5923

GEOPHYSICAL-GEOCHEMICAL REPORT

on

VLF-EM and SOIL SAMPLING SURVEYS

KING

KING CLAIM GROUP

92H/6E

COQUIHALLA RIVER, NEW WESTMINSTER
MINING DIVISION, B.C.

King Claims:	12 miles N 57 E of the town of Hope, B.C.
:	49° 121° SE
:	NTS - 92H/6E

Written for:	RICH HILL MINES LTD 216-850 W Hastings Street, Vancouver, B.C.
by:	David G. Mark Geophysicist GEOTRONICS SURVEYS LTD 307-475 Howe Street, Vancouver, B.C.
DATED:	July 28, 1976

Geotronics Surveys Ltd.
Vancouver, Canada
Geophysical Services — Mining & Engineering

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Data and Contours - Figure 4	in pocket

SUMMARY

A combined soil sampling and VLF-EM survey was carried out over the King Claim Group during June 1976. The King claims are located on Dewdney Creek and Coquihalla River 12 miles N.E. of Hope, B.C. Access is by two-wheel drive on the Coquihalla River gravel road. The terrain consists of steep slopes interspersed with rocky bluffs, and vegetation, large conifers with little underbrush. The object of the surveys was to locate probable areas of gold mineralization similar to that of the nearby Carolin Mines property.

Previous work consists of a limited magnetic survey and limited soil sampling.

The property is underlain by a pelitic schist of the Ladner Group which borders the Hozameen Fault to the northwest. Prolific steeply dipping quartz veins paralleling the schistosity to the northwest as well as the northwest structure in addition to localized quartz flooded zones occur on the property.

The VLF-EM readings and the soil samples were taken every 100 feet on 300-foot separated lines. The VLF-EM readings were Frazer-filtered, plotted and contoured. The soil samples were tested for gold, and the results plotted and contoured.

CONCLUSIONS

1. The VLF-EM anomalies largely reflect fault zones that strike in a northeast direction.

2. The three major gold soil anomalies correlate with mapped faults and VLF-EM anomalies and therefore probably reflect gold mineralization that is controlled by northeast-trending faults.

3. The VLF-EM anomalies suggest the gold mineralization may extend beyond the limits of the soil anomalies.

RECOMMENDATIONS

1. Consideration should be given to acquiring the mineral rights northeast of the property.

2. The soil sampling and VLF-EM surveys should then be extended towards the north and the east.

3. Outcrops near the soil anomalies should be carefully checked and assayed for gold. Perhaps a minor amount of hand trenching could be done to facilitate this.

GEOPHYSICAL-GEOCHEMICAL REPORT

on

VLF-EM and SOIL SAMPLING SURVEYS

KING CLAIM GROUP

COQUIHALLA RIVER, NEW WESTMINSTER M.D., B.C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the field procedure, treatment of data, and interpretation of results of a very low frequency electromagnetic (VLF-EM) survey and a soil sampling survey carried out over the King claims during June, 1976. The samples were tested for gold.

The field work was carried out by and under the supervision of the writer. A total of 6.4 miles of survey was done and 308 soil samples were picked up.

The object of the soil sampling was to delineate any probable areas of gold mineralization especially similar to that as occurs on the Carolin Mines property near by. That of the

VLF-EM survey was to delineate shear zones that may be associated with any gold mineralization.

PROPERTY AND OWNERSHIP

The property consists of four claims as shown on Figure 2 and as described below:

Claim Name	Record No.	Expiry Date
King 11-14	29171-4	May 9, 1977

The claims are wholly owned by Rich Hill Mines Ltd.

LOCATION AND ACCESS

The property is located twelve miles N57E of the town of Hope, B.C. on the east side of the Coquihalla River and on the north side of Dewdney Creek (i.e. near its confluence with the Coquihalla River as shown on Figure 2).

The geographical coordinates of the property are 49° 29' N latitude and 121° 14' W longitude.

Access to the property is relatively easy and is gained by travelling 16 miles northeast of Hope on the Coquihalla River gravel road, Just past the Dewdney Creek bridge is a road that forks off to the east and follows Dewdney Creek. About one mile up this road on the north side is the initial post of

King claims 11 and 12.

PHYSIOGRAPHY

The property is found in the physiographic unit known as the Cascade Mountains which is a subdivision of the physiographic division, Coast Mountains. Generally the Cascades consist of a rough terrain with steep and precipitous slopes and elevations varying from somewhat over a 1,000 feet on the Coquihalla River to well over 7,000 feet on some of the higher mountains.

The King claims are located on the south and west facing slopes on an east-west trending ridge. Elevations vary from 1,400 feet a.s.l. in Dewdney Creek to about 2,800 feet a.s.l. near the top of the ridge. Slopes vary from 20 to 45° and are interspersed with several rocky bluffs.

As mentioned above, Dewdney Creek flows along the southern boundary of the claims. The Coquihalla River is located 1,000 or so feet to the west.

The vegetation consists of large coniferous trees, mainly fir and spruce. The underbrush is generally light.

HISTORY OF PREVIOUS WORK

In 1974 a few lines of soil sampling and magnetometer surveying were carried out over the King claims. No other work is known to have taken place on the property except for a drift located at (18N, 6W).

GEOLOGY

The property was geologically mapped in detail by L. Sookochoff and the reader is referred to his report for a detailed description of the property geology. Below only a summary of the geology is given and was quoted and paraphrased from Sookochoff's report.

A narrow northwesterly trending band of ultramafics is exposed along a fault zone which crosses the Coquihalla at and in the area of the confluence of Dewdney Creek with the Coquihalla River. The ultramafics are bordered by the Hozameen Group of sediments and volcanics to the west and the Ladner Group of pelites and volcanic sandstone to the east. The lode gold deposits of the 'Ladner Slate Belt' and the 'Coquihalla Serpentine Belt' to the northwest of the Dewdney Creek appear to favor the major fault zone and the contact of the serpentine and the pelites of the Ladner Group.

The Aurum and the Idaho mineralization of Carolin Mines is of native gold, pyrrhotite and minor chalcopyrite occurring in large quartz veins running along the contact between slaty members of the Ladner Group and volcanic rock of the Hozameen Group.

The King claims are mainly underlain by pelitic schists of the Ladner group. The southwestern corner of the claim block appears to border the fault contact with the serpentine belt, however, this could not be verified due to overburden in the area. The two major fault systems in the immediate area, namely the northwesterly striking Hozameen Fault and the northwesterly Chuwaten Fault have superimposed the structures on a smaller scale to the pelites exposed on the property. The schistosity is of a high degree; the shear planes usually less than one-half inch apart and predominantly northwesterly striking with a dip of from 50° to 80°. to the southeast. The intense degree of schistosity reflects the near proximately to the northwesterly mineralization controlling fault structure.

Quartz veins are prevalent throughout the property. Surface mineralization is confined to pyrite within the pelitic schist.

VLF-EM SURVEY

(1) INSTRUMENTATION AND THEORY

A VLF-EM receiver, model 27, manufactured by Sabre Electronic Instruments Ltd of Burnaby, B.C. was used for the survey. This instrument is designed to measure the magnetic component of a very low frequency (VLF) electromagnetic field. The U.S. Navy submarine transmitter located at Seattle, Washington and transmitting at 18.6 KHz. was used.

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulphide body is within this magnetic field, a secondary alternating current is induced within it which in turn induces a secondary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 16 to 24 KHZ. whereas most EM instruments use frequencies ranging from a few hundred to a few thousand Hz. Because of its relatively high frequency, the VLF-EM can pick up bodies of a much lower conductivity and therefore is more susceptible to clay beds, electrolyte-filling fault or shear zones and porous horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up.

Consequently the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization (in places it can be used instead of IP). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain and, thus, VLF-EM preferably should not be interpreted without a good geological knowledge of the property and/or other geophysical and geochemical surveys.

(2) SURVEY PROCEDURE

The claim line for the King claims was used as the base line. This was chained and marked with fluorescent-orange flagging every 100 feet. In addition red flagging was placed every 300 feet. The claim line runs in a N24E direction.

The survey lines, 300 feet apart, were chained and compassed in and also marked every 100 feet with fluorescent orange flagging. Lines 18N to 33N were compassed in orthogonal to the baseline (N66W - S66E). Lines 0N to 15N were compassed in a N46W-S46E direction.

The VLF-EM readings were taken facing the transmitter at Seattle (southerly) on the survey lines at the 100-foot stations.

(3) COMPILATION OF DATA

The readings were reduced by applying the Fraser Filter. Filtered data, as shown on Sheet 3, are plotted between the reading stations. The positive filtered values were contoured at intervals of 5^{o}.

The Fraser filter is essentially a 4-point difference operator which transforms zero crossings into peaks, and a low pass smoothing operator which reduces the inherent high frequency noise in the data. Therefore, the noisy, non-contourable data are transformed into less noisy, contourable data. Another advantage of this filter is that a conductor that does not show up as a cross-over on the unfiltered data quite often will show up on the filtered data.

(4) DISCUSSION OF RESULTS

General comments and the VLF-EM's correlation with the geological mapping is discussed below. The VLF-EM's correlation with the results of the soil geochemistry is discussed in the soil geochemistry section.

As one can see by examining the results on Sheet 3, a major northeast-southwest trending anomaly predominates the map. However, the general trend of this anomaly correlates quite well with a change in the slope of the terrain (i.e. a southwest plunging ridge). Therefore, as sometimes happens

with VLF-EM, it is concluded the cause of the anomaly is strictly terrain.

Within this anomaly, however, are smaller anomalies, the causitive source of which is non-terrain. These anomalies have been enhanced by drawing dashed lines through their centres and labelling them by letters. Dashed labelled lines have been drawn through the other anomalies as well.

The lineations, as interpretted by the writer, strike in two main directions, north to northwest, and northeast to east. The northeast-trending lineations are labelled a-a' to f-f'. The northwest-trending ones are labelled g-g' to i-i'. Since anomaly j-j' occurs on the edge of the survey area, its strike could not be determined.

The northeast strike of lineations a-a' to f-f' correlates with the direction of fault and shear zones as mapped by Sookochoff. In fact, lineations c-c', d-d' and e-e' correlate directly with faults. Therefore, it is quite likely that the other northeast-striking lineations reflect fault zones as well, even though surface expressions were not mapped.

Sookochoff found no faults striking in a north-to-northwest direction. Therefore, faults are felt not to be the cause of lineations g-g' to i-i'. Possibly these lineations are caused by localized fracturing and/or northwest-striking folds.

The southeastern section of lineation j-j' correlates with a stockwork of quartz veins which, therefore, may explain this anomaly. However, the lineation also correlates with a bluff, another possible cause.

SOIL GEOCHEMISTRY

1. Survey Procedure:

The soil samples were taken at each 100-foot station on the 300-foot spaced lines with a D-handled shovel. The horizon sampled was B, which in this case was very rocky, red-coloured, and close to surface. Some samples could not be taken because of the prevalence of talus. Notes were made of the depth of sample, slope, colour, and texture. Samples were placed in brown, wet-strength paper bags with the grid co-ordinates marked thereon.

2. Testing Procedure:

All samples were tested by Acme Analytical Labs of Burnaby, B.C. The sample is first thoroughly dried and then sifted through a -80 mesh screen. Ten grams of the sifted material is then put into a test tube, ignited, and treated with a hot aqua regia acid for a certain length of time. An aliquot of the solution is then taken and the gold extracted with MIBK. The parts per billion (ppb) gold is then measured by atomic absorption and background corrected.

3. Compilation of Data

All results were plotted on Figure 4. Since most of the samples contained <10 ppb gold, this was considered to be the background. Ten ppb is then considered to be the sub-anomalous level and its contour is dashed in. Twenty ppb and above is considered anomalous. These contours were drawn in solid in somewhat of a logarithmic interval (20, 50, 100, 200, 350 ppb).

4. Discussion of Results

It is readily apparent from the results as shown on Figure 4, that the soil anomalies trend in a northeast-to-east direction. This correlates with the direction of the faults and most of the VLF-EM lineations. The gold mineralization is therefore likely controlled by these faults.

There are ten anomalies and these have been labelled A to J respectively.

Anomalies A, B and C correlate directly with VLF-EM lineations, a-a', b-b', and c-c'. Because of this correlation, as well as length and/or high values, these three anomalies show the best possibility of reflecting economic gold mineralization. Since the VLF-EM anomalies have a greater length than the correlating soil anomalies, any gold mineralization may well extend beyond the limits of the soil anomalies.

Anomalies D and E, together forming a northeast strike, very possibly may reflect the same zone.

Anomalies F, G, H and I though small, are all open in at least one direction. Anomalies H and I correlate directly with VLF-EM anomaly j-j'. The weakness of this anomalous zone may well be a reflection of greater overburden depth.

Correlation with the previous soil survey where the samples were tested for arsenic is excellent on a sample to sample basis. The contouring, however, does not correlate since the arsenic survey was very limited and its contours, as it turned out, were drawn in the wrong direction.

The previous magnetic survey, also because of only a few lines being done could not be correlated with the VLF-EM or the soils survey.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.,

David G. Mark
Geophysicist

July 28th, 1976

SELECTED BIBLIOGRAPHY

Geological Survey of Canada, Hope-Map-Area, West Half, British Columbia, 1970.

Sookochoff, L. Geological Report on the Coquihalla Property of Rich Hill Mines Ltd. T.R. Tough & Associates Ltd. July 20, 1976.

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 307-475 Howe Street, Vancouver, 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 practising in my profession for the past eight years and have been active in the mining industry for the past eleven years.

3. I am an active 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 soil sampling survey and a VLF-EM survey carried out under the supervision of myself, during June, 1976 on the King claim group.

5. I have no direct or indirect interest in the properties or securities of Rich Hill Mines Ltd., Vancouver, B.C. nor do I expect to receive any interest therein.

David G. Mark
Geophysicist

July 28th, 1976

AFFIDAVIT OF EXPENSES

I, DAVID G. MARK, Manager of Geotronics Surveys Ltd. certify the following costs were incurred in carrying out a combined VLF-EM and soil sampling survey on the King 11-14 claims on the Coquihalla River in the New Westminster Mining Division, British Columbia.

FIELD

2 men, geophysicist and helper, for 36 hours at $35/hour	$1,260.00
Room and board, 3 days at $40/day	120.00
Vehicle rental, 3 days at $30/day	90.00
Instrument rental, 3 days at $15/day	45.00
Miscellaneous supplies	25.00
	$1,540.00

LAB

Soil testing, 308 samples at $3/sample	924.00

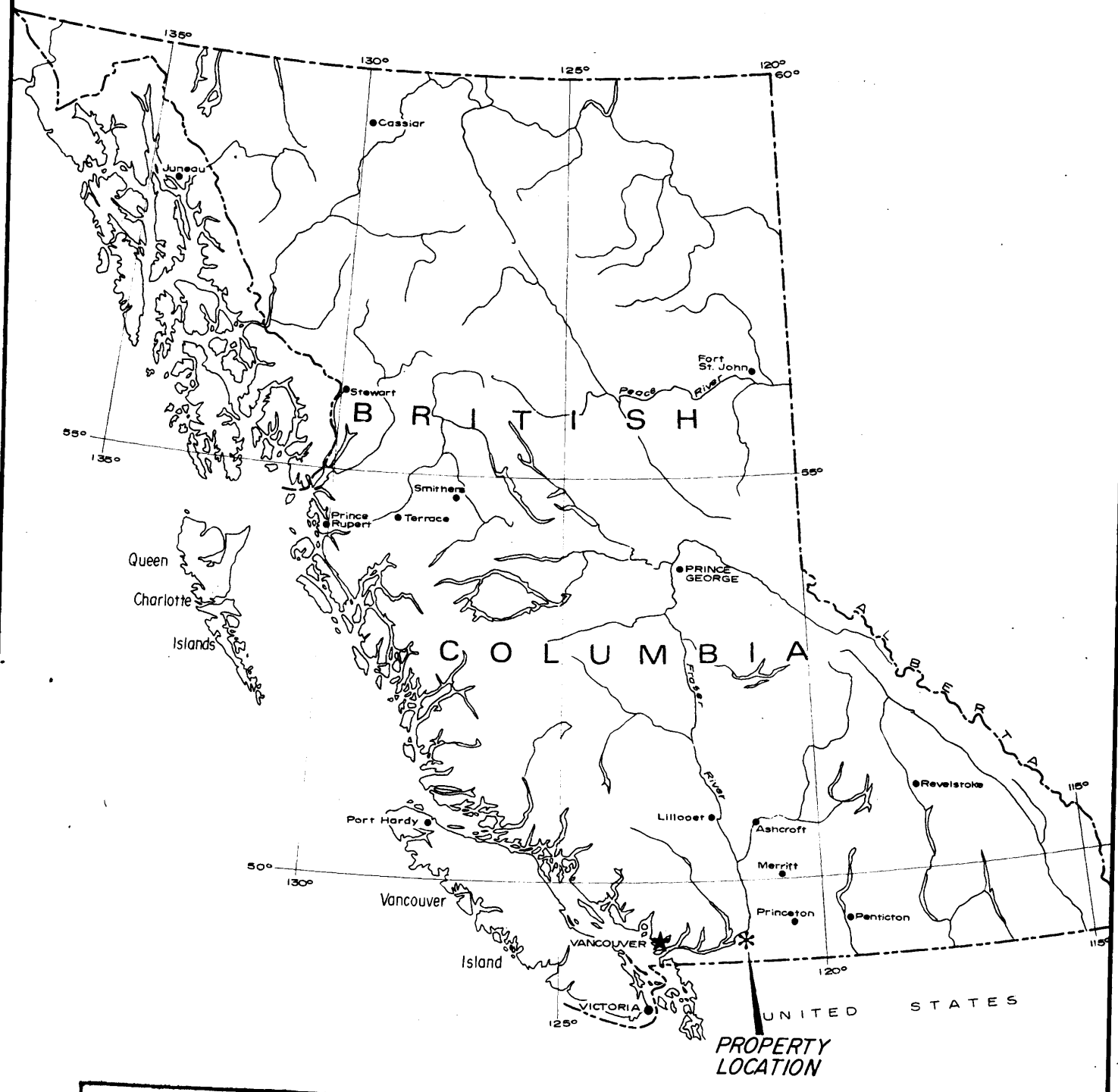
REPORT

Geophysicist, 8 hours at $25/hour	200.00
Office helper, 4 hours at $10/hour	40.00
Drafting and printing	200.00
Typing, xeroxing and compilation	100.00
	$ 540.00
TOTAL	$ 3004.00

Respectfully submitted,
GEOTRONICS SURVEYS LTD.,

David G. Mark, Geophysicist

July 28th,1976



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ASSESSMENT REPORT
NO. 5923 MAP #1

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RICH HILL MINES LTD (N.P.L.)

KING CLAIM GROUP

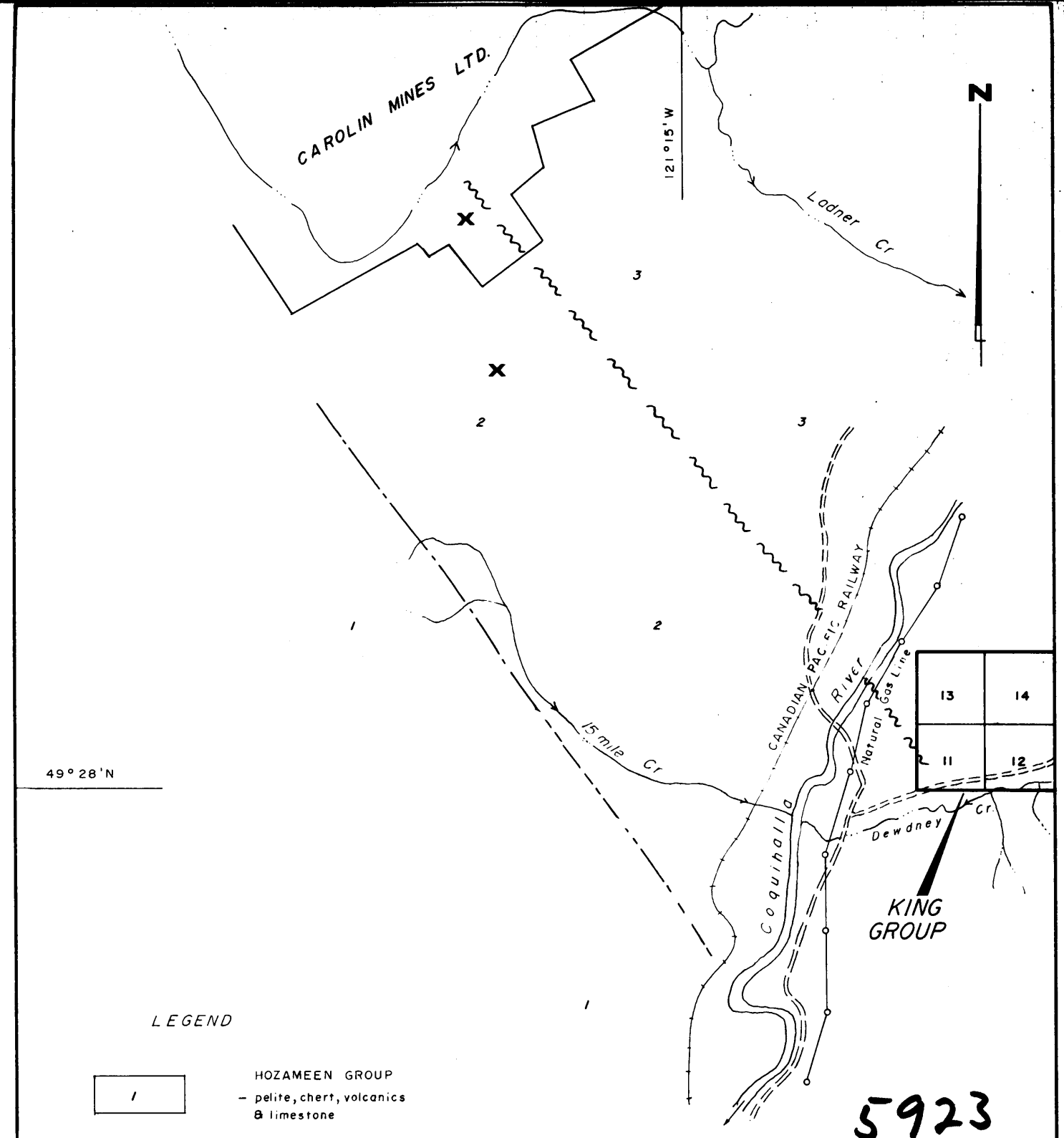
LOCATION MAP

NEW WESTMINSTER M.D., B.C.

Miles 100 50 0 100 200 Miles

Job No. 76-32	Date JULY-1976	Drawn Altair	Fig. 1.

ALTAIR drafting services ltd.



LEGEND

1	HOZAMEEN GROUP – pelite, chert, volcanics & limestone
.2	Ultramafics – serpentinite
3	LADNER GROUP pelite, volcanic sandstone
—— - ——	GEOLOGICAL BOUNDARY
~~ ~~~	FAULT
X	MINERAL OCCURRENCE

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Map 2

#2

AFTER GSC MAP 12 — 1969

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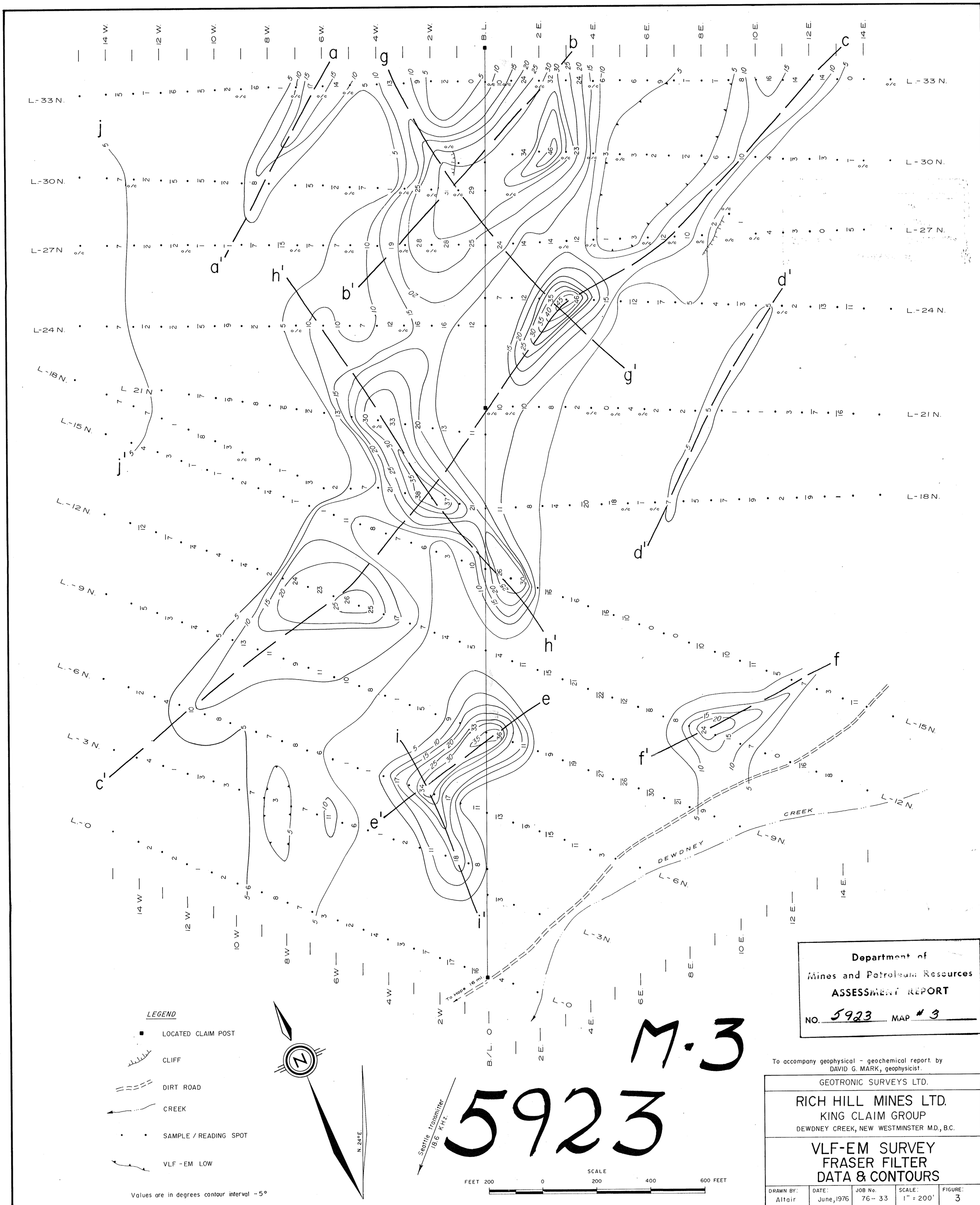
KING CLAIM GROUP
NEW WESTMINSTER M.D., B.C.
CLAIM MAP & GEOLOGY

feet
3000 0 3000

JOB No. 76-32	DATE JULY-1976	DRAWN Altair	FIG. 2



LEGEND

- LOCATED CLAIM POST
- CLIFF
- DIRT ROAD
- CREEK
- SAMPLE / READING SPOT
- VLF - EM LOW

Values are in degrees contour interval - 5°

M-3

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To accompany geophysical - geochemical report by
DAVID G. MARK, geophysicist.

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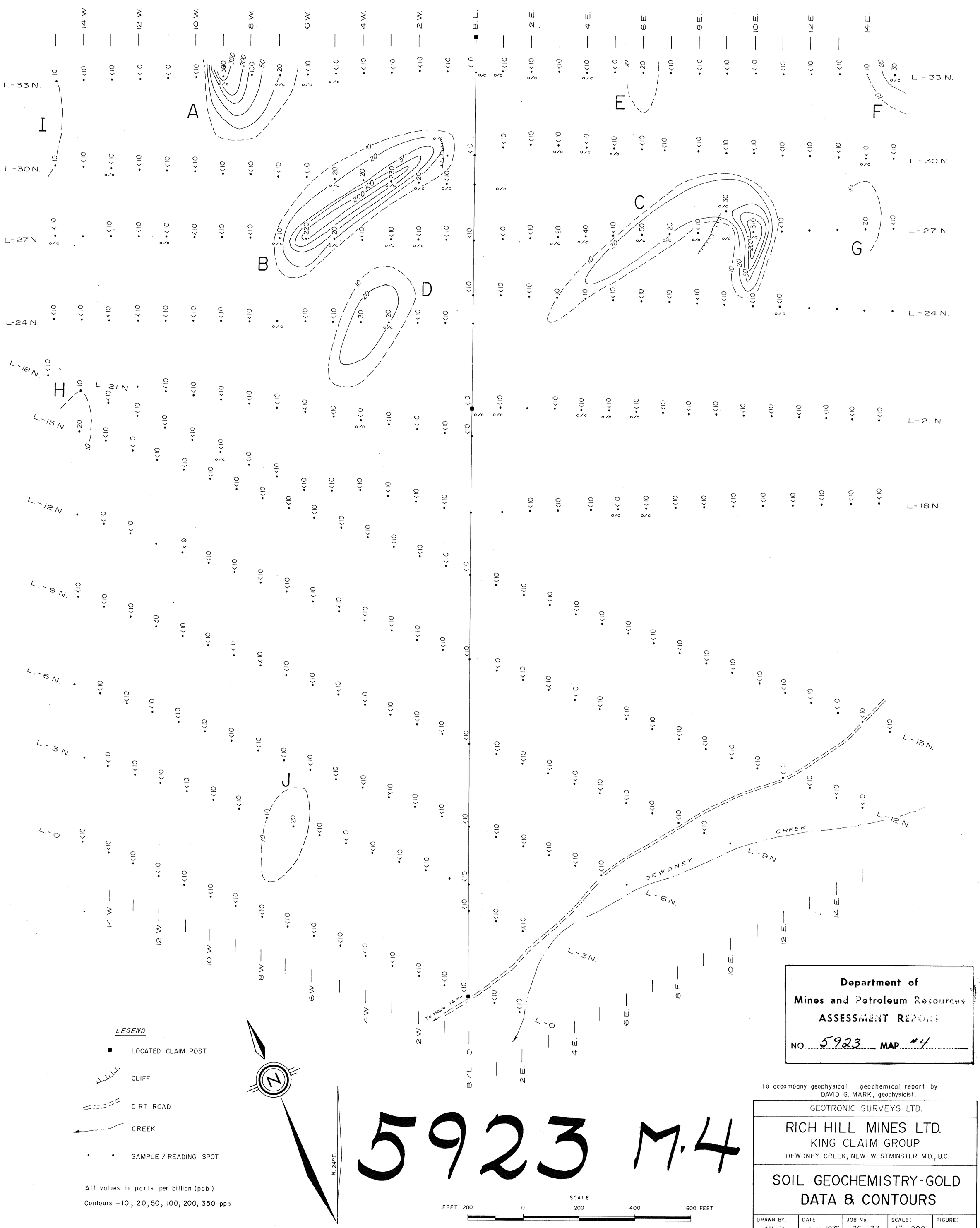
KING CLAIM GROUP
DEWDNEY CREEK, NEW WESTMINSTER M.D., B.C.

VLF-EM SURVEY
FRASER FILTER
DATA & CONTOURS

DRAWN BY:	DATE:	JOB No.	SCALE:	FIGURE:
Altair	June, 1976	76 - 33	1" = 200'	3



5923 M.4

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NO. 5923 MAP #4

To accompany geophysical – geochemical report by
DAVID G. MARK, geophysicist.

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KING CLAIM GROUP
DEWDNEY CREEK, NEW WESTMINSTER M.D., B.C.

SOIL GEOCHEMISTRY - GOLD DATA & CONTOURS

DRAWN BY:	DATE:	JOB No.	SCALE:	FIGURE:
Altair	June, 1976	76 – 33	1" = 200'	4