

GEOPHYSICAL REPORT

BY

W. N. PLUMB, P. Eng.


JUNE 8, 1967

DIP-NEEDLE & MAGNETOMETER SURVEYS OF
WOLF I-6, BEV. I-8, MARY I-6, M.C.'S
64° 29' N. LAT. 140° 45' W. LONG.
MAP 116C7, DAWSON MINING DIV., Y.T.
JUNE 17 - JULY 8, 1966

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: \$ ~~28,750~~ 32,819.85


RESIDENT MINING ENGINEER

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


COMMISSIONER OF YUKON

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INTRODUCTION

BETWEEN JUNE 17 AND JULY 8, 1966, DIP-NEEDLE AND MAGNETOMETER SURVEYS WERE MADE OVER THE ENTIRE AREA COVERED BY THE WOLF 1-6, BEV 1-8, AND HARY 1-6 MINERAL CLAIMS, SITUATED AT APPROXIMATELY $64^{\circ} 29'$ NORTH LATITUDE, $140^{\circ} 45'$ WEST LONGITUDE, ON CLAIM MAP 11607 IN THE DAWSON MINING DIVISION, YUKON TERRITORY.

PROSPECTING IN PREVIOUS YEARS HAD REVEALED SEVERAL ISOLATED OUTCROPS OF SERPENTINE NEAR THE HEADWATERS OF EASTER CREEK, NORTHWEST OF THE CLINTON MINE. OUTCROPS ARE SPARSE AND THE AREA HAS A THIN MANTLE OF RESIDUAL TALUS, MOSS AND VEGETATION. AS SERPENTINE BODIES ARE USUALLY MORE MAGNETIC THAN THE SURROUNDING COUNTRY ROCKS, THE DIP-NEEDLE WAS A CONVENIENT AND RAPID METHOD OF DETECTING BURIED SERPENTINE DEPOSITS. THIS SERVED TO INDICATE THE GENERAL AREA OF INTEREST, BUT A GROUND MAGNETOMETER, WHICH IS MUCH MORE SENSITIVE, WAS USED TO OUTLINE THE SERPENTINE BODIES IN GREATER DETAIL AND TO DELINEATE AREAS OF HIGH ANOMALOUS MAGNETISM TO SERVE AS TARGETS FOR FURTHER INVESTIGATION. AS AN AID TO INTERPRETATION, GEOLOGIC OUTCROP MAPPING WAS CONDUCTED CONCURRENTLY WITH THE GEOPHYSICAL SURVEYS.

METHODS

A 5-MAN PROSPECTING PARTY WAS USED, CONSISTING OF ONE GRADUATE GEOLOGIST, TWO SENIOR STUDENT ASSISTANTS AND TWO JUNIOR STUDENT ASSISTANTS, EMPLOYED ON FIELD WORK OR OFFICE WORK AS REQUIRED. A FLY CAMP WAS ESTABLISHED ON EASTER CREEK FOR THE FIELD WORK, AND THE PLOTTING WAS DONE IN THE NEARBY CLINTON CREEK EXPLORATION OFFICE. THE WORK WAS UNDER THE DIRECTION OF MR. DAVID R. BUDINSKI, ASSISTANT CHIEF GEOLOGIST FOR CASSIAR ASBESTOS CORPORATION LIMITED, WHO WAS, IN TURN, RESPONSIBLE TO THE WRITER. BOARD AND ROOM WAS PROVIDED BY THE COMPANY.

THE DIP-NEEDLE TRAVERSES WERE MADE AS FOLLOWS:

1. A BASE LINE DIRECTION WAS SELECTED FROM RECONNAISSANCE TRAVERSING. USUALLY THIS WAS THE CLAIM LOCATION LINE, BUT SOMETIMES THE ASSUMED LONG DIMENSION OF THE ULTRAMAFIC WAS USED.

METHODS (CONTINUED)

2. TWO-MAN TEAMS TRAVERSED THE BASE LINES, BLAZING TREES AND TYING FLAGGING TO THE BUSHES, TAKING DIP-NEEDLE READINGS AT 100 FEET INTERVALS MARKING DISTANCE AND DIRECTION ON THE FLAGGING, KEEPING NOTES AND USING COMPASS FOR DIRECTION CONTROL WHERE NECESSARY. BACKGROUND READINGS WERE DETERMINED IN NEUTRAL AREAS PRIOR TO AND FOLLOWING EACH TRAVERSE. READINGS WERE TAKEN "ON THE SWING" FOR MAXIMUM SENSITIVITY, ALWAYS FACING MAGNETIC WEST (I.E. THE READINGS WERE TAKEN IN THE PLANE OF THE MAGNETIC MERIDIAN).
3. CROSS LINES WERE RUN OUT AT 500 FOOT INTERVALS AS FAR AS SIGNIFICANT READINGS EXTENDED.
4. ONLY READINGS ABOVE AND BELOW BACKGROUND WERE PLOTTED AND, IN THIS REGION, ANOMALOUS DIPS OF 7 DEGREES OR HIGHER, EXTENDING OVER A MINIMUM DISTANCE OF 500 FEET, WERE CONSIDERED SIGNIFICANT. WHERE WARRANTED, CLOSER CHECKING WAS DONE.
5. ALL OUTCROPS ENCOUNTERED ON OR NEAR THE LINES WERE RECORDED, ROCK TYPES NOTED, SPECIMENS TAKEN, AND ATTITUDES DETERMINED WHERE POSSIBLE. (ALL PERSONNEL WERE GEOLOGY STUDENTS.)
6. A COMBINED DIP NEEDLE AND GEOLOGIC MAP WAS PREPARED AS A GUIDE TO SUBSEQUENT MAGNETOMETER WORK. PERIODICALLY, THE PARTY WOULD RETURN TO THE MAIN CAMP FOR CONSULTATION, PLOTTING AND RE-SUPPLY.

THE MAGNETOMETER SURVEY WAS CONDUCTED AS FOLLOWS:

1. AN ABEM NOBEL NZ-4 GROUND MAGNETOMETER, MANUFACTURED BY THE ABEM COMPANY, STOCKHOLM, SWEDEN, WAS USED. THIS INSTRUMENT USES THE VORSIGN WIRE SUSPENSION SYSTEM, IS MOUNTED ON A TRIPOD, IS ESSENTIALLY NON-DIRECTIONAL AND MEASURES THE VERTICAL MAGNETIC INTENSITY OF THE EARTH'S FIELD. THE SUPER RANGE ALLOWS READINGS IN FIELDS VARYING FROM PLUS 150,000 GAMMAS TO MINUS 150,000 GAMMAS. THE SENSITIVE RANGE COVERS 20,000 GAMMAS. AT CLINTON, THE BACKGROUND IS APPROXIMATELY 58,000 GAMMAS. ANOMALOUS VERTICAL INTENSITIES, ABOVE AND BELOW BACKGROUND WERE PLOTTED.
2. THE SURVEY WAS MADE ON A GRID, USING THE CLAIM LOCATION LINES AS BASE LINES AND WITH CROSS LINES AT 500 FOOT INTERVALS. READINGS WERE TAKEN EVERY 100 FEET, ON ALL LINES. RESULTS WERE CALCULATED AND PLOTTED IN THE EXPLORATION OFFICE AT THE MAIN CAMP.

THE PARTY COMPRISES THE FOLLOWING:

D. R. BUDINSKI	- ASSISTANT CHIEF GEOLOGIST
W. R. TAYLOR	- PARTY CHIEF
D. H. GRAHAM	- SENIOR STUDENT ASSISTANT
G. O. TRUSCOTT	- SENIOR STUDENT ASSISTANT
S. R. WOLLEN	- JUNIOR STUDENT ASSISTANT
G. R. POLACK	- JUNIOR STUDENT ASSISTANT

CHRONOLOGY

JUNE 17 - 24	DIP NEEDLE SURVEY FIELD WORK	4 MEN x 8 DAYS
	TAYLOR, GRAHAM, WOLLEN, POLACK	
JUNE 25 - 27	DIP NEEDLE PLOTTING	2 MEN x 3 DAYS
	TRUSCOTT, GRAHAM	
JUNE 25 - JULY 5	MAGNETOMETER FIELD WORK	3 MEN x 11 DAYS
	TAYLOR, WOLLEN, POLACK	
JULY 6 - JULY 8	MAGNETOMETER FIELD WORK	3 MEN x 4 DAYS
	TRUSCOTT, WOLLEN, POLACK	
JULY 6 - JULY 8	MAGNETOMETER OFFICE WORK	2 MEN x 3 DAYS
	TAYLOR, GRAHAM	

CALCULATIONS1. DIP NEEDLE SURVEY

EACH 2-MAN TEAM HAD ITS OWN INSTRUMENT AND DETERMINED THE BACKGROUND READING AT A NEUTRAL SPOT AT THE BEGINNING AND END OF EACH DAY'S TRAVERSE. THIS WOULD VARY WITHIN SMALL LIMITS DUE TO DIURNAL MAGNETIC VARIATIONS, SO AN AVERAGE BACKGROUND WAS USED FOR EACH DAY'S READINGS. IT ALSO VARIED BETWEEN INSTRUMENTS BUT, BY PLOTTING ONLY ANOMALOUS DIPS, THIS DIFFICULTY WAS OVIATED. ANOMALOUS DIPS, AS PLOTTED WERE SIMPLY THE ALGEBRAIC DIFFERENCE BETWEEN OBSERVED READINGS AND BACKGROUND AS RECORDED FOR EACH SET OF NOTES.

SAMPLE CALCULATION:	AREA	17
	LINE	35E
	STATION	10S
	READING	132
	BACKGROUND	<u>116</u>

ANOMALOUS DIP 16

2. MAGNETOMETER SURVEY

THE BASIC FORMULA FOR CALCULATING THE MAGNITUDE OF THE VERTICAL COMPONENT OF THE EARTH'S FIELD, USING THE AGEM MODEL MZ-4 MAGNETOMETER IS:

$$Z_1 = Z_R + Z_S$$

2. MAGNETOMETER SURVEY (CONTINUED)

WHERE: Z_R IS THE FIELD CONTRIBUTION OF THE SUPER RANGE.
(THIS DEPENDS ON THE LATITUDE AND LOCATION.)

Z_S IS THE FIELD CONTRIBUTION OF THE SENSITIVE RANGE.
(THIS VARIES WITH LOCAL MAGNETISM.)

FOR THIS INSTRUMENT,

$$Z_S = 9.3 (S - 1000)$$

WHERE: S IS THE READING ON THE MICROMETER DRUM.

AT CLINTON CREEK, THE VALUE OF Z_R IS 60,800 GAMMAS FROM THE SUPER RANGE, WHILE THE APPROXIMATE VERTICAL MAGNETIC INTENSITY AT THIS LATITUDE IS 58,000 GAMMAS, SO THE ANOMALOUS VERTICAL INTENSITY CAN BE EXPRESSED BY THE FORMULA:

$$Z_C = 2,800 + 9.3 (S - 1000)$$

SAMPLE CALCULATION:	AREA	17
	LINE	35E
	STATION	10S
	READING (s)	802

$$\begin{aligned} Z_C &= 2800 + 9.3 (802 - 1000) \\ &= 2800 + 9.3 (-198) \\ &= 2800 - 1842 \\ &= 958 \end{aligned}$$

COMPLETE SETS OF FIELD NOTES FOR BOTH DIP NEEDLE AND MAGNETOMETER SURVEYS, REFERENCED TO THE CLAIMS AND GRID LINES AS SHOWN ON ACCOMPANYING MAPS, ARE INCLUDED WITH THIS REPORT.

RESULTS AND RECOMMENDATIONS

TWO LARGE ANOMALOUS AREAS WERE INDICATED BY THE DIP NEEDLE SURVEY AND OUTLINED BY THE MAGNETOMETER SURVEY. EXCELLENT CORRESPONDENCE WAS OBTAINED BETWEEN THE TWO TYPES OF SURVEY, ALTHOUGH THE DIP NEEDLE ANOMALIES BEING LESS SENSITIVE, WERE DISCONTINUOUS.

CONCURRENT GEOLOGIC MAPPING SHOWED THE ANOMALIES TO BE DUE TO SERPENTINE WHICH WAS EXPOSED CONTINUOUSLY ALONG EASTER CREEK FOR 4500 FEET AND ALSO OCCURRED ON HIGH GROUND ON THE WOLF CLAIMS. THIS SERPENTINE IS APPARENTLY DERIVED FROM PERIDOTITES INTRUSIVE INTO SURROUNDING QUARTZ SERICITE AND QUARTZ-CHLORITE SCHISTS OF THE YUKON GROUP. IT IS QUITE POSSIBLE THAT THE TWO BODIES ARE CONTINUOUS AT DEPTH, BEYOND THE RANGE OF THE MAGNETIC METHODS USED.

RESULTS AND RECOMMENDATIONS (CONTINUED)

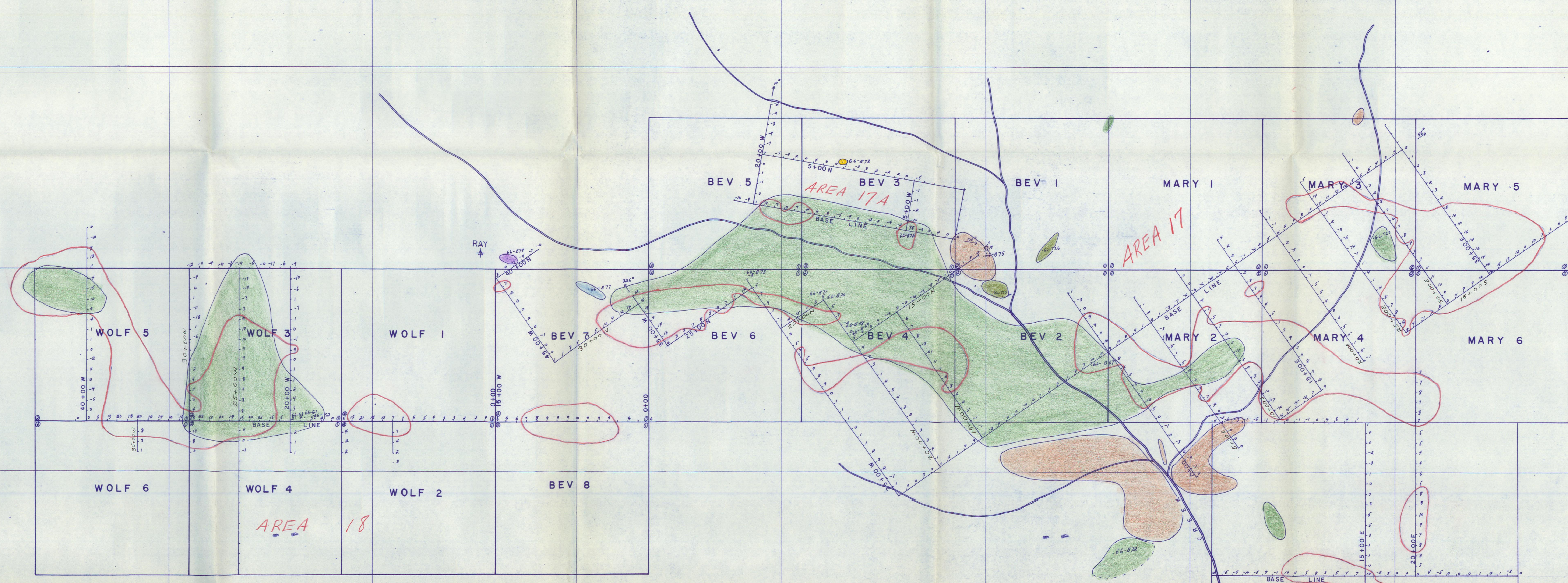
NO CHRYSOTILE ASBESTOS FIBRES IN SIGNIFICANT AMOUNTS WERE FOUND IN THE EXPOSURES EXAMINED BUT THE CLAIMS SHOULD BE RETAINED FOR POSSIBLE FURTHER WORK.

RESPECTFULLY SUBMITTED,



W. N. PLUMB, P.ENG.
CHIEF GEOLOGIST
CASSIAR ASBESTOS CORPORATION LIMITED

JUNE 8, 1957

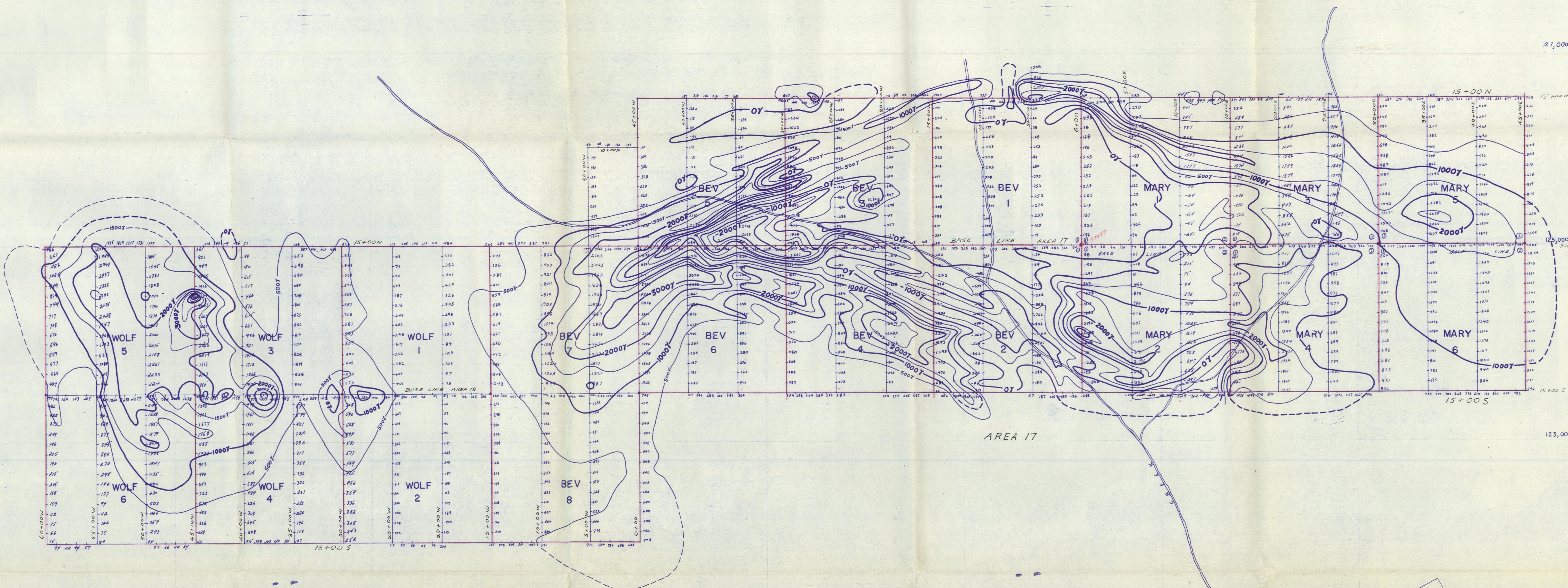


**CLINTON GEOLOGY
LEGEND**

- ANOMALOUS AREA
- 17 OVERBURDEN
- TERTIARY VOLCANICS
basalt, rhyolite
- DIORITE, GABBRO, DIABASE
- QUARTZ CARBONATE ALTERATION
- BARREN SERPENTINE, PERIDOTITE
- SERPENTINE - good fibre 7% + red
5-7% pink
- SERPENTINE - low fibre 3-5% orange
1-3% yellow
- UNIT D (GREEN & RODDICK)
- andesite, quartz-chlorite schist
- argillites (graphitic, limey)
- black limestone - thin bedded
- YUKON GROUP
- quartz biotite gneiss & schist
- quartz sericite muscovite schist
- quartzite

DIP NEEDLE SURVEY AND GEOLOGY	
AREAS 16, 17, 17A, AND 18	
CASSIAR ASBESTOS CORPORATION LIMITED.	
CLINTON CREEK, Y.T.	
FILE NO: 21-01-10	PHOTO NO: HIGH LEVEL 1452
SCALE: 1" = 400'	DATE: JUNE 24/66
DRAWN BY: <i>BB</i>	CHECKED BY:

APPENDIX 5



AREA 18

CONTOUR INTERVAL : 500 GAMMAS

CASSIAR ASBESTOS CORPORATION LTD.	
CLINTON CREEK, Y.T.	
MAGNETOMETER SURVEY	
AREAS 17, 17A, 18	
FILE No. 22-07-01	PHOTO No. 1452
SCALE: 1" = 400'	DATE: JULY 5/66
DRAWN BY: W.R.T.	CHECKED BY: D.B.

APPENDIX 6