

**AIRBORNE ELECTRO-MAGNETIC SURVEY -
HELICOPTER**

LYELL E.Z. EXPLORATIONS

57 - 159

Accompanying Maps
LEE Q9, P14.

000 LYELL - E.Z. - EXPLORATIONS

GP5

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475002

10th April, 1957

MEMORANDUM TO

Mr. G. F. Hudspeth,
Manager,
Lyell - E.Z. Explorations.

Airborne Electro-magnetic Survey - Helicopter

Attached is Adastra's report (P. Maymon) of the electro-magnetic survey carried out by this company on the 4th April, also my comments on the work.

Personnel in the helicopter were:

J. Ferguson	-	Pilot
R. Boughton	-	Navigator
B. Scott	-	Operator

B. Scott

Geologist-in-Charge.

*See my file
with Adastra
16/4/57*

MICROFILMED

Airborne EM Survey for Lyell - E.Z. Explorations - 4/4/57

Sortie No.	Engine On	Engine Off	Sortie Transit Time	Tuning	Air Line	% under 150'
	1555	1600		5		
1	1615	1750	1 hr. 35 mins. 45	6 mins.	44 mins.	51%

(Signed) P. Maymon.

ADASTRA HUNTING GEOPHYSICS LTD.

Times checked by B. Scott.

Airborne EM Survey for Lyell - E.Z. Explorations - 4/4/57Anomalies Recorded

1. 0.7 divisions out-phase probably due to swamp (bird 100')
2. 0.6 divisions out-phase probably due to swamp (bird 100')
3. 1.1 divisions in-phase (bird 80')
- 2.5 divisions out-phase

This anomaly appears to warrant further investigation. Its magnitude is greater than would be expected from reduction of bird height to 80'. The in-phase deflection is greater than would be expected from a swamp area.

4. 0.4 divisions out-phase due to low bird height (60')
5. 0.4 divisions in-phase (bird at 50')
- Suggests presence of a magnetic body.
6. 3.4 divisions in-phase (bird 25')
- Suggests presence of a large magnetic body.

Note:

Following this survey it was found that the regulator on the helicopter's generator was producing "noise" in the D.C. supply. This caused spurious counts to be recorded on the scintillometer record during part of the survey. A slightly rougher EM trace also resulted but the functioning of this equipment would not otherwise be affected.

(Signed) P. Maymon

ADASTRA HUNTING GEOPHYSICS LIMITED

5th April, 1957.

Airborne E.M. Survey for Lyell - E.Z. ExplorationsAnomalies Recorded

The position of the anomalies are located on the accompanying sketch-map.

Anomaly 1.

The in-phase component has no disturbance,

Anomaly 2.

the out-phase indicates a weak anomaly showing it to be a near surface effect. It is probably due to the decrease in elevation of the "bird", which is at 100 feet over this zone, and the occurrence of swampy ground.

Anomaly 3.

This anomaly has both an in-phase and out-phase component. The "bird" has dropped from 190 to 80 feet over this zone. In addition the flight line is over the Gordon Limestone and the Gordon Limestone-Upper Owen Contact, a rock association which gives well developed swampy areas. I am of the opinion that the anomaly can be placed as due to this double effect.

Anomaly 4.

An out-phase anomaly only, due to the low altitude of the "bird".

Anomaly 5.

There is no disturbance of the out-phase component but the in-phase shows an anomaly of 0.4 divisions. The "bird" is at a very low altitude (50 feet), but when interpreted in conjunction with anomaly 6, it suggests the presence of a magnetic orebody.

Anomaly 6.

The disturbance of the out-phase is negligible (0.1 division) but the in-phase shows a marked negative anomaly of 3.4 divisions. I have been given to understand that this is the largest anomaly yet recorded by this equipment. Despite the very

low altitude of the "bird" (25 feet) the anomaly undoubtedly indicated a large magnetic ore-body. The anomaly covers approximately 80 feet at its peak of 3.4 divisions, and 350 feet at its "base". It is asymmetrical, being steeper in the west side than the east, possibly indicating that the ore-body is dipping steeply to the east.

The scintillometer did not indicate this anomaly.

It is interesting to note that this anomaly is over the southern end of the Prince Darwin orebody, which has the following characteristics (M.L. Wade - 7th February).

Trend: 160°
Exposed Dimensions: 700 feet long, 120-200 feet in width.
Approximate Grade: Not more than 20% hematite
10% pyrite
1% copper
Some magnetite.

The orebody is highly magnetic.

Approximate Tonnage: Estimated at least 4 million tons.

The flight line over the northern end, of the known extension, of the Prince Darwin orebody was flown above 300 feet, consequently this ore zone is indicated by only a very weak anomaly of 0.1 divisions in-phase and 0.2 out-phase between points 74 and 75.

Conclusions:

Despite the short duration of the operation (50 minutes) sufficient work has been completed to demonstrate the applicability of this geophysical method in the mountainous terrain of the Jukes-Darwin area.

The presence of the marked electromagnetic in-phase anomaly 6, and the weaker anomaly 5, over the Prince Darwin orebody strengthens the recommendation made by M. L. Wade (report dated 7th February, 1957) that further detailed mapping and sampling is warranted in this area.

It is recommended that the remainder of this programme is carried out as soon as possible; only approximately 8 hours line-flying would be required to complete this operation.

B. Scott

Geologist-in-Charge.

Airborne EM Survey for Lyell - EZ Explorations 4/4/57

Sectio No	Engins on	Engins off	Sectio time	Transient	Turning	End line	% under 150'
4	1555	1600		5			
1	1615	1750	1 hr 35 min	45 50 <i>Scott</i>	6 min	214 min	51%

Times checked by B. Scott.

R. Maynard,

A.H.G.L.

Airborne EM Survey for Lyell - E.Z. Explorations, 4-4-57.

Anomalies recorded.

- ① 0.7 divisions out-phase probably due to swamp (bird 100')
~~Ref. point 15.~~
- ② 0.6 divisions out-phase " " " " " "
~~Ref. point 14.~~
- ③ 1.1 divisions in-phase (bird 30')
 2.5 divisions out-phase

This anomaly appears to warrant further investigation. Its magnitude is greater than would be expected from reduction of bird height to 30'. The in-phase deflection is greater than would be expected from a swamp area. ~~Ref. point 15.~~

- ④ 0.4 divisions out-phase due to low bird height (60')
~~Ref. pt. 51.~~
- ⑤ 0.4 divisions in-phase (bird at 90')
^{50'}
 Suggests presence of a magnetic body.
~~Ref. pt. 50.~~ ^{P. Scott}
- ⑥ 3.4 divisions in-phase (bird ^{25'} 40')
^{P. Scott}
 Suggests presence of a large magnetic body
~~Ref. pt. 52.~~

Note

Following this survey it was found that the regulator on the helicopter's generator was producing "noise" in the D.C. supply. This caused spurious counts to be recorded on the scintillation trace record during part of the survey. A slightly rougher EM trace also resulted but the functioning of this equipment would not otherwise be affected.

P. Maynes

A. H. G. C.

5-4-57

24th April, 1957

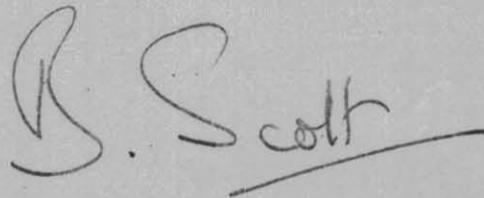
MEMO:

Mr. G.F. Hudspeth,
Manager,
Lyell - E.Z. Exploration.

This plan, Pl4, is to accompany my report on the helicopter E.M. programme dated 10th April.

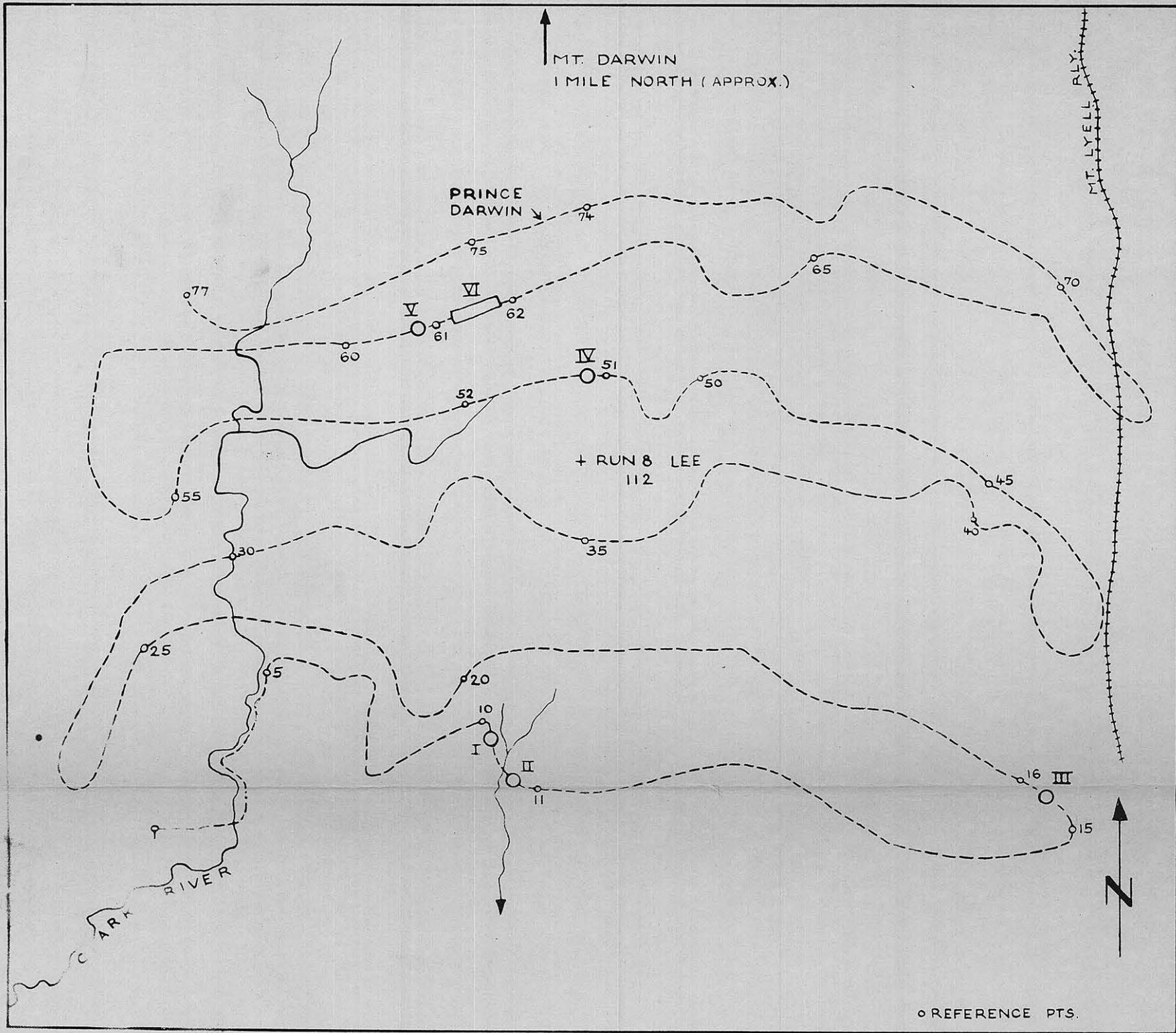
It shows the instrument's traces over the large anomaly located over the Prince Darwin orebody.

(anomalies 5/6)

A handwritten signature in cursive script that reads "B. Scott". The signature is written in dark ink and is positioned above a horizontal line.

Geologist in Charge.

HELICOPTER E-M SURVEY - MT. DARWIN SOUTH AREA



SCALE: 30 ch = 1 inch

OUTPHASE ANOMALY
INPHASE ANOMALY
BOTH

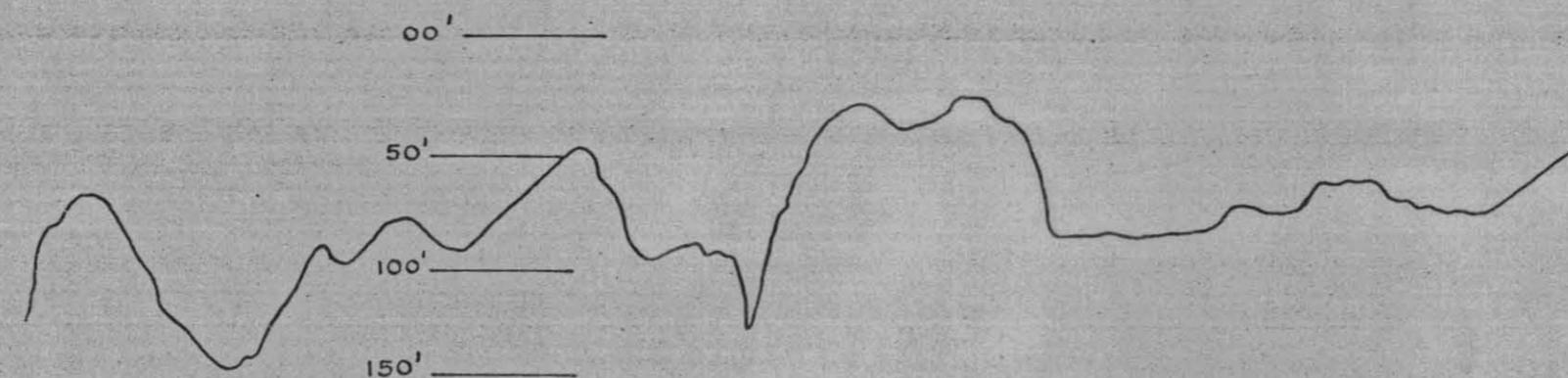
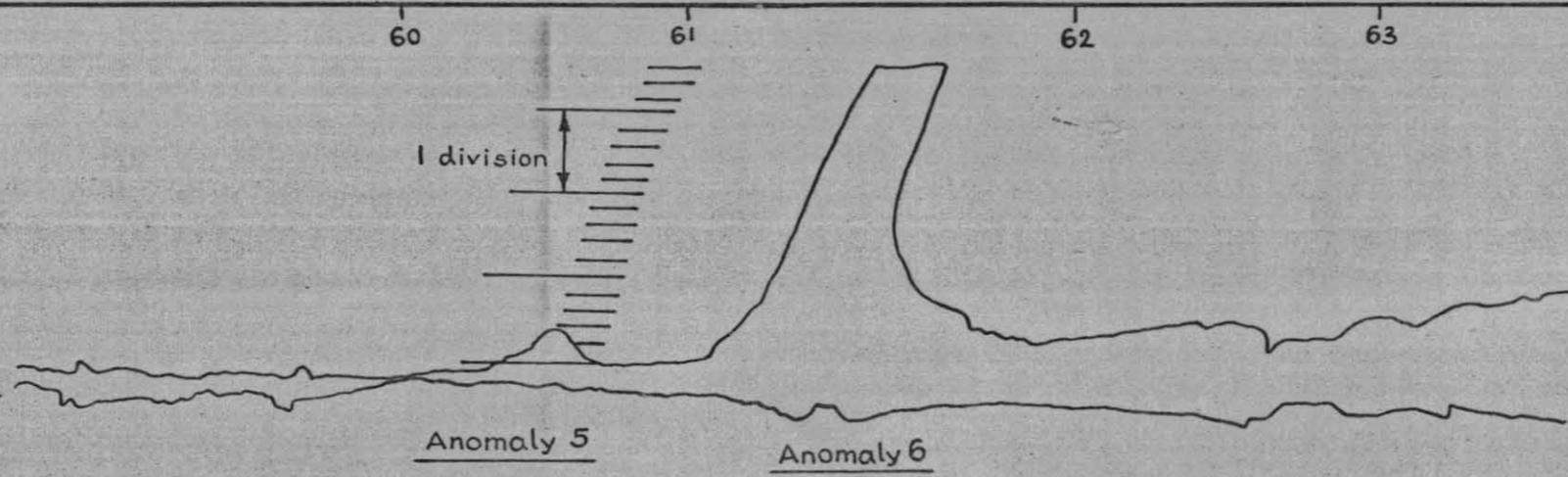
MAJOR (+1 DIWN)	MINOR (-1 DIWN)
○	○
○	○
○	○

○ REFERENCE PTS.

5 cm

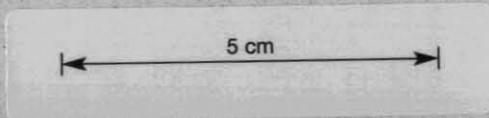
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HELICOPTER E-M SURVEY - SOUTH DARWIN LINE 5
ANOMALIES OVER PRINCE DARWIN PROSPECT

GREEN TRACE : OUTPHASE COMPONENT
 UPPER RED TRACE: INPHASE COMPONENT
 LOWER RED TRACE: RADIO ALTIMETER - HEIGHT OF INSTRUMENT ABOVE GROUND LEVEL. THE NUMBERS 60-63 ARE REFERENCE POINTS AND AGREE WITH THOSE ON THE FLIGHT LINES ON THE MAIN PLAN.



L.E.E.
 P 14