Report on a Geochemical Survey and Electromagnetic Survey on the Mark Claim Group Hart River Area, Y.T.

ALRAE EXPLORATION LTD.

This report has been examined by the Geological Evaluation Unit.
Approved as to technical worth by:

RESIDENT GEOLOGIST

Approved as to cost in the amount of: $ 4800.00

RESIDENT MINING ENGINEER

Accepted as representation work under Section 53(4) Yukon Quartz Mining Act.

COMMISSIONER OF YUKON

October 24, 1967

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and Electromagnetic Survey
on the Mark Claim Group
Hart River Area, Y.T.

INTRODUCTION

The Mark group of claims consists of 32 contiguous, full size mineral claims, situated in the Hart River area, 80 air miles northwest of Mayo, Y.T. The Mark 1 to 24 mineral claims were staked in 1966. A further 8 claims, Mark 27 to 34, were staked August 27, 1967.

H.A. Briden of Vancouver, B.C. requested Alrae Exploration Ltd. to carry out a geochemical survey and an electromagnetic survey on the claim group to investigate the strike lengths of the mineralized zones discovered during the 1966 field season and search for parallel zones. The mineralization consists of silver, lead, zinc and copper localized in fault zones.

Field work was carried out from August 17th to August 30, 1967, by Alrae personnel under the field supervision of J. Mackie.

CONCLUSIONS AND RECOMMENDATIONS

Geochemical and electromagnetic anomalies worthy of further investigation have been outlined on the Mark claim group.

There are coincident geochemical and electromagnetic anomalies over showing No. 1. The geochemical anomaly indicates that this zone is in excess of 3,000 feet long and open to the east.

Limited geochemical values indicate the existance of a mineralized zone 1,500 feet long, trending in a northwesterly direction in the vicinity of showing No. 2. It is open to the southeast.

An easterly trending electromagnetic anomaly, 2,800 feet long, has been outlined near the northern boundary of the claim group. There is no associated geochemical anomaly.

It is recommended that further geochemistry be done to define the lengths of the anomalies outlined to date and a drill program be carried out to determine the grade and dimensions of showing No. 1. Showing No. 2 could also be drilled, however, it is not as promising a target as showing No. 1.

LOCATION AND ACCESS

The claims are located at approximate latitude 64°38' and longitude 136°50' on claim sheet 116 A-10. This site is 80 air miles northwest and northeast of Mayo and Dawson, respectively.

Access to the property was by Cessna 185 from Mayo to Mark Lake. Thence by helicopter to the property, 12 miles southwest of Mark Lake. Chapman Lake and the Dempster Highway lie approximately 50 miles westwards of the property and could be used as alternate transportation routes.

TOPOGRAPHY AND VEGETATION

Relief in the area is extreme, with generally steep and unstable talus slopes bordering broad "U" shaped valleys. Most of the valleys are swampy and predominantly covered by buckbrush and willow. Spruce, the predominent tree type, is sparcely scattered throughout the valleys. Tree line is approximately 3,500 feet.

CLAIM DATA

The Mark block of 32 full size contiguous mineral claims is shown on claim sheet 116A-16. The claims are currently being transferred from the stakers to Mr. H.A. Briden of Vancouver. At the time the field program was undertaken, the ownership of the claims was as follows:

CLAIM NAME	OWNER	RECORD NUMBER
Mark 1 to 4	D. Reinke	Y 6283 to Y 6286
Mark 5 to 12	G. Hawley	Y 6462 to Y 6469
Mark 13 & 14	T. Tompkins	Y 6470 & Y 6471
Mark 15 to 18	D. Reinke	Y 6472 to Y 6475
Mark 19 to 24	O. Bergman	Y 6476 to Y 6481
Mark 27 to 32	B. Garner	Y 6912 to Y 6917
Mark 33 & 34	J. Mackie	Y 6918 & Y 6919

HISTORY

A limited amount of trenching was carried out on the claim group by Alrae Exploration Ltd. during 1966, as outlined in a report by R.G. Hawley. (Geological and Engineering Evaluation Report on the Mark 1 to 24 Mineral Claims of H.A. Briden, February 15, 1967). Otherwise no other work has been recorded on this mineral occurrence.

GEOLOGY

No attempt was made to geologically map the claim group. Regional geology in the vicinity of the claims, is taken from Map 116A, the Larsen Creek 4 mile sheet, which accompanies G.S.C. paper 62-7 by L.H. Green and J.A. Roddick.

TABLE OF FORMATIONS (from Sheet 116A)

Cretaceous 20		Orange to brown weathering diorite and gabbro, and altered equivalents.
Cambrian, Ordovician and Silurian 8		Dolomite and limestone, thick bedded, grey to buff weathering.
Precambrian 2		Orange weathering, platy, grey-green dolomite, dark slate, minor phyllite and quartzite.
	2d	Buff, orange and pink dolomite, black shaley minor black limestone, red dolomite, green argillite, maroon quartzite and shale, and greenstone.

1	Mainly dark grey, grey-green, and black thin bedded argillite, slate and phyllite.

Narrow bands of map units 1, 2, and 2d, trending easterly and dipping southerly, outcrop in the area. These are surrounded by andesitic flows which, in places, become coarse grained approaching a diorite. In places, these units are capped by limestone and dolomite of unit 8. Small diorite stocks (unit 20) intrude the above units at several locations in the area.

Cursory examination indicates that the area is highly faulted in easterly and northerly directions. The easterly faults, which appear to parallel the bedding strike, predominate.

Previous trenching and prospecting has located two areas of mineralization. Both appear to be fault controlled.

The main zone or showing No. 1 is an easterly striking, vertically dipping shear zone, 40 feet wide, which appears to carry significant values in silver, lead, zinc and copper across its entire width. A sample of pyrite float returned a gold assay of 0.30 oz. per ton. No sampling has been done below the frost level and the width and tenor of the zone is not accurately defined.

Showing No. 2 consists of a series of veinlets infilled with galena and sphalerite, striking in a northeasterly direction, situated 3,000 feet southeast of showing No. 1. The mineralization is lower grade than the main zone.

CONTROL GRID

Approximately 14.3 line miles of baseline and grid lines were marked with flagging as outlined on Fig. 2. Lines were put in

using a Brunton compass and nylon chain, establishing stations at 100 foot intervals. Some of the claim posts were tied into the grid.

GEOCHEMICAL SURVEY

(i) Field Procedure

The geochemical survey carried out was a program of soil sampling. Samples were collected along cross lines at 100 foot intervals. They consisted of residual soil immediately underlying the organic layer. A total of 11.2 line miles of grid lines were sampled.

(ii) Laboratory Procedures

All samples were analysed for lead and zinc. Approximately 1/2 the samples for copper. Laboratory work was performed by Bondar-Clegg in North Vancouver, B.C.

After drying and screening to -80 mesh, the metals were extracted by a hot HNO_3-HCl solution. The quantities of each metal in a sample were determined by atomic absorption spectrographic analysis. Contoured laboratory results for lead, zinc and copper are shown on Figures 3, 4, and 5, respectively.

(iii) Interpretation

Two anomalies, with values greater than five times background, were outlined. The stronger of the two is coincident with the main showing described in Hawley's report. It is 3,000 feet long, terminated on the west and open to the east.

The second anomaly occurs in the same area as showing No. 2 (see Hawley's report). However, the indicated strike of the anomaly is NW-SE as opposed to the geologically indicated NE-SW strike of

showing No. 2. It has an indicated strike length of 1,500 feet and is open to the northwest. Further work is necessary to verify the indicated strike of this anomaly.

ELECTROMAGNETIC SURVEY

(i) Type of Instrument

A Ronka EM-16 instrument was employed. This instrument utilizes the signals from very low frequency radio stations which are in contact with offshore submarines. The radio stations have vertical antennae, the currents in which induce concentric horizontal magnetic fields. When these induced fields meet conductive bodies in the ground, secondary fields result. The vertical components of these secondary fields are measured by the EM-16.

The instrument is a sensitive receiver tuned to the frequency band of the VLF station and consists of two coils, one vertical and the other horizontal. These coils have separate inputs. When the signal from the vertical coil is minimized by physical tilting, the angle is an accurate measure of the real component of the secondary field (in phase reading). The remaining signal is balanced by a measured percentage of a signal from the second coil. This compensation signal is a measure of the quadrature vertical signal.

For interpretive purposes, the actual readings are plotted using suitable scales, and curves constructed to determine the location of any conductive zones.

(ii) Field Procedures

Readings were taken using the signals from VLF stations NPG and NPM operating at 18.6 and 23.4 kilocycles, respectively.

Readings were taken at 100 foot intervals along all cross lines with both in phase and quadrature values indicated in percentages. In all, 12.6 line miles of survey was completed. The in phase and quadrature values are shown on Figs. 6 and 7.

The instrument was oriented northwards to eliminate the need for adjusting any readings.

(iii) Interpretation

The following interpretation is based on discussions with D. Smellie, P. Eng., consulting geophysist, Vancouver, B.C. Strong responses were obtained on lines 92W, 94W, 96W, 100W, and 104W. A simple interpretation of these responses is a pair of vertically dipping, parallel conductors under lines 92W and 94W, which have merged into a single, vertical conductor at 96W and has become a southerly dipping, conformable conductor at 100W and 104W. This conductor is coincident with a geochemical anomaly.

A zone of crossovers is outlined in the northern portion of the claim group. It is 2,800 feet long and trends easterly. There is no corresponding geochemical anomaly, thus it is highly probable that this anomaly is caused by a conductive shear, with or without pyrite.

The two conductive zones are noted on Figs. 6 and 7. More crossovers were obtained, however, it is impractical to place any significance in them at this time due to the limited knowledge of the property and the instrument.

Respectfully submitted:

J.A.C. Mackie, P. Eng.

APPENDIX "A"

TIME AND COST DISTRIBUTION

LABOUR*

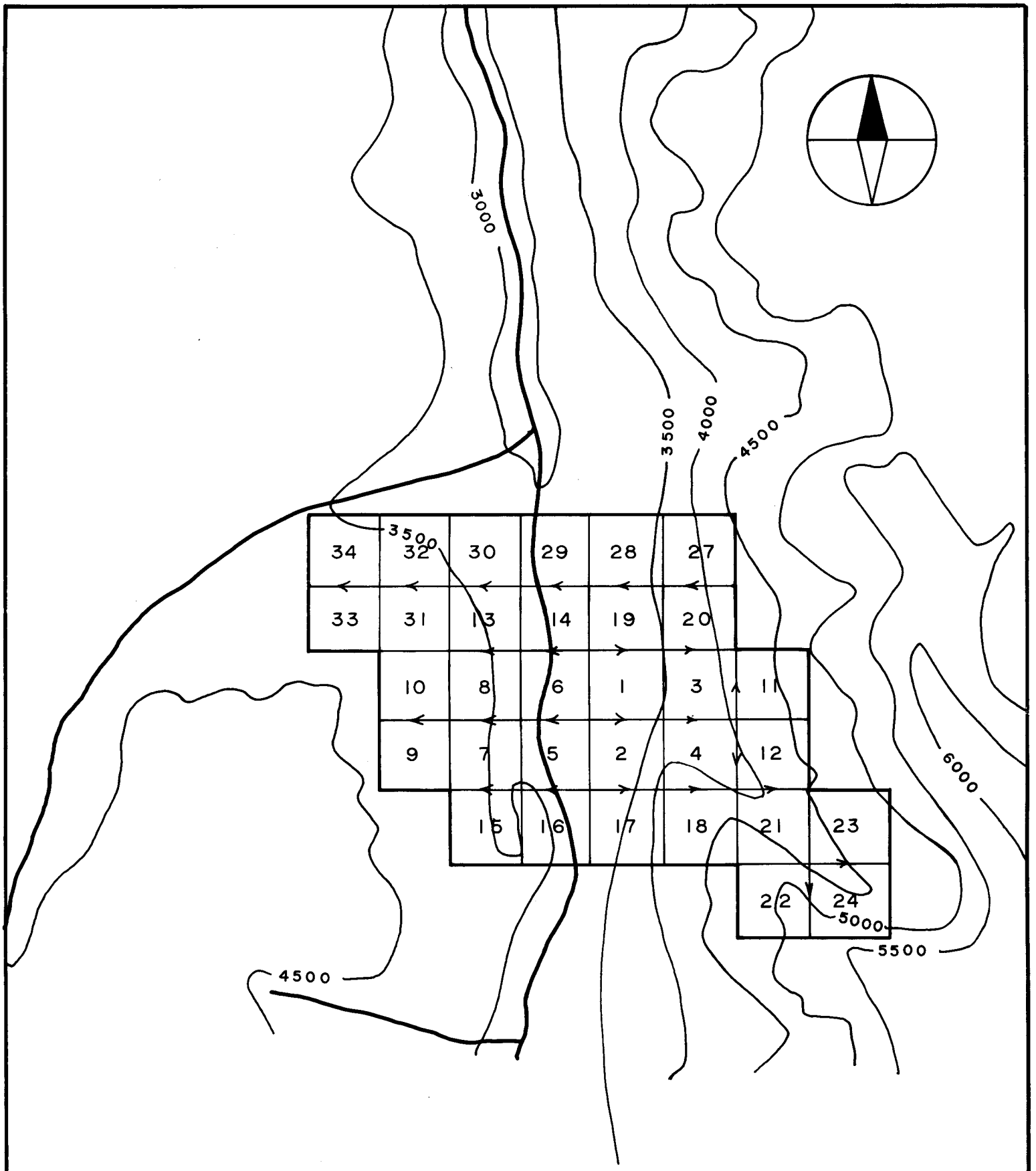
J. Mackie - Line marking and supervision Vancouver, B.C.	$ 802.00
B. Garner - Line marking Vancouver, B.C.	391.00
G. House - Electromagnetic instrument operator Vancouver, B.C.	745.00
P. Stidolph - Geochemical sampler Vancouver, B.C.	589.00

* All personnel worked from August 17 to 30, 1967, inclusive.

TRANSPORTATION

Ground	$ 225.00
Fixed wing	1,265.00
Helicopter	1,209.00
EM rental	$ 150.00
Laboratory preparation and analysis of soil samples for Pb, Zn, and Cu. (Bondar-Clegg)	1,348.65
Camp costs @ $7.50/man-day	420.00
Miscellaneous	250.00
	$ 7,394.65

An equal portion of the time and cost charges were spent on Group 1 and Group 2 as outlined on grouping notices dated October 24, 1967.



ALRAE EXPLORATION LTD.

MARK CLAIM GROUP
Mayo District
Claim Sheet # 116A-10

Drawn C. L. C.

Figure No. 1

Date Oct. 27, /66

Scale 1" = 1/2 Mi.

N
TRUE

MARK 34
MARK 32
MARK 30
MARK 29
MARK 28
MARK 27
MARK 33
MARK 31
MARK 13
MARK 14
MARK 19
MARK 20
CREEK
MARK 10
MARK 8
MARK 6
MARK 1
MARK 3
MARK 11
CAMPSITE
SHOWING No. 1
MARK 12
MARK 4
MARK 2
STEEP TALUS SLOPES
MARK 9
MARK 7
MARK 5
MARK 21
MARK 23
SHOWING No. 2
MARK 15
MARK 16
MARK 17
MOUNTAIN RIDGE
MARK 18
MARK 22
MARK 24

95 N
144 W
140 W
136 W
132 W
128 W
124 W
120 W
116 W
112 W
108 W
80 N
65 N
60 N
55 N
52 N
50 N
90 W
92 W
94 W
96 W
40 N
44 N
100 W
104 W
32 N
156 W
148 W
140 W
132 W
124 W
116 W
108 W
40 N
31 N
27 N
84 W
22 N
17 N
15 N
35 N
20 N

LEGEND

- FLAGGED LINES
- CLAIM POST
- X SHOWING
- CLAIM BOUNDARIES (tied into grid)
- CLAIM BOUNDARIES (not tied into grid)

MARK CLAIM GROUP
CLAIM and GRID PLAN

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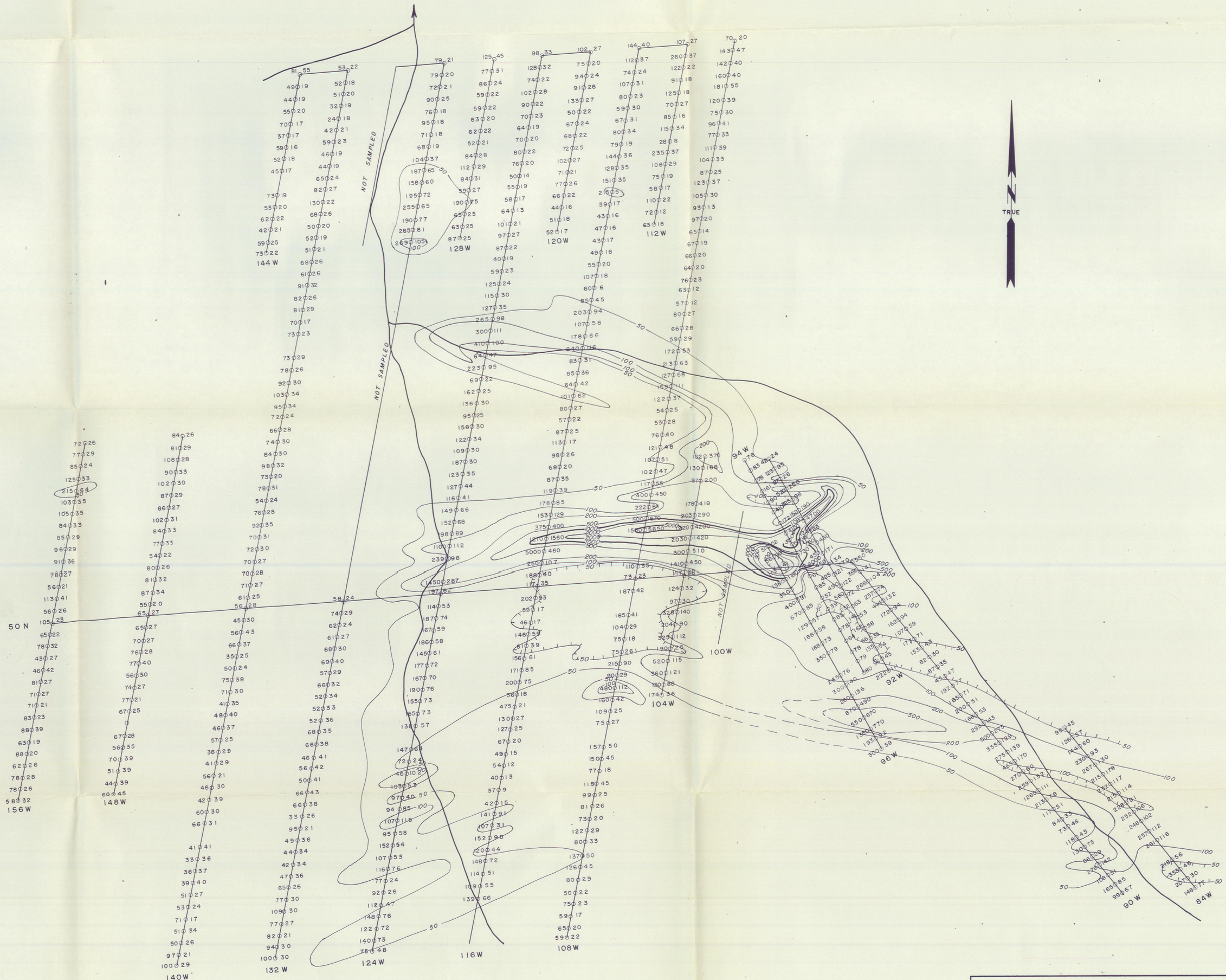
GEOLOGISTS AND ENGINEERS
VANCOUVER, B. C.

DESIGNED J. M.	SCALE: HOR. 1 " = 400 '
DRAWN M. L.	VERT.
CHECKED J. M.	DWG. No.
DATE OCTOBER 1967	

Figure No. 2



MARK CLAIM GROUP Geochemistry Results LEAD	
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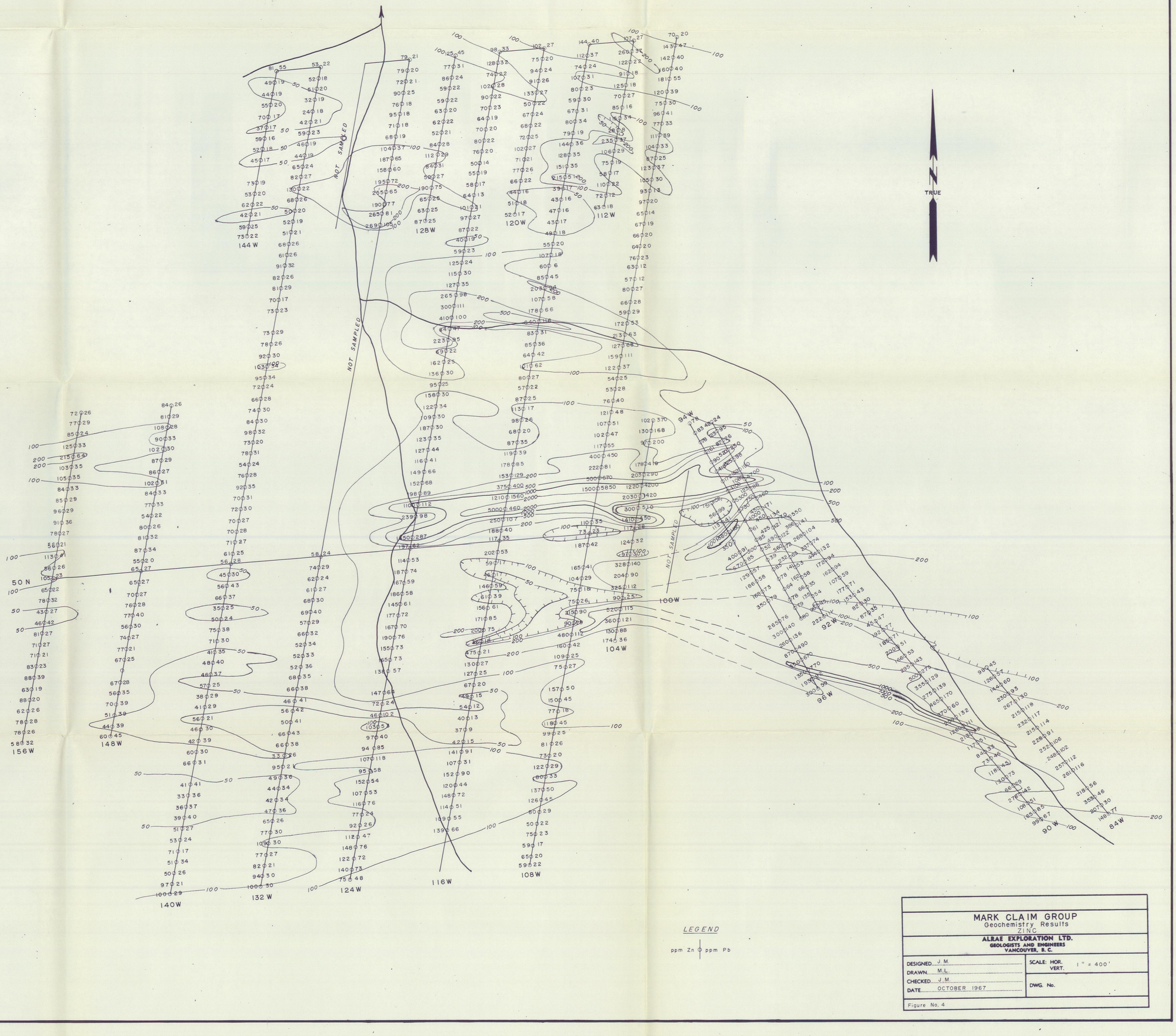
Figure No. 3	



MARK CLAIM GROUP
Geochemistry Results
ZINC

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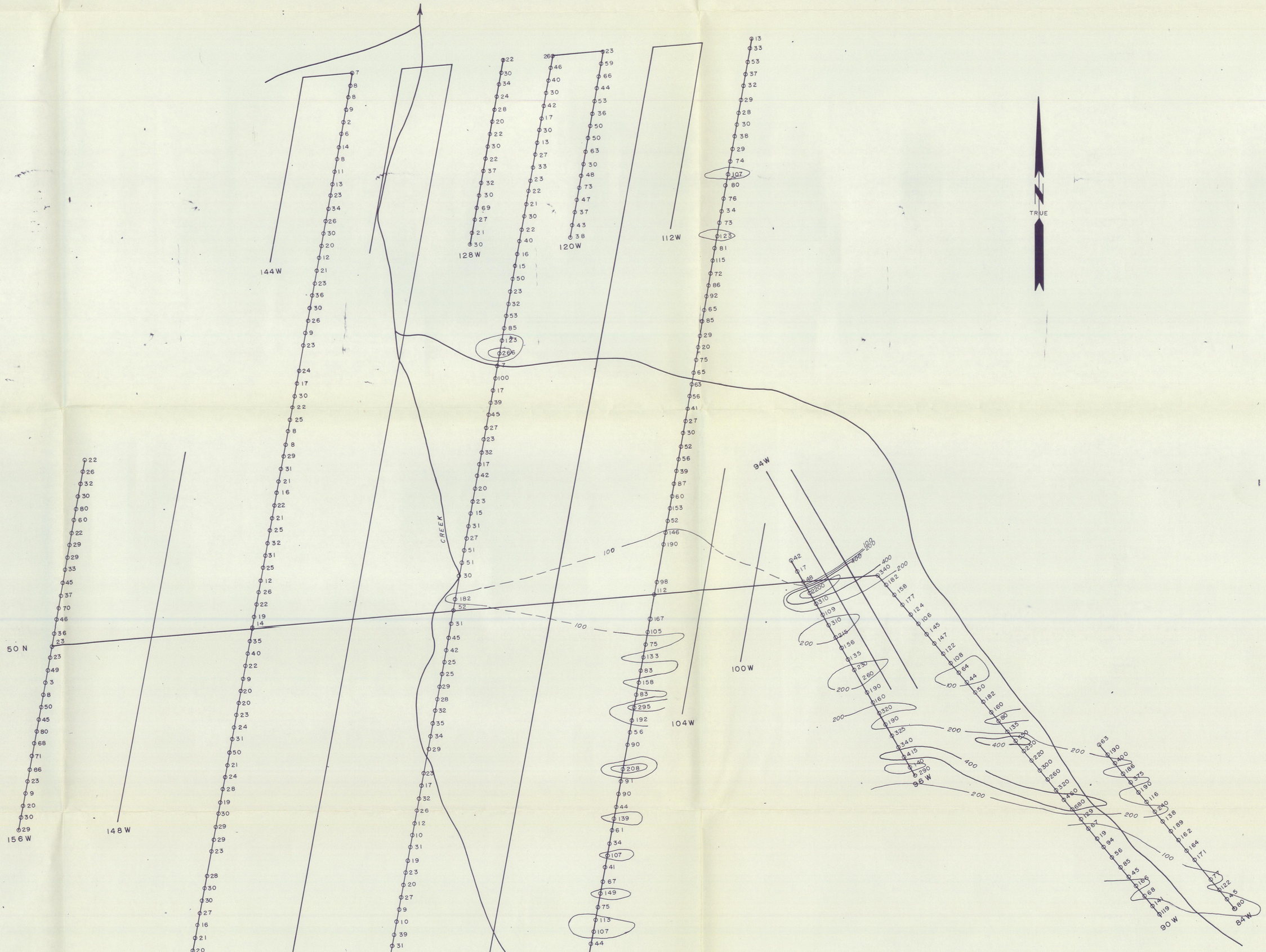
Figure No. 4



LEGEND

ppm Cu

Unmarked lines not sampled for Copper.

MARK CLAIM GROUP
Geochemistry Results
COPPER

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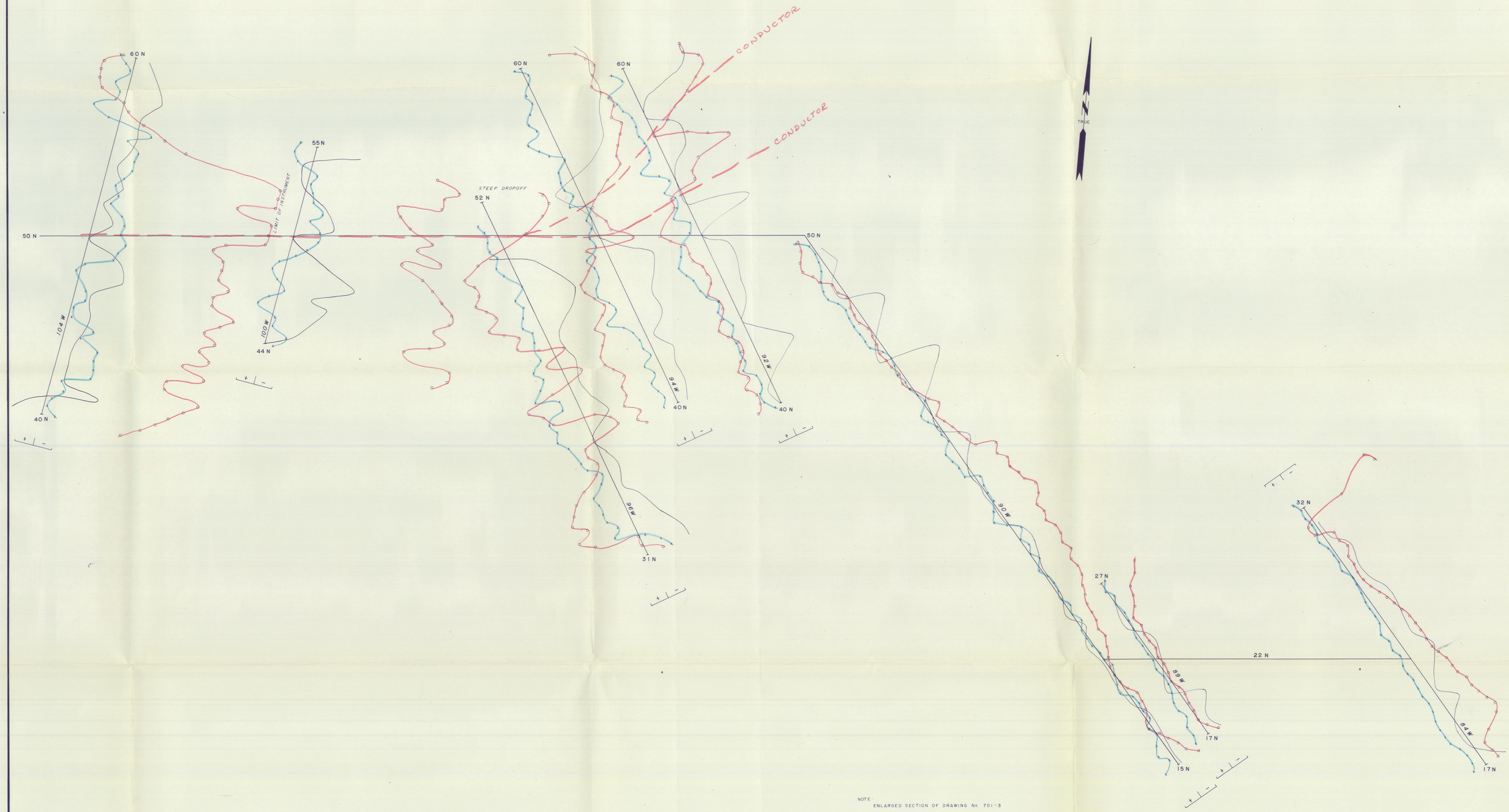
DRAWN M. L.	VERT.
CHECKED J. M.	DWG. No.
DATE OCTOBER 1967	

Figure No. 5

95 N
80 N
65 N
50 N
35 N
20 N
144W
140W
132W
128W
124W
120W
116W
112W
108W
156W
148W
CONDUCTOR(?)
60 N
55 N
52 N
44 N
40 N
31 N
32 N
27 N
22 N
17 N
15 N
104W
100W
96W
94W
92W
90W
88W
86W
N
TRUE
These Profiles are Expanded
on the Baseline on Dwg. No. 701-2
NOTE:
ALL READINGS TAKEN FACING NORTHWARDS
LEGEND
NULL READING: 1" = 30 %
QUADRATURE READING: 1" = 30 %
TOPO PROFILE: 1" = 20°
HART RIVER SILVER MINES LTD.
MARK CLAIM GROUP
E.M. PROFILES
ALRAE EXPLORATION LTD.
GEOLOGISTS AND ENGINEERS
VANCOUVER, B. C.
DESIGNED J. M.
DRAWN M.R.L.
CHECKED R.G.J.
DATE SEPTEMBER 1967
SCALE: HOR. 1" = 200'
VERT. See LEGEND
DWG. No. 701-3
Figure No. 6



NOTE:
ENLARGED SECTION OF DRAWING No. 701-3
ALL READINGS TAKEN FACING NORTHWARDS.

LEGEND

NULL READING - 1" = 30%
QUADRATURE READING : 1" = 30%
TOPO PROFILE : 1" = 20°

HART RIVER SILVER MINES

MARK CLAIM GROUP
E.M. PROFILES

ALRAE EXPLORATION LTD.
GEOLOGISTS AND ENGINEERS
VANCOUVER, B. C.

DESIGNED.. J.M.	SCALE: HOR. 1" = 200'
DRAWN.. M.R.L.	VERT. See LEGEND
CHECKED.. R.G.J.	DWG. No. 701-2
DATE.. SEPTEMBER 1967	

Figure No. 7