77-#2(2)-#(2)

6327

GEOPHYSICAL - GEOCHEMICAL REPORT

on

VLF-EM & SOIL SAMPLE SURVEYS

FLEX CLAIM

SKUHUN CREEK AREA, KAMLOOPS M.D., B.C.

June, 1977

Property:	14 miles S56E of the Town of Spences Bridge, B.C. and 6 miles south of the east end of the Pimainus Lakes.
:	50^{o} 121^{o} SE
:	N.T.S. - 92I/6E

Written by:	David G. Mark, Geophysicist GEOTRONICS SURVEYS LTD 420-890 West Pender Street, Vancouver, British Columbia
for:	Gardner Eldridge, 305-543 Granville Street, Vancouver, B.C.

July 12, 1977

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ILLUSTRATIONS

The property is located mostly within the Chataway variety and possibly partly within the Guichon variety of the Highland Valley Phase of the Guichon Creek Batholith. This batholith is of Upper Triassic to Middle Jurassic Age and has intruded into the Nicola Group of rocks which are of Upper Triassic Age.

In hand specimens apparently from the adit dump, the writer noted chalcopyrite, bornite and pyrite mineralization. The host rock appeared to be a diorite.

The VLF-EM readings and soil samples were taken every fifteen meters along 30-meter separated lines. The VLF-EM readings were Frazer-filtered, plotted and contoured. The soil samples were tested for copper and the results plotted, statistically analyzed and contoured.

Several copper soil anomalies and VLF-EM conductors were found to occur on the property, including the adit area. Correlation between the two surveys range from fair to excellent.

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SKUHUN CREEK AREA, KAMLOOPS M.D., B.C.

SUMMARY

A combined soil sampling and VLF-EM survey was carried out over a portion of the Flex Claim in June 1977. This property is located in the Skuhun Creek area, fourteen miles S56E of the town of Spences Bridge in the Kamloops Mining Division. Access is gained by a gravel road which leaves Highway 8, and thence a 'cat' road. The property is found on a fairly steep east to southeast slope covered lightly to moderately by pine, spruce and fir. The purpose of the surveys was to determine if they reflected the known mineralization on the property, and whether the known mineralization had any extension to it.

The Flex claim had not previously had any work done on it but in years past, before the claim was staked, several 'cat' trenches and an adit were dug out.

CONCLUSIONS

1. Soil Anomaly A correlates directly with the adit and shows an extension of the adit mineralized zone to be at least 90 meters in a S10W direction (though the direction may be more west because of the east slope). VLF-EM lineations a-a' and a-b' also correlate with the adit zone, though with different directions of S25E and S50W, respectively. Because of this apparent discrepancy, without some geological mapping, it is somewhat difficult to relate the adit zone with the soil anomaly and the VLF-EM lineations.

2. Other correlations on the property are:
VLF-EM lineation a-c' with copper anomaly F
VLF-EM lineation d-d' with copper anomaly C, D and E
VLF-EM lineation b-b' with copper anomaly B

It can be seen that the copper soil anomalies correlate with only parts of the VLF-EM lineations. This may be due to one or both of the following reasons:

a) The VLF-EM lineations (or conductors) are reflecting fault and/or shear zones which are mineralized in certain parts with copper sulphides.

b) The lineations reflect a mineralized zone but the mineralization where it is not reflected by copper soil anomalies occur below the bedrock subsurface.

3. The VLF-EM and soil geochemistry surveys were found to be fairly successful in meeting their objectives.

RECOMMENDATIONS

1. Very little is known about the geology of the property and, therefore, it is strongly felt that it should be mapped. This would include rehabilitating and mapping the adit as well as the 'cat' trenches. In addition to increasing the knowledge about the potential of the property, the mapping would greatly enhance the interpretation of the VLF-EM and soil geochemistry surveys.

2. The VLF-EM and soil geochemistry surveys are considered successful and therefore should be continued over the remainder of the property.

3. Only after the above work is completed should further recommendations be made.

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FLEX CLAIM

SKUHUN CREEK AREA, KAMLOOPS M.D., B.C.

INTRODUCTION AND GENERAL REMARKS

This report discusses the survey procedure, compilation of data, and the interpretation of a soil sampling survey and a very low frequency electromagnetic (VLF-EM) survey over a part of the Flex Claim located near Skuhun Creek, between Spences Bridge and Merritt, British Columbia.

The field work was carried out by T.W. Rolston, Geophysics Technician, and Robert McLean, helper, and part owner of the property, from June 24th to 27th, 1977. A total of 3.03 kilometers of VLF-EM survey were carried out and 317 samples picked up. The samples were tested for copper.

The object of the soil sampling was to delineate any probable areas of copper mineralization. That of the VLF-EM was to

delineate the mineralization as well as any shear zones associated with the mineralization.

Being that there is an adit on the property with copper mineralized rock in the dump, it was part of the object to see if there was any VLF-EM or copper soil geochemistry anomalies around the adit, and if these anomalies indicated any strike to the adit's mineralization.

PROPERTY AND OWNERSHIP

The property is comprised of one claim composed of six units staked under the modified grid system. The claim is shown on Figure 1 and described as follows:

Claim Name	Record No.	No. of Units	Expiry Date
Flex	438(7)	6	July 5, 1980*

*assuming this report is accepted for filing.

The property is owned by Robert McLean, the registered owner, and Gardner Eldridge, both of Vancouver, British Columbia.

LOCATION AND ACCESS

The Flex claim is located fourteen miles S56E of the town of Spences Bridge, British Columbia, and six miles due south of the eastern end of the Pimainus Lakes. It is found on the southeast flank of Swilkwakwil Mountain and 2,000 meters west of the confluence of Skuhun and Skuhost Creeks.

The geographical coordinates are 50° 19' north latitude, and 121° 04' west longitude.

Access is gained by travelling 14 miles southeasterly on Highway 8 from Spences Bridge to Skuhun Creek road which leaves the highway running northeasterly. One then travels eight miles along this road to a north-trending road. The Flex Claim is one mile up this road.

A two-wheel drive vehicle is adequate up to the mile-long Flex Claim road. This road is apparently more like a 'cat' road which may possibly be driven by 4-wheel drive vehicle.

PHYSIOGRAPHY

The property is found within the west central part of the physiographic division known as the Thompson Plateau, which is part of the Interior Plateau system. The Thompson Plateau is typified by gently rolling upland of low relief, for the most part lying between 4,000 and 5,000 feet, but with prominences of more resistent rock rising above it such as Spaist Mountain at 6,072 feet. The plateau is cut by numerous creeks and rivers producing steep-sided valleys and gorges.

The property itself is found on the side of one of these steep-sided valleys, specifically the Skuhun Creek valley. The elevation varies from 3,500 to 5,000 feet a.s.l.

The vegetation could be considered to be a fairly open forest consisting of pine, fir, and spruce.

Water on the property is found in only one intermittently-running creek. Otherwise, water can be obtained from Skuhun Creek, which is 500 meters off of the southeast corner of the claim.

HISTORY OF PREVIOUS WORK

The Flex Claim, as such, has had no previous work done on it. However, there is one adit on the property which supposedly was dug several decades ago, and numerous 'cat' trenches which were cut out only a few years ago.

The following was observed by Rolston about the adit:
"The Portal of the adit is on the north end of the claim at post 1E-3N, located on the dump. Samples on the dump show chalcopyrite and bornite. The tunnel is caved in at the portal except for an opening that a man could crawl in, but there is a lot of loose rock overhead. Visually looking into the tunnel, it follows a 30-inch wide vein striking in a southerly direction and dips approximately 20°. The portal is on the edge of a steep ravine which runs east-west."

GEOLOGY

The Flex claim is found within the southwest corner of the Guichon Creek Batholith, the geology of which was mapped thoroughly by Northcote. The following is therefore based on his mapping.

The claim is found almost entirely within the Chataway variety of the Highland Valley Phase. This rock-type is mainly granodiorite, mottled light cream-green, light grey, and pink, and is medium to coarse grained with well-separated, evenly disseminated, euhedral to subhedral mafic grains.

The Guichon variety may occur on the southwest corner of the claim. It is mainly granodiorite, somewhat similar to the Chataway variety, but richer in mafic minerals.

The Hybrid Phase is found to the immediate west of the property. The rock-types range from hornblendite through diorite to quartz diorite and granodiorite, though most are quartz diorite.

The writer examined some specimens that were apparently from the dump of the adit. They were highly altered and contained blebs of chalcopyrite, bornite, and pyrite with alteration to azurite and malachite. Rocks from the 'vein' walls were dioritic and somewhat magnetic indicating they contained magnetite.

Air photograph linears in the claim area drawn by Northcote trend northwesterly. He also notes shear planes to the west and to the north of the claim to strike northeasterly.

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 induçes 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 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:

A baseline, running due south from I.D Post 1E, 3N was topo-filled, compassed, and marked every 30 meters by flagging tape through the center of the property. The survey lines were run east-west at 30 meter intervals and were topo-filled, compassed and marked every 15 meters by flagging tape. Readings by the VLF-EM receiver were taken every 15 meters with the instrument facing towards the transmitter at Seattle. As shown on Sheet No. 2 only lines 1S to 11S were VLF-EM surveyed.

3. Compilation of Data:

The readings were reduced by applying the Frazer filter. Filtered data, as shown on Figure 4, are plotted between the reading stations. The positive filtered values were contoured at intervals of 2^{o}. The contour interval is rather close but was thought to be useful considering the tight grid.

The Frazer 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.

SOIL GEOCHEMISTRY SURVEY

1. Survey Procedure:

The soil samples were taken at each spot where VLF-EM readings were taken, that is, every 15 meters on the 30-meter lines. Also, lines 12S to 17S were sampled. The samples were taken with a mattock-type pick and the horizon sampled was B, the colour of which varied from dark brown to light brown to red. The depth the sample was taken from, varied from four inches to eight inches. Samples were placed in brown wet-strength paper bags with grid co-ordinates marked thereon.

2. Testing Procedures:

All samples were tested by Acme Analytical Laboratories of Burnaby, B.C. The sample is first thoroughly dried and then sifted through a -80 mesh screen. A measured amount of the sifted material is then put into a test tube with subsequent measured additions of a solution of perchloric and nitric acid. This mixture is next heated for a certain length of time. The parts per million (ppm) copper is then measured by atomic absorption.

3. Treatment of Data:

The values in ppm copper were grouped into logarithmic intervals of 0.10. The cumulative frequency for each interval of each element was then calculated and then plotted against the correlating interval to obtain the logarithmic cumulative frequency graph as shown on Figure 2.

The coefficient of deviation, indicative of the range or spread of values, was calculated to be about 0.23, a somewhat average figure. Therefore, the range of values is rather moderate. This statistical parameter is indicative of how well the element has been mechanically or chemically dispersed. Considering the average value, one could then say the dispersion rate for copper in this area is moderate. This seems to be verified on the contour map (Sheet 1) by the shape of the contours.

The graph for copper shows the mean background value to be about 20 ppm taken at the 50% level. The sub-anomalous threshhold value, (a term used by the writer to denote the minimum value that is not considered anomalous but still important as an indicator of mineralization), is taken at one standard deviation from the mean background value, which is at the 16% level and is in this case 34 ppm. The anomalous threshhold value is two standard deviations away at the 2½% level and is on this property 58 ppm.

The graph shows breaks at the 18% level which, therefore, indicates that there is an excess of high copper values on this property. This is usually the case where copper sulphide mineralization occurs. This percentage level could also just as easily be taken for the sub-anomalous threshhold value.

DISCUSSION OF RESULTS

The copper soil anomalies, for ease of discussion, have been labelled A to G respectively. The characteristics of the anomalies are summarized in the table following:

Anomaly	Highest Value	Strike	Length	Width	Comments
A	140 ppm	N or N10E	> 120m	> 60m	Adit area; open to north
B	160 ppm	N to N35W	> 230m	40m	open to south, 'cat' trench on E flank
C	98 ppm	N25W to N	> 90m	25m	open to south
D	124 ppm	N25W	65m	20m	'cat' trench in centre of anomaly
E	155 ppm	N25W (?) to N	> 110m	40m	" , open to south
F	80 ppm	?	?	?	composed of only 2 anomalous values
G	52 ppm	N15E	100m	40m	composed of only sub-anomalous values

That part of Anomaly A north of the adit is probably produced by the copper rock within the dump. Otherwise, Anomaly A appears to show the mineralized zone within the adit to be striking S10W.

Though the copper soil anomaly stops short of L-4S, the copper mineralization could still continue, but below the subsurface of the bedrock.

Rolston noticed what appeared to be a mineralized vein below the cliff at Anomaly F.

All the copper soil anomalies correlate at least to some degree with the VLF-EM delineated conductors. The conductors probably reflect fault and/or shear zones parts or all of which are mineralized with copper sulphides.

The VLF-EM conductors are described in the table below:

Anomaly	Highest Value	Strike	Length	Comments
a-a'	10°	N25W	170m	Open to north
b-b'	18°	N20W	300m	Open at both ends
c-c'	13°	N10W	210m	
d-d'	16°	N50E	180m	Open to southwest
a-b'	15°	N50E	150m	Open at both ends
c-a'	13°	N35E	130m	Open to northeast

The main strike of the VLF-EM anomalies within the survey area as evidenced by anomalies a-a', b-b' and c-c' N10-25°W. Considering that the VLF-EM anomalies are probably reflecting fault and/or shear zones, N10-25°W would appear to be the main strike of the structure on this property.

However, there does appear to be another set of directions within the survey area, namely N35-50E. These lineations are not as easily seen because of the shape of the contours and therefore have been enhanced by dashed lines. Three are shown and are labelled a-b', c-a' and d-d'.

One perculiarity noticed is that all of the VLF-EM anomalies together seem to form a rough circle. The writer is not sure whether this is significant. It is possible this feature is indicative of a circular structure pattern, or the VLF-EM anomalies are reflecting the edge of a circular conductor.

Both VLF-EM lineations a-a' and a-b' correlate with copper soil Anomaly A. These indicate two further possible strikes to the copper mineralization within the adit.

Also both VLF-EM lineations c-c' and c-a' seem to be correlating with copper soil Anomaly F and therefore may be related to the mineralized zone observed by Rolston over the cliff.

The southern part of the VLF-EM conductor b-b' and the VLF-EM contours at d' correlate very well with soil anomalies B and E, respectively. Unfortunately, the VLF-EM survey was not continued south of this point. As was mentioned above, for the adit mineralization, the mineralization causing the soil Anomaly B may continue further north as shown by conductor b-b' but below the bedrock subsurface.

Respectfully submitted,
GEOTRONICS SURVEYS LTD.

David G. Mark
Geophysicist

July 12, 1977

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Fraser, D.C. Contouring of VLF-EM Data, Geophysics, Vol. 34, No. 6 (December), 1969.

Lepeltier, Claude, A Simplified Statistical Treatment of Geochemical Data by Graphical Representation, Economic Geology, Vol. 64, pp.538-550, 1969.

Northcote, K.E., Geology and Geochronology of the Guichon Creek Batholith, B.C. Department of Mines & Petrol. Resources, Bull. 56, 1969.

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 420-890 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 in my profession for the past nine years and have been active in the mining industry for the past twelve years.

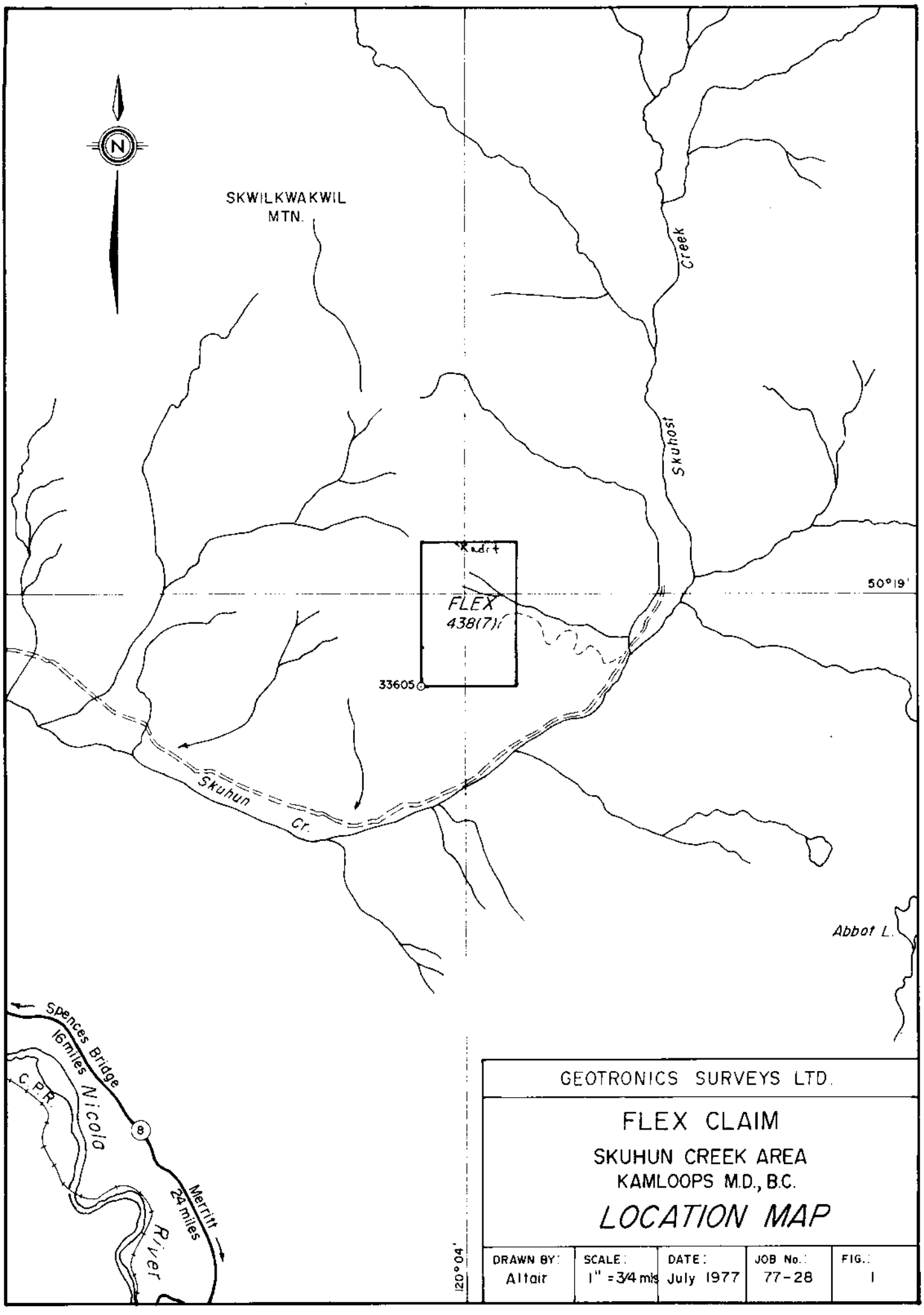
3. I am an active member of the Society of Exploration Geophysicists and a member of the European Association of Exploration Geophysicists.

4. This report is compiled from data obtained from soil sampling and VLF-EM surveys carried out by T.W. Rolston from June 24-27th, 1977 on the Flex Claim, Kamloops M.D.

5. I have no direct or indirect interest in the Flex Claim nor do I expect to receive any interest therein.

David G. Mark
Geophysicist

July 12, 1977



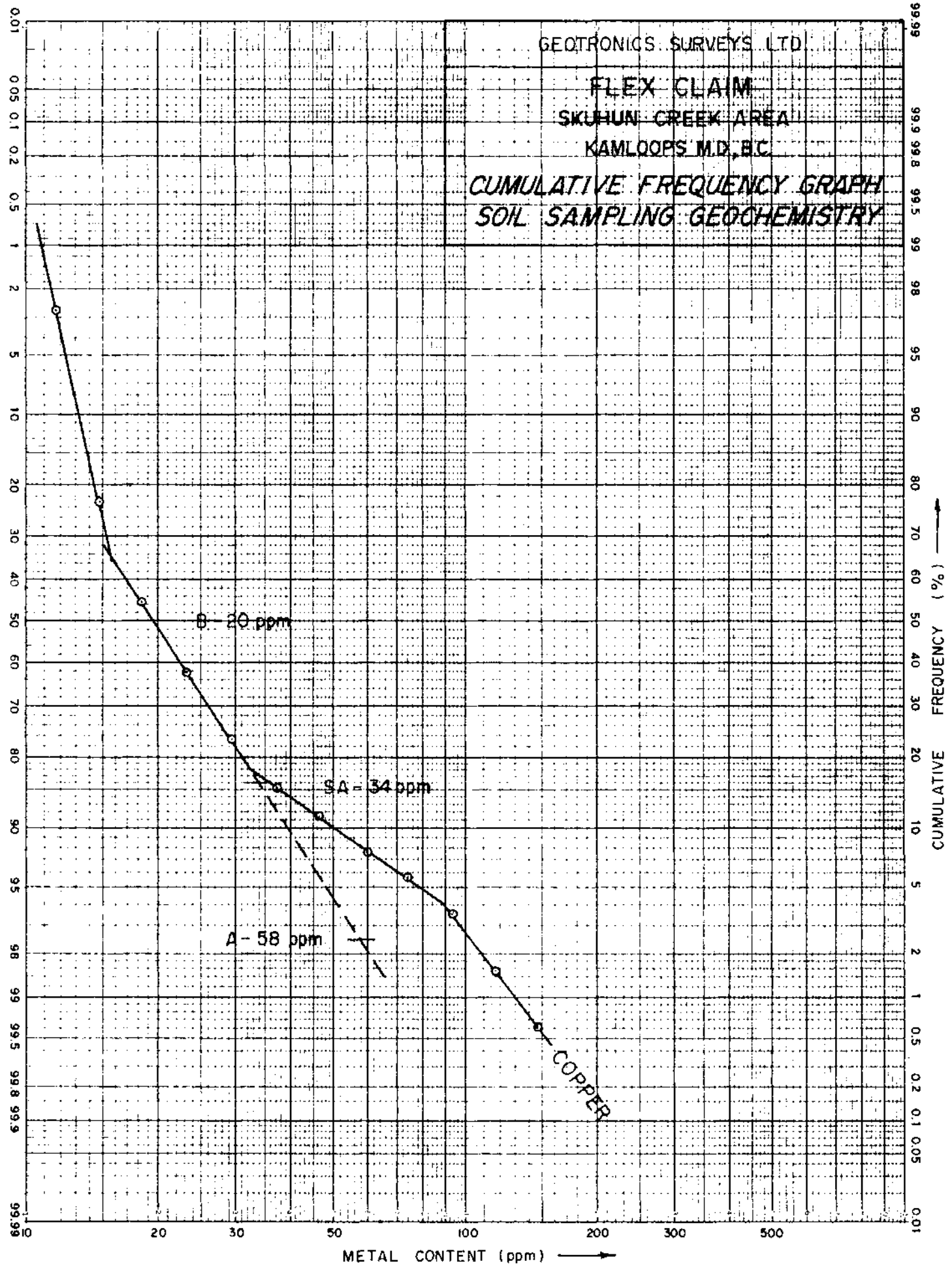
GEOTRONICS SURVEYS LTD.

FLEX CLAIM

SKUHUN CREEK AREA
KAMLOOPS M.D., B.C.

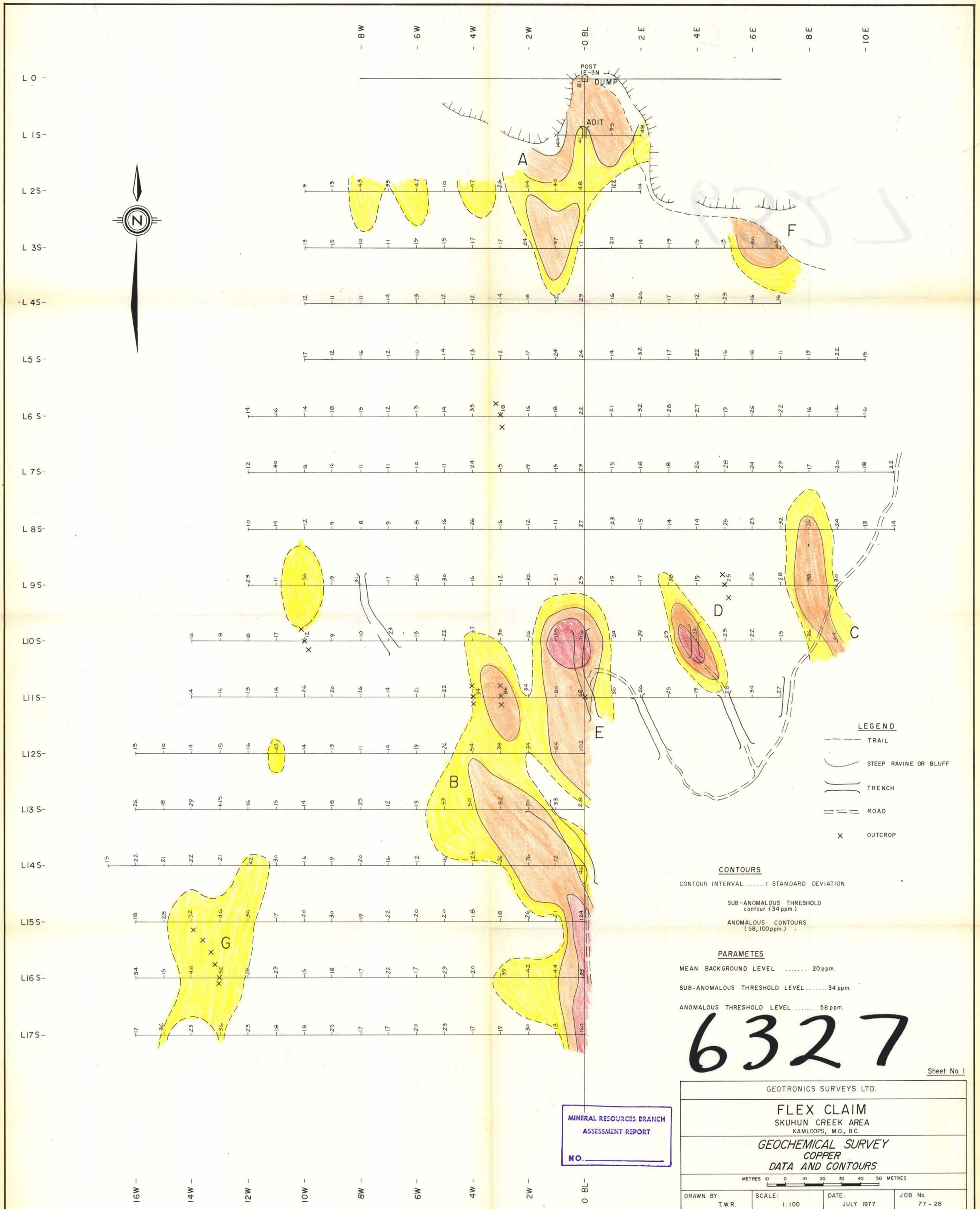
LOCATION MAP

DRAWN BY:	SCALE:	DATE:	JOB No.:	FIG.:
Altair	1" = 3/4 mls	July 1977	77-28	1


GEOTRONICS SURVEYS LTD.
FLEX CLAIM
SKUHUN CREEK AREA
KAMLOOPS M.D., B.C.
CUMULATIVE FREQUENCY GRAPH
SOIL SAMPLING GEOCHEMISTRY
B - 20 ppm
SA - 34 ppm
A - 58 ppm
COPPER
METAL CONTENT (ppm)
CUMULATIVE FREQUENCY (%)
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.5
99.8
99.9
99.99
10
20
30
50
100
200
300
500

COST BREAKDOWN: Flex Claim (6 units); June 24 - July 5, 1977

Wages:	T. Rolston - supervisor & operator; 4 days @ $200.00	$ 800.00	
	R. McLean - crew member; 4 days @ $150.00	600.00	$ 1,400.00
Equipment:	truck rental, 4 days @ $35.00	$ 140.00	
	survey equipment	50.00	
	E.M. rental, 4 days @ $15.00	60.00	210.00
Soil sample analysis, 316 @ $1.35			426.60
Geophysical report and drafting (D.G. Mark)			500.00
Engineering fees (G. Eldridge, P.Eng.)			300.00
			$ 2 , 836.60



CONTOURS

CONTOUR INTERVAL ..... 1 STANDARD DEVIATION

SUB-ANOMALOUS THRESHOLD contour (34 ppm.)

ANOMALOUS CONTOURS (58, 100 ppm.)

PARAMETES

MEAN BACKGROUND LEVEL ..... 20 ppm.

SUB-ANOMALOUS THRESHOLD LEVEL ..... 34 ppm.

ANOMALOUS THRESHOLD LEVEL ..... 58 ppm.

6327

Sheet No. 1

GEOTRONICS SURVEYS LTD.

FLEX CLAIM

SKUHUN CREEK AREA

KAMLOOPS, M.D., B.C.

GEOCHEMICAL SURVEY COPPER DATA AND CONTOURS

METRES 10 0 10 20 30 40 50 METRES

DRAWN BY:	SCALE:	DATE:	JOB No.
T.W.R.	1:100	JULY 1977	77 - 28

6327

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO.

Sheet No. 2

GEOTRONICS SURVEYS LTD.

FLEX CLAIM

SKUHUN CREEK AREA
KAMLOOPS, M.D., B.C.

VLF-EM SURVEY
FRASER FILTERED
DATA AND CONTOURS

METRES 10 0 10 20 30 40 50 METRES

DRAWN BY:	SCALE:	DATE:	JOB No
T.W.R.	1:100	JULY 1977	77 - 28