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REPORT OF GEOPHYSICAL SURVEY

KEN GROUP

LIARD MINING DIVISION

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By Gordon Gutrath, B.Sc., U.B.C.

and

Dr. G.W.H. Norman, P. Eng.

June and July, 1962

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<p>Department of Mines and Petroleum Resources ASSESSMENT REPORT NO. <u>442</u> MAP.....</p>
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REPORT OF GEOPHYSICAL SURVEY

KEN #1 to #5, #9 to #12, and #14

CLAIM GROUP

LIARD MINING DIVISION

By: G. Gutrath (B.Sc., U.B.C., 1960)

and

Dr. G.W.H. Norman, P. Eng.

For: Newmont Mining Corporation of Canada
Limited

June 27 - June 30 and July 12 - July 13, 1962

INTRODUCTION

This report presents the results of an Airborne Magnetometer Survey carried out on the Ken Claim Group during June and July, 1962. The magnetometer used was a Varian type developed at Palo Alto, California.

LOCATION

The Ken group of claims is located between the elevations of 4500 feet and 6000 feet on the divide between the headwaters of Forrest Kerr Creek and the southward flowing tributaries of the Iskut River that lie directly west of Forrest Kerr Creek. The claim group is 12 miles N.E. of the Verrett River - Iskut River junction and 14 miles N.W. of the Forrest Kerr Creek - Iskut River junction.

DESCRIPTION OF INSTRUMENT

The magnetometer used for the airborne work was a Varian type which utilizes the effect of the earth's magnetic field on the nuclei of hydrogen atoms. Kerosene provides a source of hydrogen atoms that is superior to most other materials containing hydrogen. The container with kerosene is placed inside a coil through which a current is made to flow at one second intervals. It is towed 50 to 100 feet below the aircraft. This current sets up a strong local magnetic field of uniform strength which counteracts the earth's field. When the current is released the earth's magnetic field gives the hydrogen nuclei a resonance or vibration which is proportional to its intensity. This can be converted by suitable electronic instrumentation into a continuous recording device that registers the intensity of the earth's field in gammas.

The recording device is provided with a metric chart six inches wide that travels either one or four inches per minute as required.

The magnetometer was installed in the G2 Bell helicopter by George McLaughlin, formerly electronic specialist and engineer with McPhar Geophysics Limited of Ontario and now on the staff of Newmont Exploration Limited.

WORK PERFORMED

The airborne survey was carried out by a proton precession magnetometer mounted in a Bell G2 helicopter. The helicopter was under charter from Pacific Helicopters Ltd. of Vancouver.

The work was supervised by Dr. G.W.H. Norman for Newmont Mining Corporation. G. Gutrath, field geologist for Newmont Mining in the area, assisted in preparation and correlation of data. They were employed on the project for five days each, from June 27th to June 30th and July 12th to 13th, 1962.

WORK PROCEDURES

The claim group covers an area of snowfield on a steep N.E. facing ridge between the elevations of 4500 feet and 6000 feet. The steepness and irregularity of the topography made it impossible to fly straight lines. As a result the flight lines were laid out roughly, parallel to the contours of the area. This allowed the pilot to keep a more constant elevation above the ground and a more constant flying speed.

For navigational purposes photographs and a 2000 foot to the inch map were used. In order to plot the flight lines on the contoured map, all streams and prominent locations were marked on the chart by a manually operated fiducial marker. A small bellows, held in the hand of the operator, makes small ticks when pressed on an otherwise straight red ink line on the right side of the chart. One or more ticks can be made with the marker to identify any special point along the line. The start and finish of each line were indicated by ticks of certain lengths. Notes, regarding observations important to the interpretation of the chart or altitude readings from the helicopter altimeter can be written on the chart while in operation.

The instrument bird was flown approximately 200 feet above the ground.

This would position the helicopter 250 feet above the ground because of the 50 foot cable attaching the bird to the helicopter. A check on the helicopter altimeter helped in plotting the lines on the contoured map. Prominent topographical features, easily located on the photographs, were used for starting and ending lines.

The first five lines, No. 1 to No. 5, were flown on June 30th by Dr. G.W.H. Norman as operator of the instrument and navigator. Because of poor weather conditions the lines could not be flown above the 4000 feet contour. The final line, No. 6, was flown on July 13th by G. Gutrath as operator of the instrument and navigator. All the lines were located on aerial photographs of approximately 4000 feet to the inch. This method was found to be the most accurate and simplest means of locating the lines.

The lines were flown between 500 feet and 1500 feet apart though this spacing varied considerably with the topography and areas of interest.

RESULTS

The profiles for the six lines flown and the isogam contour map constructed from the lines are enclosed in the end pockets.

The most significant magnetic high peaks (maximum 475 gammas) on the northern tip of the large outcrop to the north of Falls Glacier (fiducial point #13 on line #6). This same anomalous zone was picked up twice more on the same line between fiducial point #18 and #19 and at fiducial point #20.

The magnetic peak between #18 and #19 has an almost identical profile to the #13 profile. The high (maximum 300) at fiducial point #20, though very close to point #13, has a much lower peak. This probably resulted from the instrument being flown at a higher elevation than the previous flight over the same anomalous zone.

The general feature of this high is a small low then an abrupt increase to the peak and a gradual decrease towards the northwestward. This type of curve would suggest a fairly steep dipping zone to the northwest. The isogam contour map agrees with the profiles in showing the zone extending to the north and dipping to the northwestward.

The magnetic high lies over a skarn zone mineralized with magnetite and minor amounts of pyrite and chalcopyrite. The zone as interpreted on the isogam map trends towards the north which is also the general trend of the rocks and structures in the area.

The other anomalous zones in the area are a result of interbedded volcanic breccias and sediments or as a result of topography. Magnetite can be seen in the volcanics with the aid of a hand lens and these large masses usually give a magnetic high.

The interpretation of the profiles are complicated by the natural features of the area. Many topographic highs are ridges with small exposures of rock outcrop and with snow fields on either side.

When a line is flown over one of these ridges there is a marked magnetic high recorded while in the surrounding snow field where rocks are at a greater distance from the instrument a definite low results. The high over the group of small outcrops at the northwest corner of Ken #5 is an example of this effect.

During 1961 a small part of the Ken group was surveyed with a ground magnetometer. This work indicated that additional magnetic work was warranted. The rough mountainous terrain indicated that airborne magnetic work would eliminate the need for ground coverage in certain parts, and show where it could be most advantageously done. It is considered that the airborne work helped to achieve the objective for which it was carried out.

G. Gutrath
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G. Gutrath, B.Sc.

G.W.H. Norman
.....
G.W.H. Norman, P. Eng.

October 11th, 1962.



Dominion of Canada **In the Matter of**Province of British Columbia
RECEIVED

OCT 12 1962

M.R. # ~~45,784~~ 41.00
VANCOUVER, B.C.

To Wit:

Costs and charges for airborne magnetometer survey of the Ken group of 10 claims at the headwaters of Forrest Kerr Creek, Liard Mining Division.

I, **G.W.H. Norman**, of **604-744 West Hastings Street,**
Vancouver 1, in the Province of British Columbia.

Do Solemnly Declare that the costs, charges, and related expenses of the magnetometer survey were as follows: -

NEWMONT EXPLORATION LIMITED

Rental Varian type magnetometer 2 weeks @ \$4.00/month	\$ 200.00
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PACIFIC HELICOPTERS LIMITED

Flying time from base at Granduc to claim group on
June 27-30 and July 12-13

- 4 hours @ \$108/hr.	432.00
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Flying time on flight lines

- 2 hours 10 minutes @ \$108/hr	232.00
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NEWMONT MINING CORPORATION OF CANADA LIMITED

- Salaries G.W.H. Norman	5 days	250.00
G. Gutrath	5 days	100.00
- Camping Facilities	20 man days	120.00
- 10 Air photos and 5 enlargements		35.00
- Map preparation (final and navigational maps)		200.00
- Gas and oil, less \$7.80 per hour rebate from Pacific Helicopters		<u>54.70</u>

\$1,623.70

And I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath, and by virtue of the Canada Evidence Act.

Declared before me

at

Vancouver

in the Province of British Columbia.

this

12

day of

October A.D. 19 *62*

G.W.H. Norman
G.W.H. Norman
Gill Turner
Sub-mining Recorder
A Notary Public in and for the Province of British Columbia.
A Commissioner for taking affidavits within British Columbia.

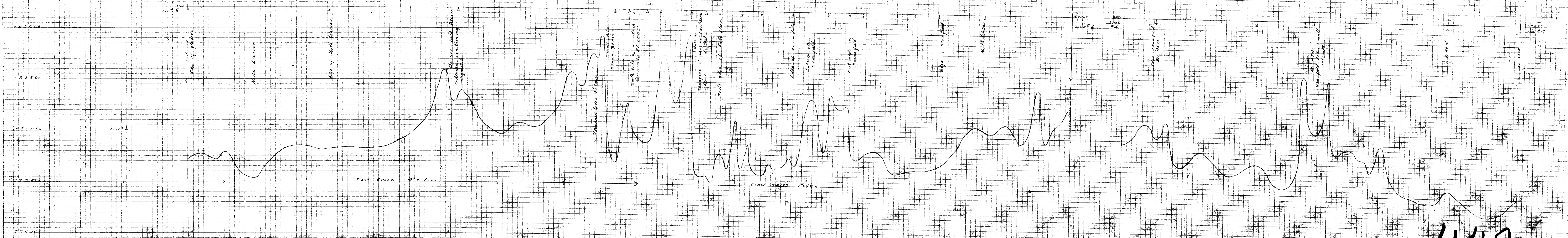
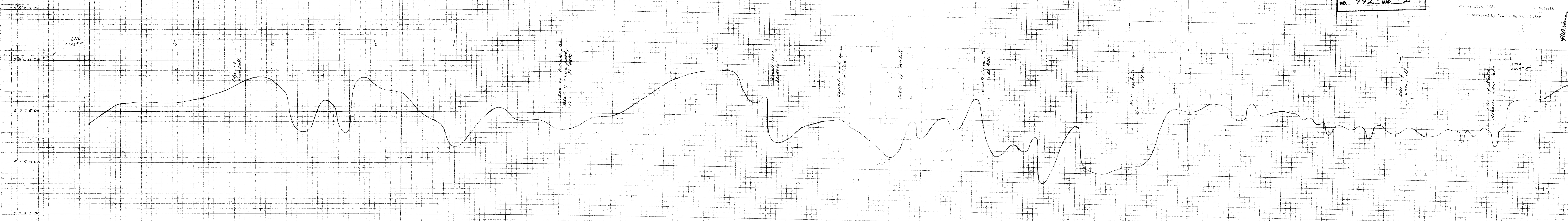


Department of
 Mines and Geological Resources
 ASSISTANT REPORT
 NO. 442
 1962

442
 (11)
 GEOPHYSICAL INVESTIGATION
 of
 LINES #1, #2, and #3
 Vertical Scale 1 cm. = 50 meters
 October 11th, 1962
 Supervised by G. J. Norman, F.R.S.

End of outcrop shot
 of subsoil
 approximately El. 3500

(13)



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Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 442 MAP 3

AIRBORNE MAGNETIC SURVEY
OF THE
KEN CLAIM GROUP
(KEN #1 to #5, #9 to #12, and #14)
LIARD MINING DIVISION
JUNE - JULY, 1962

EXPLANATION

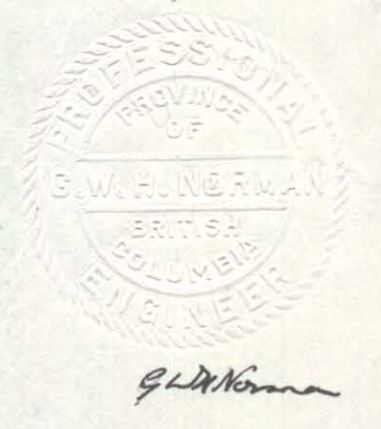
- Isogams (100 gamma interval) — 3000 —
- Surface contours (500 foot interval) — 5000 —
- Flight line with location points
corresponding to fiducial points
on profiles. — 15 —
- Outline of snowfields and glaciers - - - - -

NOTE: For total intensity add 55000 gammas.



SCALE: 1 inch = 1000 feet

October 10th., 1962 G. Guttrath
Supervised by G.W.H. Norman P. Eng.



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