UMEX

UNION MINIERE EXPLORATIONS
AND MINING CORPORATION LIMITED

BURNABY 2 (VANCOUVER), B.C.

TELEPHONE 437-9491

3736

GROUND MAGNETIC, ELECTROMAGNETIC (EM 16)

and GEOCHEMICAL SOIL SURVEY

Mineral Claims Queen 1-200
(Record Numbers 51479 to 51678)

Liard Mining Division

N.T.S. 104J/8E
51°17' to 51°21'N Latitude
130°00' to 130°11'W Longitude

By

Alfred A. Burgoyne, P.Eng., F.G.A.C.

OWNER: Union Miniere Explorations and Mining Corporation Ltd.

WORK DATES: Geochemical soil survey August 24-29, 1971
Ground Magnetic and Electromagnetic surveys
February 26 to April 4, 1972

DATE: June 20, 1972

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APPENDIX I--Detailed Costs of Geochemical Surveys Performed on Queen Claims

Labour Costs:		
Office:	A. Burgoyne, June 15, 1972, ½ day @ $75/day	$ 40.00
Field:	H. Thomas, August 24, 25, 26, 1971, @ $24/day	72.00
	P. Lee, August 24, 25, 26, 27, 28, 29, 1971, @ $26/day	156.00
	H. Colwell, August 27, 28, 29, 1971, @ $42/day	126.00
Helicopter:		
	August 24 -- 50 minutes	
	August 26 -- 40 minutes	
	August 27 -- 40 minutes	
	August 28 -- 40 minutes	
	August 29 -- 55 minutes	
	3 hours 45 minutes @ $135/hour	506.25
Personnel Maintenance:		
	12 man days @ $8/day	96.00
Analytical Costs		
	146 soil samples for copper and molybdenum plus sample preparation @ $1.70	248.20
Secretarial, Reproduction, and Miscellaneous Costs		20.00
	TOTAL:	$1264.45

Declared before me at the City of Vancouver, in the Province of British Columbia, this 17th day of July 1972, A.D.

Alfred A. Burgoyne

G. R. Phelps

A Commissioner for taking Affidavits within British Columbia or
A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER

APPENDIX II--Detailed Costs of Magnetic and Electromagnetic Surveys Performed on Queen Claims

Labour Costs: FIELD

R. Lammle, February 27-March 4, inclusive March 21-23, inclusive, @ $65/day	$ 650.00
K. Michels, February 26-April 4, inclusive (39 days plus Good Friday) @ $28/day	1200.00
H. Holm, March 9-April 4, inclusive (27 days plus Good Friday) @$28/day	784.00
T. Hammell, February 26-March 8 (12 days) @$28/day	336.00

OFFICE (Plotting, Drafting, Interpretation, Reports)

A. Burgoyne	4 days @ $75/day	300.00
R. Lammle	3 days @ $60/day	180.00
A. Pauwels	6 days @ $40/day	240.00
D. Roland	7 days @ $40/day	280.00
B. Hughes	3 days @ $25/day	75.00
H. Holm	2 days @ $28/day	56.00
L. Redenbach	2 days @ $22/day	44.00

Personnel Maintenance:

Meals Costs 128 man days @ $9/day	1152.00
Motel 39 days @ $15/day	585.00

Equipment Costs:

Equivalent rental cost of company McPhar M-700 magnetometer 39 days @ $9/day	351.00
Truck (4 x 4 crew cab) 39 days @ $15/day	585.00
Gasoline for Truck and Snowmobile	300.00
Use of Rental Snowmobile (22 days @ $15/day)	330.00
Equivalent rental cost of company Snowmobile 39 days @$15/day	585.00
Equivalent rental of EM 16 (Ronka Unit) 39 days @ $6/day	234.00
Reproduction and Miscellaneous Costs	80.00
TOTAL:	$8347.00

Declared before me at the City of Vancouver, in the Province of British Columbia, this 17th day of July 1972, A.D.

Alfred A. Burgoyne

G Phillips

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

SUB-MINING RECORDER

INTRODUCTION

A reconnaissance geochemical soil survey on the Queen claims for copper and molybdenum was completed in the period of August 24-29, 1971. Geophysical surveys consisting of ground magnetic and electromagnetic (EM 16) were completed in the period of February 26 to April 4, 1972.

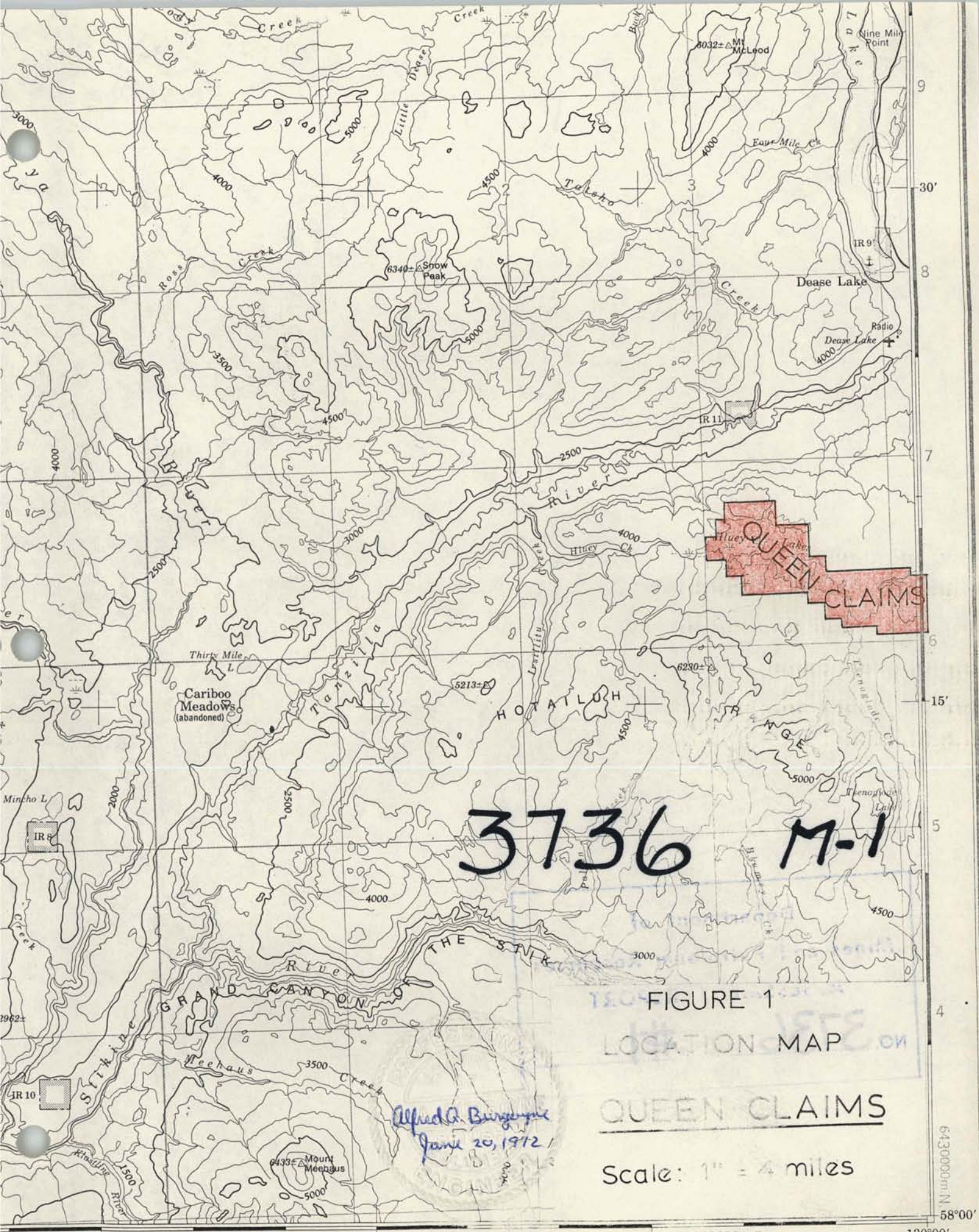
The Queen claims are located (Note Figure 1) in the Liard Mining Division, ten miles south of the village of Dease Lake at 51°17' to 51°21'N, 130°00' to 130°11'W (N.T.S. 104J/8E) on the Tanzilla Plateau of Northern British Columbia. The elevation of the property ranges from 4000 to 4500 feet. The Queen claims are located in a broad, flat, swampy, treeless and overburden covered, east-west trending valley now occupied in part by the Hluey Lakes.

For the geochemical soil survey access was provided by helicopter whereas for the geophysical surveys access was obtained by construction of 6 miles of a 4 x 4 winter road to the southeastern part of the claim block and snow clearing of 7 miles of a previously constructed tote road which in turn joins the Cassiar-Stewart Highway to the east. Two snowmobiles were used to traverse and complete the surveys on the claims. Travelling time from the Cassiar-Stewart Highway over the 13 miles of winter and tote roads to the claim block was about 1½ hours.

All surveys described in this report have been carried out under the general supervision and direction of this writer.

GENERAL GEOLOGY

Glacial overburden cover probably exceeds 98 percent of the property area. On the western portion of the claims in the vicinity of the largest lake that comprises the Hluey Lake chain the overburden depth is suspected to be in the order of 200-300 feet or greater. The majority of the few outcrops noted in the



3736 M-1

FIGURE 1

LOCATION MAP

QUEEN CLAIMS

Scale: 1" = 4 miles

Alfred A. Burgoyne
June 20, 1972

vicinity of the claims are volcanic; andesite being predominant with lesser amounts of basalts. In the eastern portion of the Queen claims granodiorite and quartz diorite have been located in outcrop. Minor amounts of syenite have been noted on the northeastern part of the claims.

GRID CONTROL

For the reconnaissance geochemical soil survey no formal grid control was set up. Sampling crews merely proceded down pre-established claim location lines and took soil samples at intervals from 300 to 750 feet depending on soil development and topography. The location of the soil sample was noted on a claim map and each sample was given a respective number.

For the ground magnetic and electromagnetic surveys a base line was placed in a N60°W direction diagonally across the claim block by use of a "Topofoil chain"[1] and compass. A marked wooden picket (4 feet x 2 inches) indicating the respective line number was placed into the snow every 800 feet along the base line. Cross lines were placed every 800 feet in N30°E and S30°W directions

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1 The Topofoil chain is a "lost" thread measuring device in which a counter accurately records in feet from 0 to 15000 feet the length of thread unreeling from the unit when measuring a length or distance covered. The operator attaches the end of the thread to a fixed point, the counter is set at zero and the operator moves on foot carrying the topofoil chain. As the thread unwinds the counter records the length. The counter readout is accurate to $\pm$ 0.2%; on completion of a measurement the counter is reset to zero. The biodegradeable thread is cut and abandoned.

by use of a Topofoil chain and compass. Magnetic and electromagnetic measurements were performed simultaneously with establishment of lines. The base line and all cross lines were tied into pre-existing claim posts and obvious topographic features.

GEOCHEMICAL SOIL SURVEY

Methods and Soil Development

In the course of the soil survey 146 soil samples were collected and subsequently analysed for copper and molybdenum. At each soil sample location a pit or hole was dug with a shovel to a depth of 4-16 inches depending on the soil development. At each sampling site 4-6 ounces of a poorly developed B soil sample was taken with a chromium plated trowel. The soil was placed in a kraft soil sample bag and appropriately marked. The soils for the most part are developed on glacially derived overburden. The soil development for the areas underlain by the claims is:

A_0 : Organic litter, undecayed leaves, twigs, normally 0-1 inch thick but up to 2 feet thick in swampy areas

A_1 : Decomposed organic debris, organic rich humus horizon, black in colour, normally 0-2 inches thick but considerably thicker in swampy areas

B : Brown to orange in colour, loose structure, accumulation of clay and iron minerals and/or organic matter, 0-4 inches thick and poorly developed

C : Weathered glacial overburden

The field supervision was carried out by geologist Matt Bell of Dolmage Campbell and the soil samplers were Harold Thomas, Peter Lee, and Harold Colwell.

Analytical Treatment of Soil Samples

The soil samples were analysed by Chemex Labs in North Vancouver. The samples were dried in their respective sample bags at a temperature of 120°F and then sieved to -80 mesh through a nylon screen. For total copper and molybdenum, one-half gram portion of these screened soils were placed in culture tubes and then digested in 3 mls of perchloric and 1 ml of nitric acid for 1 to 2 hours. The resulting digested samples were bulked to a specific volume in dilute perchloric acid and then asperated into a Techtron Atomic Absorption Spectrophotometer. Calibration of the spectrophotometer is done by preparation of respective metal standards.

Results and Conclusions

The objective of the reconnaissance soil sampling was to determine its use and hopefully to locate anomalous metal zones. The results obtained and as presented in Figures 2 and 3 have proven of little use. No significance can be attached to the few isolated high copper values or to the two high molybdenum values. A cumulative frequency vs concentration graph for copper (see Figure 4) indicates three reasonably distinct populations with ranges of 12-20 ppm, 28-50 ppm, and +67 ppm. The values over 67 ppm may be anomalous but are too scattered to be significant.

The relatively flat, poorly drained terrain combined with probably appreciable overburden depth may result in a poor reflection of underlying rock metal content.

GEOPHYSICAL SURVEYS

Field Procedures and Data Processing--Magnetic Survey

The ground magnetic survey was completed with a McPhar MF-700 flux-gate vertical component magnetometer. The reading accuracy of the instrument is

± 10 gammas below the 1000 scale and ± 20 gammas above the 1000 scale. Readings were taken every 200 feet along the N30°E-S30°W grid lines. Diurnal time corrections of the geomagnetic field were made by checking every two hours with established standard base stations located on the base line at every second cross-line. The operator traversed a given portion of the grid area in a loop-like fashion checking in at respective standard base stations. The magnetic survey results have been plotted on Figure 5 and contoured at -200, 0, 200, 400, 600, 800, 1000, 1500, 2000, 2500, 3000, 3500 and 4000 gamma intervals.

The magnetic survey was performed in part by K. Michels, H. Holm, and T. Hammell under the field supervision of R. Lammle, geologist.

Electromagnetic Survey

The ground electromagnetic survey was completed with a Ronka EM 16 VLF electromagnetic unit. The measurement range for the in-phase is ± 150% and for the out of phase ± 40% with an accuracy of 1%. The EM 16 is a sensitive audio-receiver that uses the signal transmitted by several American military stations in the 15-25 kHz range. For this survey the station "NPG" in Seattle, Washington at 18.6 kHz was utilized. The primary magnetic field generated by the station is considered uniform over the surveyed area. When the primary magnetic fields meet conductive bodies in the ground, there will be secondary magnetic fields emitted. The Ronka EM 16 effectively measures the vertical components of these secondary fields. To take a reading the horizontal co in the instrument is oriented along the magnetic field lines (here this direction is N60°E) and the vertical coil is tilted to minimize the sound signal and the tilt angle recorded in percentage or degrees. This angle is a measure of the vertical real component (in-phase) of the induced secondary field. A second

angle measurement of the minimum signal from the horizontal coil is then taken; this measurement is the quadrature or out of phase component. Em 16 in-phase and out of phase readings were taken every 200 feet along the cross lines.

In Figure 6 the in-phase and out of phase components have been plotted in profile form at a scale of 1" = 1000' = 25% and interpretation as to depth and intensity of conductors has been completed. In Figure 7 the in-phase data for the EM 16 survey results has been reproduced in contour form at a scale of 1" = 1000'. This has been done in an effort to reduce the geological noise component (which is generated in the 15-27 kHz frequency range) and to transform zero crossovers and inflections into peaks. The technique and resulting interpretation as used is described by Fraser (1969)[2]. Basically if four consecutive data points P_1, P_2, P_3, P_4, are considered then the function to be plotted is simply: $F = (P_4 + P_3) - (P_2 + P_1)$ and the plotting point falls between stations P_2 and P_3. Only positive values are contoured.

Results--Magnetic Survey

The results of the ground magnetic survey are presented on Figure 5. The results have been plotted and contoured on a 1" = 1000' topographic base and at intervals of 200 gammas below 1000 gammas and at 500 gamma intervals above the 1000 gamma level. Inferred magnetic linears have been plotted (blue lines) on Figure 5; three general magnetic linear directions are recognized:

1) N40°W to N50°W
2) N20°E to N30°E
3) N55°E to N70°E

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[2] Fraser, D. C., 1969, Contouring of VLF-EM Data: Geophysics, Vol. 34, No. 6 (December 1969), p. 958-967.

It is thought that the inferred magnetic linears or zones of parallel magnetic linears represent certain geological structures which could be faults, shear zones, zones of fracturing or possibly linear contact zones between two differing rock units. The prominent NW zone of magnetic linears coincides with the regional geologic trend. The two subsidiary zones of magnetic linears trending NE may represent conjugate fracture or structural breaks relative to the major NE zone of magnetic linears. The two subsidiary NE trending magnetic zones in the general area are also recognized from air photographs as distinct but weak linears.

On the eastern portion of the property (east of line 200) the overburden depth is not thought to exceed 100 feet whereas the overburden depth west of line 200 may exceed 200-300 feet especially over the largest of the Hluey Lakes. This observation is borne out be examination of the topographic map and the lower general magnetic background on the western part of the property. The EM 16 results indicate fewer conductors also, on the western portion of the property. On the eastern portion of the property the following approximate gamma intervals have been interpreted as representing the following rock types:

+ 1500 gammas	syenite
800-1500 gammas	acid to intermediate granitic rocks
(-) 200-800 gammas	volcanics and sediments (?)

The relationship of magnetic intensity to rock type is based upon minor reconnaissance mapping in the 1971 season and on previous work in the area. Because of the supposedly greater overburden thickness on the western portion of the property no definite conclusions relating magnetic intensity to rock type are possible.

Results--Electromagnetic Survey

In Figure 6 profiles of the in-phase and out of phase electromagnetic components are illustrated. Here the scale is 1" = 1000' = 25°. Positive readings are plotted to the left and negative readings to the right. Conductor intensity has been classified (as based on the magnitude and the ratio of in-phase to out of phase) as very weak, weak, and weak to medium; also distinction has been made between those conductors which are inferred to be deep seated and those which are near surface. The outcrop or suboutcrop of a conductive body is defined by the cross-over point of the profiles from positive to negative looking northeast. Higher value readings indicate stronger conductors. Because of the frequency, the EM 16 method is quite sensitive to conductive effects near ground surface. High in-phase values combined with low out of phase values are an indication of near surface conductivity. A high ratio of in-phase to out of phase indicates a good conductor. Because most of the conductors are very weak or weak in intensity it is doubtful that they represent sulphide mineralization.

Variables such as nature and composition of overburden, topographic, geologic structure and differing geological rock units can cause a response and be effective conductors. Thus to evaluate the results more effectively, to reduce geological noise, and to transform zero cross overs and inflections into peaks, the in-phase data was contoured by the techniques as described previously. In Figure 7 the contoured in-phase EM 16 results are weak to medium in conductivity and no good conductors such as sulfides or graphite are indicated. The dominant conductive trend directions are northwest as deduced from Figure 7. A secondary and weak conductor trend inferred from Figure 6 (profiles) is to the northeast. Because of the linearity of the many conductors, their northwest

trend (which is parallel to regional structure, and the dominant magnetic linear trend), there weak to medium conductivity, a fault/fracture/shear pattern is suggested. Many of the contoured northwest conductors are coincidental to northwest trending magnetic linears. Northeast trending structures will not be pronounced or even possibly defined in this survey because they would be parallel to the primary magnetic field emitted from the Seattle VLF station.

Conclusions and Recommendations

The ground magnetic and electromagnetic surveys have been quite useful in defining possible faults and fault zones on the Queen claims. The magnetic surveys have also indicated the position and areal extent of possible syenite and acid to intermediate granitic intrusives into volcanic [illegible] of mainly andesite and basalt composition.

A small amount of reconnaissance geophysical surveys utilizing the induced polarization method is recommended over zones of faulting adjacent or on intrusive bodies on the eastern half of the Queen claims in an effort to locate porphyry type copper sulfide mineralization.

Respectfully submitted,

Alfred A. Burgoyne

Alfred A. Burgoyne, P.Eng., F.G.A.C.

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VANCOUVER, CANADA

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UMEGREN JOINT VENTURE - TAHLTAN PROJECT

RECONNAISSANCE SOIL GEOCHEMISTRY

QUEEN CLAIM GROUP — COPPER

SCALE: 1 Inch = 1/2 Mile — FIG. 2

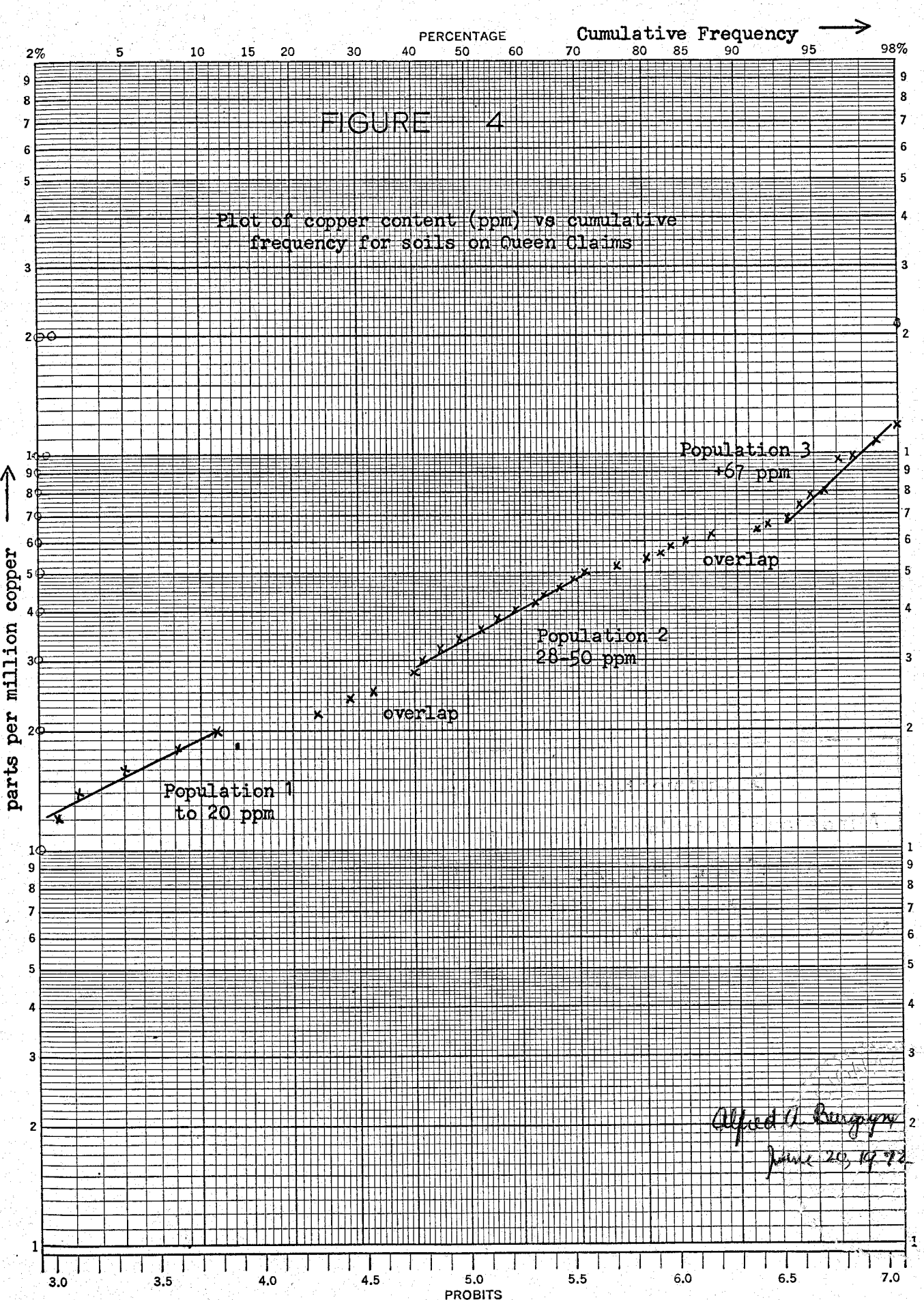
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3736 MAP #2

HLUEY LAKES

Claim Location Lines
Claim Numbers

Tsenaglode Creek

Alfred A. Burgoyne
June 20, 1972



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UMEGREN JOINT VENTURE - TAHLTAN PROJECT

RECONNAISSANCE SOIL GEOCHEMISTRY

QUEEN CLAIM GROUP — MOLYBDENUM

SCALE: 1 Inch = 1/2 Mile — FIG 3

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3736 MAP #3

HLUEY

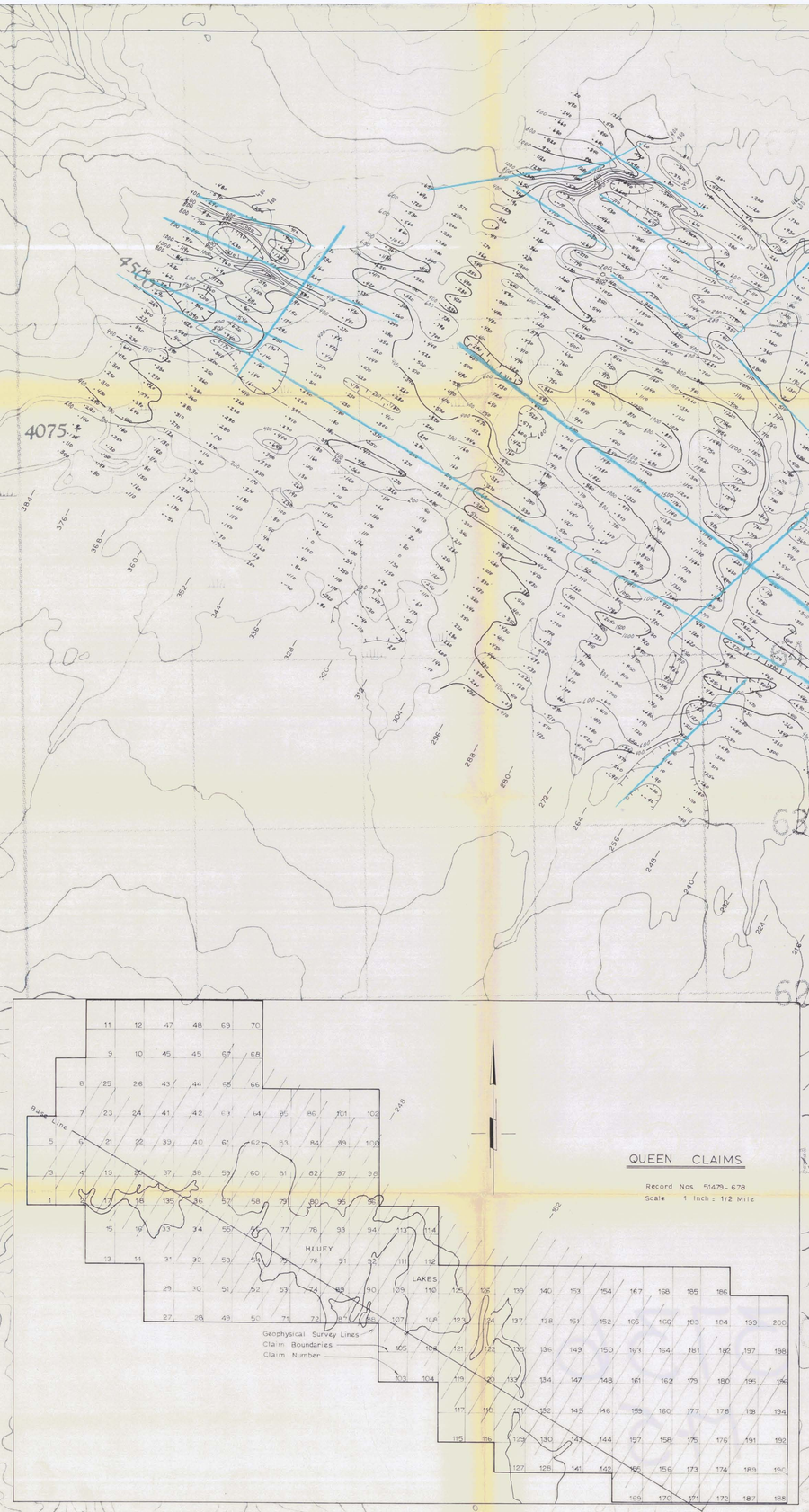
LAKES

Tsenaglode

Creek

Claim Location Lines
Claim Numbers

Alfred A. Burgoyne
June 20, 1972



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M-5

FIGURE 5

INSTRUMENT	McPHAR M700 (Vertical Field)
SENSITIVITY	20γ/Scale division (rdgs < 1000γ)
	50γ/Scale division (rdgs > 1000γ)
CONTOUR INTERVAL	200 γ below 1000 γ
	500 γ above 1000 γ
OPERATOR	H. Holm
	K. Michels
	T. Hammell (in part)
	MAGNETIC LINEARS

To accompany ground magnetic, electromagnetic (EM 16) and geochemical soil survey report by Alfred A. Burgoyne, P.ENG., F.G.A.C., on Queen Claims, 10 miles south of Tease Lake, Liard Mining Division, B. C. dated June 20, 1972

Alfred A. Burgoyne
June 20, 1972

UMEX CORPORATION LTD.

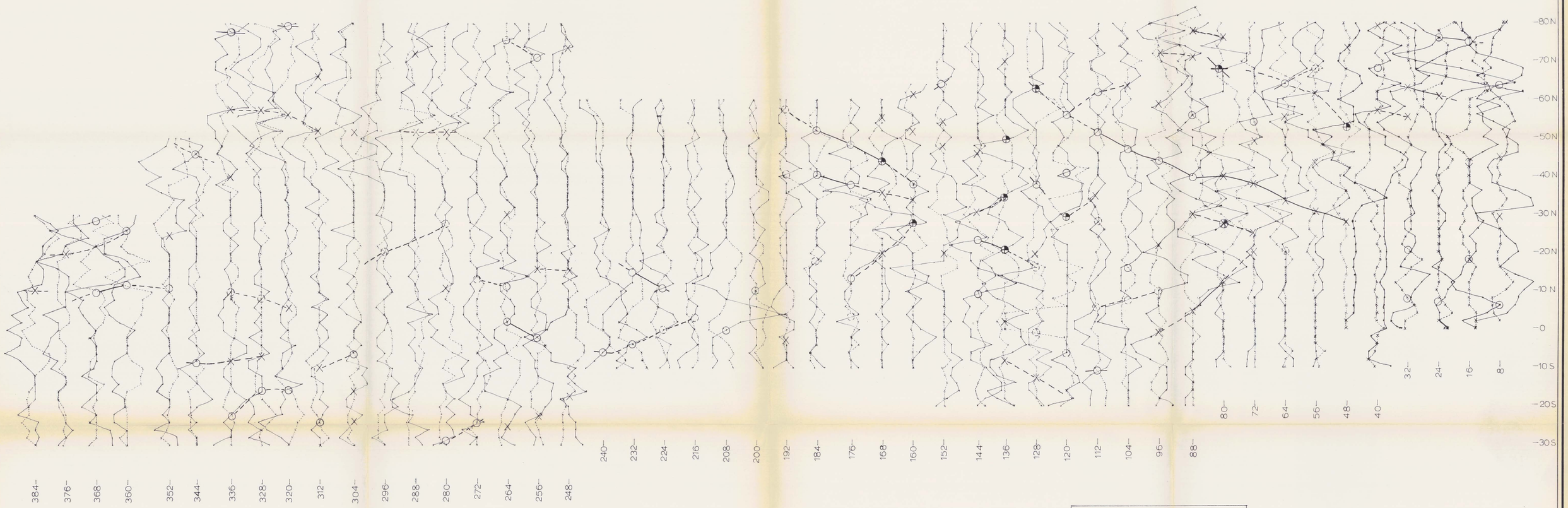
QUEEN PROPERTY

Ground Magnetics

REGION: 104 J/8		MAP NO.: 21-15 QU 1
DATE: April, 1972	COMPILED BY: D. J. Roland	DRAWN BY: D. J. Roland

0 1000 2000 3000 Feet

Declination 30° East



LEGEND

Deep Seated Conductors	◌	very weak
	○	weak
	◔	weak to medium
Surface effects with possible depth extension	X	
Strike	——	
Assumed Strike	- - -	

FIGURE 6

DEASE LAKE PROJECT
QUEEN PROPERTY
E.M. 16

—— IN PHASE
..... OUT OF PHASE

Scale: 1" = 1000' = 25%

UMEX CORPORATION LTD.

DRAWN BY: B. Hughes
DATE: May 1972
SURVEYED BY: R. MICHELS
DWG. No.

To accompany ground magnetic, electromagnetic (EM 16) and geochemical soil survey report by Alfred A. Burgoyne, P. Eng., F.G.A.C., on Queen Claims, 10 miles south of Dease Lake, Liard Mining Division, B. C. dated June 20, 1972

Alfred A. Burgoyne
June 20, 1972

VANCAL - 72


4500
4075±
4080±
4500
4400
4300
4000
4100
4091±
5090±
6230±
5300
HOTAILUH
RANGE
Hluey Creek
Tsenaglode
Tsenaglode
Baseline
Declination 29°25 East
INSTRUMENT EM 16
CONTOUR INTERVAL 10 UNITS
OPERATOR K. MICHELS
To accompany ground magnetic, electromagnetic (EM 16) and geochemical soil survey report by Alfred A. Burgoyne, P.Eng., F.G.A.C., on Queen Claims, 10 miles south of Dease Lake, Liard Mining Division, B. C. dated June 20, 1972
Alfred A. Burgoyne June 20, 1972
UMEX CORPORATION LTD.
QUEEN PROPERTY
EM 16 IN-PHASE CONTOURING
REGION 104 J/8
MAP NO. 21. 15 QU1
DATE May 1972
COMPILED BY A.Pauwels
DRAWN BY A.Pauwels
0 1000 2000 3000
Feet
FIGURE 7
Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3736 MAP #7