GROUND GEOPHYSICAL INVESTIGATIONS

SUN CLAIM GROUP

by: John S. Brock
March, 1966

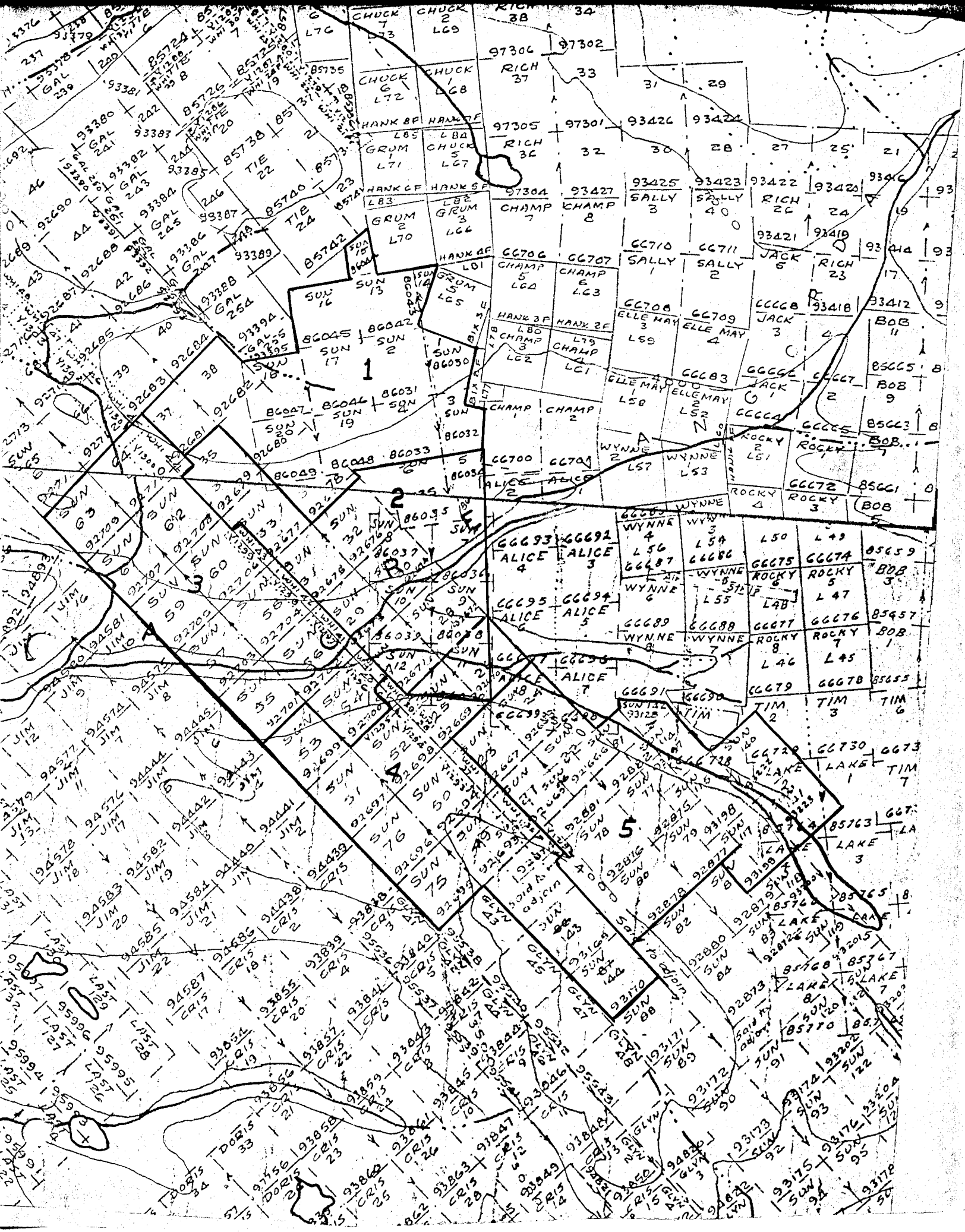
location reference: Claim Sheet 105 K-3 and K-6
62° 15' North Latitude
133° 15' West Longitude

Approved by: R. S. Addison

Anvil Mining Corporation

GROUND GEOPHYSICAL INVESTIGATIONS
SUN CLAIM GROUP

TABLE OF CONTENTS



GROUND GEOPHYSICAL INVESTIGATIONS
SUN CLAIM GROUP

INTRODUCTION

From August 27th to October 3rd, 1965.

Ground electromagnetic and magnetic surveys were carried out over the Sun Claim Group in order to locate and define airborne EM and magnetic anomalies though to be significant in the exploration for base metal sulphide deposits. The surveys were completed in advance of a rotary drilling program through which anomalies outlined were tested and evaluated for economic possibilities. It was felt that geophysical surveys of this nature were warranted because of successful results obtained by these methods over other areas of known mineralization in the same district.

LOCATION AND ACCESS

The Sun Claim Group was staked in a northwest-southeast direction across the lower limits of Vangorda and Shrimp Creeks, south of the Vangorda ore deposits. The area is heavily forested with Spruce stands, on open slopes dwarf birch predominates as does muskeg in areas of collective drainage.

Access to the Sun Claims may be made by road from the Vangorda airstrip some two miles to the north. Aircraft equipped with floats or skiis depending on the season, may land at Shrimp Lake, approximately one mile to the northeast of the claim group.

GEOLOGY

Surface outcrop of the Sun Group is largely limy chlorite schist and greenstone. It is unkown to what extent or thickness sericite schist, graphite schist and green cherty phyllite infolds (axis 340° - 360°, approximately horizontal) beneath. Quartz feldspar porphyry, possibly linked with the other Vangorda occurances, outcrops on the east side of the claim group on the hanging wall side of the infold mentioned. There is no particular evidence suggesting this porphyry occurs at depth.

A snyform (trending approximately 60°, plunging 20° southwest) occuring in Vangorda creek near the south limit of the claim group is possibly the same structure as controls the long axis of the Vangorda Mines deposit.

There is an intervening antiform, then another synform (trending approximately 100°, with a moderate westerly plunge) which coincides with a slight aeromagnetic anomaly.

Copper and Zinc geochemical stream silt sampling is slightly encouraging but inconclusive with five values averaging 20 and 300 ppm. [1].

Further mapping was done by the company in 1965, (map enclosed in folder).

SURVEY METHODS

Grid System: A central base line was established by chain and transit and cut by linecutters hired by the company. Cross lines were turned off the base line at intervals of 800 feet, survey control was maintained by picket and chain methods and stations were established every 100 feet on these lines. The grid plan is shown on all geophysical and geologic maps in the back folder.

Magnetometer Survey: A Sharpe's MF-1 Fluxgate magnetometer was used during the entire magnetometer survey. The instrument is a first order fluxgate type vertical component magnetometer, it is hand held and needs only coarse leveling and no orientation. The magnetometer has a maximum sensitivity of 20 gammas per scale division on 1000 gamma range and a readibility of 5 gammas on the 1000 gamma range.

Readings were taken at 100 foot intervals on the base line and on each cross line. Prior to the actual survey readings were taken at the intersection points of each cross line with the central base line. These stations were looped and re-read every hour as a means of controlling drift and diurnal variations. With base stations of an established value serving as check and reference points for each cross line, the survey carried out was of a more precise and relative nature on a day to day basis. The cross lines were read at 500 foot intervals throughout their length and then read at 100 foot intervals with re-reads at each pre-read 500 foot station. This method of survey provided an internal check on diurnal variations.

Electromagnetic Survey: A Crone JEM Electromagnetic unit was used during the entire survey. The instrument may be employed either as a horizontal or vertical loop apparatus. This equipment uses a method independant of transmitter receiver alignment and distance of separation or elevation differences. There are no interconnecting cables. The unit is dual frequency (1800 and 480 cps.) and is designed to be operated with a maximum coil separation of 300 feet for maximum 'depth penetration'. Resultant dip angles of the primary and secondary field are measured by the employment of a 'null' method. Each cross line on the grid was run, a 300 foot separation of coils was used and readings were taken at 100 foot station intervals. The instrument

1. From J.F. Fairley, Geologic report to Dynasty, 1964.

was used as a horizontal loop and each station was read at 1800 and 480 cps.

TREATMENT OF DATA

Magnetometer Survey

After each gamma value was corrected for diurnal variation, they were plotted on a plan of the survey grid (400 ft. to 1 inch). Profiles of each line were drawn to a standard scale (see map in folder). The gamma values were also contoured on a separate map using an isomagnetic contour interval of 50 gammas.

Electromagnetic Survey

The electromagnetic results were plotted using the same scale and grid pattern as used for the magnetics. A map of the western portion of the survey area was drawn showing high and low frequency resultant dip angle profiles for each line surveyed. A Contour map of the high frequency resultant dip angles was also plotted using a contour interval of -4° resultant dip.

INTERPRETATION OF RESULTS

The eastern portion of the grid does not reveal any magnetic anomalies of significance. The western half of the grid reveals two anomalies that are well defined magnetically. The southern anomaly lies between lines 80+00 and 96+00 at about 7+00 north and the more northern anomaly lies between lines 96+00 and 112+00 at approximately 20+00 north. Both anomalies are of an elongate nature and strike approximately northwest. Profile studies show them to be due to causative structures close to surface (less than 100 feet). The northern anomaly occurs in rocks which have been mapped as graphitic schist and the southern anomaly is found in rocks which have been mapped as schistose volcanics (see geologic map). It appears that the two anomalies may be due to the same structure but have been faulted by a northeast trending fault that appears magnetically as a series of 'lows' and directional changes in magnetic gradients. A fault is not assumed on the geologic map but structural trends in this area adopt a pronounced northeast direction.

It appears that the magnetic anomalies are probably due to disseminated pyrrhotite mineralization, similar to pyrrhotite mineralization found as a hydrothermal product in other local areas of graphitic schist and schistose volcanics.

The electromagnetic results are not well defined due to large bodies of graphite. The areas of variable electromagnetic disturbance are confined to

the graphitic schists as shown on the geologic map. A remarkable coincidence is apparent. There is good coincidence between the northern magnetic anomaly and a good electromagnetic 'crossover'. This is probably a reflection of the graphitic schist contact in this area and the change in magnetic susceptibility between the schistose volcanic rocks to the north and the graphite containing disseminated pyrrhotite.

RECOMMENDATIONS AND CONCLUSIONS

The geophysical characteristics of the area are very similar to other areas tested by the same methods and found to be economically unimportant. The large areas of electromagnetic anomalies showing variable conductivity are characteristic of graphite in this region. The coincident magnetic anomalies within the graphitic zones are almost always due to pyrrhotite as a result of hydrothermal alteration.. The anomalies however must be tested by relatively inexpensive drilling methods as graphitic schists are thought to play an important part in ore control in the Vangorda camp.

The anomalies of interest were drilled by the rotary method with the exception of the south magnetic anomaly. All drill results revealed graphite as the electromagnetic conductor and pyrrhotite as the magnetic body. The south anomaly (magnetic) was not tested however due to other more important areas demanding drilling before the end of the exploration season. This anomaly deserves to be drilled at some date if time and economics permit.

A P P E N D I X

GROUND GEOPHYSICAL INVESTIGATION

SUN CLAIM GROUP

Appendix (i)

PERSONNEL

Magnetometer Operators:	Wm. Barclay,	c/o General Delivery Haney, B.C.
	Andrew Harman,	Whitehorse, Y.T.
Electromagnetic Survey		
Chief:	Phillip Neilson,	Vancouver, B.C.
	Allan Devlin,	Calgary, Alta.
Helpers:	Scot Cameron,	Whitehorse, Y.T.
	John Zeigler,	Toronto, Ont.
Surveyor	Andrew Harman,	Whitehorse, Y.T.
Linecutters	Charlie Ollie,	Ross River, Y.T.
	Robert Etzel	" "
	Bob McLeod	" "
	Lawernce Bill	Whitehorse, Y.T.
Explorations Manager	REG Davis	Vancouver, B.C.
Report	John S. Brock	Whitehorse, Y.T.

Appendix (ii)

STATEMENT OF COSTS: Ground Geophysical Surveys, Sun Claim Group .

A Linecutting: 1) Total Footage cut: 157,000 Feet

2) Cost, includes subsistence in field and supervision:
..... $9.00/1000 feet

TOTAL COST..... $ 1413.00

B Geophysical Surveys:

1) Magnetometer Survey:

a) Footage.... 79,660 feet = 15 line miles

b) Overall Cost including instrument rental, crew subsistence
..... $ 24.00/ line mile

TOTAL COST..... 760.00

2) Electromagnetic Survey:

a) Footage .... 157,000 feet = 30 line miles

b) Overall cost including instrument rental, crew subsistence
..... $ 40.00/ line mile

TOTAL COST..... 1200.00

C) Supervision - for month of September, 1966 1000.00

D) Reduction of data and preparation of report, 300.00

TOTAL $ 4673.00

Appendix (iii)

AFFIDAVIT Supporting Statement of Costs, Geophysical Surveys, Sun Claim Group - August 27, 1965 to October 3, 1965.

I, John S. Brock, geophysicist, of Whitehorse, Yukon Territory, have compiled the statement of costs as presented in this report 'Ground Geophysical Investigations, Sun Claim Group'.

I make oath and say that to the best of my knowledge and belief, the statement of costs as presented, is true and an accurate representation of expenditure to be applied as representation work on the Sun Mineral Claim Group.

Sworn before me at Whitehorse this 6th day of March A.D. 1966

Dane D. White

Commissioner for Oaths for Yukon Territory

John S. Brock

John S. Brock

March 6, 1966

Date

144W 136W 128W 120W 112W 104W 96W 88W 80W 72W 56W 48W 40W 32W 24W 16W 8W 0 8E

CAMP

SHRIMP CREEK

YANKEE DOODLE CREEK

NOTE

CONTOURED RESULTANT DIP ANGLES
SURVEY BY: P. NIELSON, S. CAMERON
INTERPOLATION BY: J.S. BROCK
CONTOUR INTERVAL: - 4° RESULTANT DIP
NEGATIVE DIP ANGLES SHOWN
POSITIVE DIP ANGLES SHOWN
ROADS SHOWN
CREEKS SHOWN

ANVIL MINING CORP.

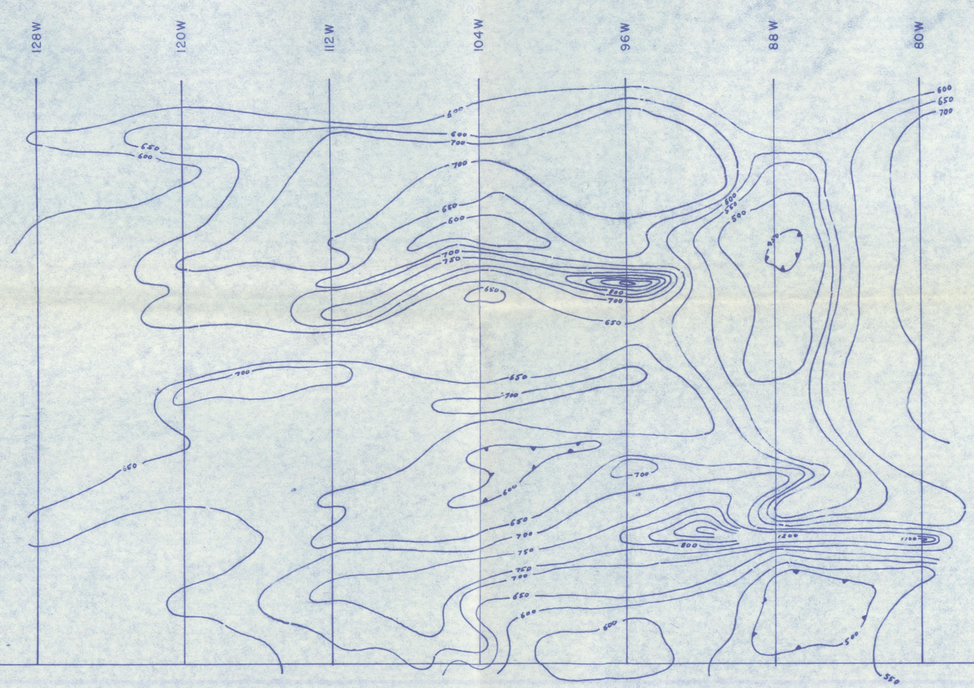
WHITEHORSE

SUN CLAIM GROUP
GROUND ELECTROMAGNETIC SURVEY
(J.E.M.) HORIZONTAL LOOP

DATE: MARCH, 66
SCALE: 1" = 400'
DRAWN BY: J.S.B.

DRAWING No.
FILE: WA-14

DATE PRINTED



ISOMAGNETIC CONTOUR INTERVAL = 50 γ
SURVEY BY: B. BARCLAY
INTERPOLATION BY: J. BROCK

ANVIL MINING CORP.

WHITEHORSE

SUN CLAIM GROUP
GROUND MAGNETOMETER SURVEY
SHOWING ISOMAGNETIC CONTOURS

DATE: 3-19-66
SCALE: 1" = 400'
DRAWN BY:

DRAWING Nº
FILE: WX-5

DATE PRINTED

144W 136W 128W 120W 112W 104W 96W 88W 80W 72W 56W 48W 40W 32W 24W 16W 8W 0 8E

SUN 7
SUN 8
SUN 9
SUN 10
SUN 11
SUN 28
SUN 30
SUN 32
SUN 31
SUN 29
SUN 27
SUN 26
SUN 25
SUN 24
SUN 23
SUN 22
SUN 21
SUN 87
SUN 86
SUN 38
SUN 37
SUN 36
SUN 35
SUN 34
SUN 33
WHI 44F
WHI 43F
WHI 42F
WHI 41F
WHI 40F
WHI 39F
WHI 38F
WHI 37F
WHI 36F
WHI 35F
SUN 64
SUN 63
SUN 62
SUN 61
SUN 60
SUN 59
SUN 58
SUN 57
SUN 56
SUN 55
SUN 54
SUN 53
SUN 52
SUN 51
SUN 50
SUN 49
SUN 76
SUN 75
SUN 85
SHRIMP CREEK
VANGORDA CREEK

NOTE
SURVEY BY : B. BARCLAY
PROFILE SCALE = ½" = 100 ɣ
INTERPOLATION BY : J. BROCK

ANVIL MINING CORP.	
WHITEHORSE	
SUN CLAIM GROUP GROUND MAGNETOMETER SURVEY SHOWING MAGNETIC PROFILES	
DATE: 3-22-66 SCALE: 1" = 400' DRAWN BY: S.M.	DRAWING Nº WA-15 FILE:

DATE PRINTED