

GEOLOGICAL AND GEOPHYSICAL ASSESSMENT REPORT

MARA MINERAL CLAIMS

SIMILKAMEEN MINING DIVISION

49° 35' North Latitude

120° 55' West Longitude

NTS 92H/10

for

MARA MINERALS INC.  
8-784 Thurlow Street,  
Vancouver, B.C.  
V6E 1V9  
OWNER & OPERATOR

by

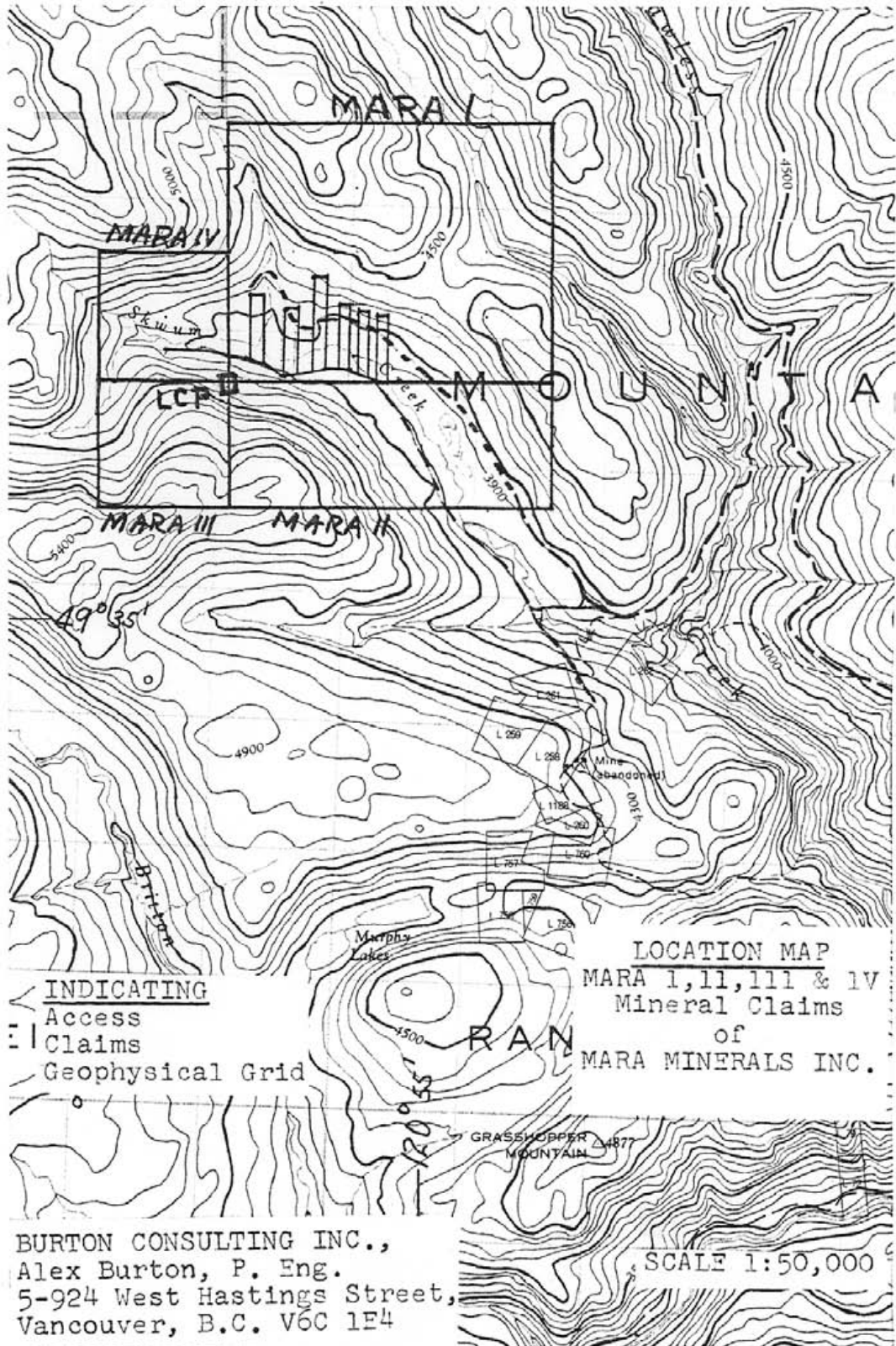
Alex Burton, P. Eng.  
Burton Consulting Inc.  
5-924 West Hastings Street,  
Vancouver, B.C.  
V6C 1E4

JUNE 29, 1978

MINING DIVISION
7/1/78
6824
NO.

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BURTON CONSULTING INC.,  
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## INTRODUCTION

### General

The claims are 13 km. N.W. of the village of Tulameen and can be reached by travelling about 25 km. on the Lawless-Britton Creeks main access logging road, then turning north-westerly for about 3 km. along a side road after crossing Skwum Creek.

The L.C.P.'s of the Mara 1,11,111 and 1V Mineral Claims are 275 metres south and 250 metres west of the junction of Irish Creek with Skwum Creek at about the 1,300 metre (4,225 feet) elevation.

Clearcut logging has been completed on about half of the area of the claims with the slash burned and reforestation completed as recently as June, 1978. The network of logging roads and bulldozer trails facilitates easy access to most parts of the logged off areas. There is a paucity of natural outcrop in the valleys and lower slopes. The logging activity has exposed only a little more bedrock.

### HISTORY

Although there is no record of it, the prospect probably was discovered by prospectors around the turn of the century when, it is assumed, the adits in Irish Creek were driven. The prospect is close to the old horse trail which goes from the Independence Camp in the north to the Whipsaw Creek Camp

in the south following the contact between the Nicola Group and the Eagle granodiorite.

In 1969 prospector S. Young discovered the old adit with the mineralized porphyry and staked the ground for Copper Range Exploration Company Ltd. Young discovered the adit by following up a regional geochemical survey for the company. Copper Range optioned some adjacent claims, named the prospect the Irish Britco Property, and explored and drilled during 1970 and 1971.

The Copper Range work was done under my immediate supervision. After the Company closed their exploration offices, title was turned over to the prospector who optioned it to Rio Tinto Canadian Exploration Ltd. They explored and drilled during 1973 and 1974. The option was dropped, the claims later lapsed and then the ground was staked by Cities Services Minerals Corporation. Cities Services did a little work and then allowed their claims to lapse. Recently Larry Sostad staked the Mara 1 Mineral Claim of 20 units and recorded a Bill of Sale on January 24, 1978 to Mara Minerals Inc.

This program of work done for the owner of property explored in the direction recommended in the Riocanex Report of April, 1974 for better grade copper-molybdenum mineralization.

SUMMARY  
Geophysical Survey

8,325 kilometres of line were surveyed with a Phoenix vertical field magnetometer MV 1 on the southwestern half of the Mara 1 Mineral Claim.

Geological Survey

The southwestern half of the Mara 1 Mineral Claim was mapped in detail and carefully searched for outcrops at a scale of 1:5000 over an area of roughly 2 square kilometres at the same time the geophysical survey was carried out.

Grid Established

8,325 kilometres of grid lines was established with compass, topofill, and altimeter. A main logging road was used as the control base line measured west from a point 1,320 metres east of the L.C.P. for Mara 1 Mineral Claim. This point is a large tree well blazed, flagged and marked "320 metres" at the edge of the logging road.

The N-S grid lines were run every 100 metres west from the starting point with stations at 50 metre intervals measured north from the control line along the road. The grid established is plotted at a scale of 1:5000.

ECONOMIC GEOLOGY

The Mara 1 prospect (Irish Britco) is

similar to the Whipsaw Creek, Law's Camp and the Independence Camp which are some of the better known occurrences of mineralization associated with the porphyry (or the "Big Dyke" as it was referred to in old reports), which occurs intermittently along the contact between the Egle granodiorite and the Nicola Group for a total length of 50 kilometres. Copper, copper-molybdenum, molybdenum, and silver-lead-zinc types of mineralization appear to be related to the porphyry.

Work on the prospect by Copper Range and the succeeding explorers has been based on the search for an open pit "porphyry copper" style of orebody with values in copper plus molybdenum. Zones of hydrothermal alteration with chalcopyrite and molybdenite mineralization have been found in both porphyry and Nicola rocks in several places on the Mara 1 Claim.

Exploration to date has discovered several bodies of altered and mineralized porphyry which are too low grade to be economic. Several adjacent and nearby areas of Nicola rocks have been discovered which are also altered and mineralized, but again too low grade to be economic.

Outcrop is minimal and overburden is often deep in critical areas so extrapolation is difficult, however, there does appear to be a relationship between

the number, and more importantly, the width of porphyry bodies to mineralization. Where there is more and wider porphyry there is more alteration and mineralization. The relationship between mineralization and its structural position to the Eagle granodiorite or to the smaller biotite pyroxenite appears to be minor.

#### CONCLUSIONS (Geological)

The most logical place, as yet untested, to find a large body of porphyry is just below the confluence of Irish and Skwum Creeks on the south and west side of Skwum Creek. Here in the valley floor no outcrop is known and an area large enough to hold an orebody remains untested.

It is just east of this area where most of the previous drilling has been done and the greatest amount of porphyry, alteration and mineralization has been found. Geochemistry is not recommended for the area of interest. Trend studies of past work show that alteration, width of dykes, percentage of dykes to country rock and amounts of mineralization all increase towards the target area. Several workers feel that the target area should be tested for instance, McClintock in his conclusions says:

- 1) "Drilling indicated that altered mineralized feldspar and biotite porphyry dykes occupy a greater area of the property than established by the previous owner of the property;



- 2) although no economic amounts of mineralization has been intersected, trends of alteration and grades indicate a promising target area straddling Skwum Creek."

The work done recently included topographic, and geological mapping along with a magnetometer survey to see if drill targets could be discerned and outlined. The objectives were:- to relate the magnetometer survey to trends of alteration; to see if the postulated N75° W fault along Skwum Creek might exit; and to find out if there is any apparent offset of the Eagle granodiorite contact across the fault.

Detailed mapping of the contact in the survey area shows the N30° W regional strike of the Eagle-Nicola contact is valid. However, an attitude taken roughly 100M south of base line station SW is N20° W/70° W. About 1,000 metres north of the Mara 1 L.C.P. at elevation 4,180 feet, the foliation in the Eagle granodiorite strikes N34° W and dips 80° W. Man made and natural outcrops of Eagle granodiorite are so positioned that an apparent left handed offset of 300 metres seems to fit the best. Foliation in the Eagle granodiorite maintains the regional attitude and tends to support the idea of offset faulting rather than a flexure.

Nicola sediments next to the Eagle granodiorite have a N30° W strike south of Skwum Creek, but are faulted and striking both at N45° W in the man made

exposure near the 11W line at 5N.

Because only a few more outcrops were found since the earlier work was completed the geological conclusion can only be that it seems reasonable that the N75<sup>o</sup> W fault exists and there is about 300 metres of left hand offset on it.

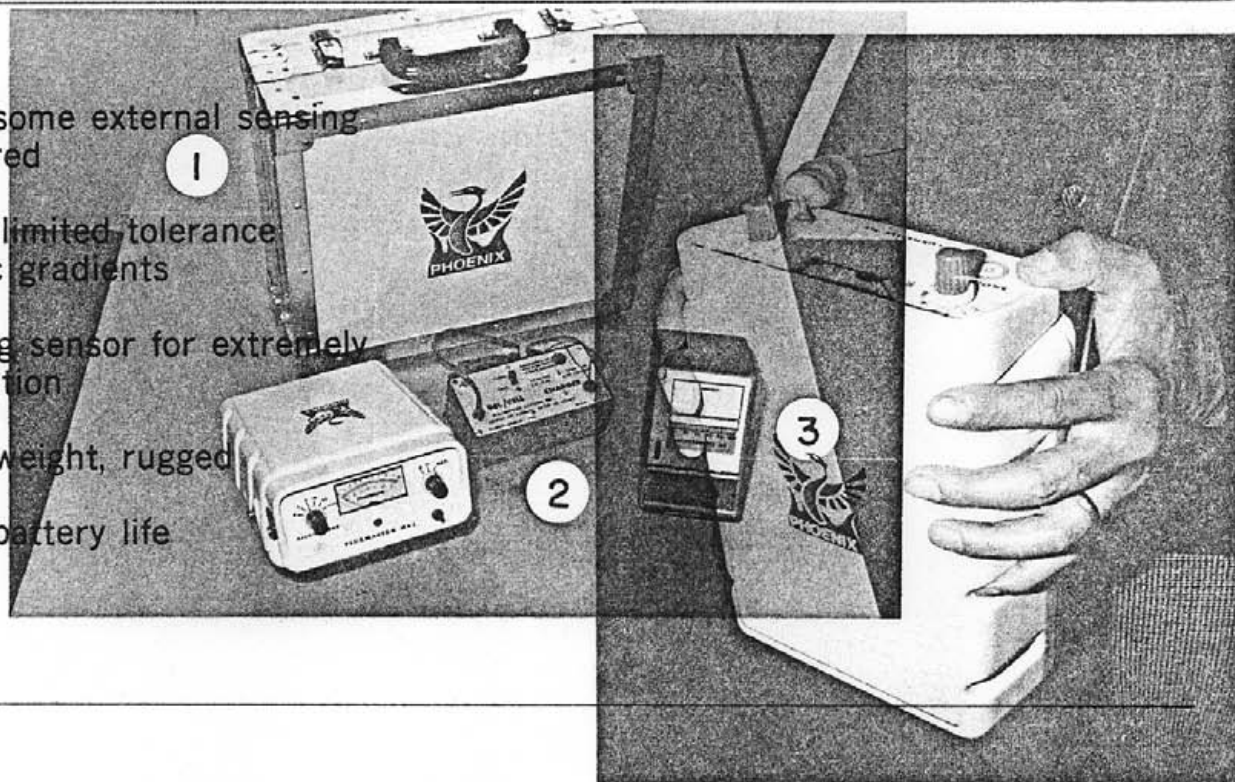
Difficulties were encountered in finding and accurately tying in the collars of the holes drilled in 1973 and 1974. Surveying differences of distance and bearing made detailed positioning difficult. Drill holes 74-1 and 74-4 were found, the probable locations of holes 73-2 and 73-1 were found, but the position given for hole 74-3 seems unlikely and no probable drill hole location could be found.

## GEOPHYSICS Introduction

The magnetic survey was conducted with a Phoenix Geophysics Limited MV-1 Vertical Field Magnetometer. A specification sheet provided by the manufacturer is enclosed with this report. The magnetometer was set at a convenient relative value 1850 gammas, of the vertical magnetic field at the chosen base station OW on the base line (ie: 1,320 metres east of the Mara 1 L.C.P.) Tie ins to the base were made upon return to the main base line after running out and returning on a pair of lines. Times were recorded for each reading and check in readings.

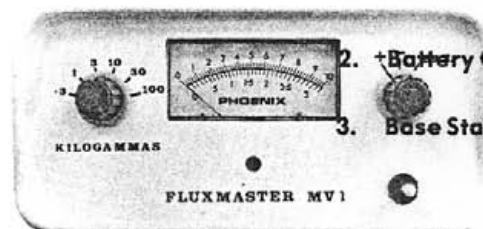


- No cumbersome external sensing head required
- Virtually unlimited tolerance to magnetic gradients
- Self-levelling sensor for extremely rapid operation
- Small, lightweight, rugged
- Six month battery life
- Low cost



1. Carrying Case : Heavy duty plastic and aluminum 30 x 10 x 35 cm (12 x 4 x 14 inches)

Specifications



Accommodates magnetometer, battery charger and base station recorder.

**Sensing Head** : Rugged self-levelling unit gives vertical field for magnetometer up to 10° off vertical.

**Meter Display** : 110 volt 50 - 60 Hz or 220 volt 50 Hz.

**Sensitivity** : 5 gammas on 300 gamma range.

**Latitude Adjustment** : Rustrak model 288 dry paper recorder plus connecting cable. ± 100,000 gammas, with easily accessible internal control.

**Other Output** : Chart recorder output provided. Input plug for 500 gammas full scale sensing head also provided.

**Operating Temperature** : -40°C to +60°C

**Temperature Drift** : 2.5 cm per hour to 60 cm per hour chart speed. Less than 30 gammas over operating temperature range.

**Battery Drain** : Batteries inside magnetometer will provide 60 hours continuous base station operation. A 12 volt automobile battery may be used to provide much longer recording time.

**Batteries** : 2 x 6V rechargeable gel-cells provide six months operation. Gel-cells chargeable from 12 volt battery or car charger.

**Case** : Plastic, high impact resistant.

**Dimensions** : 17 x 8.5 x 25 cm (7 x 3.5 x 10 inches)

**Weight** : With batteries 1.75 kg (3.9 lb)



PHOENIX GEOPHYSICS LIMITED

Geophysical Consulting and Contracting, Instrument Manufacture, Sale and Lease.

Head Office: 200 Yorkland Blvd. Willowdale, Ont., Canada, M2J 1R6. Tel: (416) 493-6350  
 1424 - 355 Burrard St. Vancouver, B.C., Canada, V6C 2G8. Tel: (604) 684-2285  
 2430 N. Huachuca Dr., Tucson, Arizona, U.S.A. 85705. Tel: (602) 884-8542

Tie in readings were consistent so no diurnal corrections were needed. A minor malfunction in the instrument necessitated taking several readings at each station and discarding the occasional spurious value. Values are plotted for each station on the base map and a separate map shows the contours at 100 gamma intervals.

A portion of the helicopter magnetic survey previously flown by Scintrex is enclosed with the report. The survey was flown on northeast lines which pick up the regional geology but tend to downplay any crosscutting features. Thus it was decided to run the ground survey normal to the airborne and concentrate on the detailed features.

The contoured values give a regular pattern consistent with the topography, surficial materials, and the underlying geology.

#### INTERPRETATION

Generally the detailed ground survey agrees with the airborne survey in that values are lower in Skwum Creek Valley east of Irish Creek and rise gradually to the northeast as the buried hornblende-biotite pyroxenite intrusive is approached. The zones of lows picked up by the ground survey show only as a flexure in the air survey contour lines.

The ground survey can be separated into a series of four N30°W panels plus an east west linear and two separate lows.

The first panel extending from the west goes east to nearly line 7W on the base line. This panel consists of 1300 to 1500 gamma reading and reflects the Nicola Group arkoses and greywackes in contact with the Eagle granodiorite, which is magnetically similar.

The second panel represents a mix of largely Nicola Group volcanic rocks with only some sediments from 7W to 4W.

From 4W eastward the magnetics reflect the more complex picture of Nicola Group sediments and volcanics, intrusive quartz feldspar porphyry, plus alteration. The two moderate lows in this panel may represent areas of greater alteration.

Readings on the northeast edge of the survey increase rapidly and reflect the influence of the hornblende-biotite pyroxenite to the east.

The sequence of lows that run east just north of the road baseline and along Skwum Creek could represent the postulated N75° W fault and associated alteration.

#### ECONOMIC INTERPRETATION

In panels 2 and 3 there are three previously drilled holes that intersected subeconomic mineralization and alteration. Each of them are in areas at the 1700

gamma level. More alteration and possibly better mineralization can be expected in the adjacent magnetically low area. The two lows centered on lines 4' and 2' bear investigation as possible centers of mineralization.

The low along the postulated fault is also a potential host for mineralization and also deserves investigation.

### CONCLUSIONS

The magnetometer survey accurately outlined geology where it was known in detail. In areas of less geological control the magnetometer survey agreed with the geological models proposed by previous workers.

Several areas were outlined for future drilling targets.

### RECOMMENDATIONS

Three holes should be drilled.

- one on line 2' at 2N
- one on line 4' at 3N
- one on line 3' at 1N

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Cities Service Minerals Corporation

C E R T I F I C A T E

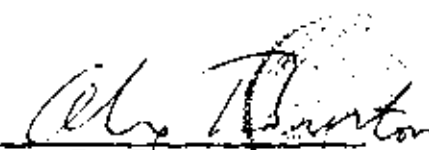
I, Alex Burton, DO HEREBY CERTIFY:

that I am a Consulting Geologist with an office at  
5-92<sup>nd</sup> West Hastings Street, Vancouver, B.C., V6C 1E4.

I FURTHER CERTIFY THAT:

- (1) I am a graduate from the University of British Columbia and hold a B.Sc. degree in Geology.
- (2) I am a Professional Engineer registered with the Association of Professional Engineers of British Columbia, Certificate No. 6262, and a Fellow of the Geological Association of Canada.
- (3) Since 1954 I have been engaged in mineral exploration work, both for major mining companies in senior positions and as an independent consultant.
- (4) The information contained in this report was obtained from my having supervised the original work by Copper Range Exploration Company Ltd. on the property, and personally doing this recent work.
- (5) I have no direct or indirect interest whatsoever in either the property or securities of Mara Minerals Inc., or its affiliates, nor do I expect to receive any such interest.

Dated at Vancouver, British Columbia, this  
29th day of June, 1978.

  
\_\_\_\_\_  
Alex Burton, P. Eng.  
Consulting Geologist



C O N S E N T

I consent to the use by Mara Minerals Inc. of my Geological and Geophysical Assessment Report on the Mara 1 Claim, Skeum Creek, Similkameen Mining Division, B.C., dated June 29, 1978 in any statement of material facts or prospectus of Mara Minerals Inc. and the filing of such a report with the Vancouver Stock Exchange and/or Superintendent of Brokers for British Columbia.

Dated 29th of June, 1978.



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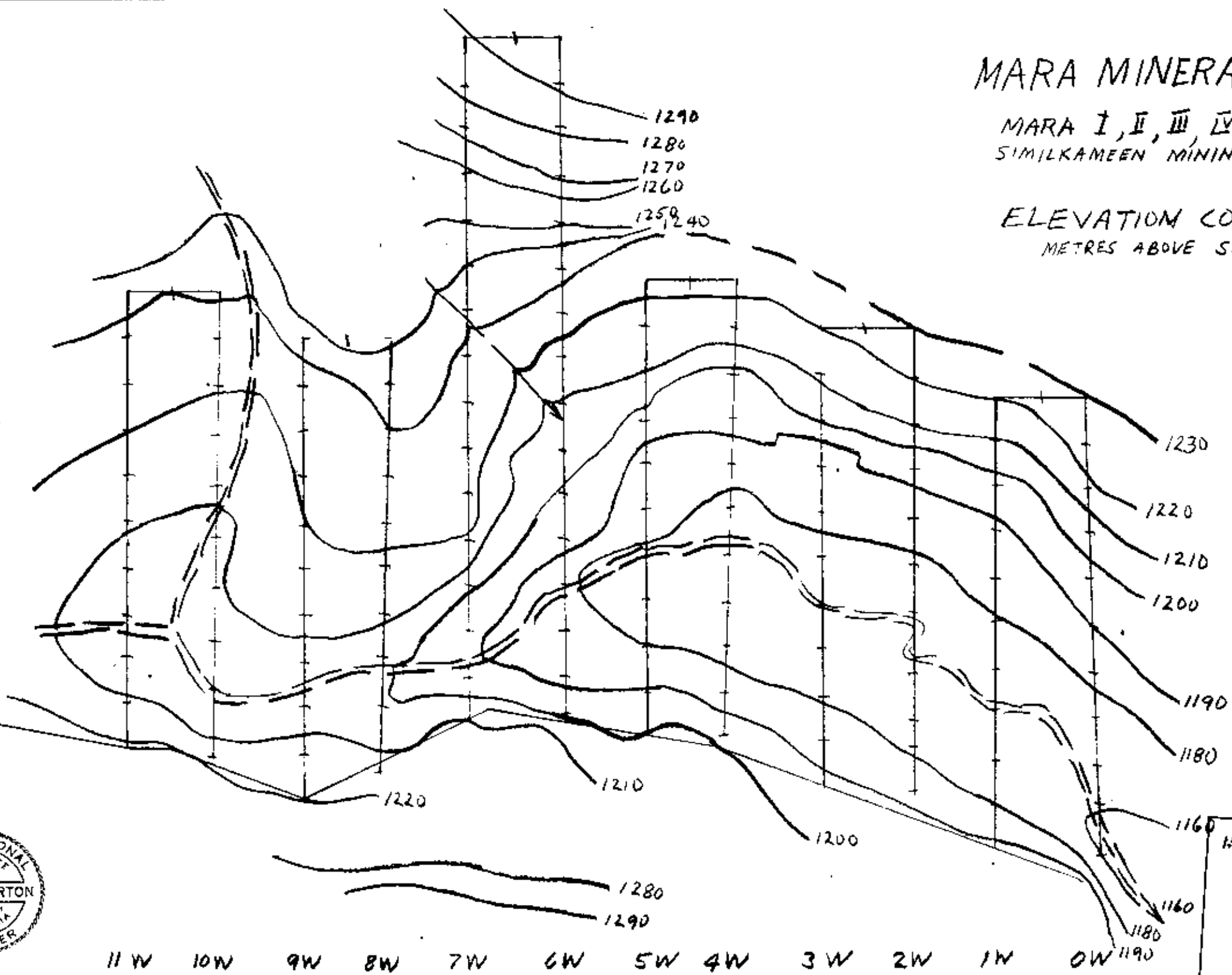
Alex Burton, P. Eng.  
Consulting Geologist

TRUE  
N

MARA MINERALS INC.

MARA I, II, III, IV CLAIMS  
SIMILKAMEEN MINING DIVISION

ELEVATION CONTOURS  
METRES ABOVE SEA LEVEL

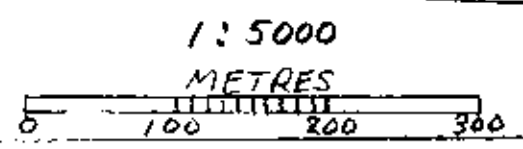


11 W 10 W 9 W 8 W 7 W 6 W 5 W 4 W 3 W 2 W 1 W 0 W

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
NO. 6824

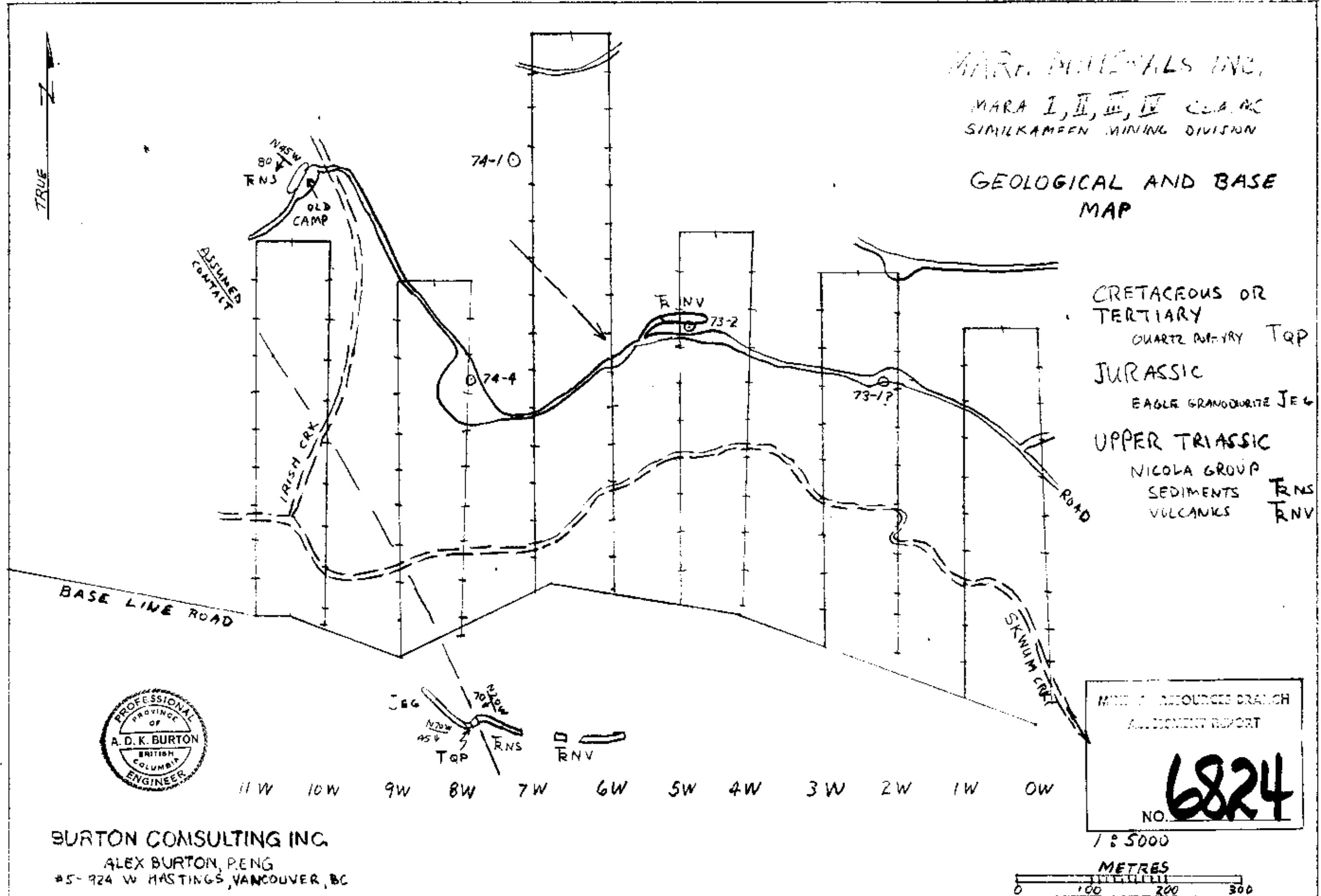
BURTON CONSULTING INC.

ALEX BURTON, P. ENG.  
#5-924 W HASTINGS, VANCOUVER B.C. JUNE 1978



MINE INVESTMENTS INC.  
 MARA I, II, III, IV CLAIMS  
 SIMILKAMEN MINING DIVISION

GEOLOGICAL AND BASE  
 MAP



TRUE  
 ↑

N45W  
 80°  
 RNS  
 OLD CAMP

74-10

DEMINED CONTACT

IRISH CRK

74-4

RNV  
 73-2

73-1?

ROAD

CRETACEOUS OR TERTIARY  
 QUARTZ VEINRY TQP  
 JURASSIC  
 EAGLE GRANODIORITE JEG  
 UPPER TRIASSIC  
 NICOLA GROUP  
 SEDIMENTS RNS  
 VOLCANICS RNV

BASE LINE ROAD

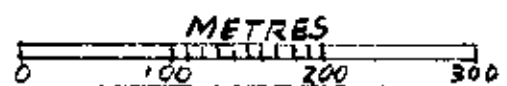
SKWUM CRK



11W 10W 9W 8W 7W 6W 5W 4W 3W 2W 1W 0W

MINING RESOURCES BRANCH  
 ALLOCATION REPORT  
 NO. 6824

1:5000



BURTON CONSULTING INC.  
 ALEX BURTON, P. ENG.  
 #5-924 W HASTINGS, VANCOUVER, BC

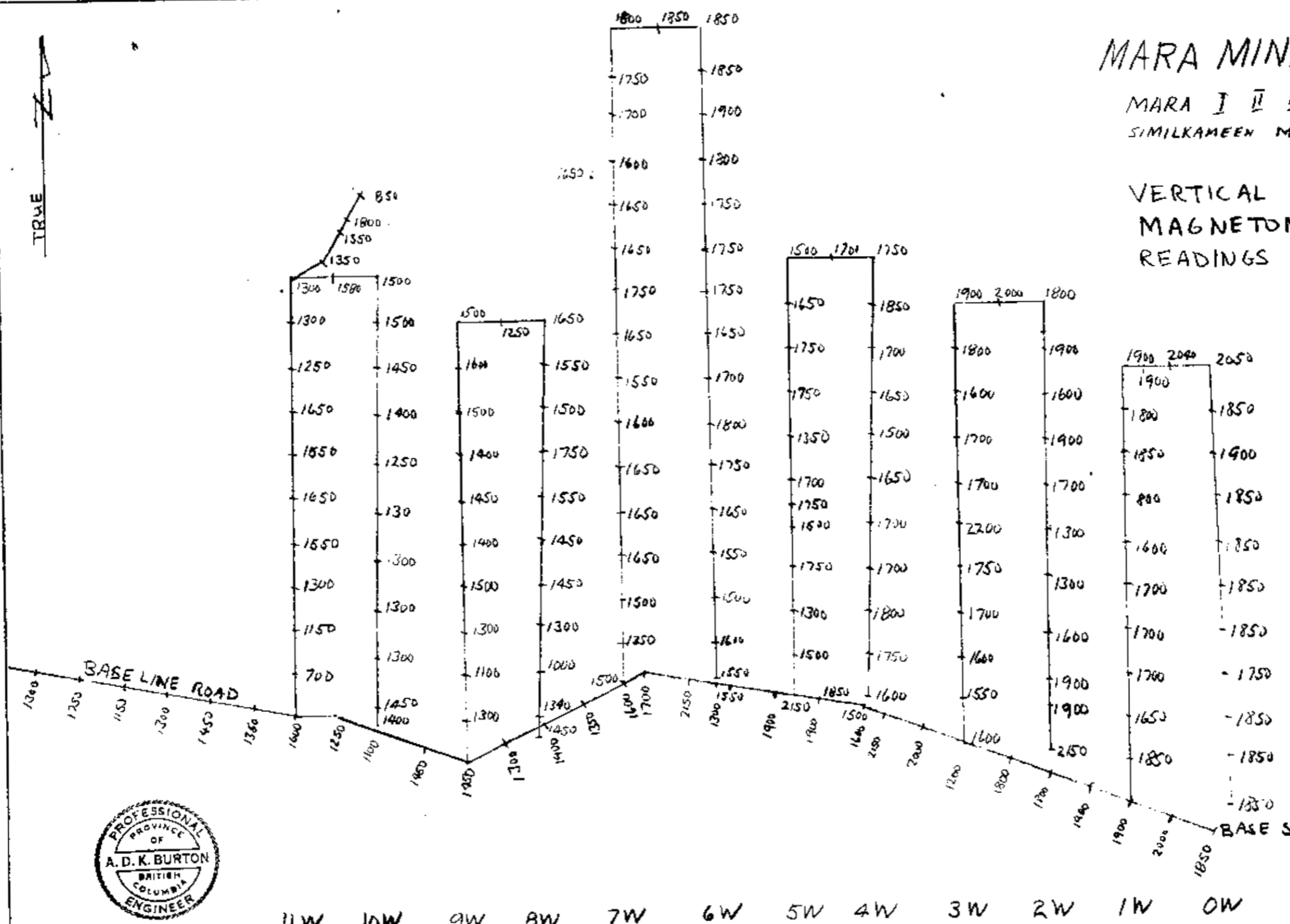
TRUE N

MARA MINERALS INC.  
MARA I II III IV CLAIMS  
SIMILKAMEEN MINING DIVISION

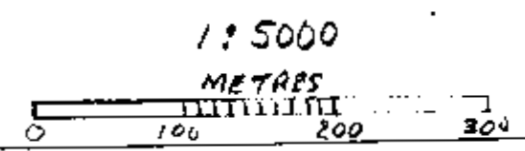
VERTICAL FIELD  
MAGNETOMETER SURVEY  
READINGS IN GAMMAS

PHOENIX  
GEO PHYSICS  
LTD.

MV 1  
MAGNETOMETER



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#5-924 W HASTINGS VANCOUVER BC. JUNE 1978

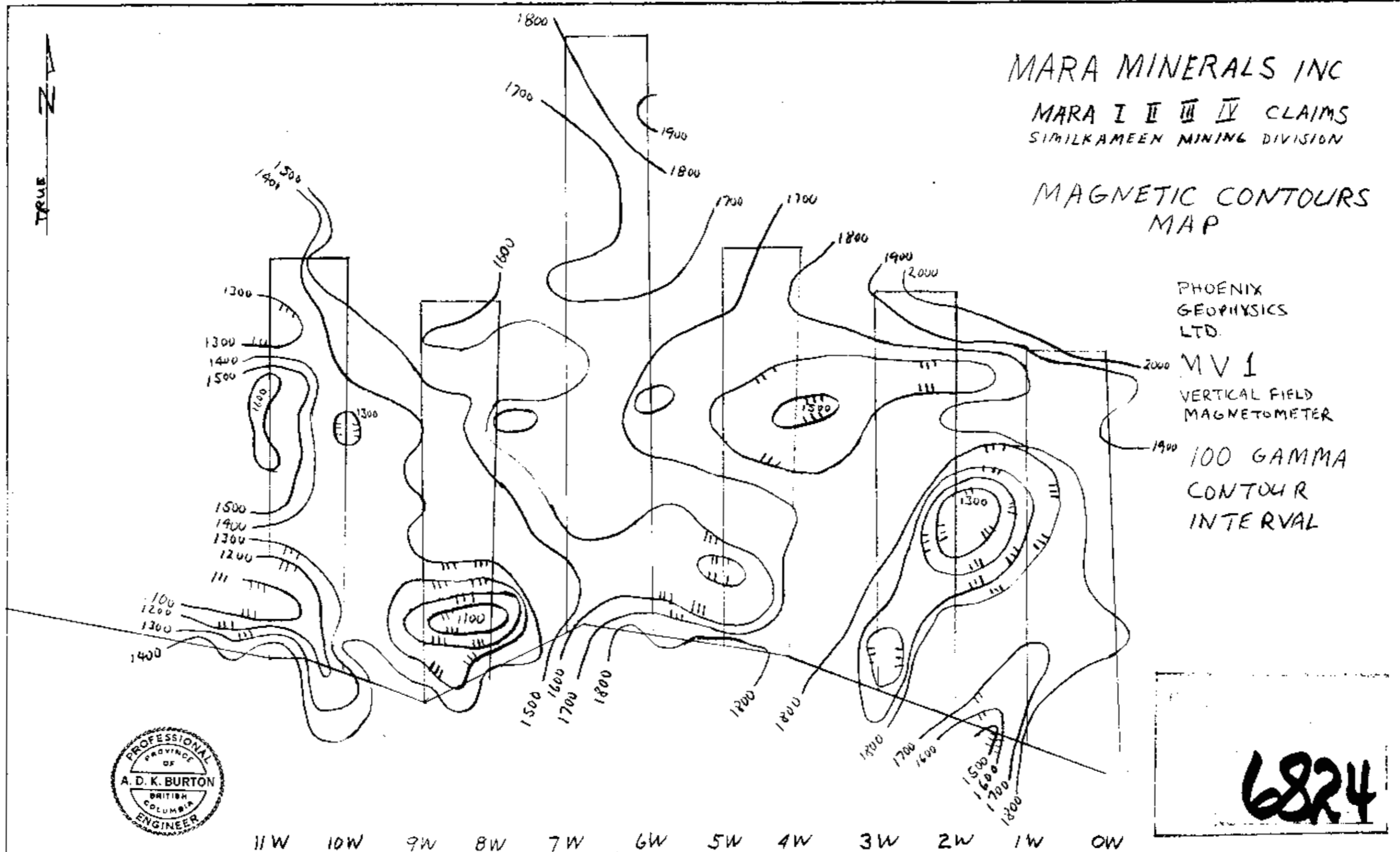


TRUE  
N

MARA MINERALS INC

MARA I II III IV CLAIMS  
SIMILKAMEEN MINING DIVISION

MAGNETIC CONTOURS  
MAP



PHOENIX  
GEOPHYSICS  
LTD.

MV I  
VERTICAL FIELD  
MAGNETOMETER

100 GAMMA  
CONTOUR  
INTERVAL



BURTON CONSULTING INC  
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F5-924 W HASTINGS VANCOUVER BC

JUNE 1978

1 : 5000  
METRES  
0 100 200 300

Cost Statement for Assessment work on  
Mara 1, 2, 4 Mineral Claims,  
Similkameen Mining Division

June 19-24	6 days, H. Richardson @ \$50/day	\$ 300.00
June 19-26	8 days, A. Burton @ \$250/Day	\$2000.00
	WAGES & FEES SUB TOTAL	<u>\$2300.00</u>

Vehicle	6 days @ \$20/day	\$ 120.00
Vehicle mileage	637 @ 15¢/mile	\$ 95.55
Magnetometer rental	6 days @ \$11/day	\$ 66.00
Accommodation, meals, fuel.		\$350.00
Office disbursements, printing, typing		\$ 100.00
Topofill thread		\$ 29.77

Sub Total \$ 761.64

Grand Total \$ 3061.64

To apply on

Geological and Geophysical Assessment Report  
Mara Mineral Claims  
Similkameen Mining Division



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