

Proposed geophysical survey, Great Northern Plains area, Gladstone

by M. J. Longman

Magnetometer Survey

A magnetometer survey in this area to delineate basement rocks, Tertiary leads and the marginal zones (which may contain tin) would involve approximately 120 miles of detailed traversing at a station spacing of approximately 300 feet. A preliminary traverse along line 14 shows the Elsec magnetometer will delineate Tertiary leads and basement areas, considerably reducing the amount of seismic work involved to locate the flat lying or gently dipping shallow tin-bearing areas.

Gravity Survey

As the traverse lines are already marked and a geophysical party is in the field it would be an ideal time to conduct a gravity survey over the same area. This would involve the use of one extra field assistant, but no additional time would be required.

The equipment and staff distribution would be:

- (1) Base station
 - Magnetometer (Elsec) (University of Tasmania).
 - Barometer (Askania) to record diurnal variation by readings at 10 to 15 minute intervals (one field assistant, this person would also reduce the previous day's readings).
- (2) Surveying party, comprising one surveyor, one chainman, one cutter and one back-site man, the latter two alternating throughout the day.
- (3) Geophysical party.
 - One geophysicist organising and reading gravity meter assisted by one person reading barometer (Mechanism).
 - Two field assistants with Elsec magnetometer (Mines Department) one reading, other carrying the detector (alternating throughout the day).
 - The geophysical party would be approximately 300 feet behind surveying party.
- (4) Vehicles needed -
 1. Four-wheel drive for access to area.
 2. Bombadier for rapid cross country travel of both surveyor and gravity meter (which must be returned to base every 2 hours).

It is expected that this survey would require three full weeks field work for all personnel.

Alternatively

A magnetometer survey could be undertaken by helicopter with the detector approximately 50' above ground level and the magnetometer recording automatically. This would considerably reduce the time and surveying involved for the same cover. The helicopter speed would be approximately 25 mph for a 300' station density.

This method would require:

- 1 surveyor
- 1 chainman
- 1 back-site man
- 1 cutter

These would set out and mark traverse spacing along convenient tracks and roads at approximately one mile intervals for the helicopter to follow. Cutting would be reduced to a minimum.

- 1 geophysicist to read and operate instrument.

Vehicles required

Four-wheel drive for surveying party
Helicopter for magnetometer.

Time required

1. For magnetometer survey
One day including setting up of helicopter.
2. Approximately one day delivery and return time for helicopter.
3. Approximately one week for surveying party.

No base station would be required with this method as the helicopter can overlap traverses to provide necessary control.

Interpretation of magnetic results would require one month and gravity results at least three months.

Magnetometer Survey — Cost Estimate

<i>Ground Survey</i>	<i>Unit cost (\$)</i>	<i>3 week period (\$)</i>
Geophysicist	130.00	390.00
Field assistants — one field, one base station	35.00	210.00
Surveyor	100.00	300.00
Assistants — 1 chain-man	50.00	150.00
2 cutters (local labour)	34.00	204.00
Travelling allowance for 5 @ \$39.00	195.00	585.00

Vehicles required

Four-wheel drive, 600 miles @ 20c per mile	120.00
Bombadier, 250 miles @ 50c per mile	125.00
Truck to and from Hobart, 500 miles @ 30c per mile	150.00
Two Holden Station Sedans, 3000 miles @ 10c per mile	300.00

Total Cost

2,744.00

<i>Helicopter Survey</i>	<i>Unit cost (\$)</i>	<i>3 week period (\$)</i>
Geophysicist (1 week)	130.00	130.00
Surveyor	100.00	100.00
Assistants	70.00	140.00
Travelling allowance for 4 @ \$39.00		156.00

Vehicles required

Four-wheel drive, 300 miles @ 20c per mile	60.00
Helicopter, 10 hours @ \$60 per hour	600.00
Two Holden Station Sedans, 800 miles @ 10c per mile	80.00
Incidental — modification to magnetometer and marker	50.00

Total Cost

1,316.00

The helicopter magnetometer survey can be completed with similar accuracy to a ground survey in approximately one-third of the time and a saving of actual cost of \$1,400.

The interpretation time will be the same for either method.

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