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COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Record No. 1969 / 149

Rum Jungle East area (Huandot and Coomalie Gap West) Geophysical Surveys

Northern Territory 1968

by

J.E.F. Gardener

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ILLUSTRATIONS

SUMMARY

Slingram, self-potential (S-P) and surface radiometric surveys were made in the Huandot area, and an S-P survey was made in the southern part of the Coomalie Gap West area. Slingram anomalies found in the Huandot area are due to unmineralised carbonaceous slate. S-P anomalies found in the Huandot and Coomalie Gap West areas have their origins in the carbonaceous slate but their cause is unknown.

1. INTRODUCTION

Geophysical surveys were made in 1968 at Huandot and Coomalie Gap West, Rum Jungle East area (Plate 1). The Huandot area is between Area 44 Extended and the northern part of the Coomalie Gap West area, which were both surveyed in 1967 (Gardener, 1968; Semple, 1968). Slingram, self-potential, and surface radiometric surveys were made.

A self-potential survey was made in the southern part of the Coomalie Gap West area between Traverses 400S and 454S in an area of known Slingram anomalies in the Golden Dyke Formation near its boundary with Coomalie Dolomite. This environment is the same as in the northern part of the Coomalie Gap West area, surveyed in 1967, where a large self-potential anomaly was found (Gardener, 1968).

2. GEOLOGY

The geological units mapped in the Huandot area are Coomalie Dolomite, transition beds, and Golden Dyke Formation (Willis, 1969); these are continuous with the units mapped in the adjoining areas to the north and south (Semple, 1968) but they strike more easterly than in either of the adjoining areas (Crohn, Prichard and Gardener, 1968).

In the Coomalie Gap West area the units mapped are also Coomalie Dolomite, transition beds, and Golden Dyke Formation. The geology is described by Shatwell (1966).

3. METHODS

The Slingram electromagnetic method is a conventional moving-transmitter, moving-receiver, horizontal-coil system. Coil spacing used was 200 feet and frequency was 1760 Hz.

In the self-potential (S-P) surveys, fixed base stations were tied to a common datum.

In the surface radiometric survey, Harwell type 1368A rate-meters (geiger counters) were used.

4. RESULTS

Huandot area

Geology, Slingram real component contours, and S-P contours are shown in Plates 2, 3, and 4 respectively.

A comparison between the geology and the Slingram real component contours (Plates 2 & 3), shows that the Golden Dyke Formation has anomalies in it, and the Coomalie Dolomite and the transition beds do not. The positive real component results in the north-west portion of the area are due to the geological strike being roughly parallel to the traverse direction. The anomalies in the Golden Dyke Formation have been shown by diamond-drilling to be due to unmineralised carbonaceous slate (Gardener, 1968).

The S-P survey was confined to the Golden Dyke Formation and parts of the transition beds, the area of Slingram anomalies. A broad elongated zone of negative values (Plate 4) follows the Golden Dyke Formation boundary, and an anomaly occurs in the north-eastern part of the area, close to a Slingram anomaly.

The S-P anomalies are associated with Slingram anomalies in general, and their origin must be in the carbonaceous slates causing the Slingram anomalies. However, the cause of the S-P anomalies is unknown.

No significant surface radiometric anomalies were found.

Coomalie Gap West area

An S-P survey was made in the southern part of the Coomalie Gap West area in an area of known Slingram anomalies in the Golden Dyke Formation near its boundary with Coomalie Dolomite (Duckworth, 1966; Shatwell, 1966). This environment is the same as the northern

part of the Coomalie Gap West area, surveyed in 1967, where a large S-P anomaly was found (Gardener, 1968). The results of the 1968 survey (Plate 5) show that this anomaly is not unique and that a number of S-P anomalies occur along the Golden Dyke Formation/Coomalie Dolomite boundary. These S-P anomalies are associated with electromagnetic anomalies which have been shown by diamond-drilling (Gardener, 1968) to be due to beds of unmineralised carbonaceous slate. However, the S-P anomalies occur discontinuously along these slate beds and have not been explained.

5. CONCLUSIONS

The Slingram anomalies found in the Huandot area are due to beds of unmineralised carbonaceous slate. The S-P anomalies found in the Huandot and Coomalie Gap West areas have their origins in these carbonaceous slate beds, but their source is unexplained.

No significant surface radiometric anomalies were found.

6. REFERENCES

CROHN, P.W., PRICHARD, C.E., and GARDENER, J.E.F., 1968 - Summary of B.M.R. exploration - Rum Jungle area, 1968. Bur. Min. Resour. Aust. Rec. 1968/102 (unpubl.).

DUCKWORTH, K., 1966 - Rum Jungle East (Woodcutters and Coomalie Gap West areas) geophysical surveys, Northern Territory 1965. Ibid. 1966/99 (unpubl.).

GARDENER, J.E.F., 1968 - Rum Jungle East area (Area 44 Extended, Coomalie Gap West and Woodcutters) geophysical surveys, Northern Territory 1967. Ibid. 1968/104 (unpubl.).

SEMPLE, D.G., 1968 - Geochemical and radiometric investigations, Rum Jungle East area, Northern Territory, 1967. Ibid. 1968/7 (unpubl.).

SHATWELL, D.O., 1966 - Geochemical and radiometric investigations, Rum Jungle East area, 1965 (Coomalie Gap West and Woodcutters areas). Ibid. 1966/34 (unpubl.).

WILLIS, J.L., 1969 - Geochemical and radiometric investigations, Rum Jungle East, NT 1968 (Coomalie Creek and Huandot areas). Ibid. 1969/36 (unpubl.).

PLATE I

DIAMOND DRILLING GEOLOGICAL AND GEOPHYSICAL SURVEYS 1968

RUM JUNGLE AREA

LEGEND

- Geochemical Surveys 1968
- Geophysical Surveys 1968
- Diamond drill holes completed since October 1967, or in progress October 1968
- Areas of rotary-percussion drilling, 1968

MILES 0 2

Reference to Australian standard 1:250,000 map series

(Based on D52/A8/301)

TO ACCOMPANY RECORD No. 1969/149 D52/B7-456-1

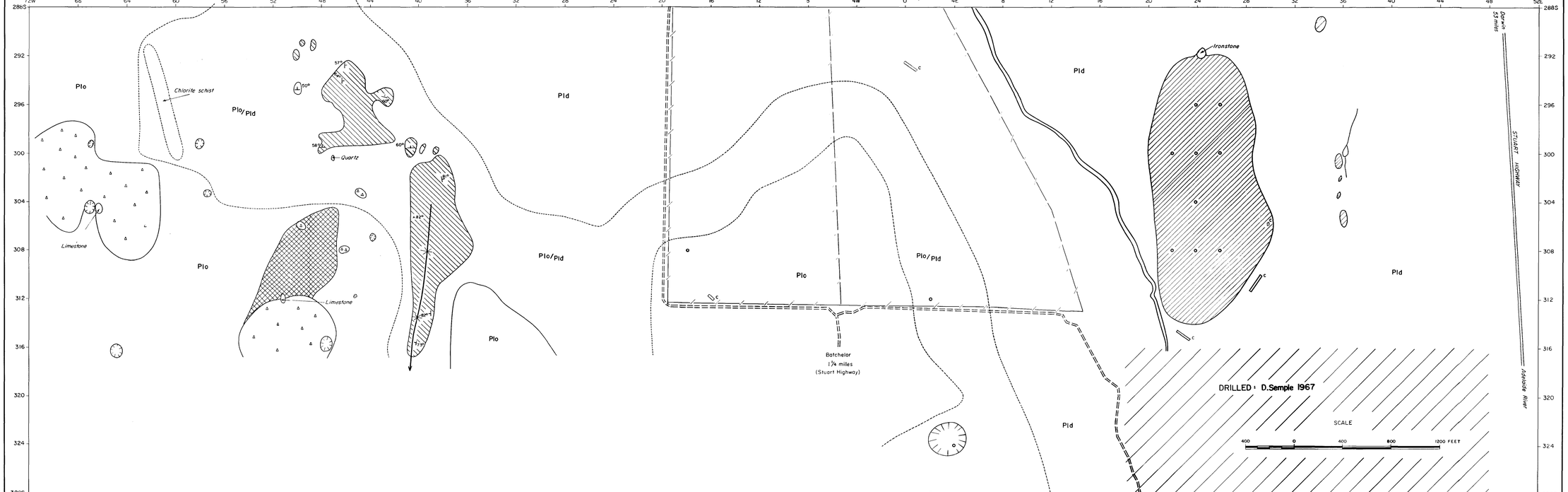

PLATE 2

LEGEND

LOWER PROTEROZOIC

GOLDEN DYKE FORMATION Pld

- Undifferentiated shale (non-outcropping)
- Siliceous lutite

COOMALIE DOLOMITE Plo

- Plo/Pld — Transition beds
- Black calcilutite
- Crystalline dolomite
- Undifferentiated quartz sand (non-outcropping)
- Quartzite
- Quartz-ironstone breccia
- Outcrop boundary
- Non-outcropping boundary
- Strike and dip of beds
- Mattock sample
- Synclinal trough
- Vehicle track
- Sink hole
- C — Costean
- Stream
- Fence line

RUM JUNGLE EAST N.T.

HUANDOT AREA.

GEOLOGY

(after Willis, 1969)

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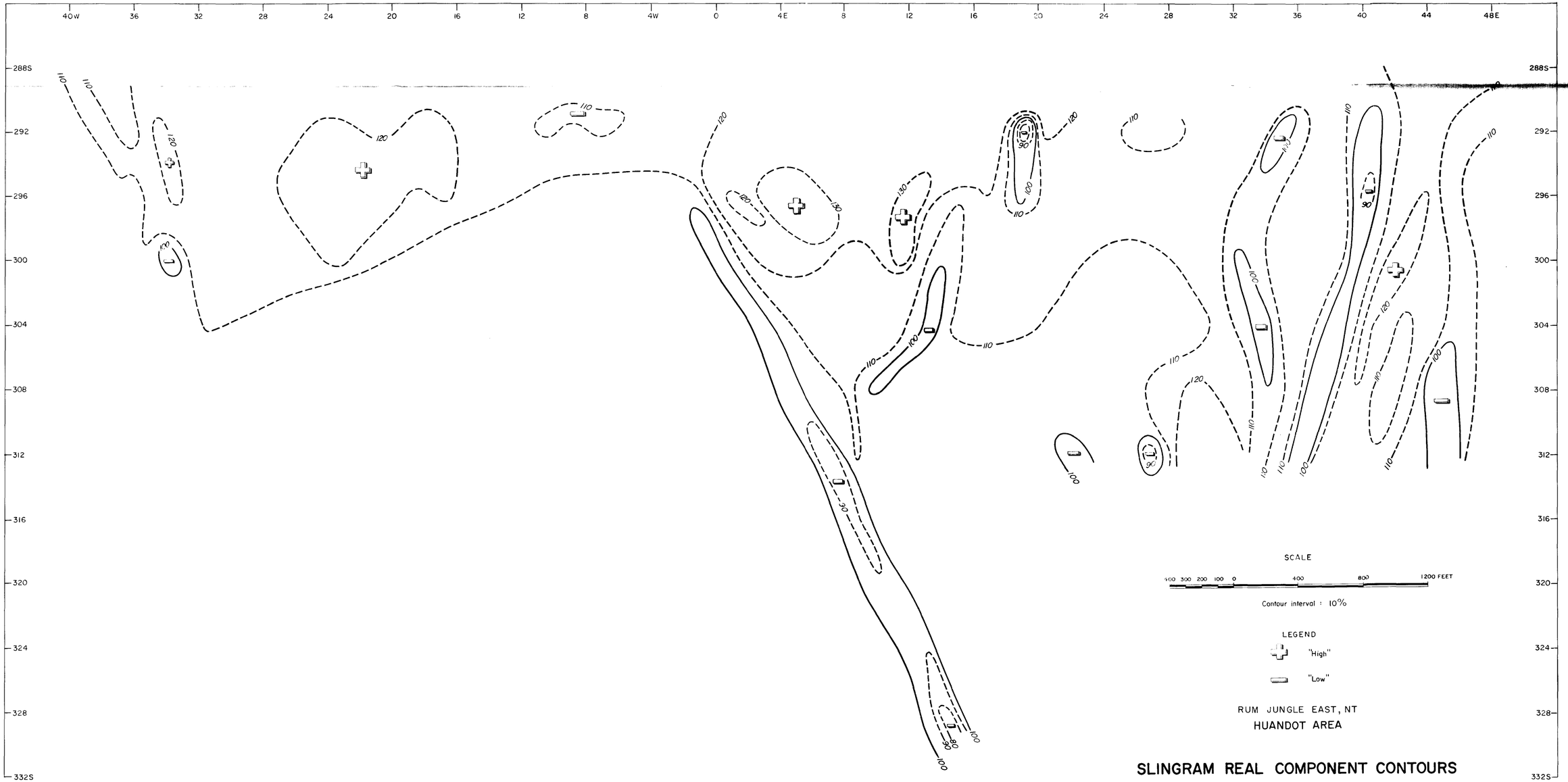
D52/B7-460

PLATE 3



SLINGRAM REAL COMPONENT CONTOURS

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PLATE 4

SCALE

400 300 200 100 0 400 800 1200 FEET

Contour interval : 50 millivolts

Main base : 308S / 20W

RUM JUNGLE EAST, NT
HUANDOT AREA.

SELF-POTENTIAL CONTOURS

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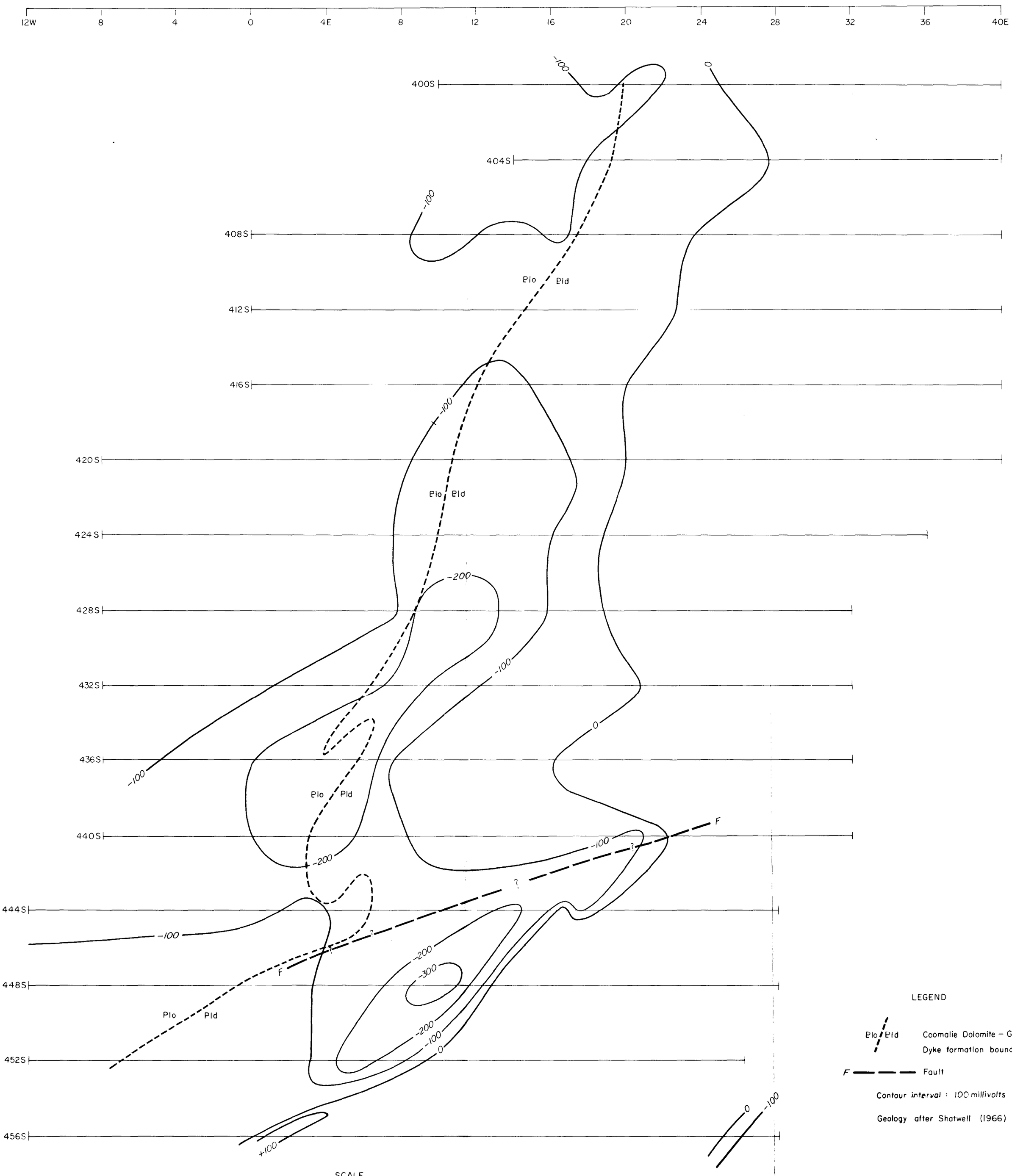
D52/B7-459

PLATE 5



LEGEND

Plo / Pld — Coomalie Dolomite – Golden Dyke formation boundary

F — — — Fault

Contour interval : 100 millivolts

Geology after Shatwell (1966)

SCALE

400 300 200 100 0 400 800 1200 FEET

COOMALIE GAP WEST, 1968

GEOLOGY and SELF-POTENTIAL CONTOURS

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