but an examination should be made of them all in the field and preference for follow-up given to anomalies which occur in residual soil and/or coincide with geophysical anomalies. In such cases consideration should be given to the use of detailed soil sampling and/or the analyses for additional elements, such as Hg (to assist in locating mineralization) or Pb/Zn (if the anomaly is thought to be due to a change in geology, and confirmation is sought of this.)

## CONCLUSIONS AND RECOMMENDATIONS

Three major I.P. responses with several weaker I.P. responses have been detected in this area. For the most part these are structurally controlled although trends counter to the north or north-west faulting are apparent.

Full evaluation of the economic potential of these responses would require a detailed geologic investigation and drilling if then warranted.

The geophysics and a cursory examination on the ground suggests that the source of the north-east anomaly is buried with no surface expression. A detailed geologic examination would help to resolve this situation. Given any encouragement or lack of explanation from the geology, this response should be tested by drilling.

Accordingly the following hole is suggested:


Collar L48N -42E directed grid W  
Bearing approx.  $270^{\circ}$ , dip  $45^{\circ}$  to a  
depth of 500 feet.

It must be noted that batholith rock outcropping here would rule out any economic possibilities as the geochemistry is negative.

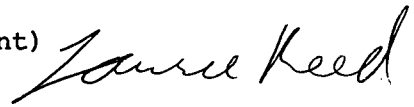
The two anomalies to the south-east may outcrop and should be looked at geologically. If the rocks did outcrop here, soil sampling would resolve their potential.

Two lower grade anomalies have some residual interest although their source would be in low grade sulphides. These are the response peaking on L48N at 46W and the response seen from L32S to 10 at about 12W. Both have higher geochemistry nearby, although the southerly response is under glacial till which would be transported from elsewhere. Some encouragement is seen in the lower resistivities on portion of their responses. A geologic examination would be necessary before any further work could be recommended.

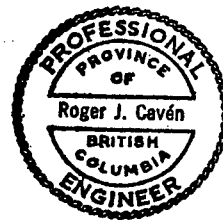
P. Bradshaw,  
Chief Geochemist.



Laurie Reed P. Eng (Ont)  
Senior Geophysicist.



Roger Caven, P. Eng (B.C.)  
Exploration Geophysicist.





BARRINGER RESEARCH LIMITED  
1198 WEST PENDER STREET  
VANCOUVER 1, B.C., CANADA  
PHONE: 604-685-5933

Great Northern Petroleum & Mines Ltd.,  
1110 One Bentall Centre,  
505 Burrard Street,  
Vancouver 1, B.C.

August 21 st, 1969.

Re: The Tip Group of Mineral Claims,  
Kamloops Mining Division, B.C.

The following personnel were working on the Induced Polarization, Ground magnetic and Geochemical surveys on the Tip Group of Mineral Claims, Kamloops Mining Division, B.C., during the period from July 11 th to August 15 th, 1969 :

Roger J. Cavén, Geophysicist - Partychief, Instrument operator	July 11 - Aug 15, 1969
John R. Johnston, Instrument and Transmitter operator, Field helper	July 11 - Aug 15, 1969
David Dixon, Field helper	July 11 - Aug 15, 1969
Terrence Vale, Physicist, Instrument and Transmitter operator	July 11 - Aug 2, 1969
Ernie Lee, Field helper	July 23 - Aug 15, 1969

Yours truly,

A handwritten signature in cursive script that reads 'Roger Cavén'.

Roger Cavén, P.Eng.

Geophysicist.



DOMINION OF CANADA:  
PROVINCE OF BRITISH COLUMBIA.

**In the Matter of**  
THE TIP GROUP OF MINERAL CLAIMS,  
KAMLOOPS MINING DIVISION, B.C.

To Wit:

I, ROGER J. CAVÉN

of Barringer Research Limited, 1198 West Pender Street, Vancouver 1, B.C.

in the Province of British Columbia, do solemnly declare that

1. I am a Geophysicist and I did and I supervised the induced polarization, groundmagnetic and geochemical surveys on the Tip Group of Mineral Claims situated in Highland Valley, Kamloops Mining Division from on or about the 11 th day of July, 1969, to on or about the 15 th day of August, 1969.

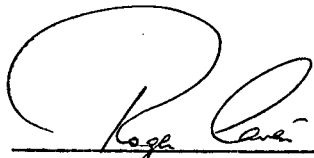
2. The aforesaid work consisted of the following:

27.6 miles of I.P. and groundmagnetic surveys at \$ 350.00	\$	9,660.00
2 days of orientation I.P. survey at \$ 345.00	\$	690.00
Mobilization	\$	550.00
382 soilsamples at \$ 1.00 incl. preparation	\$	382.00
373 analyses for Cu at \$ 1.00	\$	373.00
2 days of consulting by geochemical consultant	\$	300.00
		<hr/>
Total cost	\$	11,955.00

3. All the aforesaid work was done for:  
Great Northern Petroleums & Mines Ltd.,  
1110 One Bentall Centre,  
505 Burrard Street,  
Vancouver 1, B.C.

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City  
of Vancouver, in the  
Province of British Columbia, this 21 st  
day of August, 1969, A.D.

  
\_\_\_\_\_  
Roger J. Cavén, P.Eng.

  
A Commissioner for taking Affidavits for British Columbia or  
A Notary Public in and for the Province of British Columbia. SUB-MINING RECORDER

In the Matter of

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.....

.....

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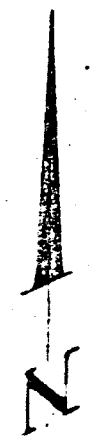
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**Statutory Declaration**  
(CANADA EVIDENCE ACT)

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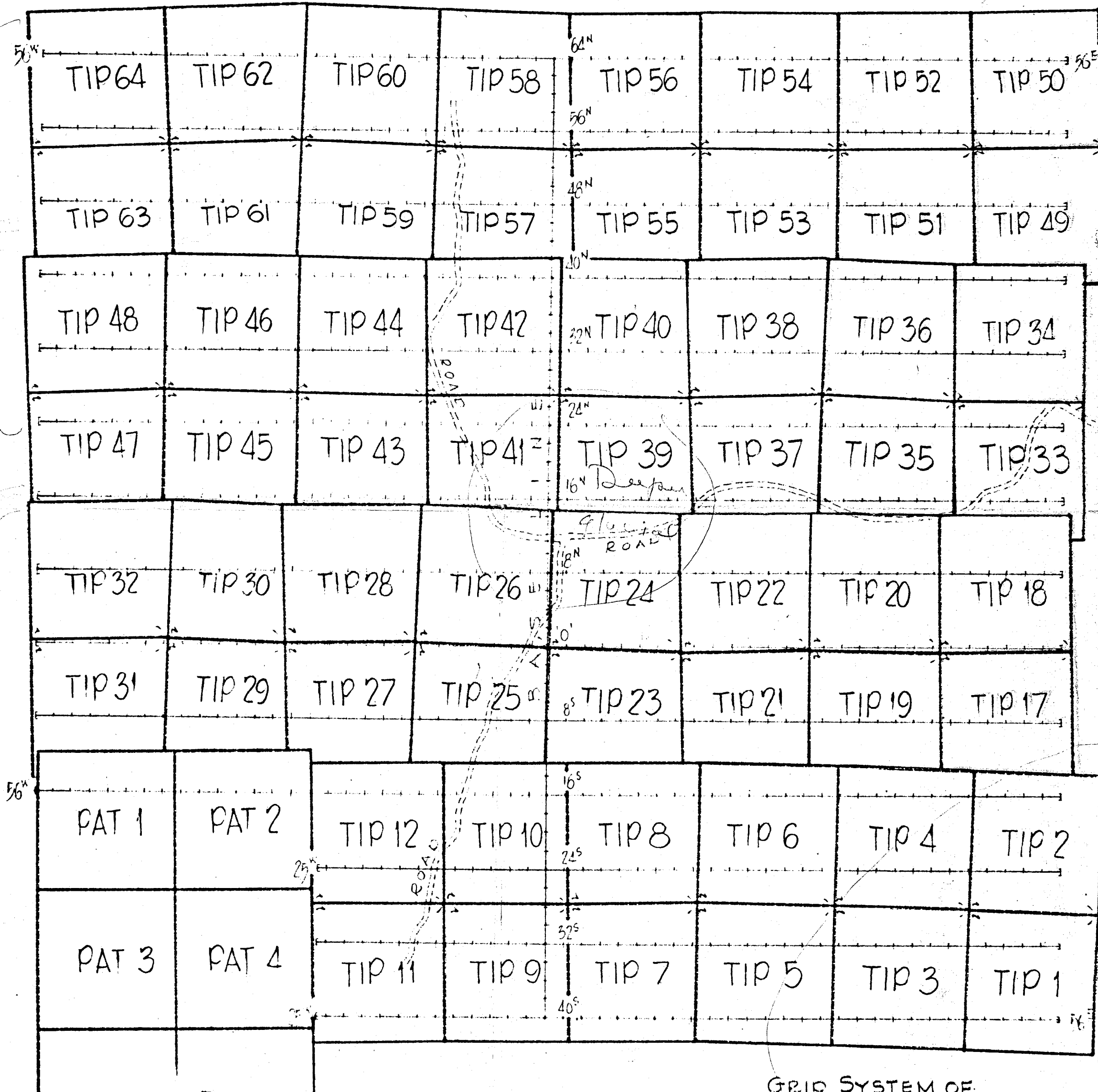
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GLOSSY MTN.



TRUE

6" = 3' good



Sand ground  
Prod. not recorded

Steeper

Shallow

MAG. DEC. 1° 25' 30" E.

2025

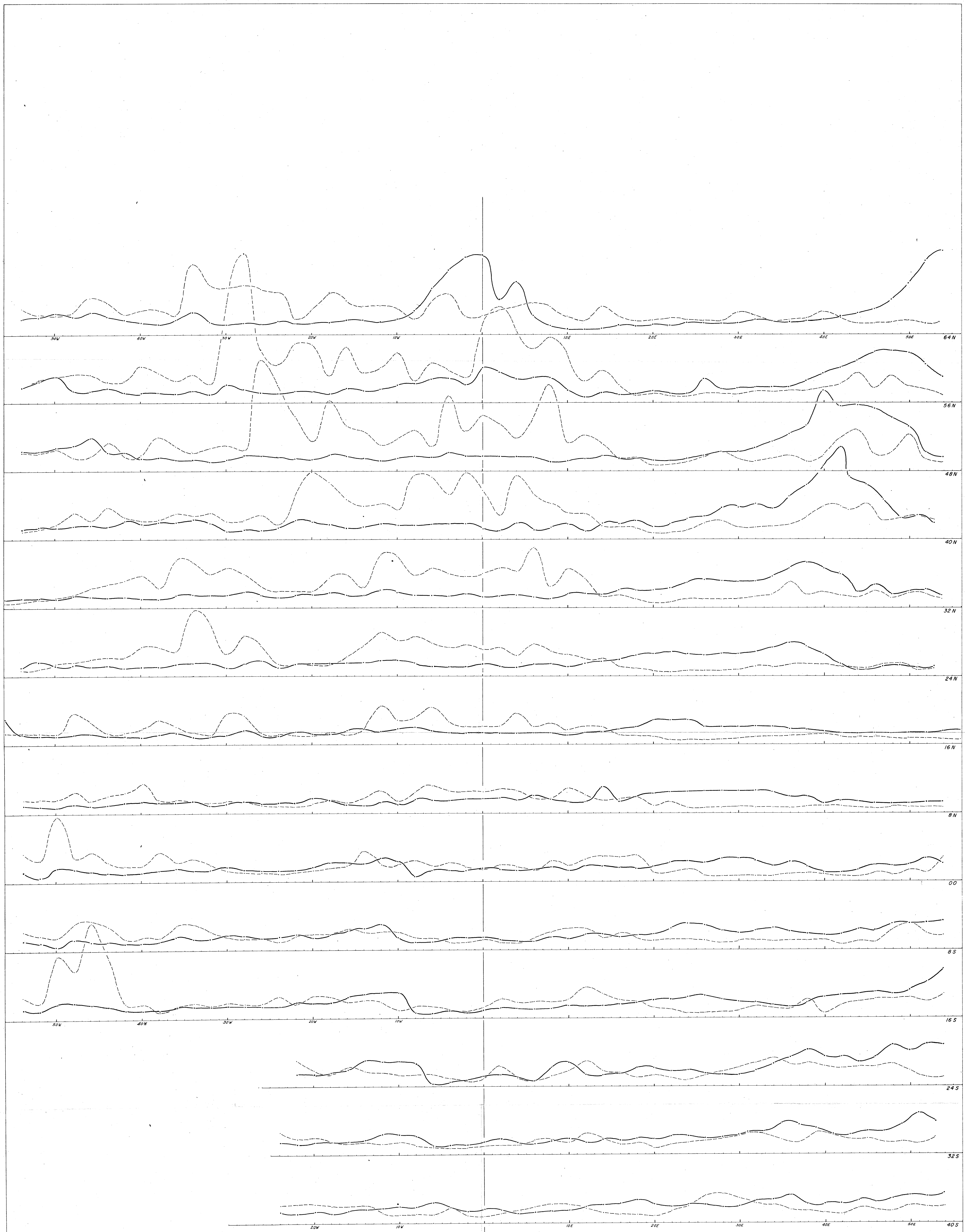
GRID SYSTEM OF  
GREAT NORTHERN PETROLEUMS & MINES LTD.  
TIP GROUP, GLOSSY MTN., HIGHLAND VALLEY, B.C.  
Reference Map 92 I/11 E

SCALE: 1" = 1000'  
AMEX EXPLORATION SERVICES LTD., KAMLOOPS, B.C. JULY, 1969.

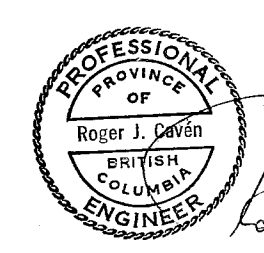
Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT  
NO. 2025 MAP #2

21.8.69

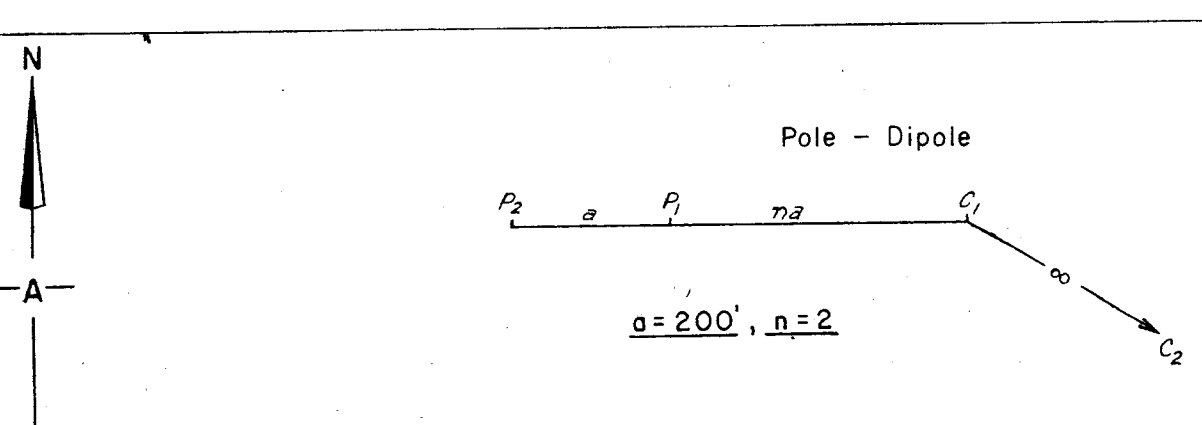
Sent a copy to Barringer Research



Department of  
Mines and Petroleum Resources  
ANNUAL REPORT  
NO. 2025 WMP #3



2025

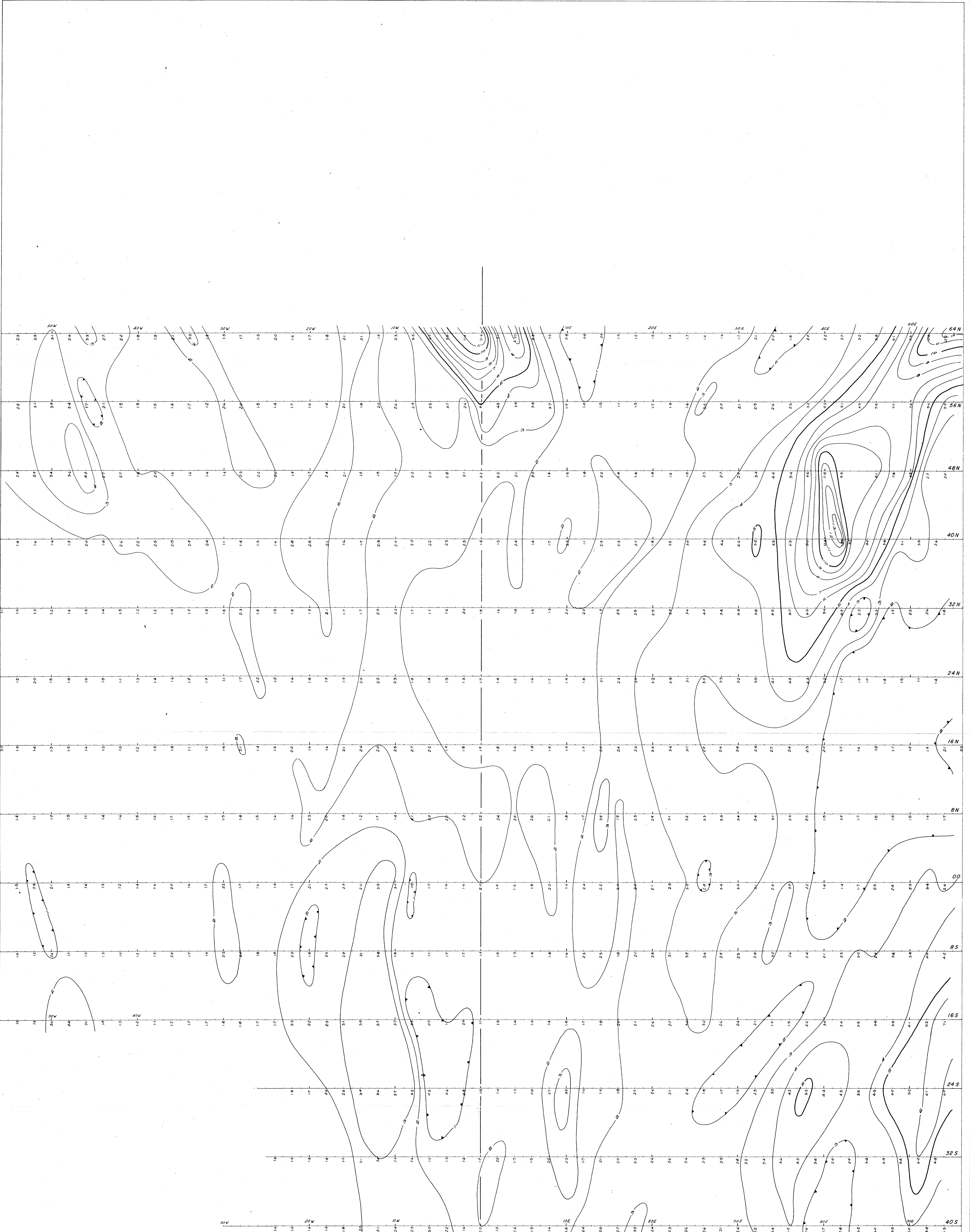


LEGEND

- Chargeability - Scale 1" = 5 millisees
- - - Resistivity - Scale 1" = 1000 ohm metres

Work undertaken by  
BARRINGER RESEARCH LTD., Toronto, Canada

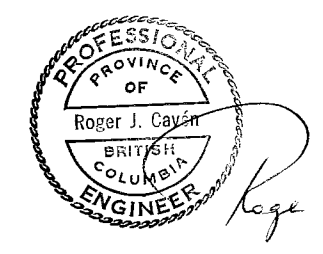
GREAT NORTHERN PETROLEUMS & MINES LTD.		
TIP GROUP - HIGHLAND VALLEY, B.C.		
INDUCED POLARIZATION & RESISTIVITY SURVEY		
POLE - DIPOLE		
SEPT. 1969	Scale 1" = 400'	DWG. 5-225-2



**LEGEND**  
 Contour interval 1 millisecond  
 5 Contour  
 1 Contour  
 Depression

Work undertaken by  
**BARRINGER RESEARCH LTD., Toronto, Canada**

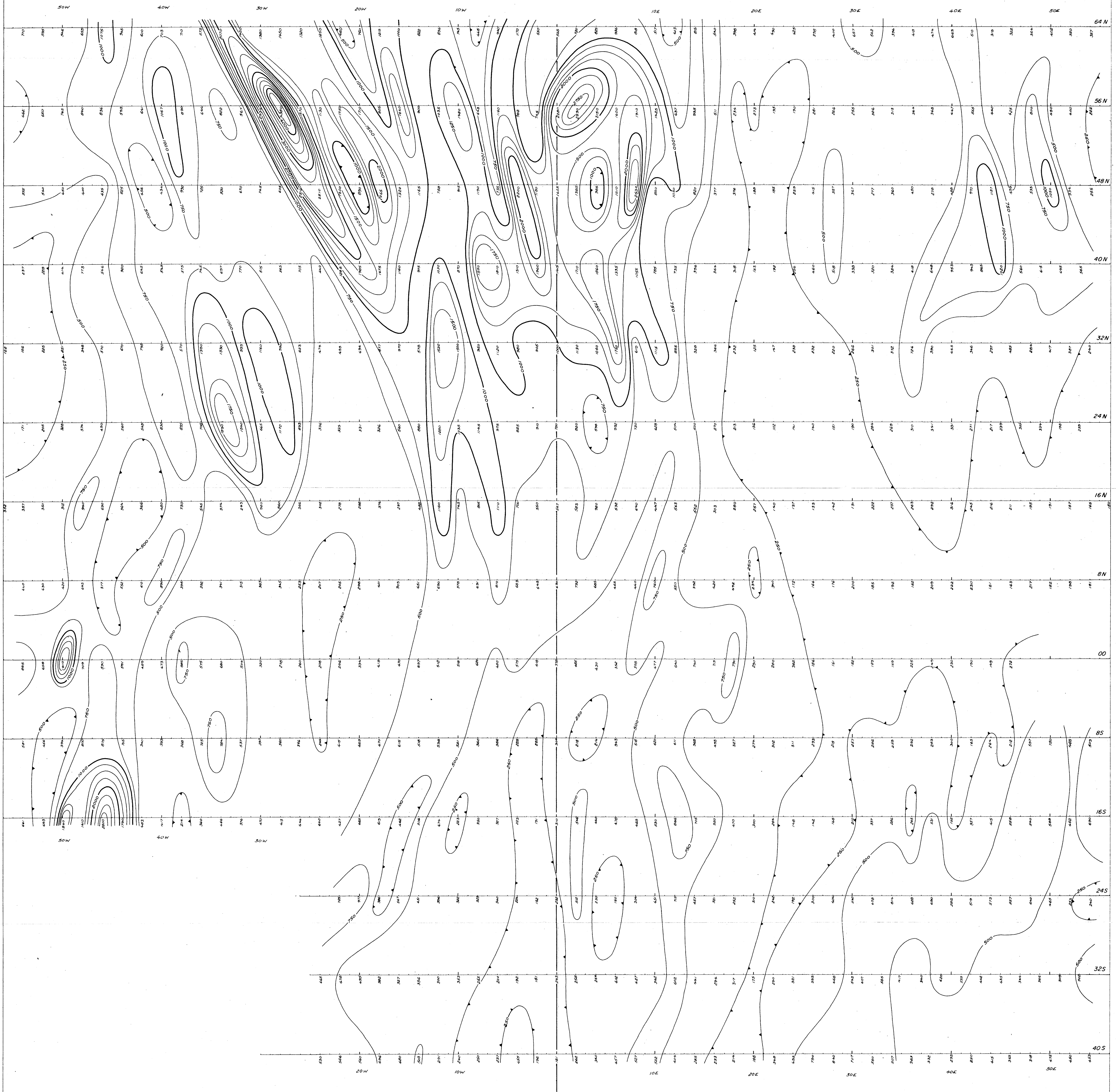
Department of  
 Mines and Technical Surveys  
 Geological Survey of Canada  
 No. 2025 Map #44



2025

GREAT NORTHERN PETROLEUMS & MINES LTD.	
TIP GROUP - HIGHLAND VALLEY, B.C.	
CHARGEABILITY CONTOURS	
a = 200' n = 2	
SEPT. 1969	Scale 1" = 400' DWG. 5-225-3





**LEGEND**

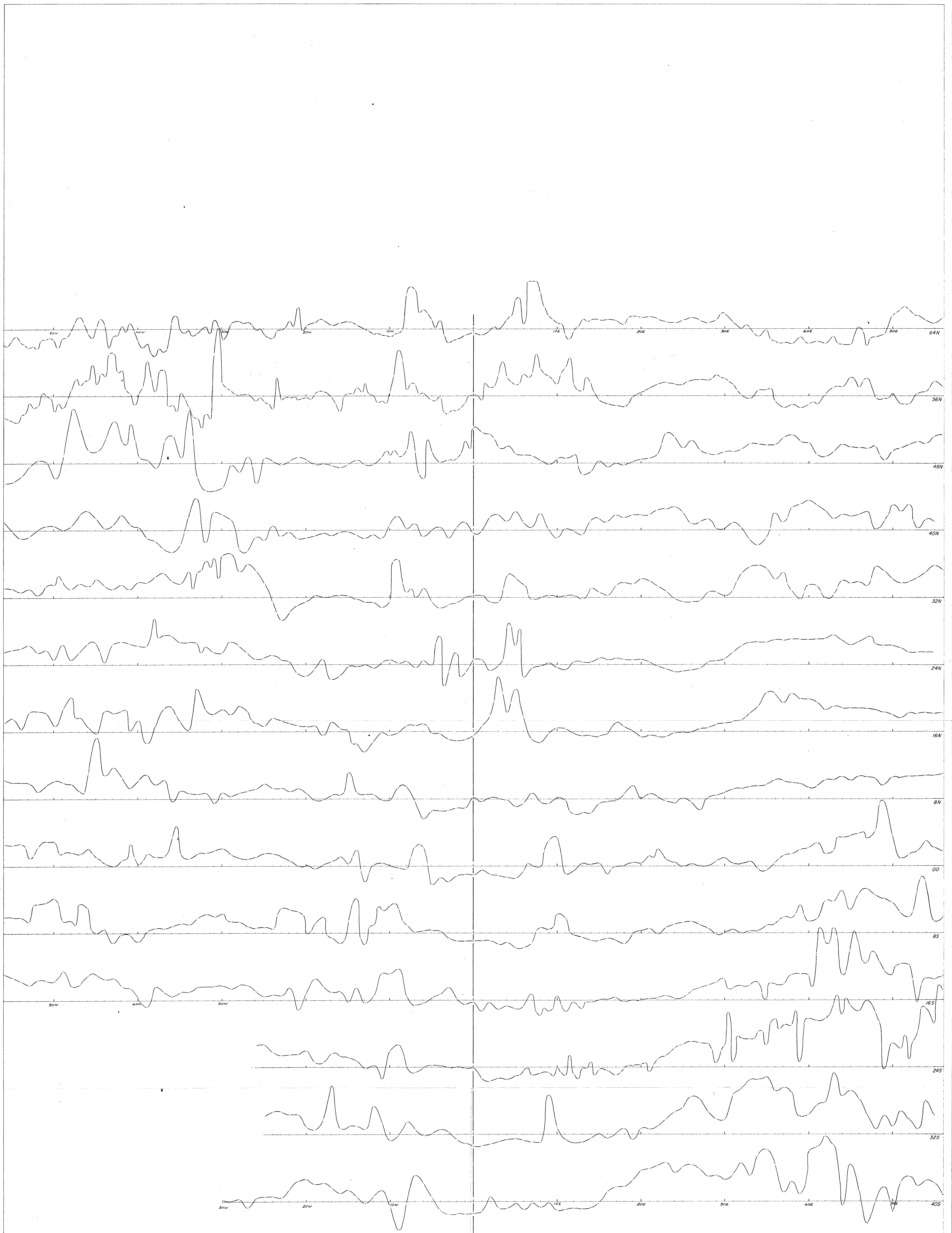
- Contour interval 250 ohm metres
- 1000 contour
- 250 contour
- Depression

Department of  
 Mines and Petroleum Resources  
 Assessment Report  
 N.C. 225 M.S.P. #5

2025

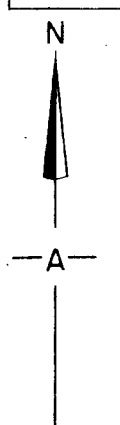
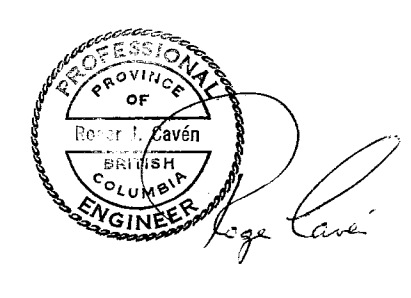
GREAT NORTHERN PETROLEUMS & MINES LTD.	
TIP GROUP - HIGHLAND VALLEY, B.C.	
RESISTIVITY CONTOURS	
a = 200'	n = 2
SEPT. 1969	Scale 1" = 400' DWG. 5-225-4

Work undertaken by  
**BARRINGER RESEARCH LTD., Toronto, Canada**



BASE LINE

Department of  
 Mines and Petroleum  
 INVESTMENT ACT  
 NO. 2025 M.P. #6



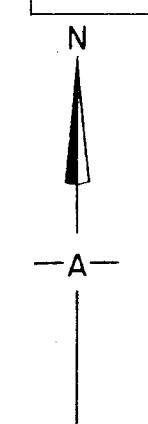
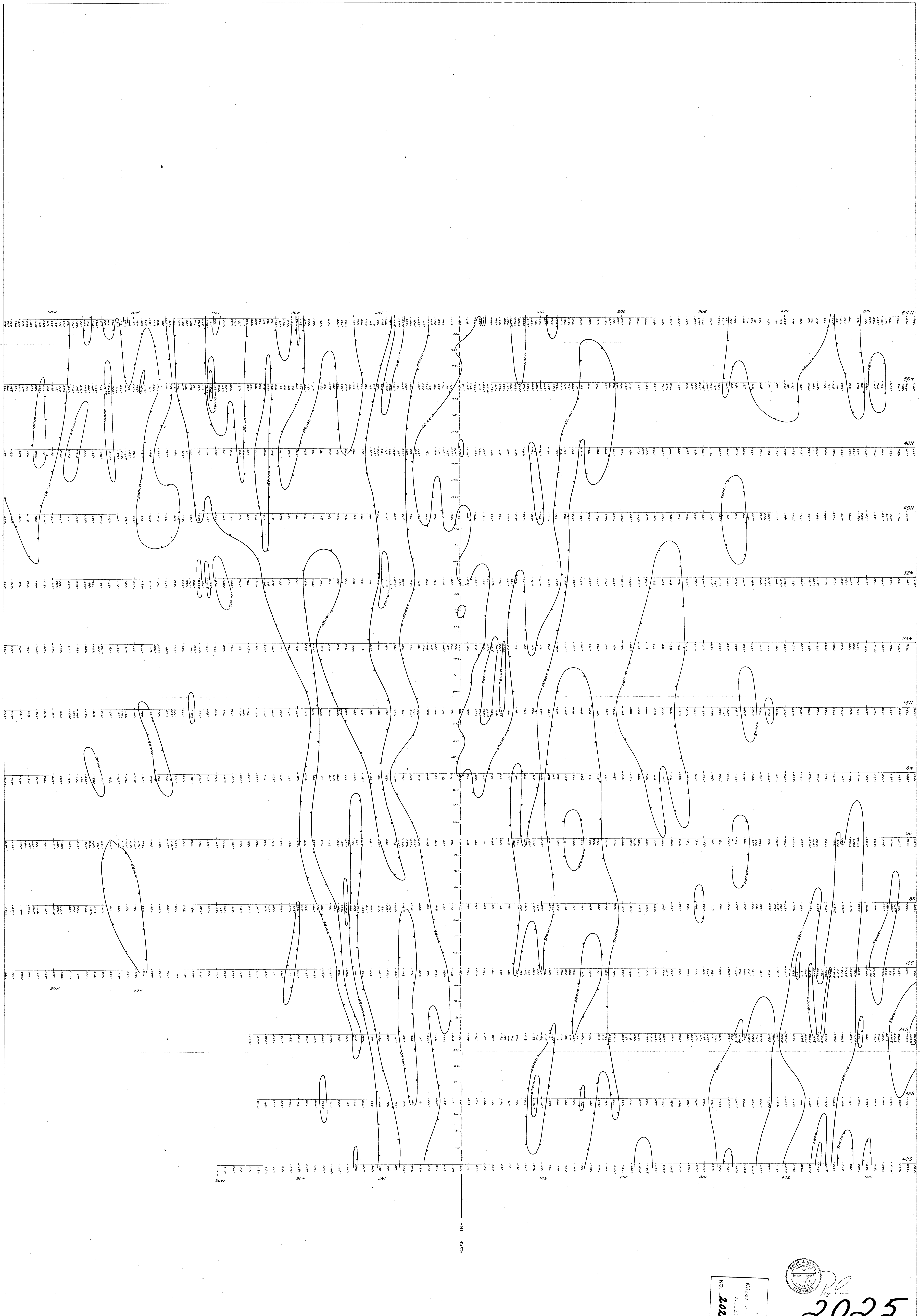
LEGEND  
 Profile - scale 1" = 100m  
 Base level 58000m

2025

Work undertaken by  
 BARRINGER RESEARCH LTD., Toronto, Canada

GREAT NORTHERN PETROLEUMS & MINES LTD.		
TIP GROUP - HIGHLAND VALLEY, B.C.		
TOTAL INTENSITY MAGNETIC PROFILES		
SEPT. 1969	Scale 1" = 400'	DWG. 5-225-5





**LEGEND**  
 Contour interval - 1000 ft  
 Depression   
 Values above datum of 57000 ft

Work undertaken by  
**BARRINGER RESEARCH LTD., Toronto, Canada**

Department of  
 Mines and Petroleum Resources  
 Assessment Report  
 NO 2025  
 MAP #7

*2025*

GREAT NORTHERN PETROLEUMS & MINES LTD.  
 TIP GROUP - HIGHLAND VALLEY, B.C.  
 TOTAL INTENSITY MAGNETIC  
 CONTOURS  
 SEPT. 1969 Scale: 1" = 400' DWG. 5-225-6





Total Copper values in parts per million

Department of  
Mines and Technical Resources  
ASSESSMENT REPORT  
NO. 2025 AND #8

*Regal*  
**2025**

GREAT NORTHERN PETROLEUMS & MINES LTD.

TIP GROUP - HIGHLAND VALLEY, B.C.

GEOCHEMICAL SOIL SURVEY  
COPPER

SEPT. 1969 Scale 1" = 400' DWG. 5-225-7

Work undertaken by  
BARRINGER RESEARCH LTD., Toronto, Canada