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Report on Photo-Interpretation of the Normanton 1:250,000 Scale Sheet, Queensland

by

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REPORT ON PHOTO-INTERPRETATION OF THE NORMANTON 1:250,000 SCALE SHEET, QUEENSLAND.

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PHOTOGEOLOGICAL MAP	In back pocket.

REPORT ON PHOTO-INTERPRETATION OF THE NORMANTON 1:250,000 SCALE SHEET, QUEENSLAND.

SUMMARY

Within the Sheet area rock outcrops are very restricted.

Permian Croydon Volcanics crop out in the southeast corner of the Sheet.

Lower Cretaceous Normanton Formation occurs around Normanton in the south west, and undifferentiated mantled Mesozoic? occurs along the central eastern edge of the Sheet.

The Cainozoic material which covers the remainder of the Sheet has been differentiated into four units.

INTRODUCTION

This study was carried out with the purpose of assisting in the planning and execution of future field work.

Photo-interpretation was carried out on black and white prints of vertical air photographs taken by the R.A.A.F. in June, 1951. The photo coverage data are:- direction of runs: east-west; camera focal length: 154.2 mm; flight altitude: 25,000 feet; nominal scale: 1:50,000. Photographs flown August, 1967 by Adastra were also consulted where necessary. These were taken at an altitude of 25,000 feet with a camera of focal length 88.41 mm., the nominal scale being 1: 85,000.

Photogeological interpretation was annotated on transparent overlays over every alternate photograph. Previous work, listed in the references, was used as a guide for photointerpretation. After the initial interpretation the Mesozoic lithologies on the western side of the sheet area were field checked by the author and H.F. Doutch in June, 1969.

Original annotation was modified where necessary then compiled on overlays of the photoscale planimetric sheets prepared by the Royal Australian Survey Corps, in 1962. The compilations were photographically reduced to 1:250,000 scale, assembled and combined with the Royal Australian Survey Corps, 1:250,000 planimetric map to obtain a composite print.

Access to Normanton can be gained from the south on a sealed road from Julia Creek. A formed-earth road from Cloncurry connects to this sealed road. Formed-earth roads link Normanton to Croydon on the east, and Burketown on the west. Within the sheet area road development is limited. Station access roads traverse the north and northwest areas of the sheet. Access to the central and eastern regions of the sheet is restricted to station service tracks only.

PHYSIOGRAPHY

The whole of the sheet area can be considered low lying. The principal rivers draining the area are the Gilbert and Einasleigh in the north and east, and the Norman in the west.

In a broad sense the sheet area can be regarded as an extensive westerly sloping plain with a small remnant of partially dissected tableland occupying the area west of the Norman River. Small hills of a similar tableland of the Gregory Range occur along the southeast edge of the sheet near Wallabadah homestead. Spot elevations on the Bouguer Anomalies Map, Normanton E54/B2-7 (Bureau of Mineral Resources, Geology and Geophysics 1969) show that the land slopes westward at approximately four feet per mile. Elevations above sea level range from a maximum of approximately 400 feet in the east to less than two feet in the west.

Twidale (1964, 1966) has studied the geomorphology of the Leichhardt-Gilbert area and classified it into physiographic divisions. His main physiographic divisions represented within the Normanton sheet are:

Donors Plateau - this topographic high is a remnant of partially dissected tableland and is represented by K_1, K_2, on the photogeological map.

Claraville Plain - an old depositional plain, shown mainly as Cz on the photogeological map.

Stirling Plain - the depositional plain of the Gilbert and Einasleigh Rivers developed on the older Claraville Plain and represented by Qa, Qas, on the photogeological map.

Karumba Plain - the coastal depositional plain flanking the Gulf of Carpentaria, shown as Qac, with some Qa, Qas on the photogeological map.

STRATIGRAPHY

The following stratigraphic divisions have been used in the photogeological interpretation.

Photogeological character		Possible Geological Equivalent			
White toned, flat lying	Qac	Coastal and riverine alluvium	Quaternary		CAINOZOIC
Light to medium toned well vegetated	Qas	Sandy river alluvium			
Light toned, sparse vegetation	Qa	River alluvium			
Medium to light toned smooth surface uniformly vegetated	Cz	Residual soil sand alluvium			
Dark uniform tone, well vegetated, commonly scarp forming.	K_1	Deeply weathered Normanton Formation	Lower Cretaceous		MESOZOIC
Light toned, soft appearance	K_2	Normanton Formation			
Light toned, flat lying	K	Undifferentiated			
Light toned, some bedding traces	Pc	Croydon volcanics	Permian		PALAEOZOIC

PALAEOZOIC

Croydon Volcanics, Pc.

Permian Croydon Volcanics crop out over a small area along the southeast edge of the sheet. These consist of Rhyodacite welded tuffs of the Croydon Cauldron Subsidence Area and have been discussed in detail by Branch (1966).

MESOZOIC

Undifferentiated Mesozoic, K

Some scattered outcrops of K occur along the eastern side of the sheet. These form light toned slight topographic highs, but good exposures are not obvious on the photos because of soil mantle. Lack of ground data prevents formational identification of this lithology. From topographic evidence the rocks have a shallow dip to the west.

Normanton Formation, K_1, K_2

The Lower Cretaceous Normanton Formation has been subdivided into deeply weathered lithologies (K_1) and relatively unweathered lithologies (K_2).

Unweathered lithologies, K_2

Unweathered Normanton Formation consists of fine lithic sandstone, siltstone, and shale. (Laing and Power, 1960). It has a light toned photo pattern with a soft appearance. At Normanton the lithology is predominantly labile lithic sandstone and is near flat lying with local undulations. Good exposures occur along the escarpment immediately east of Normanton Airport Terminal (Run 11/5172).

Deeply Weathered lithologies K_1

This unit has been introduced because of the presence of an old deeply weathered residual surface on the topographic highs of the Normanton Formation. It has a distinctive uniform dark photo tone, is well vegetated and commonly forms scarps against active stream erosion.

The dark photo tone is due to the combined effect of a surface coating of ironstone gravel and spinifex growth. (These combined features can be used as a ground identification criterion for the old weathered surface). Although the photo tone is characteristic of most lateritic surfaces no true laterite was observed on traverse.

The deep weathering has involved severe leaching of the Normanton Formation lithologies with introduction of variable concentrations of iron. In some places a mottled zone has developed. Within the deep weathered zone original lithological types are generally not recognizable. Low areas on the old land surface are remnants of the original drainage system.

CAINOZOIC

Undifferentiated, Cz

This unit consists of undifferentiated residual sand, soil, alluvium, and colluvium and covers more than half the sheet area. It has a medium to light photo tone, a smooth surface and is generally uniformly vegetated. Three main areas of differing composition are indicated. Over the areas of K_1, K_2, west of the Norman River Cz consists mainly of residual soil and colluvium, whereas northeast of the Gilbert and Einasleigh rivers the Cz is mainly alluvium, colluvium and some soil. The large area of Cz between the Norman and Gilbert rivers consists of alluvial material. This is evident from the presence of old meander channel and levee deposits. Most of the boundaries between Cz and Qa are not as definite as indicated on the map. Boundaries are commonly gradational and ill-defined because of thin surficial coatings of Qa on the Cz.

River Alluvium, Qa

This unit has a light photo tone and is often sparsely vegetated. It consists predominantly of silty alluvium and is most abundant in the depositional areas of the Gilbert, Einasleight and Norman rivers. Any extensive, residual levee deposits within the undifferentiated Cz have been designated Qa.

Sandy River Alluvium Qas

Sandy alluvial deposits along the major streams can be identified by a light to medium photo tone and well developed vegetation. The main types of sand deposits included in this unit are, ridge forming levee deposits, sheet-like flood plain deposits adjacent to the main tracts, and very recent sandy alluvium along the present river tracts. The distribution of Qas thus indicates the positions of both present and abandoned depositional tracts.

Coastal and Riverine Alluvium, Qac

Areas of Qac are generally very low, flat lying and occur within the tidal limits. They are characterized by a white photo tore. Sandy beach deposits within the Qac - but above high tide level - have been outlined by broken lines. Beach ridges within these sandy deposits can be identified by their linear shape.

STRUCTURE

Because of the presence of widespread Cainozoic deposits little can be said about the geological structure.

The Lower Cretaceous lithologies in the west are near flat lying and possibly dip to the north (Perry, 1967) or northeast. From general morphology the undifferentiated K in the east dips shallowly west.

No faults could be identified on the photos. Several lineaments, mapped on vegetation alignments, have been interpreted near the eastern edge of the sheet. These probably reflect jointing in underlying Mesozoic lithologies. The major east-northeast lineament which crosses the southern area of the map was observed on a 1:85,000 scale photo laydown. This showed as a light toned strip with a ground width of approximately one mile. It was plotted on the photogeology sheet by eye.

GENERAL COMMENTS

The following observations - based mainly on geomorphological aspects - may assist in interpretation of subsurface structure.

The distribution of abandoned levee deposits (shown as Qa) within the Cz plain between the Norman and Gilbert rivers, indicates that the Gilbert River once flowed in a westerly direction from a position near Round Hole Hut in the southeast of the map. The river appears to have migrated northwards while maintaining this approximately westerly flow direction until it reached a position about latitude $17^{\circ}30$. From the distribution of more recently abandoned river tracts and levee deposits of the Gilbert's depositional plain, the river mouth then migrated in a northeasterly direction to its present position.

Subsurface structure may have influenced the drainage of Walker Creek. The section between the Fish Hole Creek junction, and Mail Change Waterholes is considered anomalous because it is a southwesterly flowing near linear tract. Most of the surrounding rivers or streams meander with general flow directions between west and northwest.

An old strand line has been plotted north of Normanton on the western side of the sheet. This is recognizable as a topographic break. It can be traced intermittently for approximately 30 miles and is sub-parallel to, and between 15-40 feet above, the present coastline 14 miles to the west.

A lithology, not differentiated on the photogeological map, was observed on traverse in the Norman River at Glenore Crossing. It consists of Quaternary ? consolidated muds and silts deposited within the Norman River channel. It is concealed by shallow Recent alluvium.

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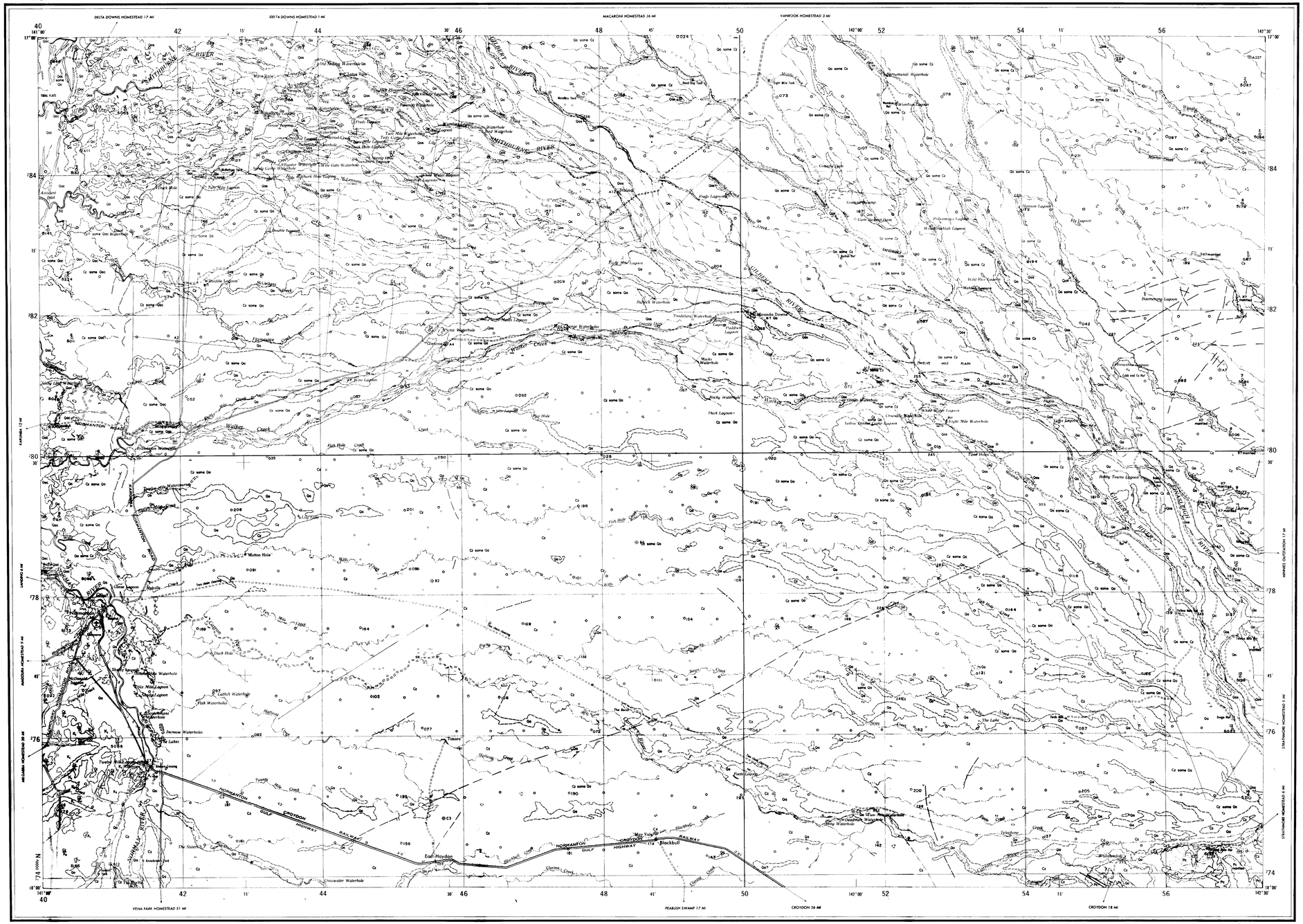
BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

NORMANTON

QUEENSLAND

AUSTRALIA 1:250,000
PHOTOGEOLOGICAL SHEET SE54-7



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Light toned, soft appearance	K_2	Normanton Formation		
Light toned, flat lying	K	Undifferentiated		
Light toned, some bedding traces	Pc	Croydon volcanics	PERMIAN	PALAEOZOIC

- Lithological boundary
- Probable lithological boundary
- Anticlinal axis
- Synclinal axis
- Fault
- Probable fault
- Edge of bed
- Probable edge of bed
- Lineament

Estimated dips

- Horizontal
- Very low
- Low
- Medium
- Steep
- Vertical

- Trend line
- Joint pattern
- Topographic scarp
- Laterite (L), Terrace (T), Scree (S)
- Dyke
- Sand ridge
- Old strand line

- Principal road
- Minor roads and tracks
- Railway line
- Telephone line
- Fence
- State boundary
- Mine
- Homestead
- Yard
- Windpump
- Airport or Airfield, Landing ground
- Bore
- Tank
- Well
- Spring
- Waterhole
- Dam
- Photo-centre points

Compiled by the Bureau of Mineral Resources, Geology and Geophysics.
Detail adjusted to photoscale compilation prepared by the division of National Mapping, Department of National Development.
Aerial photography by Royal Australian Air Force, complete vertical coverage at 1: 48,000 scale. Transverse Mercator Projection.

Scale 1:250,000

INDEX TO ADJOINING SHEETS

CAPE VANDIEMAN	GALBRAITH	WALSH
BOURKETOWN	NORMANTON	RED RIVER
DONORS HILL	CROYDON	GEORGETOWN

Photo-interpretation by the Photogeological Group, Bureau of Mineral Resources, Geology and Geophysics 1969
Interpreted by : C. J. Simpson

NORMANTON
E54-7 QUEENSLAND