

4006
92 I/10E

GEOPHYSICAL REPORT

on a

MAGNETIC SURVEY

for

BOW RIVER RESOURCES LTD (N. P. L.)

T. T. CLAIM GROUP

IRON MASK AREA, KAMLOOPS M. D., B. C.,

March, 1972

T. T. Claim Group: 11 miles west of the City of
Kamloops

: 50° 120° NW

N. T. S. : 92 I/10E

Written for:

Bow River Resources Ltd (N. P. L.)
811-850 W Hastings Street,
Vancouver, B. C.

By:

David G. Mark, Geop. and
Howard A. Larson, Geop.
Geotronics Surveys Ltd
514-602 W Hastings Street,
Vancouver 2, B. C.

Department of	March 22, 1972
Mines and Petroleum Resources	
ASSESSMENT REPORT	
NO. 4006	

Geotronics Surveys Ltd.

Vancouver, Canada

CONTRACT NO. 72-33
 BOW RIVER RESOURCES -
TT GROUP KAMLOOPS M.D., B.C.

Line Cutting - (28 claims)

G. Johnston linecutter - 9 days @ 50.00	\$ 450.00
G. Novak linecutter - 9 days @ 50.00	450.00
G. Ryan linecutter - 9 days @ 50.00	450.00
K. McCulloch linecutter - 9 days @ 50.00	450.00
R. Simpson supervisor - 9 days @ 60.00	540.00
	2,340.00

Ground Magnetic Survey

H. Larson, geophysicist - 12 days @ 125.00	1,500.00
2 geophysical assistants - 12 days @ 100.00	1,200.00
2 G-110 Fluxgate Magnetometers - 2 wks.	300.00
Interpretation and report	600.00
Mapping	300.00
Engineering fees	300.00
Survey supplies	204.00
	4,404.10

TOTAL \$ 6,744.00

Declared before me at the City
 of Vancouver, in the
 Province of British Columbia, this 3
 day of November 1972

V. C. McLeod

John Turner

within British Columbia on
 the 3rd day of November 1972
 Geotronics Surveys Ltd. Sub-mining Recorder

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GEOPHYSICIST'S CERTIFICATE H. Larson	
GEOPHYSICIST'S CERTIFICATE D. Mark	
ENGINEER'S CERTIFICATE T. R. Tough	
GRAPH AND MAPS - at end of report	Scale
#1 Location Map, Figure 1	1" = 110 miles
#2 Property Map, Figure 2	1" = 1400 feet
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#5 Magnetometer Survey Data and Contours, Sheet 1	1" = 400 feet

SUMMARY

A magnetometer survey was completed over the T. T. claims during March 1972. The property is located about 12 miles west of the city of Kamloops to the immediate south of Highway No. 1. The purpose of the survey was to assist in the mapping of the geology, especially in the outlining of the acid intrusive.

The terrain varies from flat valley bottom, to moderate slopes and to rough slopes with rock cliffs. Cherry Creek is the main drainage of the area and flows northwesterly off of the northeast end of the claims area. An intermittent stream drains Ice Lake. Tree cover is that of open forest with some thick second growth.

The property is underlain by Nicola volcanics, Coast intrusives, Tertiary volcanics and probably Tertiary Coldwater conglomerates. The G. S. C. map shows no faults or shear zones and no mineralization is known on or immediately near the property.

In the Iron Mask Batholith area, many copper occurrences are known, the main copper minerals being chalcopyrite and bornite. Major development is being carried out in this area by Afton Mines (native copper) and Leemac Mines (chalcopyrite and bornite).

The magnetometer survey reflected the Nicola volcanics, Coast intrusive and the Tertiary volcanics.

CONCLUSIONS AND RECOMMENDATIONS

It is felt the object of the magnetic survey was met with good success. The Coast intrusive as well as the other rock groups were mapped and better defined than as is shown on the G. S. C. map. There is no direct information indicating other intrusive outliers, but such information could be masked by the large magnetic variation in the basic volcanics.

Since mineralization takes place along contacts between the Jurassic intrusive and the intruded Nicola volcanics, any further work should be stressed in this area. The contact, however, is covered by the Tertiary volcanics. It is probably not too thick, though, since it has been the writers' experiences that the magnetic data of Tertiary volcanics is much more intensely variable than is shown in sheet 1.

Further work is recommended as follows:

- 1) It is important that the property be thoroughly geologically mapped. This will assist in the interpretation of any further work as well as the magnetic survey. The property has numerous rock outcrops.
- 2) The property should be soil sampled and the samples be tested for copper. It is felt the whole property should be covered since the intrusive would easily be close to the surface below the Nicola volcanics.

3) Depending on above results an IP survey should then be carried out. The survey parameters should be such that depth penetration is at least 300 feet. The survey should be run in early spring when there is sufficient moisture to ensure good electric contact.

4) A drilling program may then be recommended based upon the previous work.

Respectfully submitted,

Howard A. Larson

Howard A. Larson
Geophysicist

David G. Mark

David G. Mark
Geophysicist

March 22, 1972

GEOPHYSICAL REPORT
on a
MAGNETIC SURVEY
T. T. CLAIM GROUP
IRON MASK AREA, KAMLOOPS M. D. , B. C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the procedure, compilation, and interpretation of a fluxgate magnetometer survey carried out on the T. T. Claim group during the first half of March, 1972.

The field work was carried out by H. A. Larson, geophysicist. The number of line miles completed was 25.3 and the area covered by the survey is as shown on Figure 2.

The object of the magnetic survey was to obtain information on the geology of the property, both structural and lithological, particularly the mapping of the Iron Mask intrusive. A secondary object is the possibility of the magnetic data reflecting a disseminated sulphide body by either an anomalous low or high.

PROPERTY AND OWNERSHIP

The T. T. property consists of 28 contiguous claims, as is shown below and on Figure 2. (T. T. 69, 71, 73, 75 claims are overlapped and thus are not shown). At the time of this writing, they had not been grouped. Record numbers were not available and therefore tag numbers are given instead.

<u>Name</u>	<u>Tag Number</u>	<u>Expiry Date</u>
T. T. 69, 71, 73, 75	305013M - 16M	February 23, 1973
T. T. 77, 78	305018M - 19M	February 23, 1973
T. T. 79 - 88	305024M - 33M	February 23, 1973
T. T. 105, 106	305020M, 21M	February 27, 1973
T. T. 107, 108	305034M, 35M	February 27, 1973
T. T. 110	305023M	February 27, 1973
T. T. 111	305008M	March 2, 1973
T. T. 113-117	305006M - 02M	March 2, 1973
T. T. 118	328501M	March 2, 1973

All the claims are presently held by Bow River Resources Ltd
811-850 W Hastings Street, Vancouver, B. C.

LOCATION AND ACCESS (50° 40.5' N, 120° 35' W)

The T. T. Claims are located eleven miles west of Kamloops (in a straight line) in and around Ice Lake and to the immediate southwest of Highway No. 1. By the highway, this distance is about 12 miles.

Access to the property can be either by the highway or by way of a road that approaches the southeast corner of the claim group. After the snow is gone, one can drive on roads throughout the property.

PHYSIOGRAPHY

The property is found within the physiographic unit known as the Thompson Plateau which forms part of the Interior Plateau. The terrain varies from flat valley bottom near Ice Lake and southwest of the base line to moderately rough and steep with rock cliffs northeast of the baseline and the northeast corner of the property. The general trend of the topographic features strike in a northwest direction which is also the strike of the geological structure and contacts. The elevation varies from 1700 feet to 2500 feet giving a relief of 800 feet.

Cherry Creek is the main water drainage in the area and flows northwesterly through the northeast corner of the claims area. An intermittent stream, also flowing northwesterly, drains Ice Lake which itself is found in the centre of the northeast half of the property. Several gullies were noted, most of which strike northwesterly and which probably carry water at least intermittently.

Tree cover is generally that of open forest with grasses as well as some thick second growth.

Pleistocene ice occupied the Thompson Plateau and thus much of the claims area is probably covered by glacial drift which could become quite deep over the flatter areas.

The climate is semi-arid with annual rainfall varying from 10 to 11 inches. Temperatures vary from the high extreme in summer of over 100°F to the low extreme in winter of around -30°F, though the usual temperature during the summer days would be 60°F to 80°F and that in winter 20°F to 40°F.

GEOLOGY

The geology of the property is as shown on Figure 3. and was sketched from the G. S. C. map of W. E. Cockfield, published in 1947. While carrying out the magnetic survey, Larson identified several rock outcrops found throughout the property. Generally, the identified rocks agreed with that of the G. S. C. map with some changes. Sometimes a clean unweathered sample was difficult to obtain and therefore its correct identification was hindered.

The oldest rocks on the property are those of the Nicola group which is of Upper Triassic Age. The rock-types composing this group are greenstone, andesite, basalt, agglomerate, breccia, tuff, minor argillite, limestone and conglomerate. Larson recognized tuffs and basic volcanic rocks in the southwestern part of the survey area as well as andesite on and near the baselines. In some of the rocks one could see partial crystallization. All of these rocks were at least slightly magnetic.

The next rock group in decreasing age sequence is the Jurassic Coast Intrusives that occur within the northeastern part of the claims area. Hogan has called these rocks part of the Iron Mask Batholith. However, Larson noted pink orthoclase-rich rocks in this area, some of which contained quartz. Since the Iron Mask Batholith is deficient in quartz, the composition of the intrusive outcrops may be closer to that of the nearby Guichon Creek Batholith. The rocks, though, were badly weathered and therefore lack a positive identification. No quartz could be seen in one rock sample

and therefore it appeared to be a syenite or monzonite, a rock-type of the Iron Mask intrusive.

The Tertiary Coldwater Beds of the Kamloops Group is shown by Cockfield to occur off the northeastern end of the survey area. Rock members of this group are conglomerate, sandstone, shale, and coal. However, Larson noticed conglomerates on the northern end of L-32E and the center of the north part of L-8E. Though it is possible these form part of the Nicola Group, in all likelihood the conglomerates are of the Coldwater Beds.

The Tertiary volcanics of the Kamloops Group are the youngest rocks on the property. They occur in the northeast section surrounding the Iron Mask intrusive and the Coldwater Beds. Larson picked up a sample at a cliff-type outcropping on the northeast end of L-4E. It was a black, fine-grained volcanic, fairly magnetic, and had inclusions of what appeared to be an acid intrusive. It is, therefore, likely Tertiary volcanics close to the Coast intrusive contact.

No faults or shear zones have been shown by the G. S. C. map to exist on the property. Nonetheless, some of the prominent ridges and gullies indicate possible faulting in a northwest direction.

No economically interesting mineralization has been seen so far on or in the immediate area of the claims.

The many copper occurrences in the general area are found both within the Iron Mask Batholith and the older, intruded Nicola rocks close to the batholith. Generally, they are veins, impregnations,

stockworks and mineralized shear zones in the country rock with the principle copper minerals being chalcopyrite and bornite as well as some chalcocite, cuprite, azurite and malachite. Additional minerals that often occur with the copper are magnetite and pyrite. There have been shipments of ore, though small, from many of the prospects. The largest producer was the Iron Mask Mine which shipped a total of 189,230 tons of ore.

The main developer in the area presently is Afton Mines Ltd which, as reported on February 21, 1972, has blocked out 36 million tons of 0.66% copper. The main mineral form is native copper found within an intrusive breccia at the contact of the Nicola volcanics.

Leemac Mines is also carrying out a drilling program on a very promising prospect. Its main copper mineral is chalcopyrite with some bornite found within a porphyritic diorite.

HISTORY OF PREVIOUS WORK

The claims were staked in February, 1972. No known work has been done before or after this date within the claims area, though much work has been done within and around the Iron Mask Batholith since the turn of the century.

INSTRUMENTATION AND THEORY

The magnetic survey was carried out using a portable vertical component, Model G-110 fluxgate magnetometer manufactured by Geotronics Instruments Ltd. of Vancouver, B.C. It is a visual-null type instrument using digital dial readout with a range of 100,000 gammas and a reading accuracy of 10 gammas. The G-110 has a temperature coefficient of 2 gammas per degree centigrade.

Only 2 commonly occurring minerals are strongly magnetic; magnetite and pyrrhotite. Hence, magnetic surveys are used to detect the presence of these minerals in varying concentrations. Magnetic data are also useful as a reconnaissance tool for mapping geologic lithology and structure since different rock types have different background amounts of magnetite and/or pyrrhotite.

SURVEY PROCEDURE

The grid was put in by chain and compass immediately before the magnetic survey was started. The baseline was set up in a northwest direction with the geological strike and marked by blue flagging every 100 feet. Normal to the baseline at 400-foot intervals are the crosslines which strike in a southwest-northeast direction. Both blue and red flagging were used to mark the survey stations at 100-foot intervals on the crosslines. The baseline and crosslines were blazed in except in treeless areas where pickets were placed at 100-foot intervals. All the lines are labelled E and run from O to 84E, a distance of 8400 feet. Those stations northeast of the baseline are labelled N and those southwest S.

Magnetometer readings were taken at the 100-foot stations on the crosslines. The diurnal change was checked by first establishing magnetic values at 400-foot intervals on the baseline and then closing the loops onto these values as the survey progressed. The time to survey one loop varied from 1 hour to 2 hours.

COMPILATION OF DATA

A cumulative frequency graph, Figure 4, was drawn from all the magnetic data. The mean background value was read off the graph to be 54,700 gammas which was then subtracted from all readings so that they read positive or negative around a mean background value of 0 gammas. The resulting values were then plotted on sheet 1 and contoured at an interval of 400 gammas. The zero-contour was not drawn in since being the mean background value, it was felt it would only detract from the interpretation. The positive contours were drawn in solid and the negative ones, dashed.

DISCUSSION OF RESULTS

As one can see upon studying the magnetic data and contours of sheet 1, the results have a fairly high range of about 6200 gammas, varying from about 1800 gammas to 2400 gammas. In addition, the data exhibits a very strong high frequency component so that it was superfluous to contour below a 400-gamma interval. This type of data was not unexpected considering the geology.

Ridges and adjacent valleys were drawn in on sheet 1 since it appeared that the magnetic highs and lows could be correlated directly with the terrain.

The following observations have been made with the magnetic results:

- 1) Southwest of the baseline, positive anomalies correlate with topographical ridges and hills and negative anomalies with valleys adjacent to the ridges. One only gets such a marked topographic effect if the

underlying bedrock is magnetic, as the Nicola volcanics are. It appeared from field observations that some of these ridges could well be caused by faults.

2) There is a negative anomalous trough that strikes northwesterly on and to the northeast of Ice Lake. It appears that this largely reflects the acid intrusive since according to the G. S. C. map it occurs approximately in this area. There was negligible magnetism exhibited by any of the samples tested from this area.

The northeastern contact is very likely close to the base of the hill. The southwestern contact is concluded to follow about midway along the valley floor through Ice Lake. On the northwestern end, the contact probably ends within the survey area, though it is difficult to say since conglomerates are found near the survey boundary. The conglomerates may be isolated patches or else they may cover a large area.

Within the negative trough, there is a narrower band of more negative values that approximately follow the valley flows. The causes of this could be one or a combination of the following.

- a) strictly a terrain effect
- b) deeply buried bedrock formed by a chasm-type contact (ascertained from topography)

- c) alteration along the contact causing a magnetic low
- d) shear zone or fault.

3) Between the negative trough and the area of thumbprint anomalies to the southwest, and also over the northern corner are two bands of high values striking northwesterly. From the G. S. C. map and one observed outcrop, this is interpreted to be the Tertiary volcanics of the Kamloops Group.

Because of the highly variable results, it is difficult to ascertain whether the magnetometer has reflected any faults or shear zones, unless the Ice Lake valley is a shear zone. It is possible also that some of the long linear anomalies in the southwestern area are reflecting faults, though, perhaps it would be more correct to say the magnetometer is reflecting terrain caused by faults.

Respectfully submitted,

Howard A. Larson

Howard A. Larson
Geophysicist

David G. Mark

David G. Mark
Geophysicist

March 22, 1972

SELECTED BIBLIOGRAPHY

Aeromagnetic Map, Cherry Creek, British Columbia, Geol. Surv. of Can., Map 5217G, Sheet 92 I/10, 1968.

Aeromagnetic Map, Kamloops, British Columbia, Geol. Surv. of Can., Map 5216G, Sheet 92 I/9, 1968.

Cockfield, W. E., Geology and Mineral Deposits of Nicola Map-Area, British Columbia, Geol. Surv. of Can., Mem. 249, 1948.

Hogan, John W., Report on the T. T. Claims, Cherry Creek, Kamloops, British Columbia for Bow River Resources Ltd. (N. P. L.)
L. J. Manning and Associates Ltd., January 20, 1972.

Lepeltier, Claude, A Simplified Statistical Treatment of Geochemical Data by Graphical Representation, Economic Geology, Vol. 34, pp. 538-550, 1969.

GEOPHYSICIST'S CERTIFICATE

I, Howard A. Larson, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of GEOTRONICS SURVEYS LTD., with offices at 514-602 West Hastings Street, Vancouver 2, B. C.

I further certify that:

- 1) I am a graduate of the University of British Columbia (1971) and hold a B. Sc. degree in Geophysics.
- 2) I have been practicing in my profession for the past year and have been active in the mining industry for the past four years.
- 3) This report is compiled from data obtained from a magnetometer survey carried out by myself in March, 1972, on the T. T. claims and pertinent data from published maps and reports as listed under Selected Bibliography.
- 4) I have no direct or indirect interest in the properties or securities of Bow River Resources Ltd. (N. P. L.) Vancouver, B. C. nor do I expect to receive any interest therein.

Howard A. Larson
Howard A. Larson
Geophysicist

March 22, 1972

GEOPHYSICIST'S CERTIFICATE

I, DAVID G. MARK, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geophysicist of GEOTRONICS SURVEYS LTD., with offices at 514-602 W Hastings Street, Vancouver 2, B.C.

I further certify that:

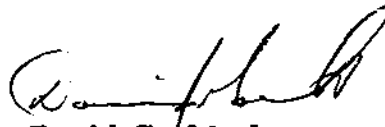
1) I am a graduate of the University of British Columbia (1968) and hold a B. Sc. degree in Geophysics.

2) I have been practicing in my profession for the past four years and have been active in the mining industry for the past seven years.

3) I am an associate member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.

4) This report is compiled from data obtained from a magnetometer survey carried out by Geotronics Surveys Ltd. in March 1972, on the T. T. claims and pertinent data from published maps and reports as listed under Selected Bibliography.

5) I have no direct or indirect interest in the properties or securities of Bow River Resources Ltd (N. P. L.) Vancouver, B. C. nor do I expect to receive any interest therein.



David G. Mark
Geophysicist

March 22, 1972

ENGINEER'S CERTIFICATE

I, THOMAS R. TOUGH, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geologist and an associate with T. R. TOUGH & ASSOCIATES LTD., with offices at 519-602 W Hastings Street, Vancouver 2, B. C.

I further certify that:

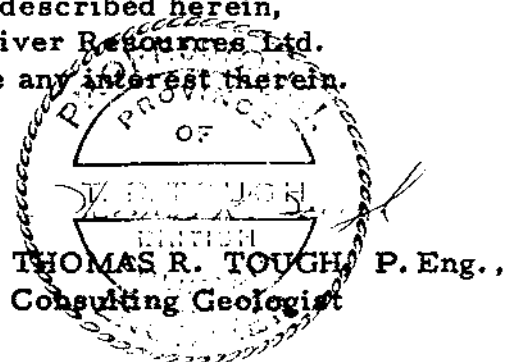
1) I am a graduate of the University of British Columbia (1965) and hold a B. Sc. degree in Geology.

2) I have been practicing in my profession for the past six years and have been active in the mining industry for the past thirteen years.

3) I am registered with the Association of Professional Engineers of British Columbia.

4) I have studied the accompanying report dated March, 1972, on a magnetometer survey submitted by Geotronics Surveys Ltd., written by David G. Mark, Geophysicist, and Howard A. Larson, Geophysicist, and concur with findings therein.

5) I have no direct or indirect interest whatsoever in the property described herein, nor the securities of Bow River Resources Ltd. and do not expect to receive any interest therein.



March 23, 1972

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 4006 MAP #1

1-M 2004

GCB-27B

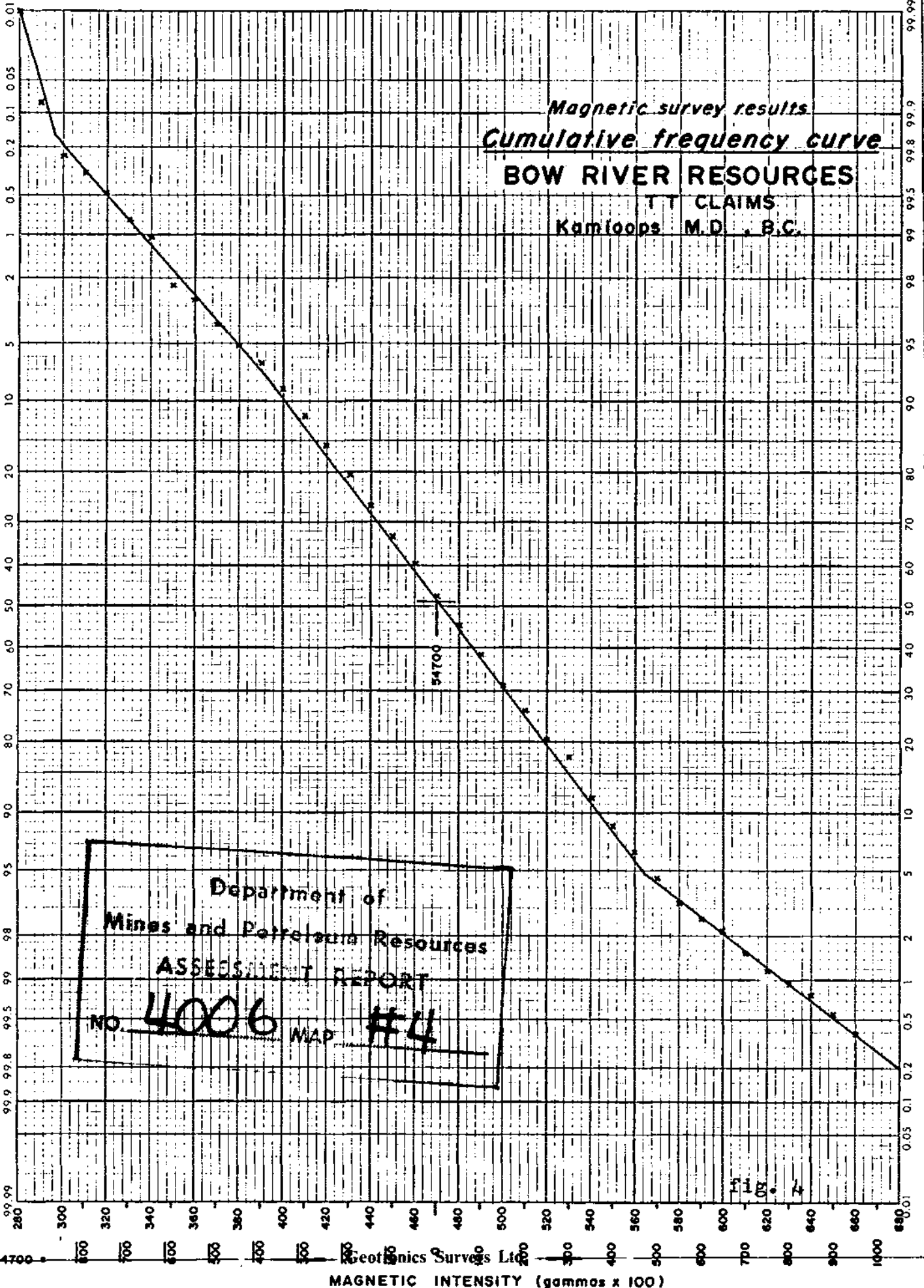
Arithmetic Probability
MADE IN CANADA

C.C.S.S.
MICRO-MAP

Magnetic survey results
Cumulative frequency curve

BOW RIVER RESOURCES

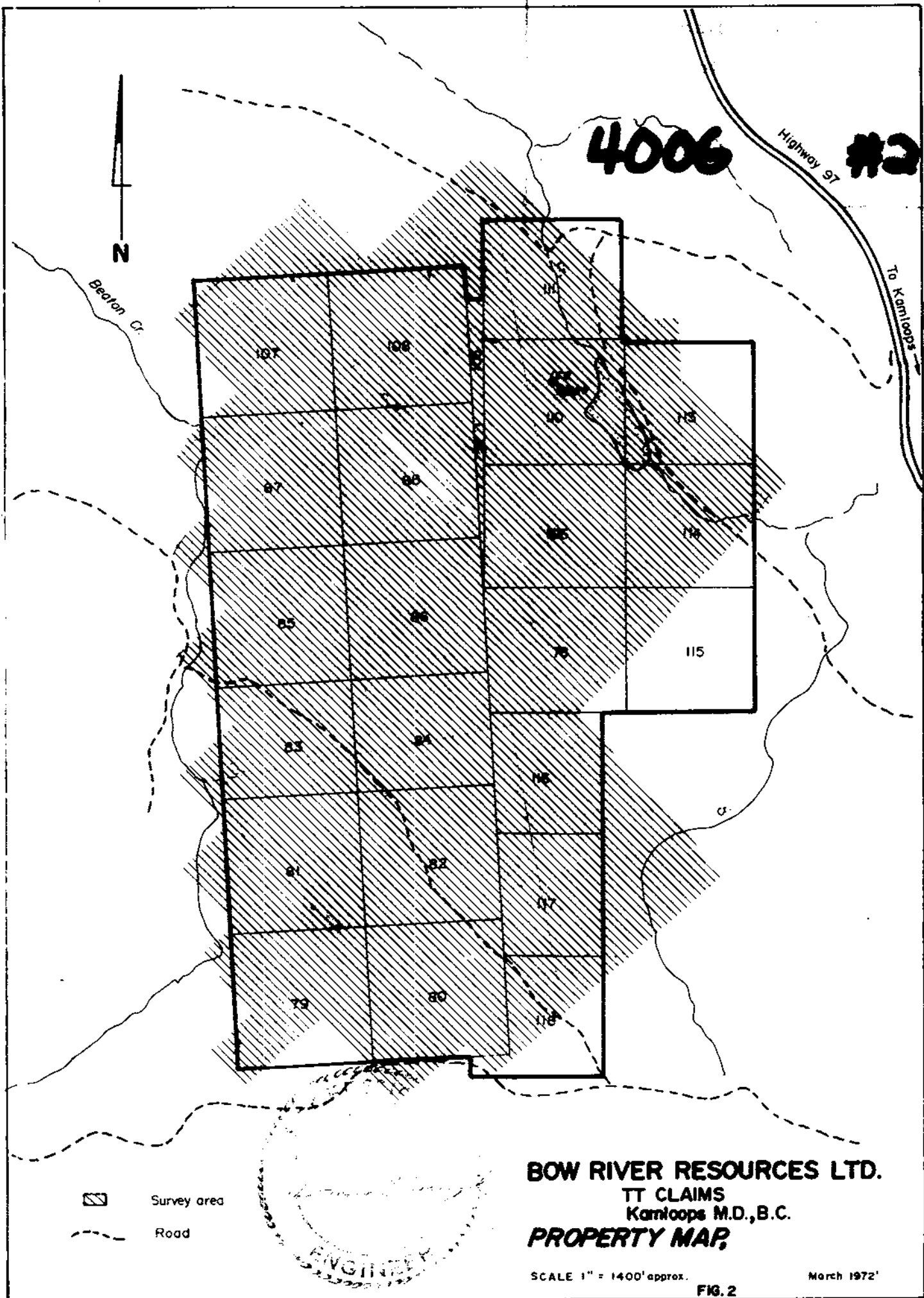
T T CLAIMS
Kamloops M.D., B.C.



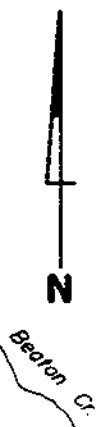
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4006 MAP #4

MAGNETIC INTENSITY (gammas x 100)

FREQUENCY (%)





4006 Highway 97 #2



Beaton Cr.

To Kamloops

-  Survey area
-  Road

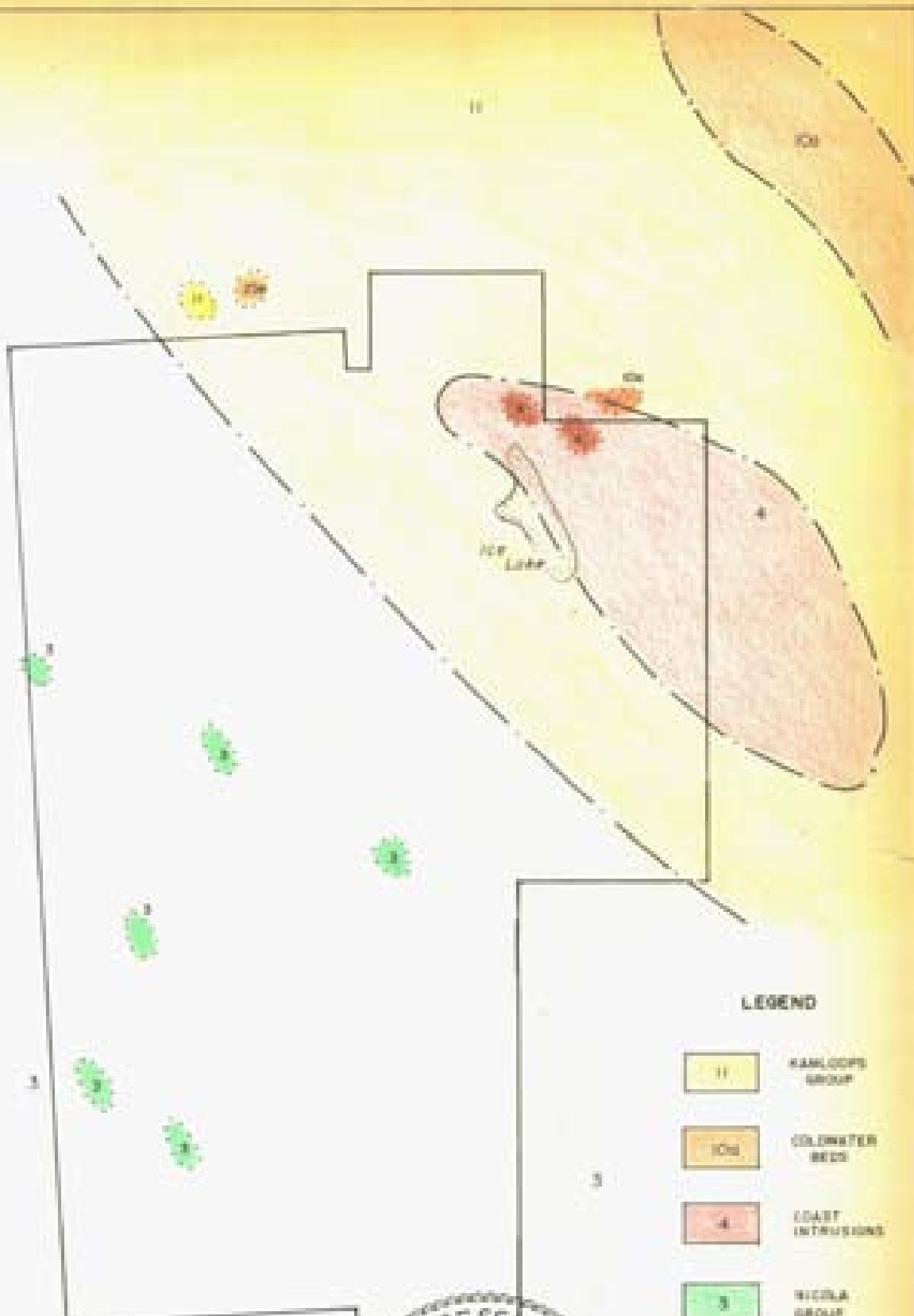


BOW RIVER RESOURCES LTD.
 TT CLAIMS
 Kamloops M.D., B.C.
PROPERTY MAP,

SCALE 1" = 1400' approx.

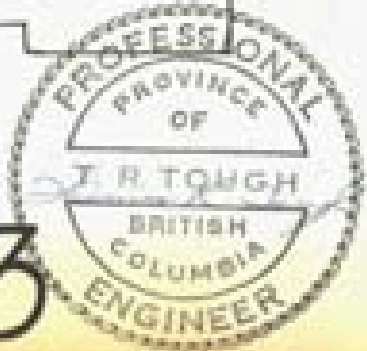
FIG. 2

March 1972'



LEGEND

- 11 KAMLOOPS GROUP
- 10a COLWATER BEDS
- 4 COAST INTRUSIONS
- 3 WICOLA GROUP
- OUTCROP



4006 M-3

GEOLOGY

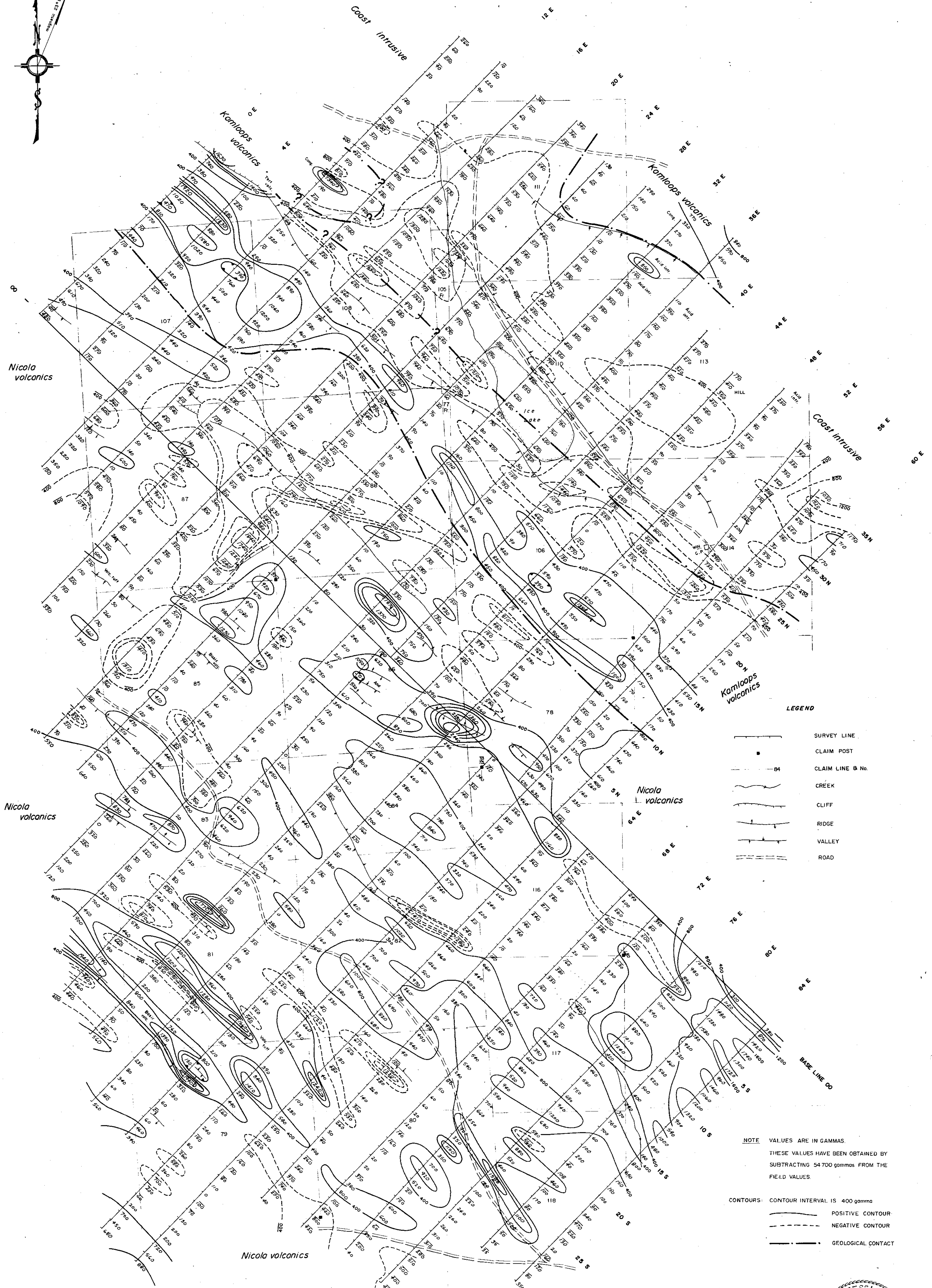
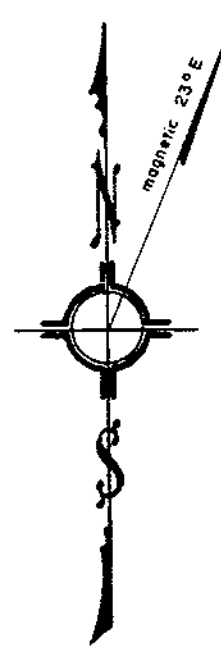
SKETCHED FROM COCKFIELD (U.S. GEOL. SURV. 2481)

FIG. 3

Department of
Mines and Petroleum Resources

ASSESSMENT REPORT

NO. 4006 MAP #3



LEGEND

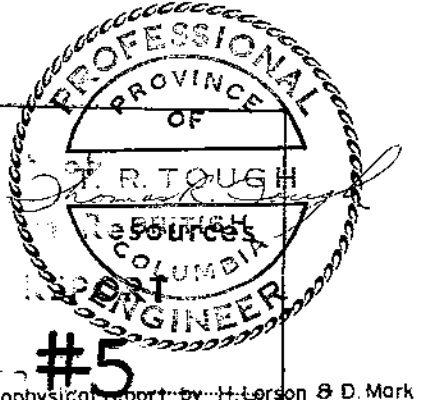
- SURVEY LINE
- CLAIM POST
- CLAIM LINE & No.
- CREEK
- CLIFF
- RIDGE
- VALLEY
- ROAD

NOTE: VALUES ARE IN GAMMAS.
 THESE VALUES HAVE BEEN OBTAINED BY
 SUBTRACTING 54700 GAMMAS FROM THE
 FIELD VALUES

CONTOURS: CONTOUR INTERVAL IS 400 GAMMA

- POSITIVE CONTOUR
- NEGATIVE CONTOUR
- GEOLOGICAL CONTACT

40006 M-5



Department of
 Mines and Technical Surveys
 Geological Survey of Canada
 Ottawa, Ontario

To accompany geophysical report by H. Larson & D. Mark

GEOTRONICS SURVEYS LTD.

BOW RIVER RESOURCES LTD.
 TT CLAIMS
 KAMLOOPS M.D., B.C.

Magnetometer Survey
 Data & Contours

SCALE 1 : 400'	DATE March 1972	JOB No. 72 - 33	SHEET No. 1	DRAWN BY P.P.
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