82L/2E

ATTWOOD MOUNTAIN

All, Muz, Legal Tender L 1951,

GEOCHEMICAL SURVEY

Ranger L 1666, Winner L 1158,

OCTOBER, 1973

Wren L 1170, Rattler L 1965,

The Granby Mining Company Limited
PHOENIX COPPER DIVISION
Box 490, Grand Forks, B.C.

TO Mr. D. H. James

FROM Mr. G. B. Hardwicke

SUBJECT GEOCHEMICAL SURVEY, ATTWOOD MOUNTAIN CLAIMS

December 5, 1973

Dear Sir:

During the month of October, 1973, a geochemical survey was made over the "Att" group of mineral claims, situated on Attwood Mountain two miles south of the Phoenix Mine. This survey was carried out under my direct supervision by Phoenix personnel.

A complete report giving the costs, results and conclusions of this work is hereby submitted for your consideration.

MAPS

#1 Geochemistry
#2 " Copper
#3 " Zinc

G. B. Hardwicke, P. Eng.
Manager

GBH:lv

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4750 MAP

The Granby Mining Company Limited
PHOENIX COPPER DIVISION
Box 490, Grand Forks, B.C.

TO G. B. Hardwicke

FROM D. R. McArthur

SUBJECT ATTWOOD MOUNTAIN GEOCHEMICAL SURVEY, WORK ORDER #1697, OCTOBER, 1973

December 4, 1973

INTRODUCTION

This report contains a summary of soil sampling work conducted by the Granby Mining Company Limited, PHOENIX COPPER DIVISION, over the Att claim area. The claims are located approximately two miles south of the Phoenix open pit. All work was completed under the direct supervision of Mr. G. B. Hardwicke, manager, of the Phoenix operations.

PROPERTY

The Att claims were staked by the company due to references of a small skarn area containing copper on the Sunnyside G. G. (L. 2879). This lease was thought to be "open ground" until proved otherwise by the Government Agent. Also, copper float in greens tone was discovered in the west central area of the claim area.

The Att claim area consists of 20 mineral claims and 6 Crown Granted Mineral Leases. The claim name, record number and expiry date are as follows:

Name	Record Number	Expiry Date
Att 1 fr.	36314	Dec. 5, 1973
Att 2	36315	Dec. 5, 1973
Att 3	36316	Dec. 5, 1973
Att 4	36317	Dec. 5, 1973
Att 5	36318	Dec. 5, 1973
Att 6	36319	Dec. 5, 1973
Att 7	36320	Dec. 5, 1973
Att 9	36321	Dec. 5, 1973
Att 10	36322	Dec. 5, 1973
Att 11	36323	Dec. 5, 1973
Att 12	36324	Dec. 5, 1973
Att 13	36325	Dec. 5, 1973
Att 14	36326	Dec. 5, 1973
Att 15	36327	Dec. 5, 1973
Att 16	36328	Dec. 5, 1973
Att 17	36329	Dec. 5, 1973
Muz 1	36401	Dec. 21, 1973
Muz 2	36402	Dec. 21, 1973
Muz 3	36403	Dec. 21, 1973
Muz 4	36634	June 19, 1974
Legal Tender C.G. (L.1551)	M-72	March 27, 1974
Ranger C.G. (L.1060)	M-72	March 27, 1974
Winner C.G. (L1158)	36733	Aug. 8, 1974
Wren C.G. (L.1170)	36734	Aug. 8, 1974
Rattler C.G. (L.1265)	36735	Aug. 8, 1974
Sibley C.G. (L.2223)	36736	Aug. 8, 1974

GEOCHEMICAL SURVEY

By chain and compass, the survey over the above mentioned claims, with exception of the Muz #4, was completed in October 1973. Lines, spaced at 500 feet, were run due east-west in direction with sample spacing at 400 feet. Control over the location of the lines was achieved through aerial photographs and topographical maps. The survey exceeded the limits of the claims to the east and west.

The number of samples per soil horizon with average depth of soil are as follows:

Soil Horizon	No. of Samples	Average Depth
"B"	268	7"
"A-B-C"	27	6"
Silts	9	9"
Total Samples	304	

The "B" horizon of soil depths ranged from 2" to 24".

Overburden depths in the valley floor is thought to be from 25 to 50 feet. Depths on the mountain slopes are considered to be shallow due to the presence of talus in the soil, outcrops, and steep terrain.

ANALYSIS AND STATISTICS

The analysis of samples, by Bondar-Clegg & Company Limited was for total copper and zinc in parts per million. Values, from the minus 80 mesh portion, were realized through Atomic Absorption methods.

The background values (p.p.m.) and anomalous contour values were computed by statistical methods. Background and anomalous values are as follows (see appendix #1):

Contour Values	Copper (p.p.m.)	Zinc (p.p.m.)
True Mean (background)	23	62
Mean plus first standard deviation	32	112
Mean plus second standard deviation	67	204
Mean plus third standard deviation	143	371
Mean plus fourth standard deviation		674

Anomalous zones are considered to be a minimum of the mean plus second standard deviation.

SURVEY EXPENSES

The sampling program required nine days for two men and the correlation, drafting and interputation of data required five days for one man. The expenses for the program are as follows:

Sample preparation & analysis (Cu. & Zn.) 304 samples @ $1.70 per	$ 516.80
Wages (sampling, drafting, etc.)	1,015.09
Vehicle - 12 days @ $15.00	180.00
Planning and Supervision	300.00
TOTAL EXPENSES	$ 2,011.89

SURVEY RESULTS

1. Copper

Fourteen separate anomalies occur over the claim area; all but three being single value highs. The most prominent feature appears to be a possible NNE linear on the east side of the claim block. Highs may be associated with diorite-andesite contacts.

Anomaly	Sample No.(s)	Value p.p.m.	Remarks
A	268	292	Mainly andesite area. Chert near sample sight. Working near sample.
B	301	245	Rock type in vicinity unknown. Overburden probably deep.
C	347	220	In vicinity of andesite-quartz diorite contact. Anomaly occurs on a saddle sloping gently to the south-east. Zinc value of 235 p.p.m. coincident.
D	189,190	160,124	Anomaly open to north. Near andesite-horneblende diorite contact. Old shaft west of and uphill from samples. Occurence near ridge and downhill but not downslope.
E	253,254	70,69	Near area where Jim Forshaw found sharp, angular andesite float containing chalcopyrite.

The remaining anomalies occur on the north half of the map and have values near the mean plus second deviation value.

2. Zinc

Ten anomalous occurrences are located primarily on the southern half of the map. Zinc values are well below the statistical mean in those areas considered to have deep overburden. All significant values are erratic, three above the third standard deviation and the highest value is 2,150 p.p.m.

CONCLUSIONS

1. Copper anomalies A. B. C. D and E probably warrant cursory examination. The high values of A and D are located on high areas with some rock exposure. The probability of a large mineralized area appears to be low. Anomalies B, C and E are located in low areas and appear to have sufficient overburden to mask any mineralization.

2. If zinc geochemistry is to reveal mineralization the only hope appears to be on the southern survey line. The two anomalous values (330, 2150) are open to the south and located on a ridge. The source of the high values must, therefore, be close to the sample sight.

3. The general overall picture of the programme results may allow one to surmise that a zoning effect is present. Zinc is notable higher in the southern portion of the claim area and may be associated with the cherty areas. Copper values are highest on the east and north east portion of the map area. The highest values appear to be present where overburden is probably less than ten feet deep.

RECOMMENDATIONS

Further soil sampling of copper anomalies "B" and "C" on a smaller grid by auger methods should be completed. Investigation at copper anomaly "E" is warrented due to the fact that deep overburden does not reflect the presence of copper minerals. Back hoe trenching at this anomaly would be sufficient.

Further soil sampling for the zinc anomaly near sample number 475 at smaller sample spacing is recommended due to the high values indicated.

All the above mentioned sampling recommendations and trenching would cost approximately $500 and require three days.

D. R. McArthur
Engineer

DRMcA:lv

APPENDIX #1

Statistical Analysis of Copper Content in Soil Samples

Group x (p.p.m.)	F	x	Fx	x^2	$F(x^2)$
0-10	17	- 1	- 17	1	17
11-20	130	0	0	0	0
21-40	106	+ 1	106	1	106
41-80	34	+ 2	68	4	136
81-160	5	+ 3	15	9	45
161-320	3	+ 4	12	16	48
321-640					
over 640					
N =	295		184		352

$$\text{Variance} = \frac{Fx^2 - \frac{(Fx)}{(N)}}{N - 1} = \frac{352 - \frac{(184)}{(295)}}{294} = 1.195$$

$$\text{Standard Deviation} = \sqrt{\text{Variance}} = \sqrt{1.195} = 1.093$$

Correction for true mean from log. centre point of X = 0 group

$$\text{Correction} = \frac{Fx}{N} = \frac{184}{295} = 0.624$$

Apparent mean = log average of and

log 11 = 1.0414
log 20 = 1.3010
Mean = 1.1712

Each group represents a multiple of 2 or

log of 2 = 0.3010

True Mean = Apparent Mean + (Correction)(Group Multiple)
= 1.1712 + (0.624)(0.3010) = 1.3590
= 23 p.p.m.

Mean & Standard Deviation = true mean + (Std. Deviation x Group Multiple)(Number of deviations)
= 1.1712 + (1.09)(0.301) = 32 p.p.m.
Mean + 2 Std. Deviation = 1.1712 + (1.09)(0.301)(2) = 67 p.p.m.
Mean + 3 Std. Deviation = 1.1712 + (1.09)(0.301)(3) = 143 p.p.m.
Mean + 4 Std. Deviation = 1.1712 + (1.09)(0.301)(4) = 305 p.p.m.

Statistical Analysis of Zinc Content in Soil Samples

Group x (p.p.m.)	F	X	Fx	X^2	$F(x^2)$
0-10	0				
11-20	2	- 2	- 4	4	8
21-40	63	- 1	-63	1	63
41-80	143	0	0	0	0
81-160	74	+ 1	74	1	74
161-320	10	+ 2	20	4	40
312-640	2	+ 3	6	9	18
over 640	1	+ 4	4	16	16
	295		37		219

$$\text{Variance} = \frac{219 - \frac{(37)}{(295)}}{294} = 0.7444$$

Standard Deviation $\sqrt{0.7444} = 0.8628$

Correction $= \frac{37}{295} = 0.125$

Apparent Mean $= \frac{\log 40 + \log 80}{2} = \frac{1.60205 + 1.90309}{2} = 1.75257$

Group Multiple $= 0.301$

True Mean $= 1.75257 + (0.125 \times 0.3010) = 1.790199 = 62$ p.p.m.

Mean + 1 Std. Deviations $= 1.790195 + (0.8625 \times 0.301) = 2.0498$

$= 112$ p.p.m.

Mean + 2 Std. Deviations $= 1.790195 + (0.2596 \times 2) = 2.309395$

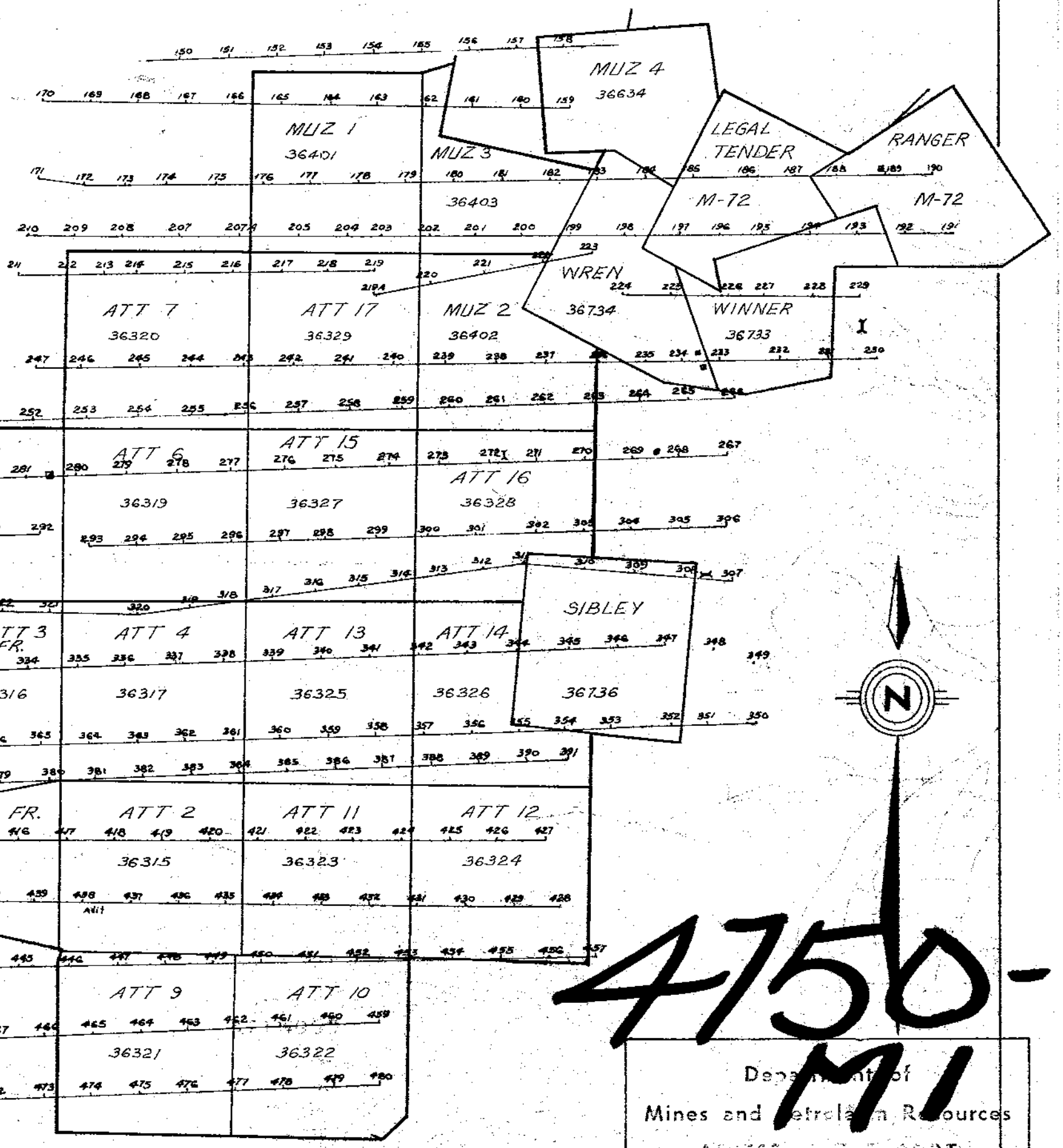
$= 204$ p.p.m.

Mean + 3 Std. Deviations $= 1.790195 + (0.2596 \times 3) = 2.5689$

$= 371$ p.p.m.

Mean + 4 Std. Deviations $= 1.790195 + (0.2596 \times 4) = 2.8286$

$= 674$ p.p.m.



4750-

M1

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

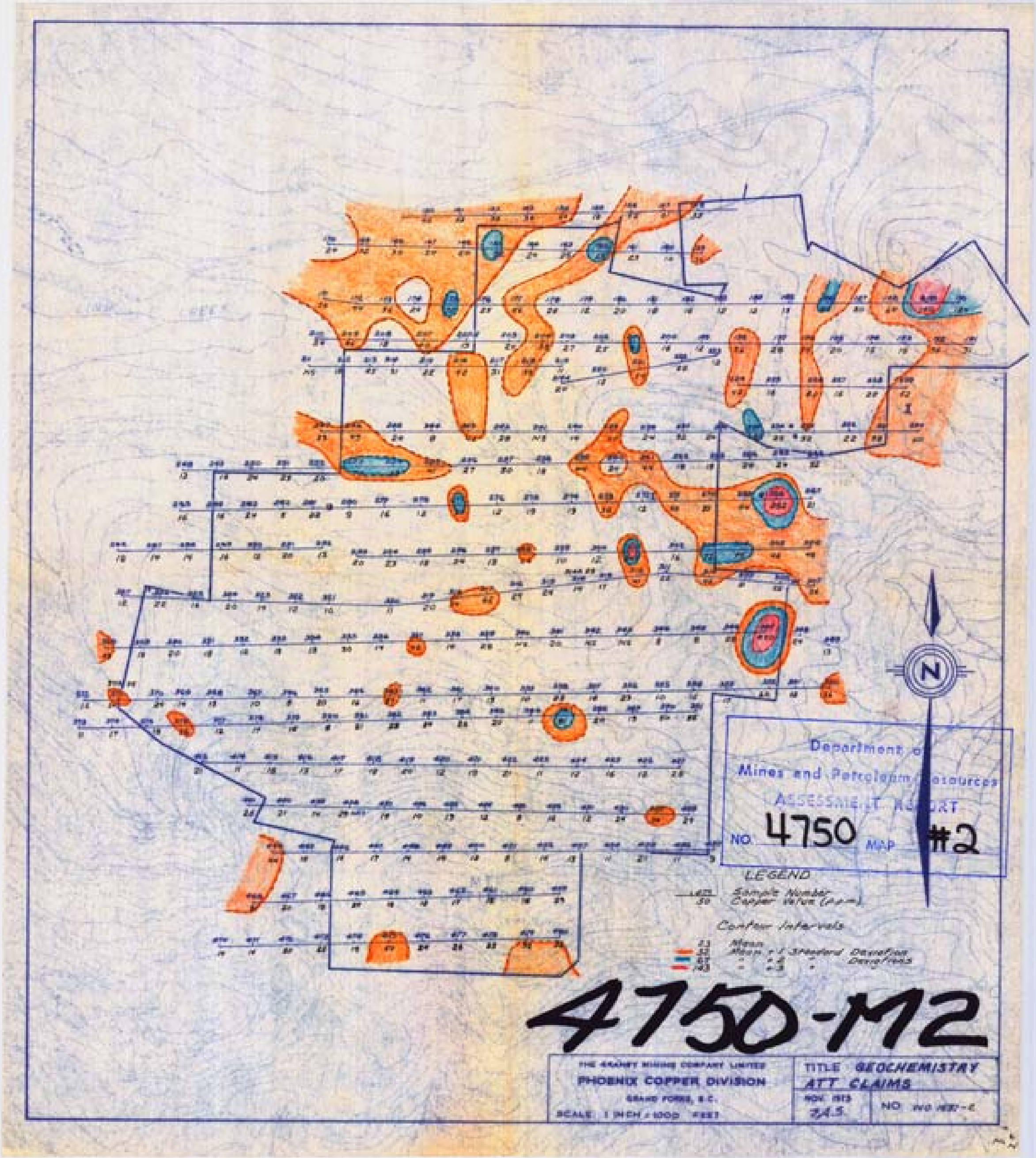
NO. 4750 MAP #1

THE GRANBY MINING COMPANY LIMITED
PHOENIX COPPER DIVISION
GRAND FORKS, B.C.
SCALE: 1 INCH = 1000 FEET

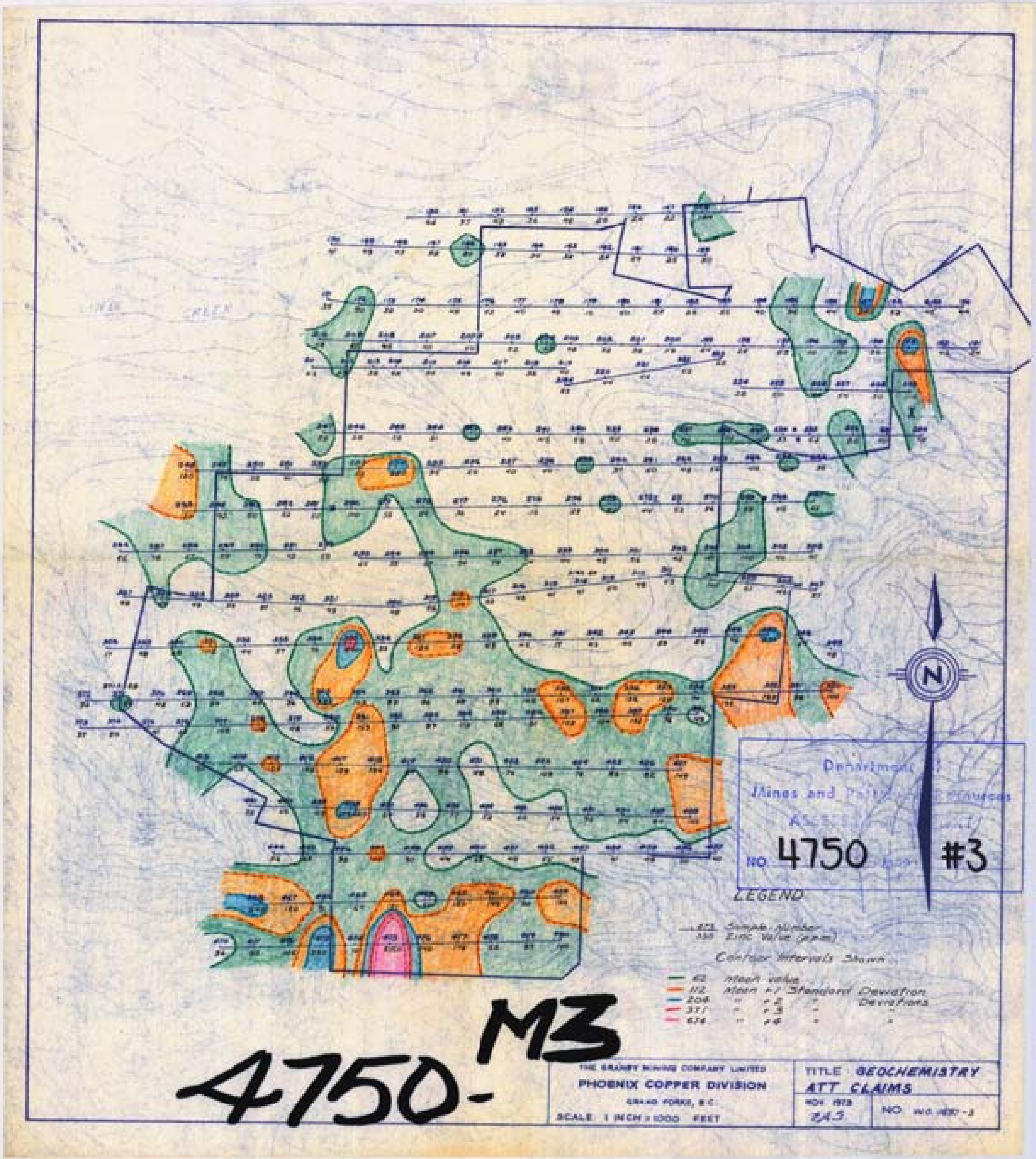
TITLE: GEOCHEMISTRY
ATT CLAIMS

NOV. 1979
E.A.S.

NO: W.O. 1697 - 1



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4750 MAP #2
LEGEND
Sample Number
Copper Value (p.p.m.)
Contour Intervals
Mean
Mean + 1 Standard Deviation
Mean + 2 " Deviations
4750-M2
THE GRANBY MINING COMPANY LIMITED
PHOENIX COPPER DIVISION
GRAND FORKS, B.C.
SCALE 1 INCH = 1000 FEET
TITLE GEOCHEMISTRY
ATT CLAIMS
NOV. 1973
NO.



Department of
Mines and Petroleum Resources
NO. 4750 #3
LEGEND
Sample Number
Zinc Value (ppm)
Contour Intervals Shown
62 Mean value
112 Mean +1 Standard Deviation
204 " +2 " Deviations
371 " +3 " "
674 " +4 " "
4750-M3
THE GRANBY MINING COMPANY LIMITED
PHOENIX COPPER DIVISION
GRAND FORKS, B.C.
SCALE: 1 INCH = 1000 FEET
TITLE GEOCHEMISTRY
ATT CLAIMS
NOV. 1973
NO.