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GEOLOGICAL BRANCH
ASSESSMENT REPORT

12,920

SUMMARY

A VLF-EM survey was carried out over a portion of the Leader 2 Claim during the summer of 1983. The claim is located 24 km west of Cranbrook, British Columbia between Angus Creek to the west and Perry Creek to the east. Access to the property is easily gained by a two-wheel drive vehicle. The terrain consists of moderate to steep slopes covered with light to moderately dense coniferous trees as well as alpine meadow. The purpose of the survey was to determine whether the VLF-EM responded to the gold-sulphide mineralization as found on the nearby Leader A Claim and whether it extended onto Hawk's Leader 2 Claim.

The northwestern corner of the property is underlain by the basal Aldridge Formation which consists of argillite and argillaceous quartzite. Striking northeasterly and easterly along the northern part of the property is a 300 m band of the Creston Formation, also composed of argillites and quartzites. The southern 75% of the property is underlain by the Kitchener/Siyeh Formation composed of impure magnesium limestone, argillite, and calcareous quartzite. Within the southeastern corner of the claim are northeasterly-striking bands of meta-diorite and/or meta-quartz diorite of the Moyie Intrusions. On the adjacent Leader A Claim occurs an auriferous quartz vein returning assays up to 0.598 oz gold/ton and 10.56 oz silver/ton across 0.58 m. Much quartz float has been noted on the Leader 2 Claim.

The VLF-EM readings were taken every 20 meters on 40-meter separated NW-SE lines. The data was then reduced, plotted and contoured.

LIST OF ILLUSTRATIONS

CONCLUSIONS

The VLF-EM survey appears not to have responded to the mineralization on the Leader A Claim and therefore it did not prove whether the vein continues onto Hawk's Leader 2 Claim. However, it shows the Leader 2 Claim contains geological structure striking mainly northerly and northeasterly. These probably are primarily faults and lithological contacts. The VLF-EM survey has also shown many areas of cross-structure which could indicate mineralization.

RECOMMENDATIONS

1) The property should be soil sampled on a 50 meter by a 100 meter grid. In the laboratory, the whole soil sample should be pulverized, screened for metalics and then fire-assayed with an AA finish for gold. It would also be useful to test for lead, zinc, silver, and copper. Any anomalies discovered should then be detailed on a 10 meter by 10 meter grid and the same lab procedure followed.

2) Geological mapping and prospecting should be thoroughly carried out over the whole property.

3) As an aid to the geological mapping, a magnetometer survey should be carried out with stations every 25 m on the same soil sample lines. Magnetics should be able to map intrusives as well as geological structure.

4) Soil anomalies should be tested by resistivity-IP sections to optimize the locations and angles of diamond drill holes.

5) It is not recommended to carry on with the VLF-EM survey due to its lack of response to the Leader A vein.

GEOPHYSICAL REPORT

ON A

VLF-EM SURVEY

OVER THE

LEADER 2 CLAIM

ST. MARY LAKE AREA

FORT STEELE MINING DIVISION

BRITISH COLUMBIA

INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data and the interpretation of a VLF-EM survey carried out over a portion of the Leader 2 Claim during the period of August 5th to 20th, 1983.

The surveys were carried out by Trans-Arctic Explorations Ltd. under the field supervision of Chris Sywulsky, geophysical technician, with the aid of Lloyd Brewer. A total of 33.8 line km of VLF-EM survey was done.

The primary purpose of the VLF-EM survey was to determine whether it responded to the auriferous quartz vein containing sulphides located on the adjoining Leader A Claim and whether this vein extended onto Hawk's Leader 2 Claim.

The survey was done on the recommendation of L. Sookochoff, P.Eng., consulting geological engineer to Hawk Resources Inc.

PROPERTY AND OWNERSHIP

The property consists of one 20-unit claim staked within the Fort Steele Mining Division as shown on Map 2 and as described below:

Claim Name	No. Units	Record No.	Expiry Date
Leader 2	20	1859	June 27, 1984

The expiry date shown does not take into account the survey under discussion as being accepted for assessment credits.

The claim is owned by Hawk Resources Inc. of Vancouver, British Columbia.

LOCATION AND ACCESS

The property is located 24 km west of Cranbrook between Angus Creek to the west and Perry Creek to the east.

The geographical coordinates are 49°33'N latitude and 116°06'W longitude.

Access is easily gained by travelling north from Cranbrook on Highway #95A to Marysville and then 15 km along an all weather road to the west running along the north side of the St. Mary River. A main logging road crosses the St. Mary River at the east end of St. Mary Lake. Two km east of the bridge one takes the Angus Creek road which runs southerly onto the property.

PHYSIOGRAPHY

The property lies to the west of the Rocky Mountain trench within the Purcell Mountains which are physiographic divisions of the Columbia Mountain System. The terrain consists of moderate to steep partially logged slopes throughout most of the property. It lies across a hilly north-trending ridge with the elevation increasing from the east and from the west to the center of the property.

Elevations vary from about 1,770 meters a.s.l. at the northwest corner of the property to 2,290 meters a.s.l. within the south central part to give an elevation difference of 520 meters.

The main water sources would be Angus Creek as well as westerly-flowing tributaries of Angus Creek.

The forest cover consists of fir, spruce and hemlock(?) and varies from closely growing, immature stands to more widely spaced, mature stands. The upper elevations are covered by alpine meadow.

HISTORY OF PREVIOUS WORK

Since the Leader 2 Claim has been staked, no work other than the VLF-EM survey has been done.

The history of the area goes back to the 1880's when prospectors working the Perry Creek placers discovered the vein now covered by the adjoining Leader A Claim. Little ore has been shipped from this vein, even though assays have run as high as 4.8 oz/ton Au and 6.8 oz/ton Ag. There are also high values in lead, zinc and copper.

GEOLOGY

The following is quoted from L. Sookochoff's 1983 Geological Evaluation Report on the adjoining Leader 2 Claim:

"The general geological setting of the area is of the Proterozoic Lower Purcell Group which is divided into three Formations. In the Hellroaring Creek - Angus Creek - Perry Creek area the Creston and Kitchener Formation predominate and are lenticularly northeasterly trending, commonly in a fault contact and bounded to the north and south by the Aldridge Formation.

"The basal Aldridge Formation - the oldest formation known to occur in the area - is composed mainly of grey to brownish grey, rusty weathering argillite and argillaceous quartzite.

"The Creston Formation is transitional from the Aldridge Formation and embraces that succession of greyish argillaceous quartzites which is included between the dark rusty weathering, argillaceous quartzites of the lower Aldridge Formation and the thin bedded, calcerous rocks of the upper Kitchener Formation. In general, the Creston Formation consists of argillaceous quartzites, purer quartzites and argillites whose beds average about one foot in thickness. Narrow beds, pods, and lenses of calcerous rocks occur in the upper part of the formation. These are more numerous toward the top of the Creston and where they are abundant, the strata are considered to belong to the overlying Kitchener Formation.

"The Creston Formation is host to gold quartz veins on Perry Creek, a northeasterly flowing tributary of the St. Mary River with the confluence 13 km northwest of Cranbrook. The deposits occur in the argillaceous quartzites which are well bedded in beds '2 inches to 2 feet' in thickness, the latter separates by thin beds of meta-argillites.

"The deposits occur as true fissure veins averaging about '8 feet' with some as wide as '20 feet'. They can be traced for long distances along strike. The gold values occur as native in the outcrops and with pyrite at depth.

"The Kitchener Formation consists predominantly of impure, magnesium limestone, argillite and calcerous quartzite. Limestone and calcerous rocks compose the bulk of the formation and serve to distinguish it from the underlying formations. The upper part is generally argillaceous. Due to the formation containing easily deformed rocks, great stretches of it have been altered to chlorite and talc-carbonate schist.

"A small stock of porphyritic granite within one km west of the property intrudes sediments of the Creston Formation. The granite contains large idiomorphic crystals of orthoclase in an isometric groundmass of plagioclase, quartz and hornblende.

STRUCTURE

"The general structure of the area is of a broad, northerly striking anticline exposing the core of the Proterozoic rocks with younger rocks to the west and east. The regional St. Mary's fault trends east northeast to the north of the property area and creates a fault contact with the Aldridge and younger formations.

"Faults extending from the south generally terminate or trend into the St. Mary's fault and commonly indicate contacts between the Creston and Kitchener formations.

"One of the fault contacts referred to as the Sawmill Creek Fault determines a Creston-Kirchener Formation contact which trends through the Leader A Claim. The St. Mary's fault is within two km north.

PROPERTY GEOLOGY

"The property covers the basal Aldridge formation in the northwest portion in a northeasterly trending contact with the Creston Formation to the southeast. The Kitchener Formation occurs in the southeast with the contact trending southwesterly through the Leader A claim in the southwest. The dip varies from 68° to 80° east. South of the adit, which is located 850 feet south of and 135 feet below the most northerly and highest workings and 650 feet south of the shaft, the overburden masks the vein continuity to the lowest workings. To the north of the adit the fissure is occupied by a continuous quartz vein varying from about one to two feet wide and averaging one and one-half feet.

MINERALIZATION

"On the adjacent Leader A Claim a mineralized quartz vein follows a strong fissure with varying strike from nearly north-south to north 35-50° with a dip of from 68° to 80° east. The vein varying from 'a few inches to three feet wide' can be traced along a length of '2,000 feet'. The vein is composed of white banded quartz containing galena, pyrite and locally chalcopyrite with tungsten reported in the adit at the southernmost extension of the vein.

"Assays from the Leader A vein reportedly returned up to .598 oz Au/ton and 10.56 oz Ag/ton across '1.9 feet' with a reported assay of 4.80 oz Au/ton. A reported 1720 tons of possible ore were calculated on the vein.

"On the Leader 2 mineral claim, it was reported that in the execution of the VLF-EM survey, abundant quartz fragments in addition to a large block of quartz were noted in several locations.

Float fragments located within a northerly flowing creek in the northwest portion of the claim were assayed returning 1.52 oz Ag/ton and 0.06 oz Au/ton.

"The creek was prospected southerly where quartz veins in place were reportedly noted with additional quartz float fragments southward.

INSTRUMENTATION AND THEORY

A VLF-EM receiver, Model 27, manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B.C. was used for the VLF-EM survey. This instrument is designed to measure the electromagnetic component of the very low frequency field (VLF-EM), which for this survey is transmitted at 24.8 KHz from Seattle, Washington.

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 that distorts the primary 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 conven-

tional EM methods and too small for induced polarization. (In places it can be used instead of I.P.). 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.

SURVEY PROCEDURE

The survey consisted of 33.8 line km of VLF-EM survey of the property as shown on Map 2.

The base line was started from the shaft on the Leader A Claim on a bearing of N30°E. It was extended for 2,600 m being well flagged with survey flagging. The survey lines were run perpendicular to the base line (S60°E - N60°W) at a 40 m spacing. The instrument readings were taken every 20 m along the survey lines facing towards the transmitter at Seattle.

COMPILATION OF DATA

The VLF-EM field results were plotted on Map 3 at a scale of 1:4,000. They were then reduced by applying the Fraser-filter and the filtered results subsequently plotted on Map 4 at the same scale. The filtered data were plotted between actual reading stations. The positive dip-angle readings were then contoured at an interval of 4°.

The Fraser-filter is essentially a 4-point difference operator, which transforms zero crossings into peaks, and a low pass smoothing operator which induces the inherent high frequency noise in the data. Therefore, the noisy, non-contourable data are trans-

formed 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 shows up on the filtered data.

DISCUSSION OF RESULTS

The major cause of VLF-EM anomalies, as a rule, are geologic structures such as fault, shear and breccia zones. It is therefore logical to interpret VLF-EM anomalies to likely be caused by these structural zones. Of course, sulphides may also be a causative source. But when VLF-EM anomalies correlate with sulphide mineralization, the anomalies are often reflecting the structure associated with the mineralization rather than the mineralization itself.

The major trend of the VLF-EM anomalies, as seen on Maps 3 and 4, are northerly and northeasterly. Considering the VLF-EM anomalies are likely reflecting structure, the major strike of structure on this property is concluded to be in these directions which agrees with the geological mapping by the G.S.C.

There is some variation in intensity from one VLF-EM anomaly to the next. This is not only due to the conductivity of a causative source, but also the direction it strikes relative to the direction to the transmitter. In other words, those conductors lying closer to the same direction as the direction to the transmitter (S55W in this case), can be picked up easier than those that are lying at a greater angle. Depending upon its conductivity, a conductor may not be picked up at all if it is at too great an angle. However, on this particular survey are some VLF-EM conductors that have strong intensity and yet are at a low optimum direction to Seattle. This is therefore an indication of the causative source being a strong conductor.

The survey has produced somewhat interesting results throughout the survey area, particularly the VLF-EM highs. These highs are of greater economic interest since they may be reflecting sulphides, fracturing and/or alteration any of which could be associated with gold mineralization. The highs often are at points of intersection of two or three conductors striking in two or three different directions. If the conductors are in fact geological structures, then the points of intersection become amenable to mineralizing fluids.

It appears, however, that the VLF-EM survey did not respond to the Leader A vein system. Therefore it cannot be proven that this vein extends onto Hawk's property. Nevertheless, it should not be precluded that some of the VLF-EM conductors may be responding to quartz veins mineralized with gold and sulphides.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark,
Geophysicist

September 26th, 1984

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1915 - p. 113
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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 located at #403-750 West Pender Street, Vancouver, British Columbia.

I further certify:

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 my profession for the past 16 years and have been active in the mining industry for the past 19 years.

3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association for Exploration Geophysicists.

4. This report is compiled from data obtained from a VLF-EM survey carried out by Trans-Arctic Explorations Ltd., under the field supervision of Chris Sywulsky from August 5th to 20th, 1983.

5. The work was done on the recommendations of Laurence Sookochoff, P.Eng., who is the consulting geologist for Hawk Resources Inc.

6. I am a director and minor shareholder of Hawk Resources Inc. However, I will not receive any further interest in Hawk Resources as a result of writing this report.

David G. Mark
Geophysicist

September 26th, 1984

AFFIDAVIT OF EXPENSES

Leader 2 Claim
(Hawk Resources Inc.)

The VLF-EM survey was carried out from August 5th, 1983 to August 20th, 1983 on the Leader 2 mineral claim, south of Kimberley Area, Fort Steele Mining Division, B.C. to the value of the following:

FIELD:

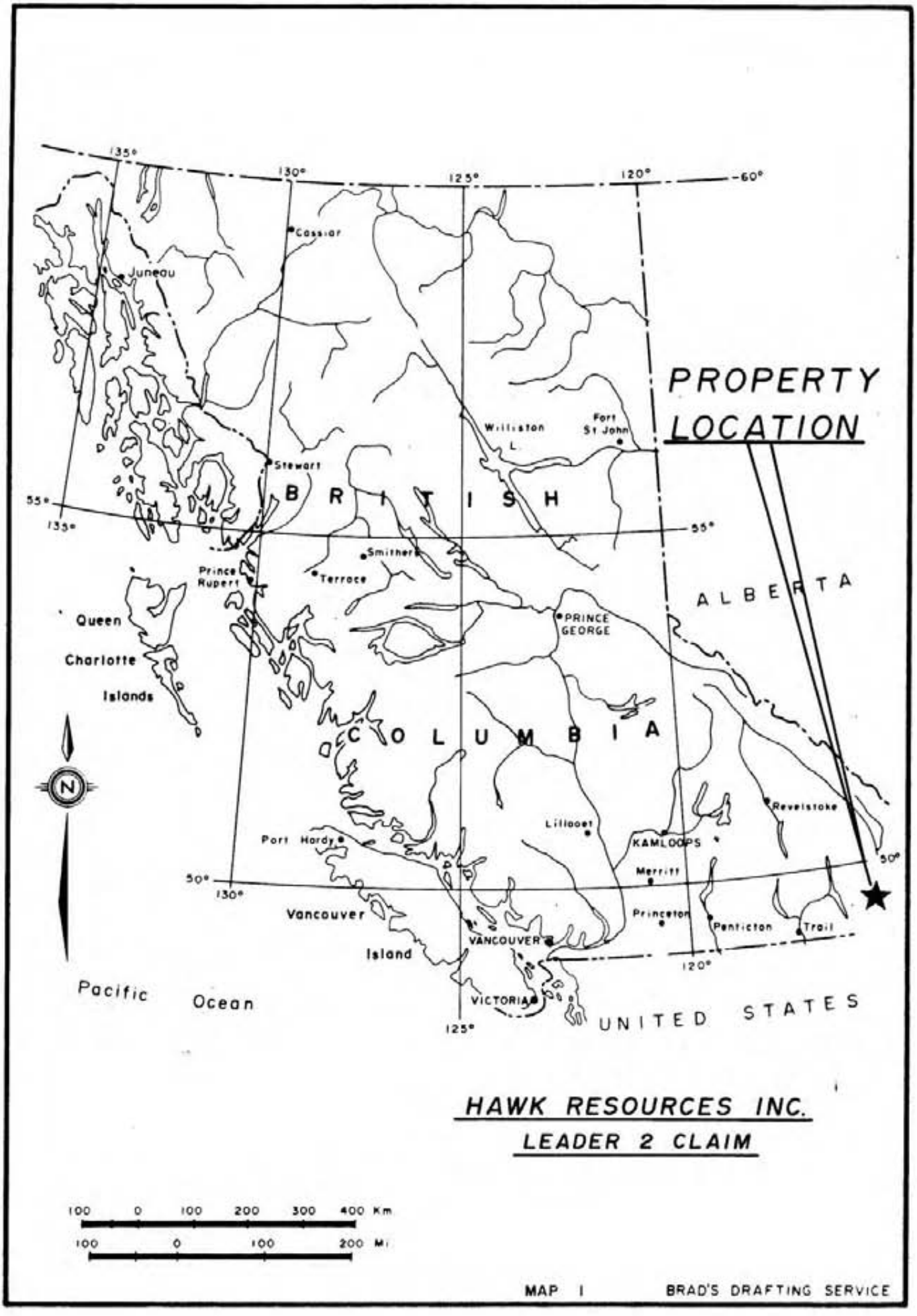
1 day	- Supervisor	$ 200
16 days	- Instrument operator @ $150/day	2,400
16 days	- Surveyors helper @ $125/day	2,000
16 days	- 4 X 4, 3/4 ton truck @ $90/day (includes oil and gas)	1,440
16 days	- Room and board in camp, 2 men @ $70/day	1,120
16 days	- Instrument rental (VLF-EM) @ $20/day	320
		$7,480

OFFICE:

Geophysicist, 13 hours @ $40/hr	$ 520
Geophysical technician, 20 hours @ $25/hr	500
Drafting and printing	400
Typing and photocopying	100
GRAND TOTAL	$9,000

Respectfully submitted,
TRANS-ARCTIC EXPLORATIONS LTD.

E.A. Dodd,
President

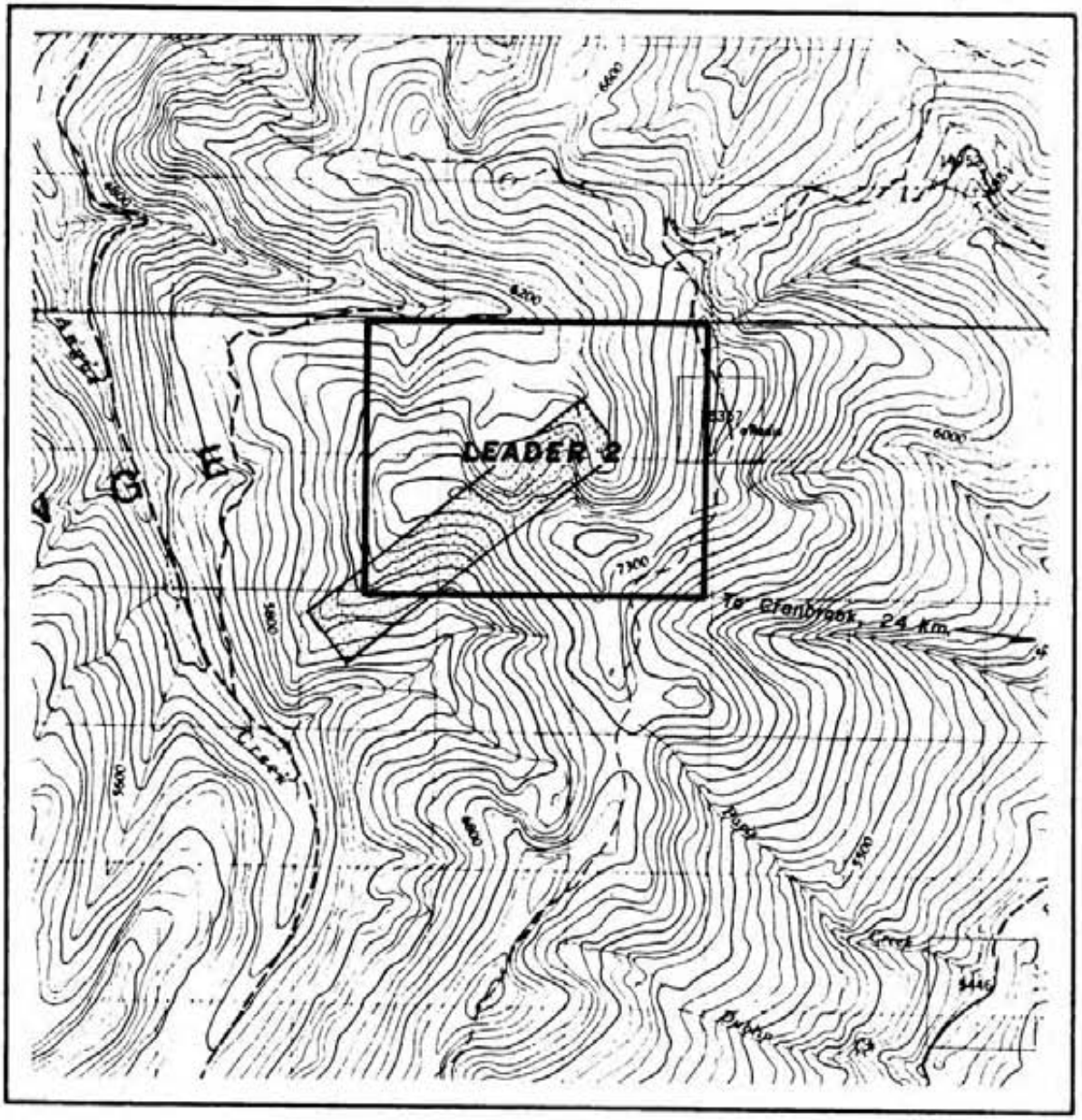


HAWK RESOURCES INC.

LEADER 2 CLAIM

MAP 1 BRAD'S DRAFTING SERVICE

116°06'



49° 33'

Survey Area

N

1 0.5 0 1 2
KILOMETRES

HAWK RESOURCES INC.

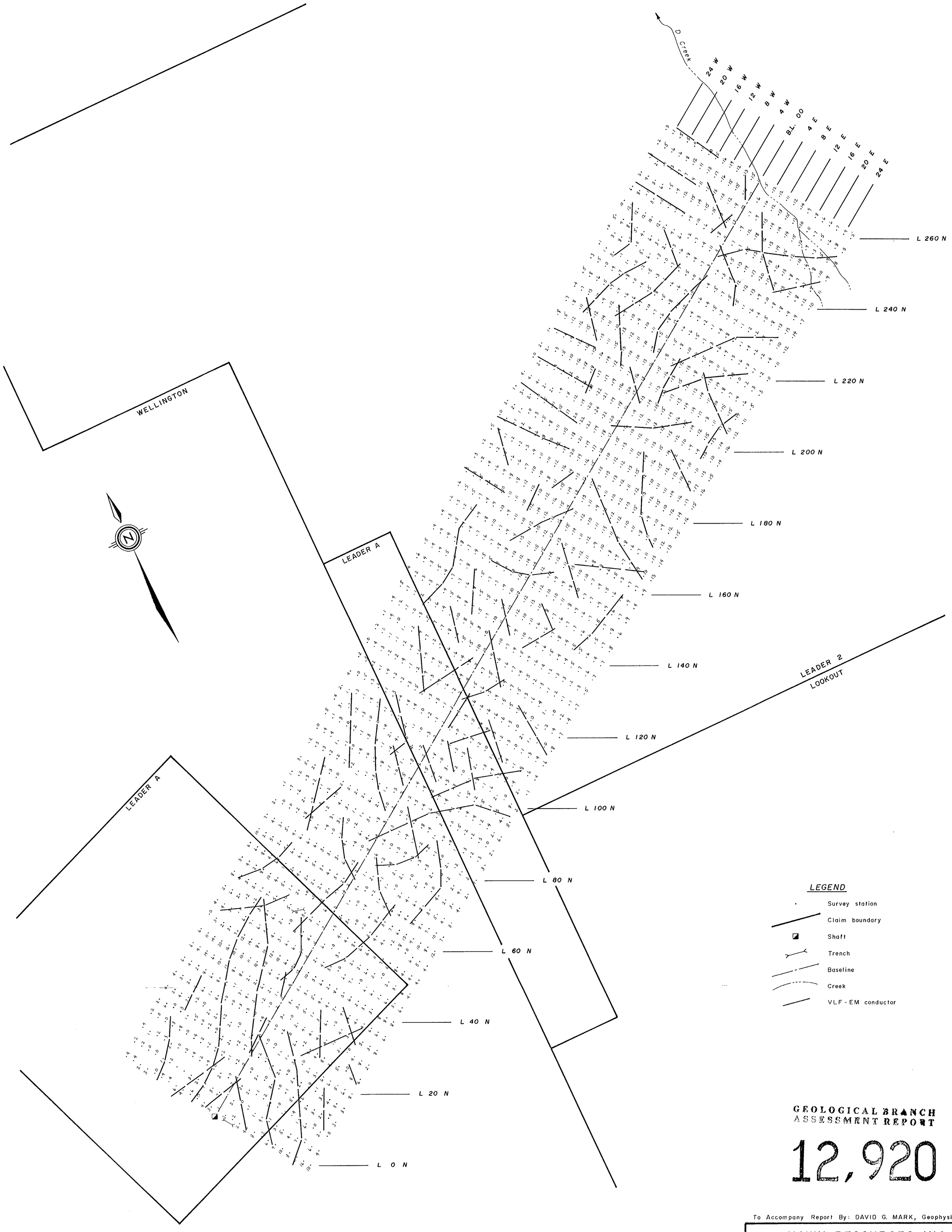
LEADER 2 CLAIM

ANGUS CREEK, D CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

CLAIM LOCATION MAP

SCALE:	DATE:	MAP:	N.T.S.
1:50,000	Sept. 84.	2	82 F/9 E



GEOLOGICAL BRANCH
ASSESSMENT REPORT

12,920

To Accompany Report By: DAVID G. MARK, Geophysicist

HAWK RESOURCES INC.

LEADER 2 CLAIM

ANGUS CREEK, D CREEK, CRANBROOK AREA, B.C.

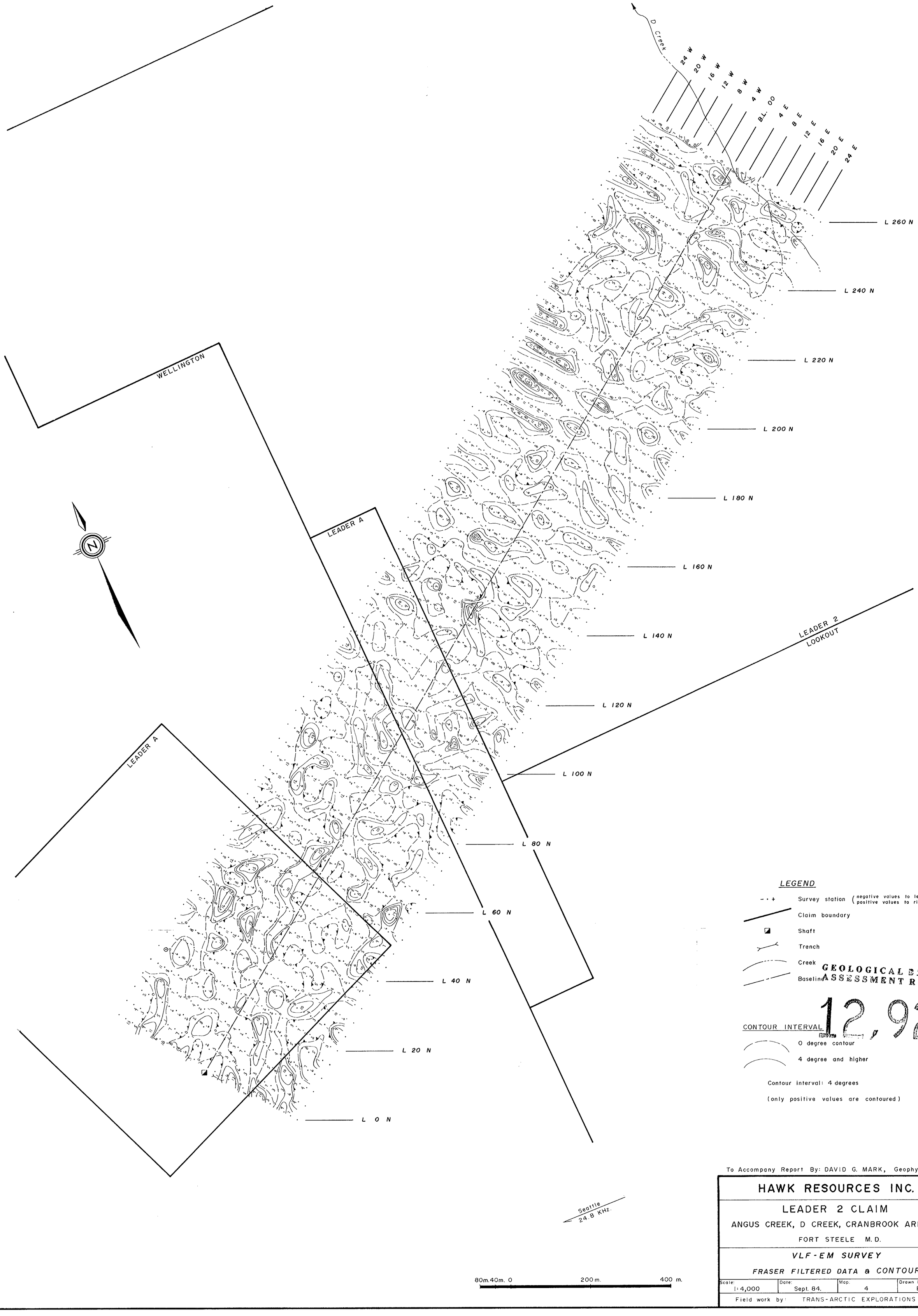
FORT STEELE M.D.

VLF - EM SURVEY

RAW DATA & CONDUCTORS

Scale:	Date:	Map:	Drawn by:
1 : 4,000	Sept. 84.	3	B. D. S.

Field work by: TRANS-ARCTIC EXPLORATIONS LTD



LEGEND

- · + Survey station (negative values to left, positive values to right.)
- Claim boundary
- Shaft
- Trench
- Creek
- Baseline

CONTOUR INTERVAL

- 0 degree contour
- 4 degree and higher

Contour interval: 4 degrees

(only positive values are contoured)

To Accompany Report By: DAVID G. MARK, Geophysicist

HAWK RESOURCES INC.

LEADER 2 CLAIM

ANGUS CREEK, D CREEK, CRANBROOK AREA, B.C.

FORT STEELE M.D.

VLF-EM SURVEY

FRASER FILTERED DATA & CONTOURS

Scale:	Date:	Map:	Drawn by:
1:4,000	Sept. 84.	4	B. D. S.

Field work by: TRANS-ARCTIC EXPLORATIONS LTD.