



A REPORT
ON
A GROUND MAGNETOMETER SURVEY
WHITEHORSE AREA, YUKON TERRITORY

FOR

LEWES RIVER MINES LIMITED

VANCOUVER, BRITISH COLUMBIA

BY

EAGLE GEOPHYSICS LIMITED

VANCOUVER, BRITISH COLUMBIA

JULY 1968

This report has been examined by
the Geological Evaluation Unit.
Approved as to technical worth by:
D. G. Fisher
RESIDENT GEOLOGIST
Approved as to the amount
of \$ See Report by 507-1
Assoc. for some survey
RESIDENT GEOLOGIST *A.M.*
Approved as representation work
under Section 53(4) Yukon Quar
Mining Act.
James Smith
COMMISSIONER OF YUKON

INTRODUCTION

BETWEEN JUNE 3RD AND JULY 10th, 1968, EAGLE GEOPHYSICS LIMITED CARRIED OUT A GROUND MAGNETIC SURVEY ON A PROPERTY IN THE WHITEHORSE AREA OF THE YUKON TERRITORY, HELD BY LEWES MINES LIMITED.

THE SURVEY WAS CARRIED OUT OVER EAST-WEST HANDCUT LINES ON TWO SEPARATE LINE GRIDS WITH NORTH-SOUTH BASELINES, WITH ALL THE LINES CHAINED AND PICKETED AT 100 FOOT INTERVALS.

READINGS WERE TAKEN EVERY 100 FEET ALONG THE PICKET LINES USING A SHARPE M.F.1 FLUXGATE MAGNETOMETER WITH ADDITIONAL READINGS AT 50 FOOT INTERVALS WHERE DEEMED NECESSARY.

THE RESULTS ARE SHOWN ON PLAN MAPS OF THE LINE GRIDS, MAPS E-128-1 AND 2, THAT ACCOMPANY THIS REPORT. THESE MAPS ARE AT A SCALE OF 1 INCH TO 400 FEET WITH THE MAGNETIC DATA PRESENTED IN CONTOURED FORM.

PROPERTY AND LOCATION

THE PROPERTY CONSISTS OF THE AC, BC, CC, CUB AN HULK GROUPS OF CLAIMS, PARTS OF WHICH WERE SURVEYED. THE CLAIMS ARE AS FOLLOWS:

AC	1	TO	96	INCLUSIVE
BC	1	TO	113	INCLUSIVE
CC	1	TO	106	INCLUSIVE
CUB	1	TO	24	INCLUSIVE
HULK	1	TO	13	INCLUSIVE
HILK	13	TO	16	INCLUSIVE

THE PROPERTY IS SITUATED IN THE WHITEHORSE MINING DIVISION OF THE YUKON TERRITORY. IT LIES WEST OF THE ALASKA HIGHWAY NEAR THE TOWN OF WHITEHORSE AND STRADDLES THE YUKON RIVER AT ITS LOCATION. ITS NORTHERN BOUNDARY IS SLIGHTLY NORTH OF WHITEHORSE WHILE ITS SOUTHERN EXTREMITY LIES ABOUT 2 MILES SOUTH OF THE CARCROSS ROAD TURNOFF.

ACCESS TO THE PORTION NORTH OF THE YUKON RIVER IS OBTAINED VIA THE SUBDIVISION OF RIVERDALE AND THE CHADBURN LAKE ROAD, WHILE THAT TO THE PART SOUTH OF THE RIVER IS OBTAINED OFF THE ALASKA HIGHWAY.

PURPOSE

THE PURPOSE OF THE SURVEY WAS TO DETERMINE MORE ACCURATELY THE POSITION OF THE LIMESTONE-COAST INTRUSIVE CONTACT, PREVIOUSLY INDICATED ON THE GOVERNMENT AEROMAGNETIC SURVEY AND ON A DETAILED HELICOPTER AIRBORNE MAGNETIC SURVEY (SEIGEL ASSOCIATES LTD., MARCH, 1968), AND TO DEFINE POSSIBLE EMBAYMENTS IN THE ABOVE CONTACT, CONSIDERED GOOD LOCATIONS FOR MINERAL DEPOSITS IN THIS AREA, FOR FURTHER DETAILED INVESTIGATIONS.

GEOLOGY

GENERAL

FOR A GENERAL DESCRIPTION OF THE GEOLOGY OF THIS AREA THE READER IS REFERRED TO: (A) MEMOIR 312 OF THE GEOLOGICAL SURVEY OF CANADA, "WHITEHORSE MAP AREA, YUKON TERRITORY, 105D", BY J. D. WHEELER, AND (B) PAPER 63-44 OF THE GEOLOGICAL SURVEY OF CANADA, "COPPER AND IRON RESOURCES, WHITEHORSE COPPER BELT, YUKON TERRITORY" BY E. D. KINDLE. BRIEFLY IT IS AS FOLLOWS:

(A) GEOLOGICAL ENVIRONMENT. THE ORIGINAL ROCKS OF THE WHITEHORSE COPPER BELT WERE THE LEWES RIVER GROUP, UPPER TRIASSIC IN AGE AND CONSISTING FOR THE MOST OF QUARTZITES, ARKOSES, GREYWACKES, ARGILLITES, LIMESTONES AND DOLOMITES. THESE, IN PARTS OF THE COPPER BELT, ARE overlain BY THE LABERGE GROUP OF LOWER JURASSIC AGE. THE LIMESTONES AND DOLOMITES WERE THE MOST PREDOMINANT ROCK TYPES BEFORE BEING INTRUDED AND CONSEQUENTLY METAMORPHOSED BY THE LARGE COASTAL INTRUSIVE BATHOLITH OF CRETACEOUS AGE. IN VERY RECENT TIMES THE FOREMENTIONED ROCKS HAVE BEEN COVERED IN PARTS BY THE MILES CANYON EXTRUSIVE BASALT.

(B) ECONOMIC GEOLOGY. THE DEPOSITS OF THE WHITEHORSE COPPER BELT LIE AT OR NEAR THE CONTACT OF GRANITIC ROCK WITH THE LIMESTONES OF THE LEWES RIVER GROUP. THESE DEPOSITS ARE MOSTLY CONTACT METAMORPHIC SKARN DEPOSITS WITH ASSOCIATED MAGNETITE, BUT OCCURRENCES OF "PORPHYRY TYPE" DEPOSITS SUCH AS THE KEEWENAW ORE BODY DO OCCUR.

BORNITE AND CHALCOPYRITE ARE THE PRINCIPAL ECONOMIC COPPER MINERALS BUT CHALCOCITE, COPPER CARBONATES AND CHRYSOCOLLA DO OCCUR.

GEOLOGY SETTING OF THE PROPERTY

THE PROPERTY LIES ON THE EAST SIDE OF THE WHITEHORSE COPPER BELT AND IS BELIEVED BY THE WRITER TO BE MOSTLY DRIFT COVERED. THE THICKNESS OF OVERBURDEN IS THOUGHT TO VARY FROM A FEW FEET TO OVER TWO HUNDRED FEET IN PLACES. HOWEVER, OUTCROP OCCURRENCES OF GRANITE HAVE BEEN REPORTED IN THE SOUTHERN PORTION OF THE PROPERTY NEAR THE CARCROSS TURNOFF.

THE CLAIM GROUPS ARE UNDERLAIN MAINLY BY TRIASSIC VOLCANIC AND SEDIMENTARY ROCKS OF THE LEWES RIVER GROUP, BY JURASSIC MARINE AND NON-MARINE SEDIMENTARY ROCKS OF THE LABERGE GROUP, WITH MILES CANYON BASALTS ALONG THE EAST SIDE OF SCHWATKA LAKE ACCORDING TO KINDLE. IN FACT THE 'SEDIMENTARY-INTRUSIVE' CONTACT SUPPOSEDLY RUNS NORTHWEST-SOUTHEAST THROUGH THE CLAIM GROUPS.

SURVEY SPECIFICATIONS

THE MAGNETIC SURVEY WAS CARRIED OUT USING A SHARPE M.F.1. FLUXGATE MAGNETOMETER. THIS INSTRUMENT MEASURES VARIATIONS IN THE VERTICAL COMPONENT OF THE EARTH'S MAGNETIC FIELD TO AN ACCURACY OF ± 10 GAMMAS. CORRECTIONS FOR DIURNAL VARIATIONS WERE MADE BY TYING-IN TO PREVIOUSLY ESTABLISHED BASE STATIONS AT INTERVALS NOT EXCEEDING TWO HOURS.

READINGS WERE TAKEN EVERY 100 FEET ALONG THE PICKET LINES AND ADDITIONAL FILL-IN READINGS WERE TAKEN IF THE MAGNETIC GRADIENT BETWEEN 100 FOOT STATIONS WAS LARGE.

IN ALL 52.5 MILES OF SURVEYING WERE COMPLETED ON GRID 1 WHILE 43.2 MILES WERE COMPLETED ON GRID 2.

DISCUSSION OF RESULTS

GRID 1

THE RESULTS OF THE GROUND MAGNETOMETER SURVEY AGREED VERY WELL WITH THOSE OBTAINED FROM PREVIOUSLY DONE AIRBORNE MAGNETIC SURVEYS.

FROM THE NATURE OF THE MAGNETICS IT APPEARS THAT THE CLAIMS SURVEYED ARE UNDERLAIN BY THREE DIFFERENT MAGNETIC ROCK TYPES, UNITS M_1 , M_2 AND M_4 RESPECTIVELY. UNIT M_1 CORRESPONDS TO THE SEDIMENTARY ROCKS, WHILE UNIT M_2 CORRESPONDS TO THE INTRUSIVE ROCKS. UNIT M_4 WHICH HAS THE SAME CHARACTERISTICS AS UNIT M_2 BUT A SOMEWHAT LOWER INTENSITY IS BELIEVED BY THE WRITER TO BE INDICATIVE OF INTRUSIVE ROCKS COVERED BY A GREATER THICKNESS OF OVERBURDEN.

THE INTERPRETED INTRUSIVE-SEDIMENTARY CONTACT CAN BE TRACED THROUGH THE CLAIMS SURVEYED. ITS POSITIONING GENERALLY SHOWS GOOD AGREEMENT WITH THAT POSTULATED BY KINDLE. A DEFINITE EMBAYMENT IN THIS CONTACT CAN BE SEEN ON THE WESTERN BOUNDARY OF THE SURVEY AREA.

NO MAGNETIC HIGHS THAT MIGHT CORRESPOND TO MAGNETITE AND ASSOCIATED SULPHIDE MINERALIZATION ARE OBSERVED IN THE INTERPRETED LIMESTONE NEAR THE FOREMENTIONED CONTACT.

GRID 2

HERE AGAIN THE RESULTS AGREED VERY WELL WITH THOSE OBTAINED FROM PREVIOUSLY DONE AIRBORNE MAGNETIC SURVEYS.

AGAIN THE NATURE OF THE MAGNETICS SHOWS THE CLAIMS SURVEYED TO BE UNDERLAIN BY THREE DIFFERENT MAGNETIC ROCK TYPES, UNITS M_1 ,

M_2 AND M_3 RESPECTIVELY. UNIT M_1 CORRESPONDS TO THE SEDIMENTARY ROCKS, WHILE UNIT M_2 CORRESPONDS TO THE INTRUSIVE ROCKS. UNIT M_3 CORRESPONDS TO THE MILES CANYON BASALTS. THIS UNIT EXHIBITS LOW MAGNETIC INTENSITY INSTEAD OF THE HIGH MAGNETIC INTENSITY USUALLY ASSOCIATED WITH BASIC ROCKS. THIS IS ATTRIBUTED TO THE BELIEF THAT THE BASALTS ARE REVERSELY POLARIZED, I.E. THE DIRECTION OF THE EARTH'S MAGNETIC FIELD WAS REVERSED AT THE TIME OF EXTRUSION OF THE BASALTS AND THUS THEY ACQUIRED A HIGH REMANENT MAGNETIZATION AS THE FLOWS COOLED THROUGH THEIR CURIE TEMPERATURE. THIS REMANENT MAGNETIZATION IS LARGER THAN THE INDUCED MAGNETIZATION, HENCE THE RESULTANT IS IN AN OPPOSITE DIRECTION TO THE CURRENT MAGNETIZATION.

THE INTERPRETED INTRUSIVE-SEDIMENTARY CONTACT CAN BE TRACED THROUGH THE CLAIMS SURVEYED, AND AGAIN ITS POSITIONING SHOWS GOOD GENERAL AGREEMENT WITH THAT SUGGESTED BY KINDLE. NO EMBAYMENTS IN THIS CONTACT CAN BE SEEN. HOWEVER, A SMALL LOW INTENSITY MAGNETIC HIGH JUST EAST OF BOTH THE INTERPRETED CONTACT AND THE LARGEST LAKE CAN BE OBSERVED IN THE INTERPRETED SEDIMENTARY ROCKS. THIS COULD POSSIBLY BE ATTRIBUTABLE TO THE PRESENCE OF MAGNETITE IN THE SEDIMENTARY ROCK BUT COULD ALSO CORRESPOND TO AN OFFSHOOT OF THE INTRUSIVE SIMILAR TO UNIT M_4 ON GRID 1.

THE INTERPRETED INTRUSIVE-VOLCANIC CONTACT IS NOT NEARLY AS WELL DEFINED AS THAT OF THE INTRUSIVE-SEDIMENTARY CONTACT. IN FACT THE MAGNETIC PATTERN SUGGESTS THE COVERING OF EXTRUSIVE ROCKS TO BE (A) VERY THIN AND (B) VARY IN THICKNESS AND POSSIBLY DISCONTINUOUS. HENCE IN UNIT M_3 THERE ARE PROBABLY PLACES WHERE NO BASALT COVERS THE COAST INTRUSIVE AT ALL.

SUMMARY AND RECOMMENDATIONS

BETWEEN JUNE 3RD AND JULY 10TH, 1968, EAGLE GEOPHYSICS LIMITED CARRIED OUT A GROUND MAGNETIC SURVEY OVER TWO GRIDS ON PARTS OF THE AC, BC, CC, CUB AND HULK CLAIMS GROUPS HELD BY LEWES MINES LIMITED.

THESE CLAIMS ARE LOCATED IN THE WHITEHORSE MINING DIVISION OF THE YUKON TERRITORY AND ARE SITUATED EAST OF THE ALASKA HIGHWAY IN THE VICINITY OF THE TOWN OF WHITEHORSE.

THE MAGNETIC SURVEY SUGGESTED THAT THE PROPERTY IS UNDERLAIN BY THREE DIFFERENT MAGNETIC ROCKS TYPES, CORRESPONDING TO OLDER SEDIMENTARY ROCKS, COAST INTRUSIVES AND RECENT VOLCANIC FLOWS RESPECTIVELY.

THE INTRUSIVE-SEDIMENTARY ROCK CONTACT APPEARS WELL DEFINED THROUGHOUT BOTH GRID AREAS, AND A DISTINCTIVE EMBAYMENT IN IT IS LOCATED ON GRID 1.

THE VOLCANIC-INTRUSIVE ROCK CONTACT IS POORLY DEFINED DUE TO THE APPARENT VARYING THICKNESS AND DISCONTINUITY OF THE FLOWS.

A SMALL LOW INTENSITY MAGNETIC HIGH CAN BE OBSERVED ON GRID 2 LYING WITHIN THE INTERPRETED SEDIMENTARY ROCKS. THIS COULD BE CAUSED BY MINOR MAGNETITE MINERALIZATION OR BY AN OFFSHOOT OF THE INTRUSIVE MASS.

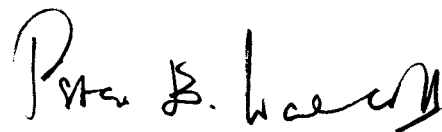
FURTHER EXPLORATION SHOULD BE UNDERTAKEN ON PARTS OF THE PROPERTY SURVEYED TO TEST FOR THE POSSIBLE OCCURRENCE OF MINERALIZATION.

THIS ADDITIONAL WORK SHOULD CONSIST OF INDUCED POLARIZATION SURVEYING AND SHOULD BE CONFINED TO AREAS AROUND THE FAVOURABLE INTERPRETED INTRUSIVE-SEDIMENTARY CONTACT, AND IN PARTICULAR TO THE AREA

AROUND THE EMBAYMENT IN THE CONTACT ON GRID 1, TO THE AREA AROUND THE DISCUSSED MAGNETIC HIGH ON GRID 2 AND TO THE AREA AROUND THE SMALL INTRUSIVE (UNIT M_4) ON GRID 1.

THE INDUCED POLARIZATION METHOD, A DEEP PENETRATION TECHNIQUE CAPABLE OF DETECTING LOW GRADE MINERALIZATION, HAS BEEN RECOMMENDED BECAUSE OF (A) THE THICKNESS OF OVERBURDEN COVER AND (B) THE NEED TO DETECT LOW GRADE MINERALIZATION.

RESPECTFULLY SUBMITTED,
EAGLE GEOPHYSICS LIMITED

A handwritten signature in black ink, appearing to read "Peter E. Walcott". The signature is written in a cursive style with a large initial 'P'.

PETER E. WALCOTT, P.ENG.
GEOPHYSICIST

VANCOUVER, BRITISH COLUMBIA

JULY 1968

A P P E N D I X

(1)

COST OF SURVEY

EAGLE GEOPHYSICS LIMITED UNDERTOOK THE MAGNETIC SURVEY AT A FIXED PRICE OF \$50.00 PER LINE MILE. THEREFORE, THE TOTAL COST OF CARRYING OUT 95.7 MILES OF SURVEYING WAS \$4,785.00.

(11)

PERSONNEL EMPLOYED ON SURVEY

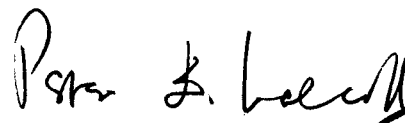
<u>NAME</u>	<u>OCCUPATION</u>	<u>ADDRESS</u>	<u>DATES</u>
PETER E. WALCOTT	GEOPHYSICIST	EAGLE GEOPHYSICS LTD. 815-736 GRANVILLE VANCOUVER 2, B.C.	JULY 16 th & 17 th , 1968
V. R. FALLSTROM	GEOPHYSICAL OPERATOR	"	JULY 2 ND TO 10 th INCLUSIVE 1968
G. McMILLAN	"	"	JUNE 3 RD TO 11 th INCLUSIVE 1968
V. PASHNIAK	"	"	JUNE 3 RD TO 8 th INCLUSIVE 1968

(111)

CERTIFICATION

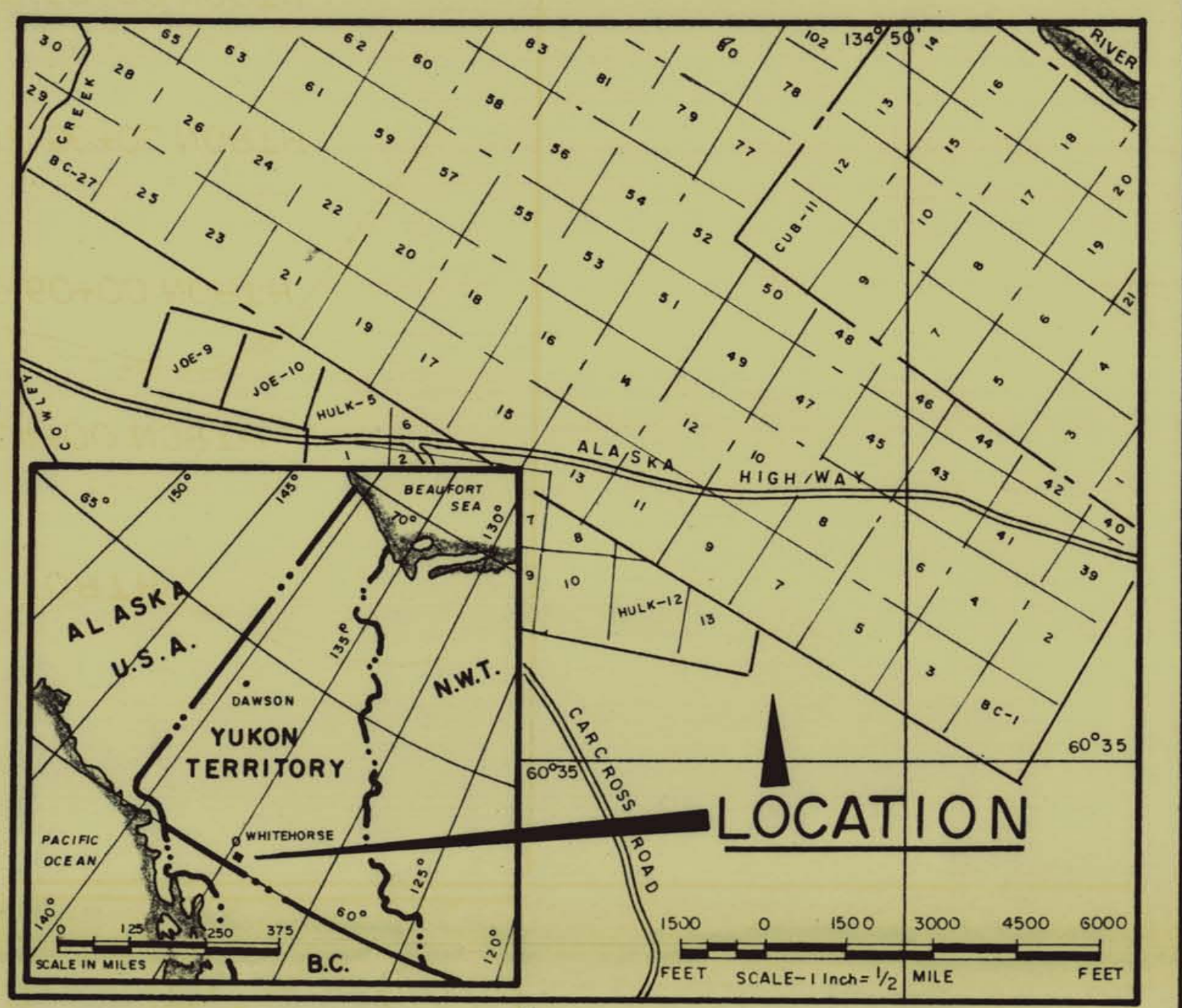
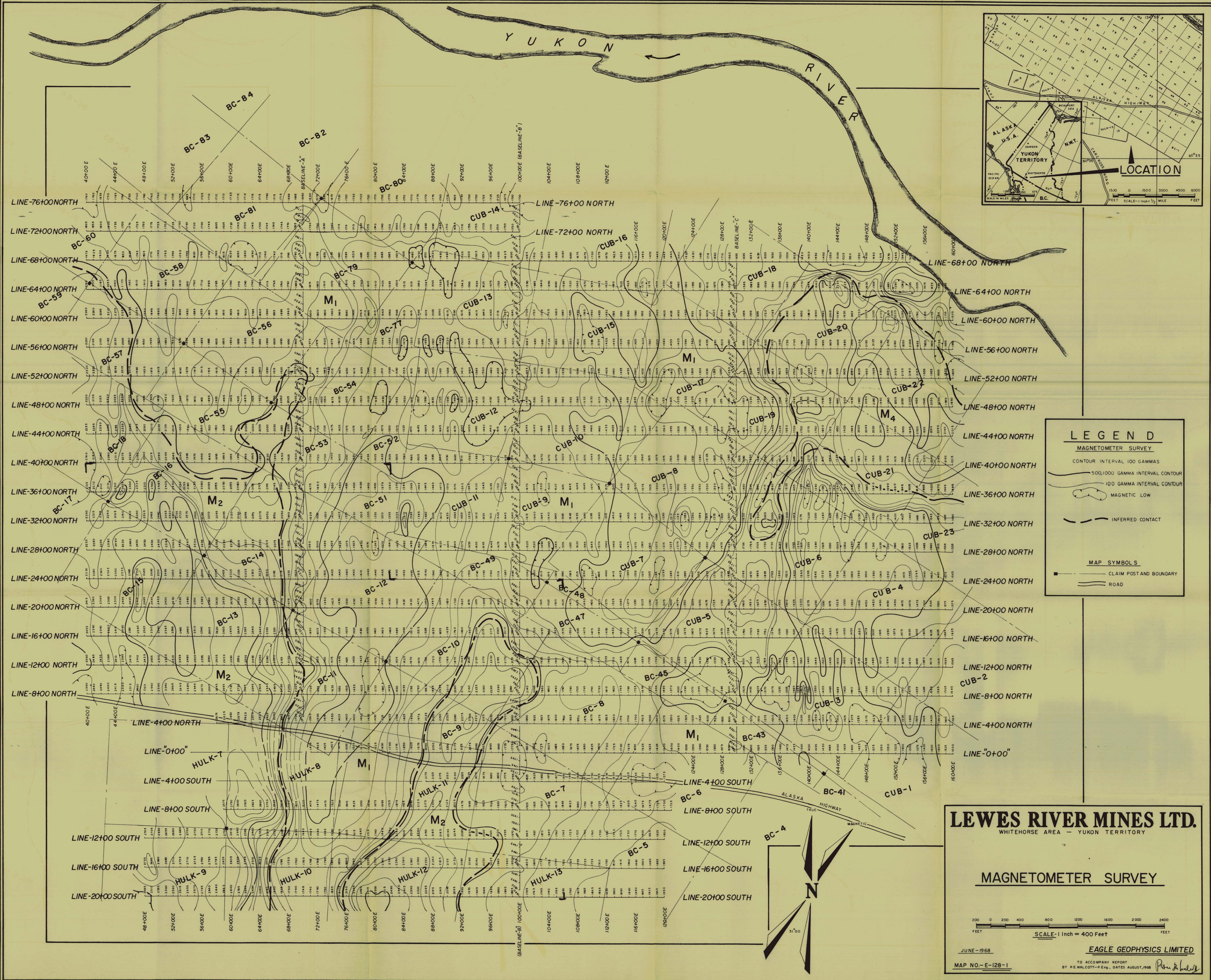
I, PETER E. WALCOTT, OF THE MUNICIPALITY OF COQUITLAM,
BRITISH COLUMBIA, HEREBY CERTIFY THAT:

1. I AM A GRADUATE FROM THE UNIVERSITY OF TORONTO IN 1962
WITH A B.A.Sc. IN ENGINEERING PHYSICS, GEOPHYSICS OPTION.
2. I HAVE BEEN PRACTISING MY PROFESSION FOR THE LAST SIX YEARS.
3. I AM A MEMBER OF THE ASSOCIATIONS OF THE PROFESSIONAL
ENGINEERS OF ONTARIO AND THE YUKON.
4. I HAVE NO SHARES OF LEWES RIVER MINES LIMITED, NOR DO I
EXPECT TO RECEIVE ANY.



PETER E. WALCOTT, P.ENG.

JULY 17, 1968.



LEGEND

MAGNETOMETER SURVEY

- CONTOUR INTERVAL 100 GAMMAS
- 500,000 GAMMA INTERVAL CONTOUR
- 100 GAMMA INTERVAL CONTOUR
- MAGNETIC LOW
- INFERRED CONTACT

MAP SYMBOLS

- CLAIM POST AND BOUNDARY
- ROAD

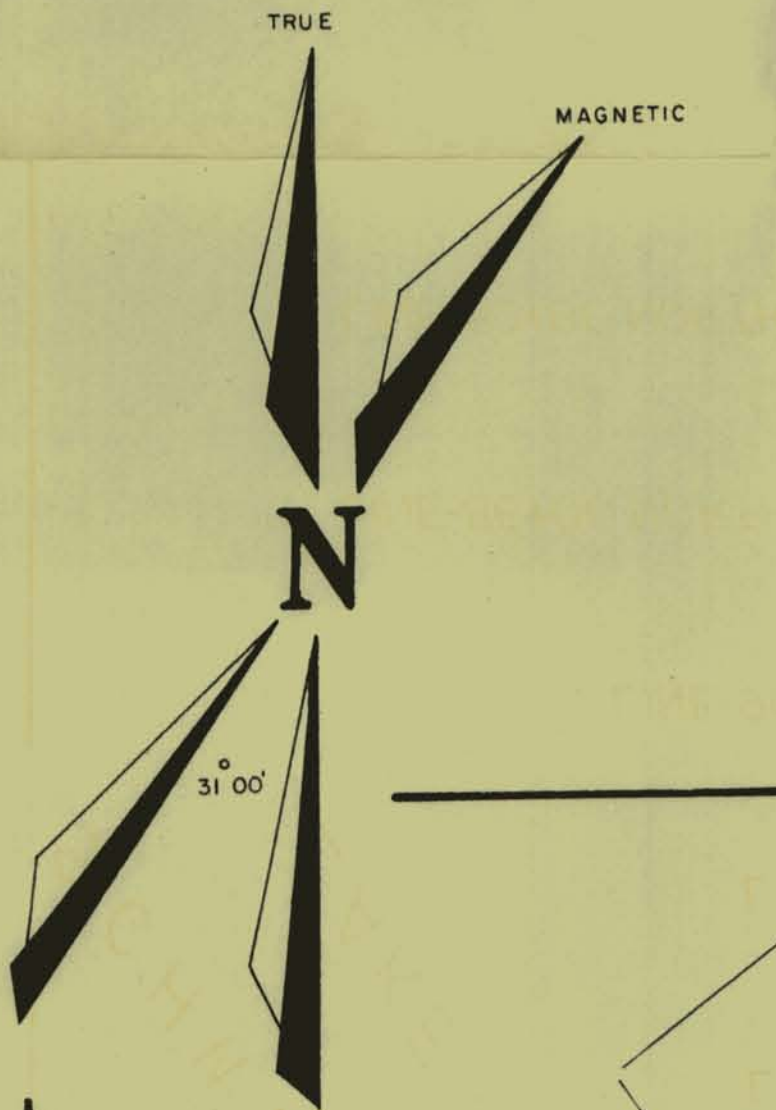
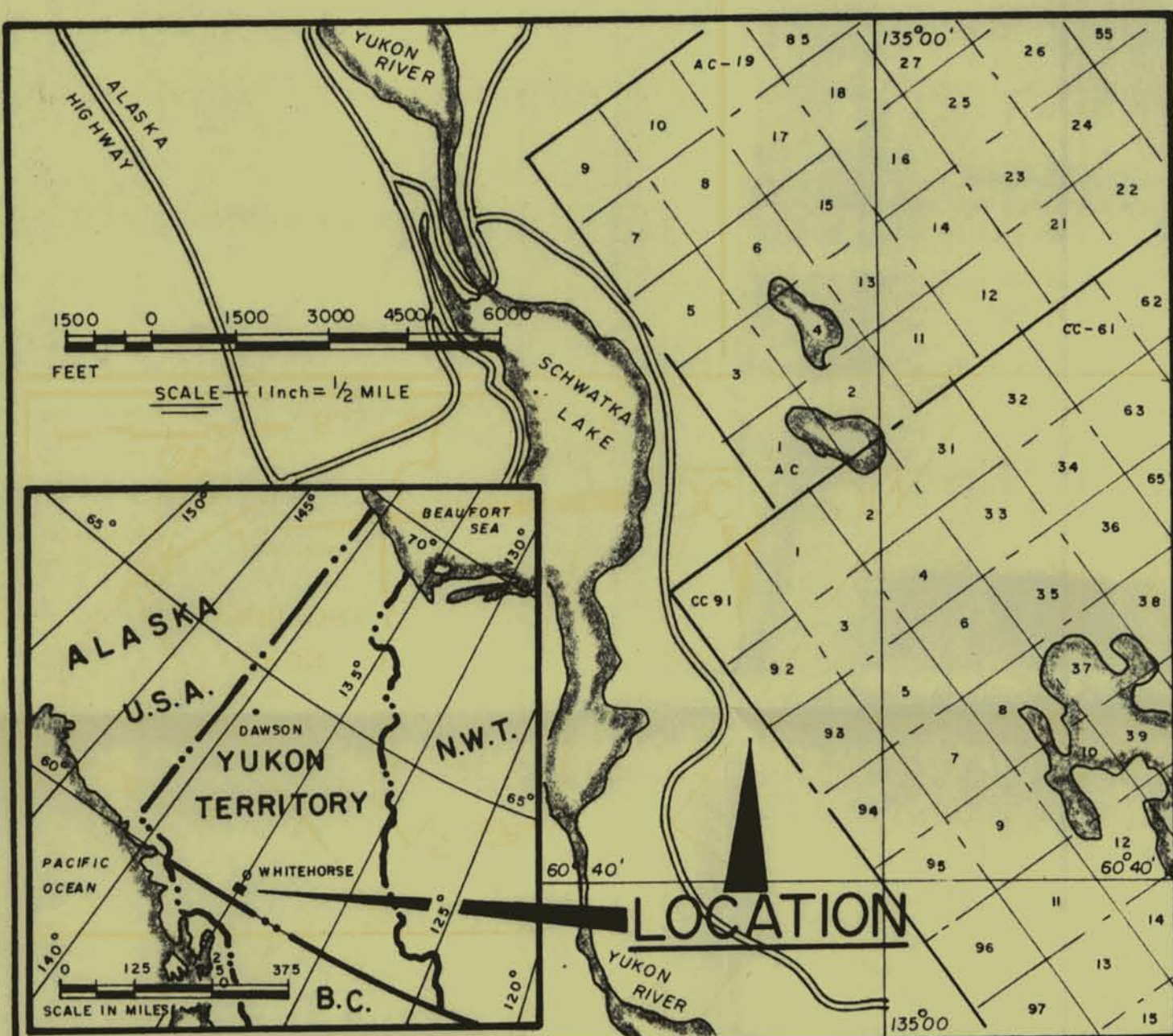
LEWES RIVER MINES LTD.
WHITEHORSE AREA - YUKON TERRITORY

MAGNETOMETER SURVEY

200 0 200 400 800 1200 1600 2000 2400
FEET
SCALE - 1 Inch = 400 Feet

JUNE - 1968
EAGLE GEOPHYSICS LIMITED

MAP NO. - E-128-1
TO ACCOMPANY REPORT BY RE WALCOTT-PENG, DATED AUGUST, 1968
P. H. & L. L.



SCHWATKA
LAKE



LEGEND

MAGNETOMETER SURVEY

CONTOUR INTERVAL 100 GAMMAS

500,1000 GAMMA INTERVAL CONTOUR

100 GAMMA INTERVAL CONTOUR

MAGNETIC LOW

INFERRED CONTACT

MAP SYMBOLS

CLAIM POST AND BOUNDARY

ROAD

LEWES RIVER MINES LTD.
WHITEHORSE AREA — YUKON TERRITORY

MAGNETOMETER SURVEY

200 0 200 400 800 1200 1600 2000 2400
FEET
SCALE-1 inch = 400 Feet

JULY-1968

EAGLE GEOPHYSICS LIMITED
TO ACCOMPANY REPORT
BY P.E. WALCOTT-P. Eng., DATED AUGUST, 1968

MAP NO.-E-128-2