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REPORT ON THE PHOTO-INTERPRETATION OF THE GOONDIWINDI
1:250,000 SCALE SHEET, QUEENSLAND AND NEW SOUTH WALES

by

C.E. Maffi

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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SUMMARY

The Ashford Spur Granite, intruded in early Permian time crops out in the south-east. Palaeozoic sediments occupy the eastern part and are overlapped by the Mesozoic formations of the Surat Basin. Flows of Tertiary basalt cap the older rocks in the south and locally in the north. Undifferentiated Cainozoic deposits and duricrust cover the western half of the sheet.

The very low degree of morphological contrast and the small photo-scale have precluded detailed mapping especially with regard to the tectonics.

INTRODUCTION

Black and white contact prints of vertical air photographs taken by Adastral Airways in 1963 were used. The photo-coverage data are: direction of runs east - west; focal length 88.09 mm; flight altitude 25,000 feet; nominal scale 1:85,000; forward overlap 80%.

Many stereoscopic models are distorted by tilt and perhaps by contractions of photographic emulsion: locally, scale differences make the stereo view difficult.

The photo-interpretation was carried out using a traversing mirror stereoscope equipped with a 3X magnification binocular.

On account of the large forward overlap, overlays on every fourth photograph were annotated; the annotation was then modified where necessary after a two weeks field check. A list of specimens collected is recorded in Appendix 1. The compilation was made on overlays of a photo-scale base map obtained from redrawing and reduction of the 1:75,000 scale R.A.S.C. planimetric map. The compilation was photographically reduced to 1:250,000 scale.

Morphological units were mapped, then correlated where possible with stratigraphic units by means of the field trip and in accordance with previous work.

The result is a photogeological map prepared with the purpose of assisting in the planning and execution of future field work.

During the field trip more attention was paid to the Queensland part of the sheet than to the New South Wales part, which has been mapped by geologists of the Geological Survey of N.S.W.

Grateful acknowledgment is made to them for their cooperation in the field.

Data from wells drilled by Union Kern A.O.G. are recorded in Appendix 2.

PHYSIOGRAPHY

The whole area belongs to the Macintyre River basin. The main watercourses are the Macintyre River itself, the Weir River, the Macintyre Brook and the Dumaresq River, the last named forming the boundary between Queensland and New South Wales.

Dendritic drainage is well developed on the Palaeozoic and locally on the Mesozoic outcrops, which form a hilly landscape reaching altitudes in the Palaeozoic up to 2060 feet. A flat landscape, ranging between 650 and 900 feet from west to east, characterizes the Undifferentiated Cainozoic areas. A wide flood-plain with an intricate system of abandoned meanders lies on both sides of the Macintyre and Weir Rivers.

The lower areas are cultivated or used for pasture; the higher areas are mainly covered by forest, especially where Mesozoic rocks crop out. The road system provides satisfactory access to most parts of the region.

SUMMARY OF STRATIGRAPHY

<u>Photogeological character</u>		<u>Possible geological equivalent</u>			
Light toned, flat lying, treeless surface with traces of flood in places	Qa	Alluvium	}	QUATERNARY	
Very light toned surface, slightly elevated above Qa	Qt	Terrace deposits			
Very light toned, flat lying or slightly inclined, hard appearance, timber covered, scarp-forming	Czd	Duricrust	}	CAINOZOIC	
Flat lying, cultivated surface	Cz	Undifferentiated			
Dark toned, hard appearance, forming characteristic terraces in places	b	Basalt			TERTIARY
Dark toned, undulating, cultivated or timber covered	M ₃				
Light toned, soft appearance, slightly undulating, cultivated, topographically lower than M ₃	M ₂		}	MESOZOIC	
Very similar to but topographically lower than M ₃	M ₁				
Isolated outcrops similar to M ₁ and M ₃	M	Undifferentiated			
Light toned, soft, cultivated, gently undulating, underlying M and b	?	Undetermined unit			
Medium grey toned, generally concealed by forest, cut by dense drainage network with rounded interfluves; prominent trend	Pzt		}	PALAEOZOIC	
Light toned, soft appearance, forms low lying, gently undulating landscape; some hard beds in relief	Pzs				
	Pzj	Red jasper			
Very dark toned, hard appearance, covered by forest, forming elevated relief	Pzh				
	Pz	Undifferentiated			
Uneven surface with coarse texture, hard appearance, fractured	g	Granite		PERMIAN	

STRATIGRAPHY

GRANITE

The fresh rock appears as a light toned, hard, uneven and fractured surface with coarse texture. It is impossible to detect on photographs the altered part, which is mingled with the surrounding sediments. Therefore the outcrops mapped here will probably be enlarged and perhaps joined with each other as a result of the field work.

On the ground it is a light grey, coarse porphyritic granite. According to Mack (1963, p. 18) the Ashford Spur Granite belongs to the New England Batholith and "is inferred to have been intruded during Permian time".

A small, isolated outcrop of granite lies in the north - east.

PALAEOZOIC

Undifferentiated Palaeozoic rocks do not show a definite photo-geological character. Generally they appear a little harder than the surrounding Mesozoic; commonly there is only a weak difference in the vegetation cover or in the drainage pattern, therefore the boundaries mapped are mostly uncertain.

Among the Palaeozoic rocks some units were separated on the basis of slight morphological differences, but little lithological reason for these could be found during the field check; the symbols in the legend reflect the main distinguishing character (thus Pzh : hard; Pzs : soft; Pzt : with trends). On the contrary the unit Pzj was identified at first in the field.

Stratigraphic relations between units are uncertain; however, Pzs appears in places to underlie Pzt (Run 4, photo 5118).

Pzh is a hard, very dark toned unit, covered by forest and forming elevated terrain.

Pzj, jasper, has no definite photogeological character; when it contacts Pzs it occupies a relatively elevated position.

Pzs is a soft, light toned unit forming a low-lying, gently undulating landscape. Some supposed hard beds are in relief.

Pzt is the most definite unit; prominent trends and a dense drainage network, with rounded interfluvies, are its characteristics. The medium grey tone is commonly concealed by dark forest.

With the exception of Pzj, which is red jasper with films of manganese and in places crystalline magnetite, the remaining Palaeozoic is composed chiefly of quartzite, sandstone and greywacke. Phyllite occurs in places, especially in Pzt where in some areas it forms the main component; good exposures were seen along the Inglewood-Warwick road, for example Run 3, photo 5009.

It has been impossible to relate these units with known formations.

UNDETERMINED UNIT

A light toned, soft, cultivated, gently undulating unit is mapped in the southern ^{part} of the sheet. Along the boundary it is topographically lower than the bordering Mesozoic and basalt. No field check was made in this area and from the photos it has been impossible to correlate this isolated outcrop with other units or formations.

MESOZOIC

The remarks made on the undifferentiated Palaeozoic apply also to the undifferentiated Mesozoic. Generally it forms an undulating, dark toned, cultivated or timber covered landscape. The division in to three units rests on the presence of a soft, light toned band (M_2) between two elevated, dark toned, forest-covered areas (M_1 at the east and M_3 at the west side).

Topographically, M₁ corresponds with Mack's Bundamba Formation (Lower Jurassic), M₂ with Walloon Formation (Jurassic) and M₃ with Blythesdale Formation (Jurassic-Lower Cretaceous). In this area Walloon (Mack 1963, p. 15 and 16) conformably overlies Bundamba and is progressively overlapped by Blythesdale; this last relation is evident in the photogeologic map to the north-north-east and to the south-west of Inglewood.

On the ground the Mesozoic is represented by sandstones of variable grain size and composition. Bands of claystone and sandy claystone were found in places.

CAINOZOIC

The basalt outcrops in the south are dark toned, hard and in places form characteristic terraces, which cap the older units. The outcrops in the north are harder than the bordering Mesozoic, but terraces are absent (Dalby, Run 8, photos 5208 and 5212).

Basalts were extruded from local centres of vulcanism in Tertiary time (Mack 1963, p. 21).

Undifferentiated Cainozoic (Cz) forms a very flat, cultivated or grassy plain which covers the western half of the sheet. Probably it is mostly composed by old alluvium and residual soil.

Duricrust (Czd) caps in places the Mesozoic and the Undifferentiated Cainozoic. It forms a light toned, flat or slightly inclined, hard surface covered by forest and in many places bordered by a steep scarp. On the ground, below the silicified surface, it is a white to light brown, medium grained, labile to sub-labile sandstone. In places clayey siltstone and sandy claystone were seen.

Small alluvial terraces (Qt) are located along the Weir River in the north-west.

Alluvium (Qa) is well developed along the main watercourses, especially in the flat area west of Goondiwindi, where several traces of recent floods are recognizable on the photos. On account of the total lack of relief the separation of Qa from Cz is generally uncertain; it is made on the basis of little differences in tone (Qa darker than Cz) or in vegetation (Qa less cultivated than Cz).

STRUCTURE

Not many data are available in this area, where rock beds are rarely visible on the photographs. The exception is represented by the unit Pzt, the prominent arcuate trend of which is probably connected with the presence of phyllite. On the ground this trend corresponds with steeply dipping cleavage not clearly related to bedding. Minor folds and faults in places complicate the trend.

Some hard beds with undetermined inclination are visible on Pzs, especially east and north-east of Texas.

A circular trend probably connected with structural features characterizes a range of Palaeozoic hills about 20 miles east of Inglewood (Run 4, photo 5122).

A peculiar concentric pattern less than 1 mile across was observed on Cz, 16 miles north-north-west of Goondiwindi (run 3, photo 5041). On the ground it corresponds with the disposition of tall trees, that grew in this fashion after a bush-fire (from local information); so-called "Melon holes" up to 20 feet across are scattered in the area. Traces similar to this have sometimes attracted the attention of Archaeologists (see for instance some figures in Gogvuey, 1966). Further investigation could be worth while in this area.

The duricrust in the northern part of the sheet appears in places slightly folded (Run 1, photos, 5024 and 5016).

The granite and, in places, the Palaeozoic is jointed and crossed by rare supposed dykes. The dominant trend is north-west.

CONCLUSIONS

The relations between morphology and geology are feeble and rock beds are rarely displayed in this area. Therefore the photogeological map lacks definite information and many boundaries are approximate; during future field work it should be regarded as a general guide only.

Sections on the Palaeozoic could be checked along the Inglewood - Warwick, and the Inglewood - Pikedale - Texas roads. The Mesozoic is so poorly exposed that the only reasonable suggestion is to search it wherever possible.

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APPENDIX 1

FIELD TRAVERSES

Specimen localities are recorded on the photos and on the map; observation points only on the photos. Each point is marked by a letter and three numbers: the letter D refers to the Dalby photographs (used for the northern edge of the sheet) and G to Goondiwindi; the numbers refer to run, photograph and point respectively.

INDEX OF SAMPLES

Granite

G 7/11-1 Grey porphyritic granodiorite

Undifferentiated Palaeozoic

D 8/12-3 Blue-grey quartzite

G 1/12-3 Coarse grained, dark-grey quartzose feldspathic micaceous metamorphosed sandstone

G 4/22-6 Dark grey quartzite

G 5/02-2 Dark grey, fine grained, well indurated quartzite; fractures filled by quartz

G 5/02-3 (2 pieces) White and dark grey, fine grained quartzite

G 5/10-6 (2 pieces) Grey, medium grained, impure sandstone. Chert.

G 5/14-2 (2 pieces) Light brown, very fine grained sandstone. Grey, coarse, pebbly, labile sandstone

G 6/38-4 Dark-grey phyllite

G 7/07-1 (2 pieces) Hard, fine grained greywacke with a few specks of pyrite

G 7/11-3 (2 pieces) Dark-grey chert. Dark-grey, very fine grained greywacke.

Pzi

G 5/10-2 Red jasper with films of Mn and crystalline magnetite in places.

Pzs

- G 4/22-3 Dark-grey, hard mudstone
G 5/10-1 Light-grey, well indurated, coarse quartzose sandstone
G 5/10-4 (2 pieces) Grey, medium grained, hard, quartzose sandstone.
Quartzite
G 5/14-1 Dark blue-grey, medium grained quartzite
G 5/14-3 Light brown, medium grained, labile sandstone
G 6/38-3 Grey, fine grained, sugary limestone
G 7/15-2 (2 pieces) Dark blue-grey, fine grained, sub-labile, well
indurated arenite. Light brown, very fine grained, sublabile
arenite; ?tuffaceous
G 7/23-3 (3 pieces) Fine grained sandstone with rounded pebbles of
sandstone and quartzite

Pzt

- G 2/66-3 (2 pieces) Reddish, cleaved siltstone. White ?talcosic
mudstone
G 2/70-2 Dark-grey, hard, fine grained sandstone
G 4/26-3 (2 pieces) Dark-grey, medium to coarse grained feldspathic,
quartzose sandstone. Dark-grey phyllite
G 4/22-8 Dark-grey quartzite

Undifferentiated Mesozoic

- G 5/06-6 (3 pieces) Very coarse, labile sandstone with rock fragments.
Brown ?concretionary mudstone. White sandy claystone
G 7/03-1 Pale-brown to white, quartzose sandstone; some clayey cement
and quartz granules

M₁

- G 2/66-2 Coarse-grained, weathered, quartzose sandstone with quartz
pebbles

M₂

- D 8/08-2 (2 pieces) Silicified, poorly sorted, light-brown sandstone
with plant remains

- G 1/16-1 White, fine to medium grained, quartzose sandstone with coarse, rounded quartz grains; commonly strongly silicified
- G 1/12-2 Light-brown; fine to medium grained, sub-labile to labile sandstone

M₃

- G 3/21-2 (3 pieces) Labile, fine grained, very weathered, red sandstone. White sandy claystone
- G 5/94-1 Brown, coarse, quartzose sandstone with pebbles of quartz
- G 5/98-2 Whitish sandy claystone; sand fraction poorly sorted; pebbles of quartz
- G 5/98-4 Brown siltstone and interbedded medium to coarse, quartzose sandstone with lenticular, white claystone bands

Czd

- G 1/44-2 White, medium grained, poorly sorted, weathered, feldspathic, labile sandstone
- G 1/24-1 (2 pieces) Top of scarp: white, labile to sub-labile, micaceous, medium grained sandstone. Bottom of scarp: grey clayey siltstone
- G 2/58-2 (2 pieces) Light brown, sandy claystone. Light brown, labile, fine grained sandstone

APPENDIX 2

WELL RECORDS

TINGAN no. 1

Drilling Company: Union Kern A.O.G.

Lat. 28° 25' 07" S

Long. 150° 15' 12" E

<u>Age</u>	<u>Formation</u>	<u>Depth (feet)</u>	<u>Thickness</u>
Lower Cretaceous	Roma	0 - 1552	1552
Jurassic	Blythesdale	1552 - 3529	1977
"	Walloon	3529 - 4170	641
"	Hutton sandstone	4170 - 4728	558
"	Evergreen shale	4728 - 5028	300
Trias-Jurassic	Precipice	5028 - 5329	301
Triassic	Cabawin	5329 - 5698	369
Permian	Kianga	5698 - 5824	126
"	Back Creek	5824 - 5957	133

GOONDIWINDI no. 1

Drilling Company: Union Kern A.O.G.

Lat. 28° 38' 25" S

Long. 150° 11' 28" E

<u>Age</u>	<u>Formation</u>	<u>Depth (feet)</u>	<u>Thickness</u>
Cretaceous	Roma	0 - 1485	1485
Jurassic	Blythesdale	1485 - 3208	1723
"	Walloon	3208 - 3824	616
Trias-Jurassic	Hutton-Evergreen- Precipice	3824 - 4670	846
Triassic	Cabawin	4670 - 5198	528
Permian	Kianga-Back Creek	5198 - 7250	2052
Permo-Carbonif.	Kuttung	7250 - 7292	42

YARRILL CREEK no. 1

Drilling Company: Union Kern A.O.G.

Lat. 28° + 5.35 miles S

Long. 150° + 26.65 miles E

<u>Age</u>	<u>Formation</u>	<u>Depth (feet)</u>	<u>Thickness</u>
Lower Cretaceous	Roma	0 - 1156	1156
Cret-Jurassic	Blythesdale	1156 - 2088	932
Jurassic	Walloon	2088 - 2720	632
Jur.-Triassic	Bundamba	2720 - 3680	960
Permian	Kuttung	3680 - 4545	865

MINIMA no. 1

Drilling Company: Union Kern A.O.G.

Lat. 28° 21' 33" S

Long. 150° 06' 54" E

<u>Age</u>	<u>Formation</u>	<u>Depth (feet)</u>	<u>Thickness</u>
Lower Cretaceous	Roma	0 - 2893	2893
Jur.-L. Cretaceous	Blythesdale	2893 - 3976	1083
Jurassic	Walloon	3976 - 4577	601
Jur.-U. Triassic	Bundamba	4577 - 5695	1118
Triassic	Cabawin	5695 - 6153	458
U. Permian	Kianga	6153 - 6264	111
Permian	Back Creek	6264 - 6782	518
Permo-Carbonif.	Kuttung	6782 - 7142	360

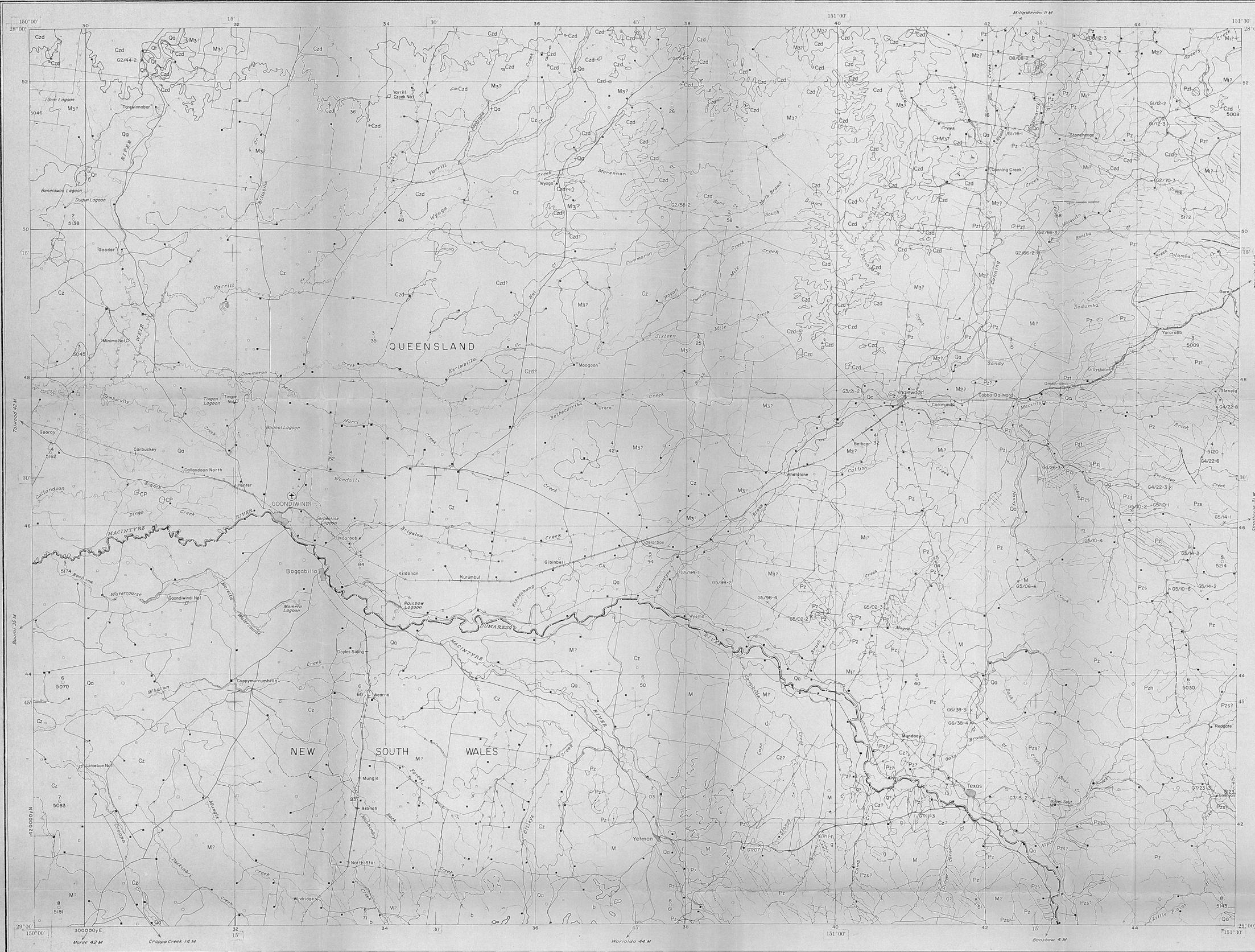
LIMEBON no. 1

Drilling Company: Union Kern A.O.G.

Lat. 28° 49' 17" S

Long. 150° 03' 31" E

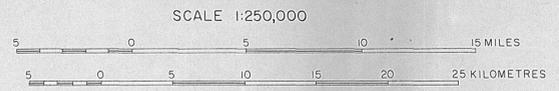
Data not available at present (January, 1968).



Photogeological Character	Possible Geological Equivalent	
Light toned, flat lying, treeless surface with traces of flood in places	Qa Alluvium	QUATERNARY
Very light toned surface, slightly elevated above Qa	Q1 Terrace deposits	
Very light toned, flat lying or slightly inclined, hard appearance, timber covered, scarp-forming surface	Czd Duricrust	CAINOZOIC
Flat lying, cultivated surface	Cz Undifferentiated	
Dark toned, hard appearance, forming characteristic terraces in places	b Basalt	TERTIARY
Dark toned, undulating, cultivated or timber covered	M3	MESOZOIC
Light toned, soft appearance, slightly undulating, cultivated, topographically lower than M3	M2	
Very similar but topographically lower than M3	M1	
Isolated outcrops similar to M1 and M3	M Undifferentiated	
Light toned, soft, cultivated, gently undulating, under lying M and b	? Undetermined unit	PALAEOZOIC
Medium grey toned, generally concealed by forest, cut by dense drainage network with rounded interfluvies; prominent trend	Pz1	
Light toned, soft appearance, forms low lying, gently undulating landscape; some hard beds in relief	Pz5	
	Pzj Red Jasper	
Very dark toned, hard appearance, covered by forest, forming elevated terrain	Pzh	
	Pz Undifferentiated	
Uneven surface with coarse texture, hard appearance, fractured	g Granite	PERMIAN

	Lithological boundary		Principal road
	Probable lithological boundary, queried where inferred		Minor roads and tracks
	Anticlinal axis		Railway line
	Synclinal axis		Telephone line
	Fault		Fence
	Probable fault		State boundary
	Edge of bed		Mine
	Probable edge of bed		Homestead
	Edge of bed expressed as scarp		Windpump
	Estimated dips		Airport or Airfield, Landing ground
	Horizontal		Dry hole, abandoned
	Very low		Tank
	Low		Well
	Medium		Spring
	Steep		Waterhole
	Vertical		Dam
	Undetermined		Clay pan
	Trend line		Photo-centre points
	Joint pattern		Photo-centre points-adjoining sheet
	Topographic scarp		
	Laterite (L), Terrace (T), Scree (S)		
	Dyke		
	Sample location		

Compiled by the Bureau of Mineral Resources, Geology and Geophysics.
Detail adjusted to photoscale compilation prepared by the Royal Australian Survey Corps.
Aerial photography by Adstra Airways Pty. Ltd.; complete vertical coverage at 1:85,000 scale. Transverse Mercator Projection.



INDEX TO ADJOINING SHEETS

SURAT	DALBY	IPSWICH
ST. GEORGE	GOONDIWINDI	WARWICK
MOREE	INVERELL	GRAFTON

Photo-interpretation by the Photogeological Group,
Bureau of Mineral Resources, Geology and Geophysics 1967
Interpreted by C.E. Maffei
Compiled and drawn by R.G. Winchester