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COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

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PROGRESS REPORT ON THE GEOLOGY OF PART OF THE NORTHERN EROMANGA BASIN, 1962

by

Manuka
Richmond
Hughenden (part)

R.R.Vine and L.V.Bastian
(Bureau of Mineral Resources)
and
D.J.Casey
(Queensland Geological Survey)

PART 1 of 2

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R.R. Vine, L.V. Bastian
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PROGRESS REPORT ON THE GEOLOGY OF PART OF THE NORTHERN EROMANGA BASIN, 1962

SUMMARY

During 1962 the Manuka, Richmond and part of the Hughenden Sheet areas in northern Eromanga Basin were mapped. From north to south across the area there is a complete sequence nearly 4000 feet thick, from the Gilbert River Formation (Upper Jurassic to Lower Cretaceous) to the Winton Formation (Lower to Upper(?) Cretaceous), overlying Precambrian crystalline basement and overlain by the Tertiary Glendower Formation and late Cainozoic basalts. Older Mesozoic and late Permian sediments are present in Corfield Town Bore and east of the mapped area, and some can be recognised from the drillers' logs of water bores from within the area.

The Wilgunya Formation (Lower Cretaceous) is divided into five members, including the previously named Toolebuc Member. Mackunda Beds were mapped extending across the Manuka area, and are thickening eastwards.

A prominent fault trending north-north-east across the Manuka area and extending into the Richmond area is probably a continuation of the Cork Fault. With several smaller, parallel faults in the north of the Richmond area, it appears to be a continuation of faults of the Broken River Rift in the Georgetown Inlier.

Underground water is available from three groups of aquifers. Pre-Wilgunya aquifers produce abundant supplies of potable water; lesser supplies of variable quality are obtained from the Mackunda Beds and Winton Formation; potable water, generally with good supplies, is available from the Glendower Formation beneath basalt plateaus.

Petroleum prospects are dependent on proving suitable early Mesozoic or Palaeozoic source beds; suitable reservoir rocks and structures are present. Gold has been produced from the northern parts of the area, but there is no mining or prospecting carried out at present. Dam sites for irrigation water are available, particularly one on Betts Gorge Creek which is most suitable. Substantial reserves of low grade iron ore are available in the north of the Richmond area.

INTRODUCTION

This report relates to the area mapped during the 1962 field season by the Great Artesian Basin Party, as part of a long term project to map the whole of the Queensland portion of the Great Artesian Basin. The work is being done by a joint field party of the Bureau of Mineral Resources and the Queensland Geological Survey. The 1962 field season lasted from early June to mid-September. Much time was spent plotting the position of bores and new tanks accurately and bringing up-to-date planimetric detail. Previously this had been plotted by photo interpretation of air photos taken in 1951.

The first phase of the project, mapping the Eromanga Basin in Queensland west of 141°E, was completed in 1960. It is expected that the second phase, mapping of the northern Eromanga Basin north of 24° S, will be completed in 1964. During 1962 the Manuka, Richmond and part of the Hughenden 1:250,000 Sheet areas were mapped. The limit of the mapping in the Hughenden area is shown on Plate 2. The party consisted of R.R. Vine, L.V. Bastian and I. Chertok (draftsman) of the B.M.R., and D.J. Casey of the Q.G.S.

Air photos at an approximate scale of 1:50,000 taken by the R.A.A.F. in 1951 provide a complete coverage of the area. Planimetric maps at 4 miles to 1 inch are available from the Queensland Department of Public Lands. Topographic maps of the Richmond and Hughenden Sheets at 1:250,000, produced by the Royal Australian Survey Corps, are available from the Division of National Mapping, Canberra. A 1:250,000 planimetric sheet of Manuka is being produced by the Division of National Mapping.

Plate 2 shows the location of the area mapped, together with highways, main roads and railways within the area. The highways and main roads are formed but mostly unsurfaced, although local supplies of sand or gravel have been used for road making in a few places. All roads are impassable for a few days after heavy rain, but drainage is facilitated by the high crowns which have been formed on all the major roads. From 1st July it is intended to rename the Burdekin and Landsborough Highways as the Flinders Highway, and the Hann Highway is to be renamed the Kennedy Developmental Road.

Access to the area is by air, rail or road. A regular air service between Townsville and Mount Isa, calling at Hughenden and Richmond, is operated by T.A.A. with between four and six planes a week in each direction. Winton is connected, via Rockhampton, with Brisbane by rail, and the Great Northern Railway from Townsville to Mount Isa, runs east-west across the area. By road the area can be reached on the North-Western Highway (through Winton) or by the Landsborough and Burdekin Highways from Mount Isa and Townsville. The Hann Highway connects Hughenden with Cairns, and Brisbane is connected directly with Hughenden by a main road through Muttaburra.

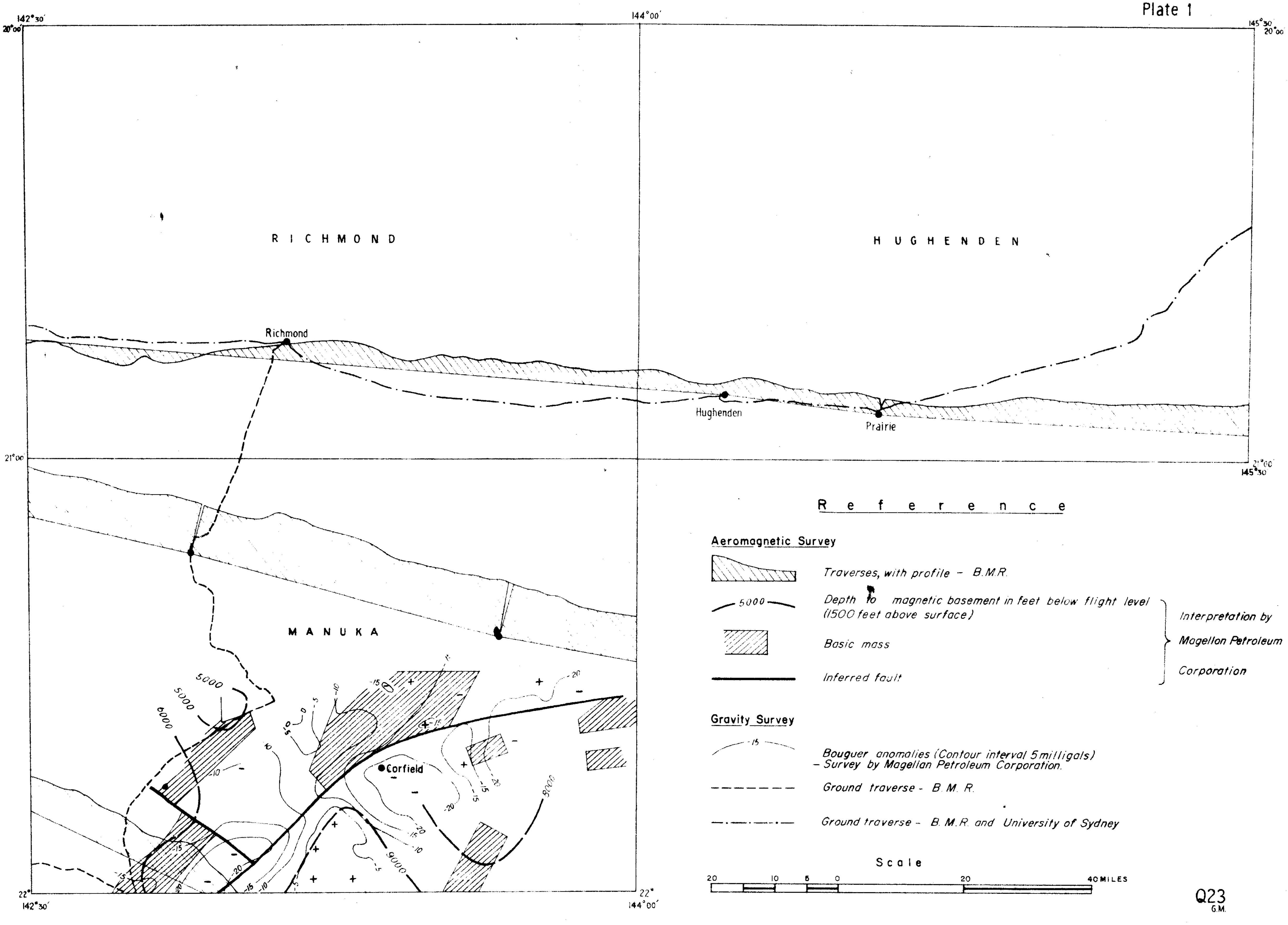
A large part of the area, particularly in the south, consists of open downs or plains which are used almost exclusively for sheep grazing. Most of the sheep properties are small (20,000 to 40,000 acres) and all are divided into small paddocks with an abundance of station tracks. Thus access within the downs area is excellent. To the north areas of basalt outcrop have a boulder strewn surface which is almost impassable even for a four wheel drive vehicle, unless the station owner has gone to considerable trouble and expense to construct an access track for his own purposes. Fortunately a considerable part of the original area of basalt, in common with other parts of the Richmond and Hughenden areas, is now covered with a veneer of younger sand. This supports an open forest vegetation suitable for low density cattle grazing. Properties are therefore considerably larger than in the sheep country, and at least one, Dutton River, exceeds 1000 square miles. In this area station tracks are widely scattered. Ground navigation between tracks commonly has to be by dead reckoning as much of the sand plain is featureless and visibility is limited by the trees.

Water supplies in the area are obtained mainly from bores, many of which are flowing. Waterholes are mainly small and temporary, although some on the Flinders River are either permanent or last through all except long droughts. Water is also readily available within a few feet of the surface in the sandy beds of the upper reaches of the largest northern rivers: Flinders River, Porcupine Creek, Dutton River, Cambridge Creek (Stawell River) and Woolgar River. Porcupine Creek is a permanent stream for about 10 miles in Galah Gorge.

The climate is tropical-continental, characterised by large temperature ranges (annual 50° to 55°, diurnal 30°) and with averages of 40 to 60 days with century temperatures each year. Rainfall averages are between 16 and 19 inches annually, increasing from south-west to north-east, but the rain has poor reliability (average deviation from normal 30%). Nearly all the rain falls during the summer.

GEOPHYSICAL SURVEYS

Plate 1



Bureau of Mineral Resources, Geology and Geophysics. May 1963

To accompany Record No 1963/75

TABLE 1. PREVIOUS INVESTIGATIONS

Age ascribed to units / Reference	DAINTREE 1872.	JACK, 1886, 1895, 1898. JACK & ETHERIDGE 1892.	REID 1914, 1916, 1918, 1929.	DUNSTAN 1916, 1920.	WHITEHOUSE 1924, 1926a, b, 1930.	WHITEHOUSE 1940, 1945, 1954.	LAING & POWER 1959.	CASEY 1959.	THIS REPORT
CAINOZOIC OR TERTIARY	Volcanic Desert Sst.	Basalt		Basaltic S. Desert S. (in part)		Basalt (Laterite) Glendower Fm. (Laterite)	Lynd Fm.		Unconsolidated sand Basalt Glendower Fm.
CRETACEOUS Upper: Turonian, Cenomanian	"Cretaceous" (includes Marathon and Hughenden Bd.)	Desert Sst.	Desert Sst.	Winton S.	Winton S.	Rolling Downs Gp.: Winton Fm.			--?--?--?--?--?--? Rolling Downs Gp.: Winton Fm.
CRETACEOUS Lower: Albian (U-M, L)		Rolling Downs Fm. (includes both marine & freshwater beds)	Rolling Downs Fm.	Rolling Downs Marine S. (includes Blythesdale Braystone & part of Desert Sst.)	Rolling Downs Fm.: Tambo S. Non-deposition	Rolling Downs Gp.: Tambo Fm. (coquina at base) Non-sequence	Normanton Fm. Kamileroi Lst.	Wilgunya Fm.: Toolebuc Mb.	Mackunda Bd. Wilgunya Fm.: Allaru Mb., Toolebuc Mb., Ranmoor Mb., Jones Valley Mb., Doncaster Mb.
CRETACEOUS Lower: Aptian		--?--?--?--?--			Roma S.	Roma Fm.	Blackdown Fm.		
CRETACEOUS Lower: Neocomian		Blythesdale Braystone				Blythesdale Gp.: Transition St., Mooga Sst., Fossil Wood St., Gubberamunda Sst.	Gilbert River Fm. Carpentaria Basin	Longsight Sst. western Eromanga Basin	Gilbert River Fm. northern Eromanga Basin
JURASSIC Upper	"Oölitic" (includes Wallumbilla Bd.)		"sandstones of the White Mountains" (Walloon(?) S.)	Walloon S. ("Desert Sst. in part)	Walloon S.		--?--?--?--?--?--	--?--?--?--?--?--	--?--?--?--?--?--?--
JURASSIC Middle & Lower						Walloon Coal Measures Marburg Fm.			Triassic - Jurassic sandstone.
TRIASSIC						Bundamba Sst.: Boxvale Sst., Evergreen Sh., Precipice Sst. Moolayember Sh. Clematis Sst.			
PERMO-CARBONIFEROUS			Betts Creek S. Coal measures at Oxley Creek			Permo-Carboniferous sediments.			Permian sediments Rhyolite porphyry
PRE-PERMIAN	Metamorphics (Silurian or older)	Cloncurry S. (Silurian)	Metamorphic S.	Cloncurry S. (Silurian)		Bedrock (includes Permain and older rocks)			Dumbano Granite, metamorphics (Precambrian)

Abbreviations

Bd.	Beds	S.	Series
Fm.	Formation	Sh.	Shale
Lst.	Limestone	Sst.	Sandstone
Mb.	Member	St.	Stage.

PREVIOUS INVESTIGATIONS

Before the 1962 survey little systematic work had been done specifically on the area of the Manuka, Richmond and Hughenden Sheets. Early observations were made mainly by geologists travelling through the area. From such observations, and others throughout the Great Artesian Basin, an understanding of the stratigraphy and structural setting of the basin developed. The development of stratigraphical nomenclature and knowledge as applicable to the latest mapping is summarized in Table I. It includes the work of Whitehouse, who was the first to attempt to map the Great Artesian Basin as a whole and synthesize the mapping with the previously published nomenclature.

Two units have been the principal cause of confusion, due almost entirely to misinterpretations of original descriptions; this is not explicit in Table I. The Desert Sandstone was originally named by Daintree (1872) from exposures of sandstone and conglomerate, north-east of Hughenden, approximately at the place which Whitehouse later used as the type section for the Glendower Formation (Whitehouse, 1940, 1954). In the type area the Desert Sandstone is lateritised and has an impoverished soil supporting only a sparse and scrubby vegetation. Subsequently more attention was paid to a "desert" vegetation than to the lithology, so any flat-topped, duricrust-capped remnants were mapped as Desert Sandstone, but many sandstone units ranging in age from Permian to Tertiary were also included. When the confusion became apparent the name was dropped (Saint-Smith, 1914; Dunstan, 1916; Reid, 1929). Whitehouse renamed the original unit Glendower Series (and later Glendower Formation) to avoid ambiguity with the earlier incorrect usage of the term.

The Blythesdale Group has had a similar history of use and misuse. It was originally named the Blythesdale Braystone by Jack (1895), as a sequence of very friable sandstone and conglomerate approximately 500 feet thick and conformably below the Rolling Downs Formation. Jack regarded it as the main aquifer of the Basin. An impervious calcareous sandstone within the Rolling Downs Formation was mapped as Blythesdale by Saint-Smith (1914), and since this was obviously not the main aquifer the sandstone was regarded as unimportant and the name fell into disuse. All aquifers were then included in the Jurassic Walloon Series. Whitehouse (1945, 1954) realised Saint-Smith's error and reinstated the unit, but extended it (as the Blythesdale Group) to include marine Cretaceous sandstone of Jack's type area and Upper Jurassic aquifers conformably below. "Walloon" was then restricted to underlying coal measures.

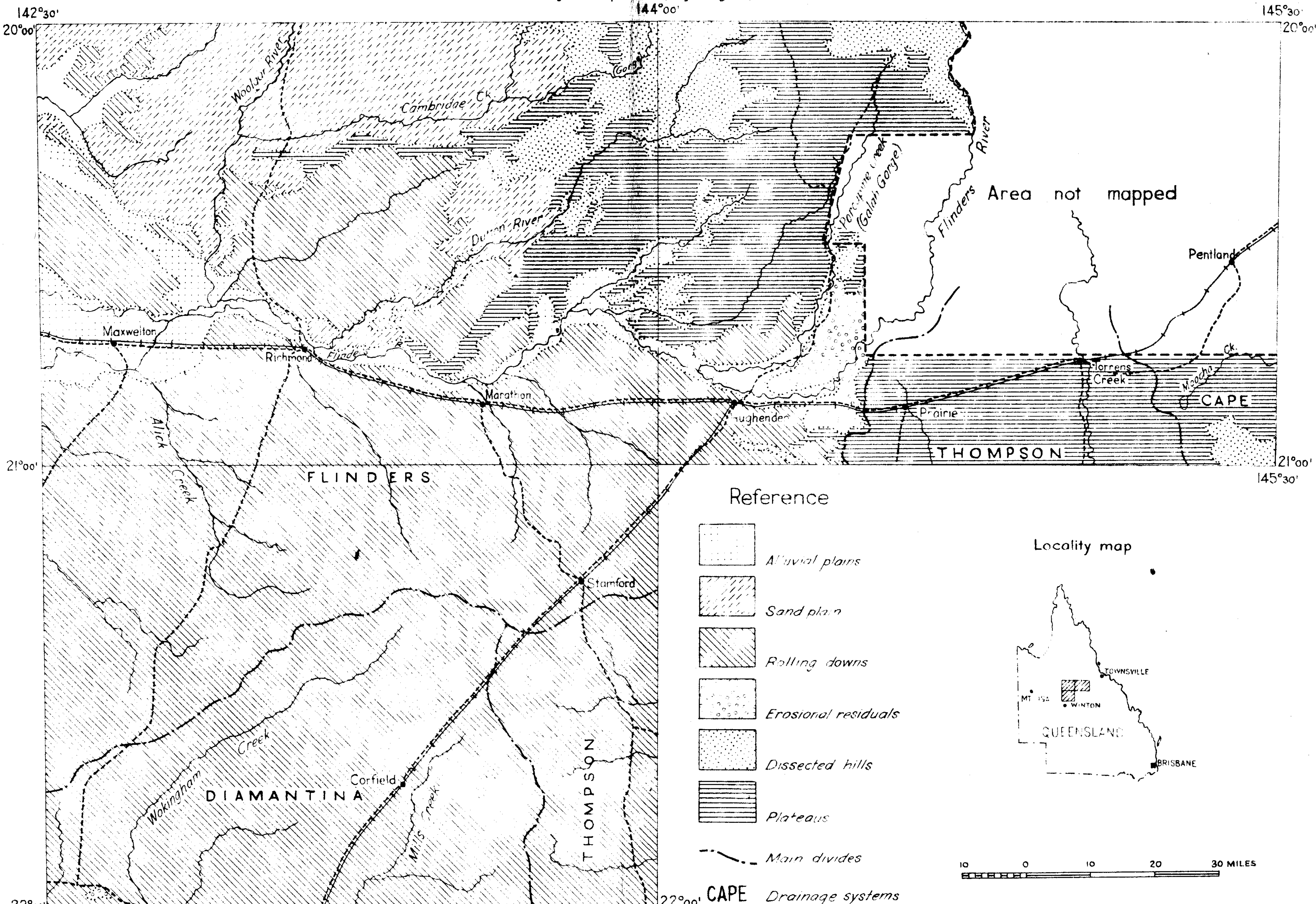
Detailed geological investigations were restricted to areas of economic interest east of the mapped area of the Hughenden Sheet. Permian coal measures are discussed by Reid (1916, 1918), Marks (1910, 1911), Hall (1946), and Ridgway (1947). Rands (1891) reported on the Cape River Goldfield.

A photo interpretation of the whole area was made by the Institut Francais du Petrole and the Bureau of Mineral Resources (Scanvic, de Lassus St. Genies, & Perry, 1962). Photo interpretation of a small part of the south-east of the Hughenden area was carried out for the Stekoll Petroleum Company (Trexler, 1960). Several very gentle folds were suggested by this work.

Location of geophysical work together with an indication of the results is shown on Plate 1. An interpretation of the results of an aeromagnetic survey by the Catawba Corporation was included by Magellan Petroleum Corporation in the report on their own detailed gravity survey in the south of the Manuka area (MPC, 1961). The Bureau of Mineral Resources has made isolated aeromagnetic traverses (Jewell, 1960a, & unpubl.) and gravity traverses (unpubl.) one of which coincides with a traverse by the University of Sydney (Marshall & Narain, 1954).

PLATE 2

Locality map and physiographic units



Bureau of Mineral Resources Geology and Geophysics May 1963. To accompany Record 1963/75

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PHYSIOGRAPHY

Within the area are the headwaters of three main river systems, Flinders, Thomson and Diamantina. In addition Moocha Creek, in the south-east of the Hughenden area, drains into the Cape-Burdekin river system which flows into the Pacific Ocean. The Flinders River drains into the Gulf of Carpentaria; the Thomson and Diamantina systems form part of the Lake Eyre internal drainage basin. These drainage systems are shown on Plate 2.

Most of the watersheds between the drainage systems are of very low relief, very difficult to delineate on the ground. The Great Dividing "Range", in the south-east of the Hughenden area, is a flat sand plain. The divides in the Manuka area are no more than slight topographic culminations within extensive areas of rolling downs. Only the divide between the Flinders and Thomson drainage systems east of Hughenden coincides with any strong topographic feature; there it is the edge of a plateau of lateritised Tertiary rocks.

Virtually all the streams are intermittent. They flow only after heavy rain, then shrink to chains of waterholes, most of which dry up during the winter. The most notable exception is Porcupine Creek, a tributary of the Flinders River, which is a permanent stream for a distance of about 10 miles in Galah Gorge. This is part of the intake area of the Eromanga Basin and eventually the water is absorbed by Mesozoic sandstones. Valleys in the basalt plateau north of Hughenden contain numerous springs issuing from the Glendower Formation below basalt, and feeding short running streams. Most of this water is lost by evaporation.

The topography of the area is essentially a reflection of the degree to which a Tertiary erosion surface has been modified by subsequent vulcanicity and erosion. Briefly, a duricrust surface, together with a cover of basalt forms plateaus. Marginal erosion of the plateaus has produced dissected hills and erosional residuals, or extensive rolling downs where erosion is almost complete to the new local base level. Sand plains and alluvial plains have developed by deposition on the lower erosion surface. The various landforms that have resulted are described and discussed below; locations of the several physiographic units are shown on Plate 2.

Plateau Forms

The term "plateau" is used for high level surfaces of very low relief. Within the area mapped this landform owes its existence to the presence of flat-lying resistant rocks which protect the underlying rocks from all except lateral erosion. Two types of resistant capping form the plateaus. The more extensive is basalt; the lesser, but older, is duricrust.

Plateau country east of Hughenden consists of lateritised Tertiary sediments with a veneer of late Cainozoic sand and clay. It is apparently the northern part of the extensive plateau which Whitehouse (1941) called the Alice Tableland and Twidale (1956a) called the Baronta Plateau. It continues south to the vicinity of Jericho, and includes the Great Dividing "Range" and the internal drainage of Lakes Buchanan and Galilee. The elevation is approximately 1500 feet in the Hughenden area.

The extensive basalt-capped plateau north of Hughenden extends as a lobe south-westwards to within 20 miles of Richmond. It slopes gently from altitudes of nearly 3000 feet in the extreme north to slightly less than 1000 feet east of Richmond, over a distance of approximately 90 miles. Twidale (loc.cit.) referred to it as the Sturgeon Plateau.

Twidale (loc.cit.) included within the Gilberton Plateau parts of the units described as plateau, dissected hills and sand plain in this report. White (1962a) restricted the use of the term to the actual plateau in the Gilberton area to the north. The small plateau in the north of the Richmond area is the southern extension of the Gilberton Plateau as so used. It is composed of lateritised sandstone of the Gilbert River Formation with a veneer of late Cainozoic sand. The altitude is approximately 2250 feet.

PLATE 3

Fig. 1. Galah Gorge, near northern end. Incised meanders through basalt capped plateau; main cliffs are sandstone overlying sandstone, coal and carbonaceous shale of Permian age. View looking south.

BMR Neg. G/5591.

Fig. 2. Dissected hill country on southern margin of the Gilberton Plateau. River in middle distance is Cambridge Creek, with basalt plateau beyond.

BMR Neg. M/250.

The least defined of the plateaus is south of Cambridge Creek. In the east it has a resistant cap of basalt with a veneer of Cainozoic sand, but merges westwards into a narrow plateau of lateritised Glendower Formation, also with a younger sand cover. Both southern and northern margins are well defined where the capping is basalt, but westwards only the southern margin forms an appreciable scarp, mainly less than 40 feet high. The northern and western margins are indistinct below a sand cover. The plateau slopes very gently from an altitude of 1500 feet in the east to 1000 feet in the west.

Original volcanic landforms provide the only significant relief on the plateaus. Low scarps are common on the plateau surface and approximate the original limit of individual basalt flows. Their relief is normally only a few feet, but one such scarp running east from Colindale Homestead (29 miles north of Hughenden) is between 30 and 100 feet high and probably indicates the southern limit of flows from some of the northern vents. Vents are mainly at the culminations of wide, low domes of Mauna Loa type, occurring either as a small rubbly mound (e.g. Mount Desolation) or as steep cones, more or less dissected (e.g. Mount Emu).

Erosional Forms

Mechanical erosion of the plateaus has been principally by scarp retreat and most of the plateau margins are well defined scarps. Where streams have succeeded in cutting through the resistant cap, particularly where this is basalt, they rapidly cut downwards to form deep gorges. Some of the most spectacular are in the headwaters of the Flinders River and its tributaries north of Hughenden, particularly Galah Gorge (Plate 3, Fig.1) and the gorge of Prairie Creek. Galah Gorge has excellent examples of incised meanders.

The gorges extend laterally by scarp retreat. This has commonly taken place at different rates in different parts of the gorges so that some eventually become window-like, broad valleys in the plateau, with narrow outlets. The best examples are those in which Strath Stewart and Dutton River Homesteads are situated. It is thought that these "windows" reflect original differences in the thickness of basalt cover; that areas with very thin lava flows were easily quarried, resulting in quick lateral erosion, whereas other areas, occupied by several superimposed lava flows, afforded strong resistance to quarrying action. Some of the "windows" may even have originally been low hills which were by-passed by the lava flows, and are now seen in a reversed role.

Although scarp retreat has become dominant within the "windows", downcutting by the streams continues. In consequence the walls retreat as a series of steep slopes, with benches developed at any horizons that are a little more resistant than the average. The resultant topography is of benched scarps and numerous irregular hills set within the "windows".

The topography of the erosional areas marginal to the plateaus is mainly dependant on the lithology of the rocks protected by the resistant cap. Where this is nearly uniform and has little resistance, as in the Wilgunya Formation, scarp retreat is rapid. Outlying erosional residuals of the scarp are left as isolated steep sided mesas and buttes. Two main areas of erosional residuals are present in the area mapped. In the south-west of the Manuka area, the Ayrshire hills represent the last stage of such residuals. They are some of the furthermost outliers of the large duricrust plateau south of Winton, and consist of a maze of buttes with a few mesas. The area of residuals near Hughenden contains numerous large and small mesas. Those south of the railway line are all duricrust-capped (e.g. Mount Walker, Mount Devlin), whereas those north of the railway have basalt caps (The Sentinel, Mount Arthur, Mount Beckford, Mount Agnes, Burraway Hills, Mount Wongalee). A slightly more advanced stage of erosion is shown by hills such as Mount Mowbray, Mount Castor and Mount Pollux; on each of these the resistant duricrust cap has been completely removed and the hills are now suffering rapid denudation.

Where the underlying rocks are resistant, or have resistant beds, scarp retreat is inhibited. Such are the Permian and older crystalline rocks north of Mount Emu Plains Homestead, and the Gilbert River Formation in the headwaters of Cambridge Creek (Plate 3, Fig.2) and the Dutton River. These form areas of very rugged relief, with sparse tree cover and tussocky grass or spinifex. Some of the crystalline hills are more rounded due to the development of a scree cover. These rugged hills, together with the "windows" in the plateau form the dissected hills.

Rolling downs are formed where lateral erosion of plateaus and the outlying mesas is almost complete and the land surface approximates to the new local base level of erosion. The downs are extensive gently undulating grasslands, locally relieved with a few scattered trees on stony rises and with coolibah along braided watercourses. The stony rises commonly mark the site of a completely reduced erosional residual, the only indication being a few remaining pebbles or cobbles of silcrete. Some of the tree covered rises indicate more resistant beds within the Rolling Downs Group, and these are more characteristic of the Mackunda Beds and the Winton Formation than the Wilgunya Formation.

Depositional Forms

Erosion of the Gilbert River and Glendower Formations has released large quantities of sand and some gravel. Most of this has apparently not travelled very far in the area mapped, for a large part has been deposited again as a veneer of unconsolidated sand over several older units and forming an apron round the source area. Deposition took place mainly on a surface of very low relief, and has tended to subdue what little relief there was. The resultant sand plain is mainly extremely flat. In parts of the Richmond area, north of Cambridge Creek, the surface upon which the sand was deposited was more irregular, reflecting incomplete planation of the underlying Gilbert River Formation. Here the sand plain is more undulating, interrupted by scattered rounded and sand-covered hills and sharp rocky outcrops. This topography merges gradually with the dissected hill country to the east. The sand plain is now residual for it is being eroded marginally.

Sand deposits are also common on the plateaus but have not modified the plateau landform appreciably.

The present day rivers are subject to strong seasonal flooding, and where they flow across a senile topography they have formed wide alluvial plains. Most are grassland, commonly with wide bare patches ("clay pans") but with tall gums along the stream channels. The wide alluvial plains in the west of the area are of clay and silt, derived from the Wilgunya Formation and the Mackunda Beds. Alluvial plains in the east are commonly thickly tree covered where sand brought down by the Flinders River is mixed with the finer alluvium.

STRATIGRAPHY

Problems of nomenclature cause trouble in any mapping of the Great Artesian Basin. The most widely used nomenclature at present is that of Whitehouse (1954), in which a laudable attempt was made to define the then existing terms in accordance with the Australian Code of Stratigraphic Nomenclature; many anomalies were removed in so doing. Unfortunately the divisions of the Cretaceous, although called formations, were primarily palaeontological and not really related to lithological differences; they were to a large extent a reflection of Whitehouse's detailed palaeontological work on the marine beds of the Rolling Downs Group. Although the definitions and type areas given (op.cit. p.10) for the Roma, Tambo and Winton Formations are valid and clearly recognisable in the type areas it is difficult to map areas far removed without depending entirely on faunal determinations. Much of the extensive outcrop correlation was apparently on palaeontological evidence, whereas lithological criteria were used as a guide to subsurface correlation. Thus Whitehouse (loc.cit.) noted: "From the Roma to the Winton there is most uniform lithology in outcrop. Although the Tambo is a marine formation and the Winton lacustrine, the gradation between the two is so perfect that I have not found it possible to draw a line of demarcation between them, with any precision, in the field. In bore logs it is not difficult to draw the line between Tambo and Winton by the increase in sandstone members and the incoming of coal seams. But this distinction is not appreciable in outcrops."

When mapping was started on the western margin of the Eromanga Basin by a joint B.M.R. - G.S.Q. field party in 1957 it was felt undesirable to assume continuity, without change, of the Cretaceous units over the large distances from the type areas of the Roma and Tambo Formations and of the Blythesdale Group. A new nomenclature was, therefore, established by Casey (1959) in which the Wilgunya Formation, including the Toolebuc Member, was regarded as a probable correlate of the Roma and Tambo Formations, and the Longsight Sandstone as a probable correlate of at least the upper part of the Blythesdale Group. This nomenclature is now normally used in the western part of the Eromanga Basin. The continuity and definition of the Winton Formation was not then in doubt. It was recognised at the time that further work round the margins of the Eromanga Basin should eventually show the relationship of the Wilgunya Formation to the Roma and Tambo Formations and probably lead to abandonment of the former name; but the Toolebuc Member, as a lithological unit, could only be related by inference to what Whitehouse (1954, p.10) recorded as a coquina at the base of the Tambo Formation.

Subsequent surface mapping in the north-west and north of the Eromanga Basin has been concerned largely with two problems: the Wilgunya/Winton boundary, and variations of lithologies within the Wilgunya Formation. The concept of the Winton Formation (Winton Series of Dunstan, 1916) has always been of a freshwater or lacustrine unit forming the upper part of the Rolling Downs Group (Rolling Downs Formation of Jack, 1886). Identification has been primarily on the occurrence of a terrestrial flora, and of coal, as opposed to a marine fauna in the underlying rocks; only incidentally has reference been made to the presence of arenaceous beds. Both the Wilgunya and Tambo Formations were defined as dominantly argillaceous sequences and containing a marine fauna, and on this basis it was originally assumed that an increase in arenaceous beds was indicative of the Winton Formation.

The Mackunda Beds (Vine, 1963) were mapped in the western part of the Eromanga Basin as a transitional unit between the Winton and Wilgunya Formations. They are lithologically similar to the Winton Formation (with small differences of detail) but contain a marine fauna, commonly in coquinas, and a terrestrial flora. The need for this distinction of a transitional unit, particularly in relation to Whitehouse's work, is because in outcrop the presence of a marine fauna would have been taken as indicative of the Tambo Formation, whereas a driller's log of a water bore would record sandstone beds which would be taken as indicative of the Winton Formation. The 1962 mapping showed that the Mackunda Beds could be mapped as a lithological unit eastwards across the Manuka Sheet.

Mapping in the Richmond area embraced the complete section of the Wilgunya Formation and provided a unique opportunity to relate small lithological variations to the stratigraphic position. Although the Wilgunya Formation consists dominantly of claystone grading to fine siltstone, parts of the sequence contain numerous coarser beds, calcareous beds or glauconitic beds. The interbeds are sufficiently common and sufficiently restricted stratigraphically, yet of wide enough lateral extent to allow subdivision of the Wilgunya Formation into five members, including the Toolebuc Member. Formal definitions of the units, based on the mapping in the Richmond area, and of the Mackunda Beds, are being published by Vine (1963); the lithologies are described in detail in the sections which follow. All stratigraphic names have been approved by the Queensland Stratigraphic Nomenclature Committee.

The sequence from the Wilgunya Formation to the Winton Formation is the lithological and faunal correlate of the Roma, Tambo and Winton sequence as defined by Whitehouse (1954), and is therefore, regarded as comprising the Rolling Downs Group in the western and northern parts of the Eromanga Basin.

Regions of outcrop of the aquifer bearing sequence below the Rolling Downs Group are widely separated with the intervening areas masked by spreads of Cainozoic deposits. North of Roma is the type area of the Blythesdale Group (Whitehouse, 1954 p. 9); the Longsight Sandstone (Casey, 1959) of the Boulia area is a probable correlate of at least part of the Blythesdale Group; and the Gilbert River Formation (Laing & Power, 1959) mapped in the Richmond and Hughenden areas is a continuation of the unit mapped to the north by Reynolds (1960), and regarded as a correlate of part of the Blythesdale Group. This multiplicity of names is justified at the existing state of knowledge of sub-surface conditions between the three regions, particularly as lateral variations are common. It is evident from bores such as Corfield Town (deepened by Magellan Petroleum Corporation as Corfield No. 1) that the arenaceous sequence recorded by water bore drillers below the Wilgunya Formation consists of both Blythesdale Group equivalents and older units. For this reason, in cross-sections on the geological maps the pre-Wilgunya sequence is recorded as undifferentiated Mesozoic; it is recognised, however, that late Palaeozoic rocks may be present; only definite or probable Permian rocks are differentiated in the cross-sections.

Several traverses were made outside the area of the Hughenden Sheet shown as mapped during 1962. Although some additional information was obtained, there are several outstanding problems, mainly in regard to the stratigraphic position and relationships of arenaceous units; this work is to be continued during the 1963 field season. In the sections of the report which follow only brief reference is made to the additional information obtained from these traverses but the problems are stated.

Palaeontological work on the macrofossils collected during 1962 is being carried out by R. Day of the Queensland Geological Survey, but the volume of material to be examined precluded all but a cursory examination of most of the material before the writing of this report. Available reports by Day are included in Appendix A, together with a summary of previous palaeontological work on the area mapped. Other comments by Day are included below in the sections to which they refer. Examination of surface and subsurface material for microfaunas was carried out by Terpstra (1963) and Lloyd (1963); their conclusions are incorporated in the following sections.

All collections are listed serially throughout the Great Artesian Basin with the prefix "GAB"; on the maps this is abbreviated to "G". A summary of the stratigraphy is given in Table 2.

PRECAMBRIAN

Undifferentiated Metamorphics

A group of metamorphics, including metasediments, metamorphosed granite and metamorphosed basic igneous rocks, resulting from moderate to high grade regional metamorphism, was not differentiated during the mapping. Outcrops are restricted to the north-east of the Richmond area and the north of the Hughenden area, where they occur principally as inliers in the bottom of narrow valleys and gorges cut through the basal Mesozoic sediments. Much of this area is rugged and surrounded by rough surfaced basalt plateau; access is, therefore, extremely difficult.

The principal lithologies are quartz-felspar-mica schist and gneiss. Typically the schists are grey, with a well developed schistosity, and contain approximately 30% microcline, 30% oligoclase-andesine, 20% quartz, 10% biotite and 10% muscovite. Epidote and chlorite are common minor minerals, and garnet and zircon are rare accessories. The gneisses are medium to coarse-grained with approximately 25% microcline, 25% oligoclase-andesine, 30% quartz, 10% biotite and 10% muscovite. Epidote and chlorite are minor minerals. A small proportion are porphyroblastic granitic gneisses, with relic igneous textures indicating metamorphism of porphyritic granite and pegmatite.

A few amphibolite bodies, associated with the schists and gneisses, are of similar metamorphic grade and probably represent basic intrusives emplaced before the metamorphism. Typical amphibolite consists of approximately 70% green hornblende, 25% oligoclase-andesine, with minor quartz, epidote and sphene.

Most of the areas could only be examined briefly because of limited time and difficult access so a fully representative collection of material could not be made. The lithologies examined correspond with those described by Turner & Verhoogen (1951, Chap.18) from the amphibolite facies, possibly grading to the greenschist facies. However there is evidence of post-formational modification in that:

a) numerous felspar crystals are corroded, fractured and altered,

b) quartz commonly shows undulatory or shadow extinction,

c) some mica flakes are bent,

d) chlorite commonly appears as an alteration product of, and growth on, biotite.

These features can best be explained by postulating the imposition of stress, possibly accompanied by retrograde metamorphism. This is discussed further below in relation to the Dumbano Granite.

Rhyolite bodies are common within the schists and gneisses, and are concordant with the schistosity or foliation. Their form is suggestive of emplacement before the metamorphism, but the rhyolite does not appear to be recrystallised or altered texturally. It must therefore be regarded as unmetamorphosed, and the occurrence in the form of dykes. They are probably related to the numerous late Palaeozoic rhyolite intrusions and extrusions recorded by White (1961) and possibly to the Permian rhyolite porphyry described below. However they are too small and too intimately mixed with the metamorphics to be mapped separately in the Richmond and Hughenden areas.

Foliation and schistosity of the metamorphics are variable in strike, but in the Cambridge Creek area are mainly between 0° and 45°, dipping between 50° and 60° to the west. Two distinct lineations are present in directions of approximately 315° and 45°. The rocks have small folds plunging steeply to the north-east, and some minor faulting. These trends are in marked contrast to the north-westerly trending belt of metamorphics which forms the Great Dividing Range north-west from Pentland (east of the mapped area), but coincide with the trends of the Einasleigh Metamorphics (White, 1961a) to the north, in the area of the Woolgar Goldfield.

The age of the metamorphics is doubtful. In the Richmond-Hughenden area regional metamorphism had ceased, and the rocks had been exposed to erosion, before deposition of the Permian coal measures which now outcrop at the northern end of Galah Gorge and at Oxley Creek. In the vicinity of the Mount Emu Goldfield, near the upper Flinders River, similar metamorphics are intruded by the Dumbano Granite of Proterozoic(?) age. The grade of metamorphism is comparable or slightly lower than that of the Einasleigh Metamorphics of Archean(?) age, and with similar trends. Northwards the continuation of the body of metamorphics is mapped, by photo interpretation on the Gilberton Sheet, as "Precambrian undifferentiated metamorphics". This term is retained for the present mapping in the absence of good evidence for the age.

Dumbano Granite

The Dumbano Granite was named by White (1959) from outcrops near Reedy Springs Homestead in the Clarke River Sheet area to the north. Only a small part of the Dumbano Granite, forming its southern margin, occurs in the area mapped during 1962. Outcrops extend over an area of approximately 100 square miles in the Hughenden area from near Pretty Plains Homestead east to the Flinders River. Further parts of the granite to the south are concealed by the Sturgeon Basalt.

Typically it is a grey, medium grained, holocrystalline alkali granite, composed of approximately 40% orthoclase, 25% oligoclase (some showing zoning), 20% quartz, 10% biotite and 5% epidote. Chlorite is a minor mineral, usually associated with the epidote.

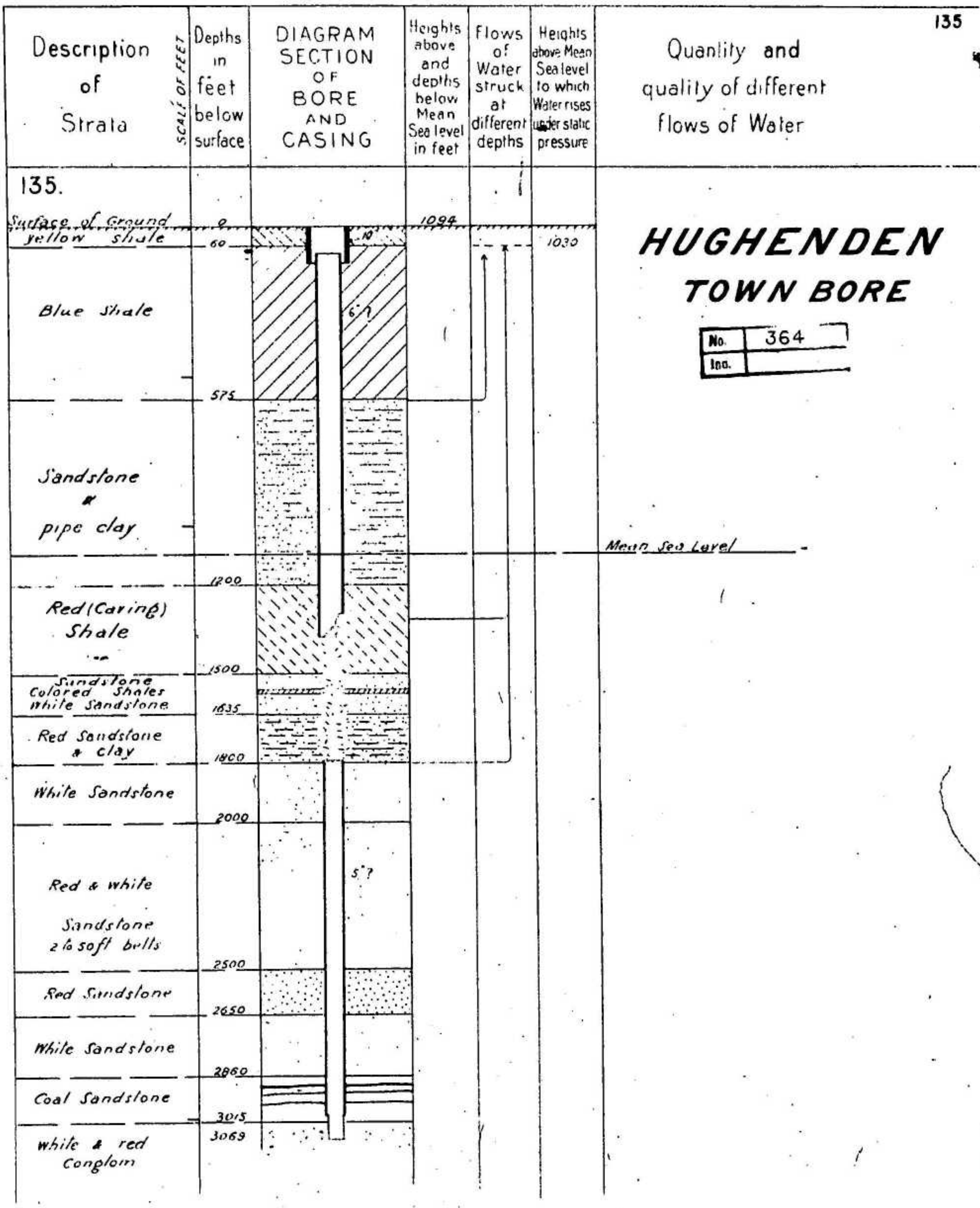
Variations of the granite are numerous. Grain size varies from fine to coarse, and the lithology varies from the dominant alkali granite to granodiorite. Pegmatites are also associated with the granite.

The contacts of the granite were nowhere seen, but south of the workings on the Mount Emu Goldfield xenoliths of schist are common, apparently incorporated from the undifferentiated Precambrian metamorphics. The presence of epidote with associated chlorite is also suggestive of incomplete assimilation of metamorphics.

Radioactive dating, by the potassium-argon method, of a sample of the Dumbano Granite from near Reedy Springs was carried out by J. Richards of the Australian National University, and gave an age of 390 million years i.e. Lower Devonian age. However D.A. White of the B.M.R. (pers.comm.) considers the age is not in accordance with field relationships and probably indicates a later deformation of the granite. This is further suggested by granite which is strongly foliated (strike 35°) near Saunders Creek and from samples which in thin section show:

(a) strained quartz crystals in both granite and its associated pegmatite,
(b) distorted mica flakes.

In the present mapping the Dumbano granite is assigned to the late Precambrian as for areas to the north. A sample of the granite was collected from the Hughenden area for age determination, but was found to be too weathered.



Graphic log of the abandoned Hughenden No.1 Town Bore (Reg.No.364).
Reproduced from the records of the Queensland Irrigation and
Water Supply Commission.

To accompany Records 1963/75

TABLE 2. SUMMARY OF STRATIGRAPHY

Age	Rock Unit	Lithology	Thickness	Fossils & Correlation
QUATERNARY	Alluvium and soil (Qa)	Sand along Flinders River, Dutton River, Cambridge Creek and larger tributaries; clay and silt in west of Richmond area and in Manuka area.	Superficial	
	(Qs)	Sand in relic sand dunes	Superficial	
CAINOZOIC (undifferentiated)	(Czs)	Sand, gravel and clay, forming a veneer on older units in an apron round the main outcrop area of the Gilbert River Formation.	Superficial	
	Sturgeon Basalt (Czm) Chudleigh Basalt (Czc) Unnamed Basalt (Czy)	Porphyritic olivine basalt	0 - 150' +	
	Duricrust (Czd)	Laterite, silcrete.	Superficial	
TERTIARY	Glendower Formation (Tg)	Illsorted, pebbly, argillaceous sandstone, sandy siltstone, sandy claystone, pebble and cobble conglomerate.	0 - 200'	
		U N C O N F O R M I T Y		
LOWER TO UPPER CRETACEOUS.	Winton Formation (Kw)	Thick bedded to massive, fine to very fine grained, feldspathic, lithic sandstone, calcareous sandstone, and sandy limestone, lithic siltstone, claystone; some thin coal recorded in drillers' logs.	1000' (top eroded)	Indeterminate plant and wood fragments.
LOWER CRETACEOUS	Mackunda Beds (Klm)	Very fine grained, feldspathic, lithic sandstone, calcareous sandstone and sandy limestone, lithic siltstone, claystone; dominantly thin to medium bedded.	500' - 700' thickening eastwards.	Pelecypods, gastropods, belemnites, ammonites, fish scales and teeth, starfish, wood and plant fragments, forams. Fauna has Tambo (Albian) affinities.
	Wilgunya Formation (Klw): Allaru Member (Kla)	Blue and grey claystone, silty limestone, cone-in-cone limestone, lithic siltstone.	700' possibly thickening westwards.	Pelecypods, ammonites, nautiloids, turtles, forams. Fauna has Tambo (Albian) affinities.
	Wilgunya Formation (Klw): Toolebuc Member (Klo)	White, grey and pink limestone, coquinite, light grey calcareous shale.	30' - 40'	Pelecypods, ammonites, nautiloids, belemnites, gastropods, dragonflies, vertebrates, radiolaria, forams, wood fragments. Fauna has Tambo (Albian) affinities.
	Wilgunya Formation (Klw): Ranmoor Member (Klq)	Blue-grey to dark grey and black claystone, carbonaceous claystone; some calcareous siltstone.	200'	Pelecypods, ammonites (few fossils), forams. Fauna has Tambo (Albian) affinities, but has only been collected from upper part of member.
	Wilgunya Formation (Klw): Jones Valley Member (Klj)	Khaki siltstone, calcareous siltstone, silty limestone.	25'	Pelecypods, belemnites, gastropods, crinoids. Fauna not diagnostic, but probably has Roma (Aptian) affinities.
	Wilgunya Formation (Klw): Doncaster Member (Kld)	Blue-grey claystone, glauconitic claystone to siltstone, silty limestone; sandstone interbeds at base.	250' - 350' in north 450' - 550' in south.	Pelecypods, ammonites, gastropods, belemnites, vertebrates, algae, wood, forams. Fauna has Roma (Aptian) affinities.

TABLE 2 (Contd.)

Age	Rock Unit		Lithology	Thickness	Fossils & Correlation	
UPPER JURASSIC to LOWER CRETACEOUS	Gilbert River Formation (Klg)	Member 5	Fine to coarse grained sandstone, pebbly in part; lenticular pebble conglomerate; medium bedded to massive.	160' + (full section not seen)	None found.	Blythesdale Group
		Member 4	Fine grained micaceous sandstone grading to micaceous coarse siltstone; minor medium grained sandstone; intraformational conglomerate of mud pebbles. Thin bedded.	160' thinning eastwards.	None found; some worm(?) tubes.	
		Member 3	Very fine to medium grained sandstone, some coarse grained sandstone; medium bedded to massive and torrentially cross-bedded; middle part of member is argillaceous sandstone and micaceous siltstone but lensing.	200' possibly thinning eastwards.	Wood fragments.	
		Member 2	Fine grained, slightly micaceous sandstone, with a few very coarse and pebbly bands; medium bedded to massive, and strongly cross-bedded.	60'	None found.	
		Member 1	Basal conglomerate; argillaceous sandstone grading to sandy claystone.	30' - 100' very variable.	None found.	
	D i s c o n f o r m i t y (?)					
TRIASSIC(?) to MIDDLE(?) JURASSIC.	R - J		Fine to medium grained sandstone (Jurassic) overlying disconformably fine to coarse grained sandstone with intercalations of red shale and green siltstone (Triassic(?) in Corfield Town Bore. Fine to coarse grained and pebbly sandstone, with thin interbeds of red shale or siltstone.	675' (J) 540' (R) (in Corfield Town Bore)	Microspores in Jurassic sequence only.	
PERMIAN	Unnamed sediments(P)		Coarse sandstone, with interbeds of coal and grey shale.	388' (in Corfield Town Bore)	Betts Creek "Series" of Reid (1916)	
	Rhyolite Porphyry (Pr)		Porphyritic rhyolite	60' (?)	Permian acid intrusives into Georgetown Inlier.	
PRECAMBRIAN	Dumbano Granite		Alkali granite, grading to granodiorite			
	Undifferentiated metamorphics		Schist, gneiss, granitic gneiss, amphibolite, rhyolite.		Metamorphics may be continuation of Archaean Einasleigh Metamorphics. Rhyolite probably in dykes, may be Permian.	

PRE-PERMIAN

Corfield Town Bore (deepened as Magellan Corfield No. 1) intersected granite below Permian sediments at a depth of 4488 feet and bottomed in it at 4507 feet. Evans (1962) referred to it as a coarse crystalline granite but noted that no detailed petrological work had been done on the bottom hole core. Samples of the granite received by the Bureau of Mineral Resources are not suitable for age determination by radiometric methods.

Granite was also recorded at a depth of 3100 feet by the driller of Narollah Homestead Bore (Reg. No. 4375), 14 miles west-north-west of Corfield, and there is no reason to doubt the identification. Probable basement is not recorded in the drillers' logs of any other bores in that area.

On the available evidence these granites can only be dated as pre-Permian. They may be related to the Precambrian granites of either the Georgetown Inlier (White, 1961) or the Precambrian mineral belt of north-west Queensland (Carter, Brooks, & Walker, 1961); it is also possible that they are related to the Silurian/Devonian granite of the Longreach area (Cleeve No. 1 well).

PERMIAN

Rhyolite Porphyry

In the north of the Hughenden area is a small body of strongly jointed rhyolite porphyry which is one of the southern exposures of numerous late Palaeozoic acid intrusions and volcanics. Within the area mapped outcrops are mainly confined to an area of about 20 square miles north of Camden Homestead. There are also isolated outcrops, too small to be mapped, near Pretty Plains Homestead and Mount King. The rock weathers along joints to produce low but rugged hills with sparse grass and tree cover.

Typically the rock is pink to grey, porphyritic rhyolite, with phenocrysts of quartz and feldspar (orthoclase and plagioclase) approximately 1 mm in diameter, comprising 20% of the rock. The groundmass is microcrystalline, consisting mainly of quartz and felspar (microcline, orthoclase and plagioclase), with minor myrmekite and accessory biotite. Outcrops near Pretty Plains and Mount King are dominantly rhyolites with only a few quartz phenocrysts.

In outcrop the rhyolite porphyry is characterised by strong vertical columnar jointing, resulting from the intersections of three joint systems. Some flow structure is present. The main body appears to be a flow about 60 feet thick over the Dumbano Granite. The rhyolites near Pretty Plains and Mount King are intrusive, and White (1962b) describes rhyolites and related porphyries of the Clarke River area as dominantly intrusive. In the section on Precambrian undifferentiated metamorphics reference is also made to rhyolite intrusions in those rocks. These may also be related to the rhyolites described here.

From stratigraphic relationships White (loc.cit.) regards the Clarke River rhyolitic rocks as Permian and possibly Triassic in age. In the Hughenden area the rhyolite porphyry is divorced from areas of Permian or later sedimentation, and there are no volcanic rocks interbedded with the sediments. On the other hand, whereas rhyolite intrusions which are probably related to the porphyry, are seen cutting Precambrian undifferentiated metamorphics, no rhyolite dykes have been seen cutting any of the sediments. The rhyolites are, therefore, probably no younger than late Permian; for the present mapping they are regarded as Permian in age.

Sediments (Un-named)

Within the area mapped there is only sub-surface evidence of Permian sediments. From the interval 4100-4488 feet in Corfield Town Bore, Evans (1962) identified Permian microspores from a sequence of coarse, angular sandstone, with interbeds of coal and minor amounts of grey shale. In the water bore driller's log of the abandoned Hughenden No. 1 Town Bore (Plate 4), coal and sandstone is recorded between 2860 and 3015 feet, overlying white and red conglomerate which continues to total depth of 3069 feet. By analogy with *Glossopteris*-bearing coal measures farther east (Betts Creek Series of Reid 1916) this sequence is regarded as of Permian age.

Outcrops of Permian rocks were visited in two places east of the area mapped. At the northern end of Galah Gorge is a sequence of grey shale, carbonaceous shale, sandstone, conglomerate and coal. Plant fossils, including several species of *Glossopteris* of Permian age (White, 1963), were collected from different parts of the sequence. The Permian rocks are folded into an anticline plunging steeply to the east, and which was partly eroded before younger arenites were deposited. Three problems require further work in this area:

(a) the extent of the Permian rocks,

(b) the amount eroded before the deposition of the younger arenites,

(c) the stratigraphic position of the younger arenite sequence; it may be part of the Gilbert River Formation, or may be an older arenitic sequence, possibly the same as that forming the White Mountains to the east which is Triassic(?) or Jurassic(?).

Detailed prospecting for coal, including the sinking of a test shaft, was carried out by Mount Isa Mines Ltd in an area of outcropping and partly concealed Permian rocks near the junction of Oxley and White Mountain Creeks (Hall & Morton, 1946). Reid (1918) reported an estimated thickness of 1300 feet of Permian sediments consisting of sandstone, carbonaceous shale, conglomerate and coal. The Permian sediments are overlain disconformably or unconformably by the unfossiliferous sandstone sequence of the White Mountains (Triassic or Jurassic).

TRIASSIC - MIDDLE(?) JURASSIC

Triassic and Jurassic rocks, older than the Gilbert River Formation, lack formal definition and nomenclature in the area. The only established occurrences are in Corfield Town Bore (Magellan No. 1 Well) from which Evans (1962), on palynological evidence, reported Lower to Middle (?) Jurassic in the interval 2885 to 3560 feet and, on stratigraphic evidence, Triassic in the interval 3560 to 4100 feet.

The Triassic rocks were reported as angular, fine to coarse-grained quartz sandstone, with intercalations of dark red soft shale and green siltstone. No micro-fossils were found in the unit, but Evans assigned the unit to the Triassic on the grounds of:

(a) the presence of red beds, which allows comparisons with dated sequences in wells in the Bowen and Surat Basins, and with S.P.L. No. 1 (Birkhead) Well in the Eromanga Basin;

(b) its position between very late Permian rocks and Lower (but not necessarily basal) Jurassic rocks.

The Lower to Middle (?) Jurassic rocks in Corfield Town Bore were reported by Evans (loc.cit.) as very fine to medium grained, friable quartz sandstone and tuffaceous sandstone, with common carbonaceous shale and coaly intercalations below 3300 feet. The unit was dated by microfloras, and regarded as a probable correlate of the Bundamba Group, and perhaps the Hutton Sandstone, of the Roma area.

Rocks, interpreted as probably of Triassic age are recorded in the driller's log of the abandoned Hughenden No. 1 Town Bore (Reg. No. 364) in the interval 1200 to 2860 feet (Plate 4). They underlie the Gilbert River Formation and overlie the coal bearing sequence of probable late Permian age. The main basis of the interpretation of a Triassic age, admittedly extremely tenuous, is the occurrence of red beds in the sequence. Evans (pers.comm.) has noted from numerous stratigraphic wells throughout the Eromanga, Surat and Bowen Basin that red rocks are characteristic of sequences of Triassic age but uncommon in later sequences.

East of the area mapped, in the White Mountains, are quartz sandstones, varying from fine grained to coarse grained and pebbly, and containing a few interbeds of red shale or siltstone. The sequence overlies the Permian rocks of the Oxley Creek coal prospect unconformably (Reid, 1918 p.5), but the relationship with the Gilbert River Formation is unknown; this will be investigated during the 1963 mapping. Outcrops of the sequence within the area mapped during 1962 are confined to the extreme south-east of the Hughenden area, where they occur as an inlier within Tertiary and later sediments. The dominant lithology is pure white, fine to coarse grained, lithic sandstone with scattered pebble bands; medium bedded to massive, with some thin beds. Thin section examination (Bastian, 1963) shows that the sandstone is moderately sorted and made up of approximately equal proportions of angular to sub-angular quartz and lithic fragments. The lithic fragments are crushed quartzose rock with minor kaolinite and hydro-muscovite. Minor lithologies comprise pink, white, brown or chocolate, fine to very fine grained, micaceous lithic sandstone and siltstone. In a section 200 feet thick measured near Spotted Gum Creek these minor lithologies only totalled 13 feet.

No fossils have yet been found in this sequence. Reid (1918) regarded it as Jurassic in age, and part of the "Walloon Series", which at that time included the sandstone sequence now separated as the Blythesdale Group. Whitehouse (1954, p.7) referred the sequence to the Bundamba Group which he regarded as Triassic. Until more is known about the sequence, and its relation to the Gilbert River Formation no definite age can be postulated. In the present mapping it is shown for convenience as **R-J**

UPPER JURASSIC TO LOWER CRETACEOUS

Gilbert River Formation.

The Gilbert River Formation was named by Laing and Power (1959) from outcrops of interbedded conglomerate, grit, sandstone and siltstone along the Gilbert River near Croydon. The thickness of the formation measured there is 110 feet. The formation contains marine and plant fossils, but marine fossils have only been found near the top of the formation around Croydon (Whitehouse, 1954) and near Georgetown (Reynolds, 1960). All are of Lower Aptian age. The Gilbert River Formation is thought to be a correlate of the Wrotham Park Sandstone further north. Outcrops in the area mapped were originally regarded by Whitehouse as part of the Blythesdale Group of the Roma area.

Gilbert River Formation outcrops across the northern parts of the mapped area eastwards from about 143°15' E. The best exposures are on the deeply dissected margin of the Gilberton Plateau, in the valleys of Cambridge Creek, Dutton River and their tributaries. In the 600 feet deep gorge of Cambridge Creek practically the whole of the formation is exposed overlying lateritized crystalline basement. North and north-east of Stawelton, relics of the plateau stand out as prominent mesas and buttes. Westward there are fairly common outcrops in sandy country almost to the Woolgar River. Elsewhere, in the Hughenden area, basalt covers most of the old Gilbert River topography, but there are inliers in gorges cut through the basalt, notably Galah Gorge on Porcupine Creek.

PLATE 5

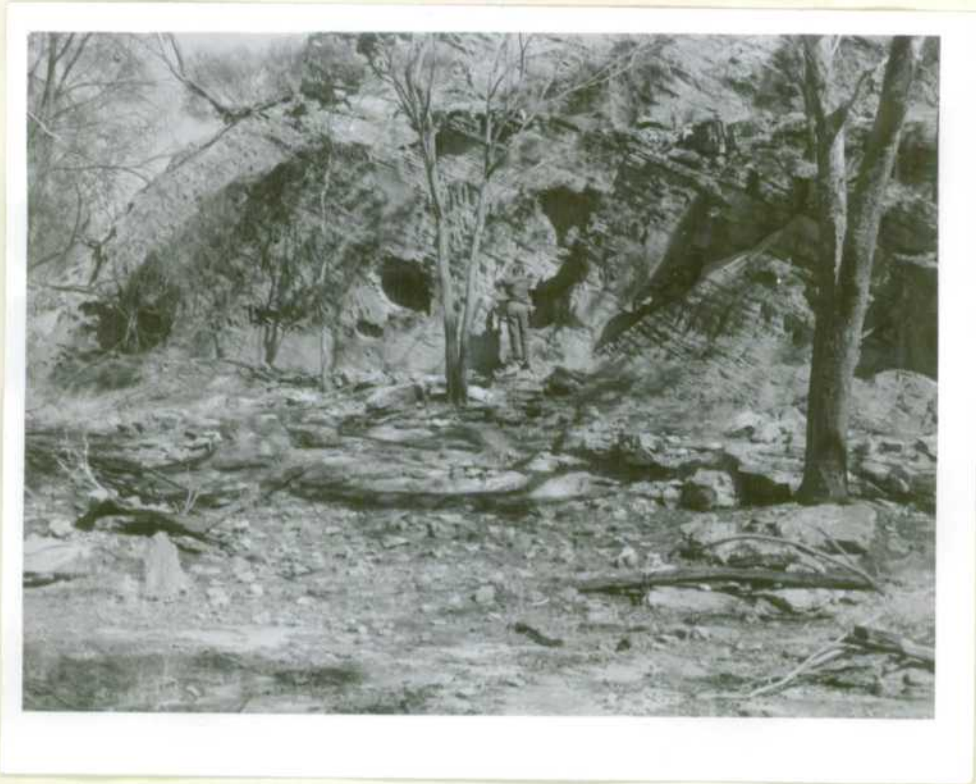


Fig. 1. Cliff of Member 2 on Cambridge Creek, ten miles east of Stawelton Homestead, showing foresets on massive cross-bed. View looking east.

BMR Neg. M/250

Fig. 2. Upper bench of Member 3 in Section X3, showing rough and honeycomb outcrop.

BMR Neg. M/250.

Topographically the unit contrasts strikingly with the Rolling Downs Group. It is composed of beds of widely varying resistance, producing prominent benches and terraces on the flanks of gorges and hills. Its sandstones break down into sand which has in the past contributed largely to the Tertiary Glendower Formation and, more recently, to unconsolidated sand and gravel that stretch westwards over the Wilgunya Formation. The outlying mesas project abruptly from the midst of these sand plains. Trees are common on the sandy and amply jointed Gilbert River Formation, and only lacking on steep slopes. One exception to this is a terrace-forming member (Member 4) of the unit which is virtually treeless, due probably to a much smaller joint system. Spinifex grows where trees are absent.

Gilbert River Formation is a composite unit made up of many different sandstone types. Its beds can be followed continuously on the ground and in air photos around any one outcrop area, and important ones could be mapped. They fall broadly into five members, each of which is characterised by prominence of one or other lithology.

Member 1:

The lowest member was seen only in the vicinity of section X3 (Plate 6) in the gorge of Cambridge Creek 19 miles east of Stawelton Homestead. Above a 9' basal pebble and cobble conglomerate, derived from adjacent Precambrian metamorphics, it consists of massive beds of friable white and cream argillaceous sandstone, ranging from fine to very coarse and pebbly, grading upwards to white sandy claystone. Member 1 is weak, and forms receding slopes with some beds eroding to small earth pillars. It is developed on a surface of lateritized Precambrian rocks with strong relief; in section X3 it is 104 feet thick, but less than 200 yards to the north the thickness is only 30 feet.

Member 2:

The second member is characteristically a strong cliff-forming unit. The lithology is white, brown-weathering, fine-grained sandstone, slightly micaceous, and with a few very coarse and pebbly bands. It is medium bedded to massive and strongly cross-bedded (Plate 5, fig.1). Directions of foresets in the Cambridge Creek area indicate rather variable currents but dominantly from north-west. Jointing is also variable and widely spaced, and approximates to the direction of foresets. In the measured sections the complete thickness was only exposed in X3, where it is 60 feet thick.

Member 3:

The middle member has more variable lithology than the others, but generally develops two fairly strong benches characterised by very rough outcrops, with honeycomb weathering, and a tendency to outcrop as walls due to a strong unidirectional joint system (Plate 7, fig. 1). On air photos the upper bench appears to be thicker and much more consistent than the lower one, which cannot be traced in some areas east of Cambridge Creek. In section X3 the member is 204 feet thick. In section X1, thirteen miles to the north-west, its base is not seen, but at least 175 feet is present. In section X5, on Pine Tree Creek 25½ miles east-north-east of X3, the lower bench is missing and the upper bench alone forms a strong cliff. The total thickness of 124 feet measured in that section is entirely in this member. Photo interpretation shows that Member 2 is immediately below the base of X5. The measured thickness of 124' in X5 represents practically the whole of Member 3 which is, therefore, thinning in this direction.

The two main benches are composed of very fine to medium grained quartz sandstone, white to cream, weathering brown and red, fairly well sorted, and angular to sub-rounded. There is some coarse-grained sandstone, with a few pebble bands and micaceous laminae. Quartz grains show strain and are commonly composite, indicating derivation from metamorphics. The sandstones are medium bedded to massive, and torrentially cross-bedded. Directions of foresets

SECTIONS IN THE GILBERT RIVER FORMATION

Bureau of Mineral Resources, Geology and Geophysics. May 1963 To accompany Record No 1963/75

F 54/4/1 JK

indicate very consistent currents to the east in both benches, with minor swings to north-east and north (Plate 6). Jointing in every outcrop seen is parallel to the average direction of foresets, and is evidently controlled by the cross-bedding. The consistency of this jointing, as regards spacing, straightness and vertical extent, increases with the consistency of the cross-bedding directions.

The interval between these benches consists, in X3, of many repeated interbeds of argillaceous white sandstone with abundant ferruginised red mud pebbles; very thin-bedded and platy, fine-grained silty sandstone, and laminated, fissile, micaceous siltstone, with numerous ferruginous concretions. The whole interval makes up a fairly weak, recessive terrace. In sections X1 and X2 to the north-west, this interval is more uniform, consisting of very fine to fine-grained white to cream argillaceous sandstone, medium bedded to massive and cross-bedded. This lithology probably lenses out or breaks down into individual beds within the finer lithologies which dominate the interval to the south-east. In X1 there are several lensing thin beds of ripple-marked, chocolate, micaceous siltstone and shale, which suggest a possible source for the mud pebbles in the beds on Cambridge Creek. Within the unit beds show an upward grading from the sands to finest clay and so indicate conditions of standstill between floods. They also show that the waters carried strongly oxidized red silt and mud and were capable of depositing red beds, even though the bulk of their load, being sandy, was naturally not coloured in this way. The source of this red material was probably lateritized older rocks, similar to those underlying X3.

Member 4:

Member 4 is the most distinctive in lithology and topographic expression. It forms broad receding terraces with a treeless spinifex cover which contrasts with the fairly thick timber on outcrops above and below. Slopes are generally littered with a talus of plates and flags of very fine-grained sandstone. The thickness is 125' on section X3, and 157' on X2, 14 miles to the west-north-west. It is missing altogether from X5 to the east, and air photo interpretation suggests a rapid lensing out of this member about twelve miles east of Cambridge Creek.

The member consists of white or cream, very fine-grained micaceous sandstone grading to coarse siltstone, with minor medium-grained sandstone. It is thin-bedded to platy in most parts, but develops some thicker beds which form minor benches. The rock is very well sorted, quartzose, with only micas and accessories, but contains bands of flattened mud pebbles and numerous ferruginous concretions. Thin-section examination shows that the rock has considerable quartz cement with pressure solution of grain contacts, and is very tight. Throughout there is a well developed small-scale cross-bedding with very irregular foreset directions. No consistent current direction was obtained from any single cross-set. At one locality - a waterfall undercut 5½ miles north of New Camoola Bore on Dutton River Station, several beds are made up of oscillation ripple marks of large amplitude and wave-length, which in section would give the appearance of cross-bedding such as seen here. This suggests that Member 4 was mostly underwater during its period of deposition.

The highest bench is generally stronger than the others and contains beds of pipe-rock sandstone with abundant vertical worm? pipes. This bench is 115' above the base of the member in the Cambridge Creek section and 102' up in the X2 section. Reynolds (1960) records two pipe-rock beds 25 and 55 feet from the top of the section in fine-grained and thin-bedded sandstones on Brennan's Knob 35 miles north of Esmeralda (about 140 miles north-west of Cambridge Creek). Again at Newcastle Range (about 100 miles north of Cambridge Creek), there are tubular ?burrows 10 feet from the top of a measured section, about 80 to 90 feet above a granite basement.

PLATE 7.

Fig. 1. Gilbert River Formation 10 miles north-east of Stawelton, showing wall-like outcrops of Member 3 as developed in beds with consistent currents from west. BMR Neg. G/5589.

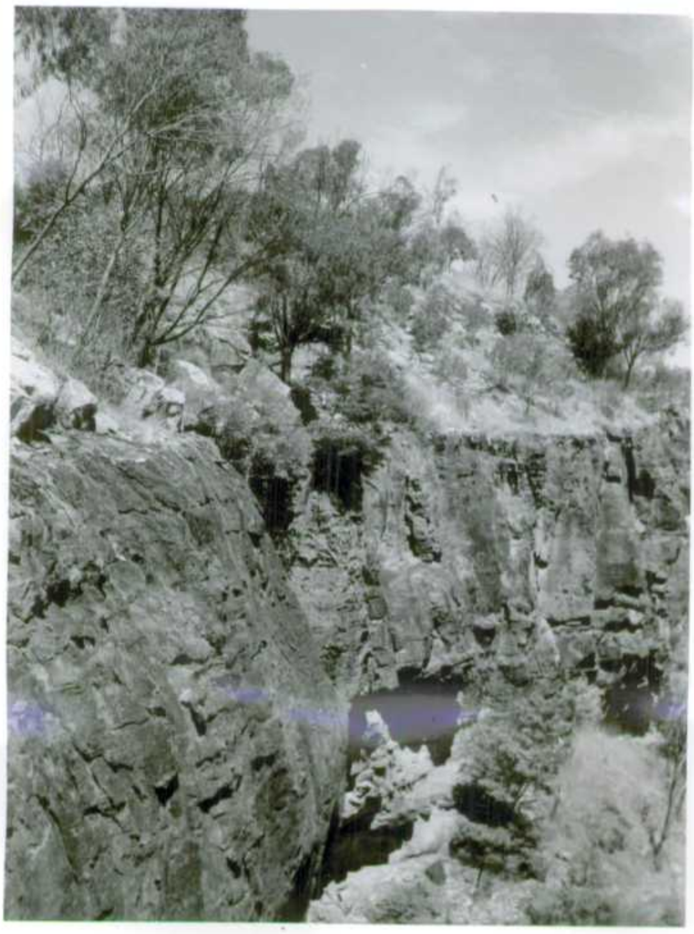


Fig. 2. Top bed of Gilbert River Formation on Prairie Gorge. Immediately above the cliff are the first intercalations of claystone of the Wilgunya Formation. BMR Neg. M/250.

Member 5:

The top member of Gilbert River Formation is a reversion to lithologies seen in lower members, and forms a number of strong sandstone benches above the slopes of the previous member. The main lithology is a white and cream, brown weathering, fine to coarse grained sandstone, with scattered pebbles, and with one or several lenticular bands of pebble-conglomerate near the base. The sandstone is moderately sorted, angular to subrounded, medium bedded to massive and with strong cross-bedding showing variable current directions but mainly from south (Plate 6). Jointing is irregular in direction and the rock weathers into rough and honeycombed surfaces with wind worn undercuts. In the sections, notably X4, 15 miles south-south-east of X3, and less markedly in X2 and X3, there is a basal bench (26' thick in X4) separated from the main portion of the member by a terrace of friable rock. This bench varies on air photos and cannot be recognised in other places, suggesting that it is lenticular. In X4 the terrace is a white argillaceous fine to coarse sandstone, and in X3 it is a ferruginised very fine-grained micaceous sandstone more suggestive of the member below. The top 12' in section X4 contains moulds of disintegrated wood fragments, and is thinner bedded than lower benches. At Prairie Gorge, and in the Flinders River and nearby valleys in the Hughenden area, the junction of the Gilbert River and Wilgunya Formations is exposed. At these localities the top of the Gilbert River Formation is a strong cliff-forming medium to coarse pebbly sandstone, cream to white, thick bedded to massive and with strong large-scale cross-bedding (Plate 7). It is not known yet whether this top bed, roughly 40 to 60 miles south-east of the measured sections can be correlated lithologically with Member 5. In appearance it is noticeably thicker bedded, and could conceivably belong to lower members, with higher parts not developed.

Member 5 is 164' thick in section X4 where the top is lateritized, but the top of the member is not reached. This is the most complete section of the member. Elsewhere only small thicknesses of the lower part of the member were measured. In section X5, the highest cliff there appears from air-photos to represent a combination of the higher bench of Member 3 with the top Member 5; the very fine micaceous sandstones of Member 4 having lensed out altogether between Cambridge Creek and this locality.

The argillaceous fraction of the sandstones that form the main benches appears like grains of kaolinised feldspar in hand-specimens, and many of the field descriptions included arkoses. This material is largely made up of fine intergrowths of crushed quartz, with lesser muscovite and hydromuscovite, and occasionally kaolinite (Bastian 1963). Such a lithology is seen in mylonitized zones from metamorphics of the nearby Precambrian basement, and while it is not established that all or much of the material originated in this way, certainly none is kaolinised feldspars. This lithic material is very weak, and many of the grains are crushed out to form a matrix amongst neighbouring quartz grains; it is apparent that it could not survive long periods of transport. An abundance of acid metamorphics in the source areas of Gilbert River Formation is suggested, and the best possible rock types to supply the metamorphic quartz and crushed material would appear to be mylonitized acid rocks.

From the measured sections the Gilbert River Formation has a composite thickness of approximately 650 feet. Drillers' logs of water bores throughout the area are insufficiently detailed to identify the base of the unit. However some record a zone generally lacking in aquifers, containing thin red beds (described as "red marl") or a few beds of "coal". All the bores in the Richmond and Manuka areas which entered this zone record thicknesses of sandstone above the zone which are comparable with or greater than the measured thickness of the Gilbert River Formation. "Red (caving) shale" is also recorded in the log of the abandoned Hughenden No. 1 Town Bore (Plate 4) after passing through 625 feet of "sandstone and pipe clay".

This zone may thus be tentatively put below the base of the Gilbert River Formation. Most of the thicknesses to the zone are greater than the measured thickness of the formation and increase irregularly from north to south. Corfield Town Bore (Reg. No. 14125) entered probable Triassic rocks containing red shales only after passing through at least 675 feet of Lower to Middle(?) Jurassic beds (Evans, 1962) below 510 feet of Gilbert River Formation. It is suggested therefore, that the red rocks elsewhere are probably Triassic and may not directly underlie Gilbert River Formation, except perhaps in the northern part of the area. Evidently an increasing thickness of Jurassic is present in the south. No other evidence can be gleaned from the drillers' logs to give the true thickness of the formation.

Whitehouse (1954) placed rocks which are now mapped as Gilbert River Formation, in the Blythesdale Group, for which he had suggested an age of Upper Jurassic to Lower Cretaceous, on the basis of marine fossils found in the "Transition Beds" at the top of the Group. Laing and Power (1959) gave an age of Lower Cretaceous (Lower Aptian) for the Gilbert River Formation, but again this was based on fossils from the top of the unit. Marine fossils collected later near Georgetown, which had a Roma-type fauna (Dickins, 1960), also came from the top of the unit.

The only evidence of marine fossils in the Gilbert River Formation in areas mapped during 1962 were poor casts from beds transitional to the Wilgunya Formation, near Valley Bore (Reg. No. 4935) of Wongalee. Day (pers.comm. in field) thought them comparable with the pelecypod Thracia. The casts were too poor to justify collecting. M.E. White (1963) found that a plant, Cladophlebis australis (Morr), collected from the top of the unit at a waterhole known locally as "The Rockies", on Flinders River 12 miles upstream from Glendower Homestead, was in keeping with a Lower Cretaceous age. Plant fragments (GAB 1033) collected at Galah Gorge about 10 miles north of Wongalee Homestead, from the upper half of the unit, suggested an age of Jurassic or Lower Cretaceous.

All these fossils have given an age only to a high part of the unit, and as over 500 feet of section is seen below that part in some areas it is likely to range into the Jurassic as suggested.

It is possible that there is a hiatus within the Gilbert River Formation. Member 5 is considerably coarser than Member 4, has a sharp contact with it, and appears to overlap it eastwards. Whether this represents thinning of Member 4, or erosion, remains to be proved. If such a hiatus exists it is highly likely that the lower parts of the unit, as now defined, are Jurassic in age.

Cross-bedding directions in the Gilbert River Formation can be used to suggest possible sources for the sediments. The directions indicate currents coming from directions varying between north-westerly and southerly, but with the strongest and most consistent from the west. Plate 6 shows the variations, related to the divisions of the Gilbert River Formation. In the area mapped the Gilbert River Formation is almost exclusively a terrestrial deposit. The combination of terrestrial deposits with consistency of current direction from the west, particularly in Member 3, indicates that the source area for this part of the unit must also have been in the west. This is because terrestrial sedimentation directions are not affected by modifying or dispersive currents, as in a sea, and thus sediment tongues tend to stretch fairly directly out from their source areas.

S. Skwarko (B.M.R) (pers.comm.) suggests an age of Aptian and possibly down to Neocomian, for the oldest Cretaceous sediments of the Mount Isa area, based on their lithological correlation with dated sediments in the Northern Territory. On this evidence and the probability that Gilbert River Formation extends down into the Jurassic, it is likely that the Mount Isa area was exposed at the time when lower parts of the unit were laid down.

However the actual belt now exposed appears to have too wide a variety of rock-types in addition to quartz-rich rocks (all described in Carter, Brooks and Walker, 1961) to offer a source. It is suggested that a more quartz-rich area not now exposed may have contributed the sediment. Possible areas are south-east of the Mount Isa area or even east of it towards Julia Creek. Longsight Sandstone outcropping in that area is thought to be a correlate of the Gilbert River Formation, but deposition there may have only commenced late in the history of the unit. Considerable thinning of Longsight Sandstone over the St. Elmo Structure was noted by Vine & Jauncey (1962), suggesting that here was tectonic land probably until Aptian times, and thus could be a source area for most of the period of deposition of the Gilbert River Formation.

Reynolds (1960) notes a rapid thinning northwards of Gilbert River Formation in the Gilberton Plateau. Lithologies in measured sections there suggest that the thinning is due to a progressive loss of lower parts of the section, plus appreciable thinning in beds that persist. This indicates an onlap over an appreciable slope of pre-Mesozoic rocks in the area. The lowest part of the unit in Richmond area gave its most consistent currents from north-west, so evidently the pre-Mesozoic rocks in this area were exposed and being actively eroded early in Gilbert River time, then were overrun by sediments of Member 3 derived from higher ground to west and south-west. Reynolds also notes a marked thinning of the unit southwards from the north of Gilberton Sheet to the vicinity of a roughly east-west fault near the Woolgar River. South of this line air photos show the rapid thickening to the south over the Gilberton Plateau mentioned above. It would seem that one of the main topographic features of the time was associated with that fault.

No direct evidence is available for possible sources of the well sorted and mature quartz sand and silt of Member 4. It is obvious that transport was much longer than in the lower members and probably was caused by burial of the close western source postulated for them. Furthermore the small-scale cross-bedding and beds of pipe-rocks suggest that a shallow marine incursion may have taken place at this time.

A northwards current direction is postulated for Member 5 from measurement of foreset dips. Marine faunas are present in the higher Gilbert River beds at Croydon further north in the Carpentaria Basin, but terrestrial conditions are indicated by plant fossils found 20 feet from the top of the unit at the "Rockies" on the Flinders River. Thus the regional slope was to the north, consistent with the current directions recorded. No suggestions can be offered as to the source area for the sediments of this member.

LOWER CRETACEOUS

Wilgunya Formation.

Doncaster Member:

Doncaster Member (defined Vine, 1963) is the lowest member of the Wilgunya Formation. It is named from Doncaster Homestead, which is 28 miles north-north-east of Richmond, at 20°23' S, 143°23'E. The type area is along the main Richmond-Stawelton road within Doncaster Station. There it is seen as low rolling downs of clay soils, with scattered outcrops of silty glauconitic claystone and floaters of limestone, and brecciated limestone with fossil beds.

The unit is distributed in a belt trending roughly east-south-east across the central part of the Richmond area, extending from Bald Hills Homestead, through Doncaster and Sherwood Downs Stations to the western part of Gilgunyah Station. There are further inliers within widespread Cainozoic sand deposits to the north-west on Burleigh, Elmore and Pialah Stations. To the east of the belt thin incomplete sections are well exposed in the valley of Middle Valley Creek on Dutton River Station, and probably

PLATE 8

Fig. 1. Exposure of Doncaster Member in creek bank 3 miles north of Dutton River Homestead, showing thin bed of glauconitic claystone and nodules of silty limestone in blue-grey claystone. BMR Neg. M/250.

Fig. 2. Line of nodular limestone in Doncaster Member, approximately 3 miles north of Dutton River Homestead. BMR Neg. M/250.

along the nearby gorge of the Dutton River, although that locality was not visited. Erosion of Sturgeon Basalt in these areas has revealed the Wilgunya Formation below. East of the main outcrop of the Sturgeon Basalt there are further outcrops in the Hughenden Sheet area in the valleys of Porcupine Creek and the Flinders River.

Doncaster Member in common with most other rocks of the Rolling Downs Group, weathers easily to clay soils developing typical "downs" country. It has little resistance to erosion when fresh and forms weak receding slopes even in deeply incised valleys of the basalt plateau. In the vicinity of Towri and Grampian Hills Stations west of the type area, there are prominent bright red hills of lateritized glauconitic siltstones of Doncaster Member which owe their resistance to the lateritization. Limestone beds are too thin to have any topographic expression and form only lines of small floaters. Nevertheless the unit is fairly easy to recognise by its greenish glauconitic beds which are fairly common in gullies and creek banks, and brecciation of the limestones is also quite distinctive. The nearby presence of the unit can be inferred by the collections of large ammonites displayed in homestead gardens.

The lithology consists of more than 80% blue-grey claystone and silty claystone, with thin to medium interbeds of silty to sandy, glauconitic claystone and siltstone, and thin beds of brownish-grey silty limestone (Plate 8, fig.1), commonly strongly brecciated. Locally they carry algal colonies and some are richly fossiliferous. All lithologies are well exposed in an inlier in the valley of Middle Valley Creek, north of Dutton River Homestead. Claystone is mostly closely cleaved, non-fissile, but shaley in part.

Glauconitic rocks are greenish-grey to light green, poorly sorted, glauconitic claystones, with a minor sand or silt component. Most have about 15% glauconite but the mineral ranges up to 35% of some specimens. The glauconite is a type derived from muscovite (Bastian, 1963), generally a much lighter green colour than most. Glauconitic rocks have a patchy, balled structure suggestive that glauconitic layers had been interworked with clay layers shortly after deposition.

Limestones are khaki or light brown calcilutites, commonly showing strong and multiple brecciation with recementation. Some are richly fossiliferous; the condition of fossils suggests a quick burial of living communities, possibly by sudden precipitation of calcium carbonate onto the sea floor.

Limestones also commonly occur as large nodules of up to 2'6" diameter, and some of these contain many glauconitic clay balls and some belemnites. The nodules were not seen to transgress bedding planes and may be primary features. In a tributary of Station Creek three miles north of Dutton River Homestead, the nodular limestones were found as long lines, straight or gently curving and roughly parallel (Plate 8, fig.2). Six lines were found, with trends ranging from 75° to 90°, and glauconitic claystone laminae were draped over the line figured, clearly indicating its primary origin. These limestones are intensely brecciated and almost certainly algal by their similarity to a confirmed algal limestone (GAB 890) from a nearby locality. An algal structure roughly 8' across was found on Sherwood Downs Station and many other possible algal structures (unconfirmed) were seen in other localities. On Mill-Mill Creek on Gilberton Sheet Reynolds (1960) records some lithologies not seen in the area mapped, the main types being fine-grained fossiliferous sandstone and silty shale with cone-in-cone limestone. In good exposures, as on Dutton River Station limestones and glauconitic claystones are seen as thin beds in claystone. This is seen in section X6 at Big Magney's Bore (Reg. No. 2018 - no driller's log available) on Dutton River Station:

Top concealed

55' -56'	Bed of white, green flecked, glauconitic claystone.
40' -55'	Blue-grey claystone, with few thin beds of siltstone, and nodular silty limestone grading laterally to claystone.
39' -40'	Grey fossiliferous limestone with coquinite of ammonites, belemnites, pelecypods, and partly opalised wood.
25' -39'	Blue-grey claystone, with thin beds of siltstone and nodular silty limestone.
23½'-25'	Thick bed of white, green flecked, glauconitic claystone, forming slight bench.
0' -23½'	Blue-grey claystone, with thin beds of siltstone and nodular silty limestone.

Base in creek bed.

No complete sections of the unit have been found, but interpretations of driller's logs give probable thicknesses varying from 350 feet to 250 feet.

Further south, in the Manuka Sheet area, the thickness of the combined Jones Valley/Doncaster section has been derived, in many bores, from the well marked change of rock colour recorded by the drillers, corresponding to the boundary between the Ranmoor Member and lower lithologies. Figures range from about 450' in the north to over 550' in the south-western part of Manuka Sheet. The combined thickness in the Corfield Town Bore (Reg. No. 14125) is interpreted from the electrical logs (Jewell, 1960b) as 450 feet.

Marine fossils, including belemnites, ammonites, crinoids, pelecypods and gastropods, occur typically in small pockets in limestone. Several species of large ammonites were found, ranging up to about 2' diameter. Paired pelecypod valves are common and fairly complete crinoids lie surrounded by hundreds of cleaved crinoid fragments, indicative of a sudden overwhelming of communities. Occasional blocks of wood are found, and a large calcified tree trunk, roughly 15 feet long and 2-3 feet diameter, was found on Sherwood Downs Station. It is possible that this trunk had touched bottom and stuck on a bank in very shallow water.

Detailed determinations of the fossils collected during the 1962 mapping have yet to be made by R. Day, of the Queensland Geological Survey. From a preliminary examination Day (pers.comm.) suggests the fauna has affinities with that of the Roma Formation. Whitehouse (1954) gives an age of Aptian (Lower Cretaceous) for the Roma Formation.

The change from Gilbert River Formation to Doncaster Member is quite sharp in the three outcrops where it was seen, at "The Rockies" outcrops, in Prairie Gorge (Plate 9, fig.1), and near Valley Bore (Reg. No. 4935) of Wongalee, and consists of two or three interfingered coarse sandstone and thin claystone beds before the continuous claystone sequence is entered. No grain-size between the two was found as an intermediate lithology. A change in sediment source is indicated, coinciding with a change to the marine environment of the Cretaceous sea, as otherwise finer derivatives from the Gilbert River sediments would be expected in this transition zone. Therefore it appears that, not only was there a rapid sinking of the westward sources of Gilbert River sediment, but that new sediments originated from other distant sources, possibly to the east, the precursor of the eastern source for all younger Rolling Downs Group sediments. A sudden recession of Gilbert River sediment would be aided by diversion of sediment tongues by currents of the expanding sea.

The rich shell beds, "in situ" brecciation of limestones suggestive of wave breakup (Bastian, 1963), plentiful wood, and the glauconite are indicative of a shallow marine environment. Glauconite is accepted to be of shallow marine origin and indicative of a rather reducing environment

Fig. 1. Transition beds at top of Gilbert River Formation at Prairie Gorge. First thin bed of leached claystone is undercut behind hammer; foreground is top of main sandstone bench of Plate 7, Fig. 2. Continuous claystone sequence is at least 35 feet above hammer.

BMR Neg. M/250.

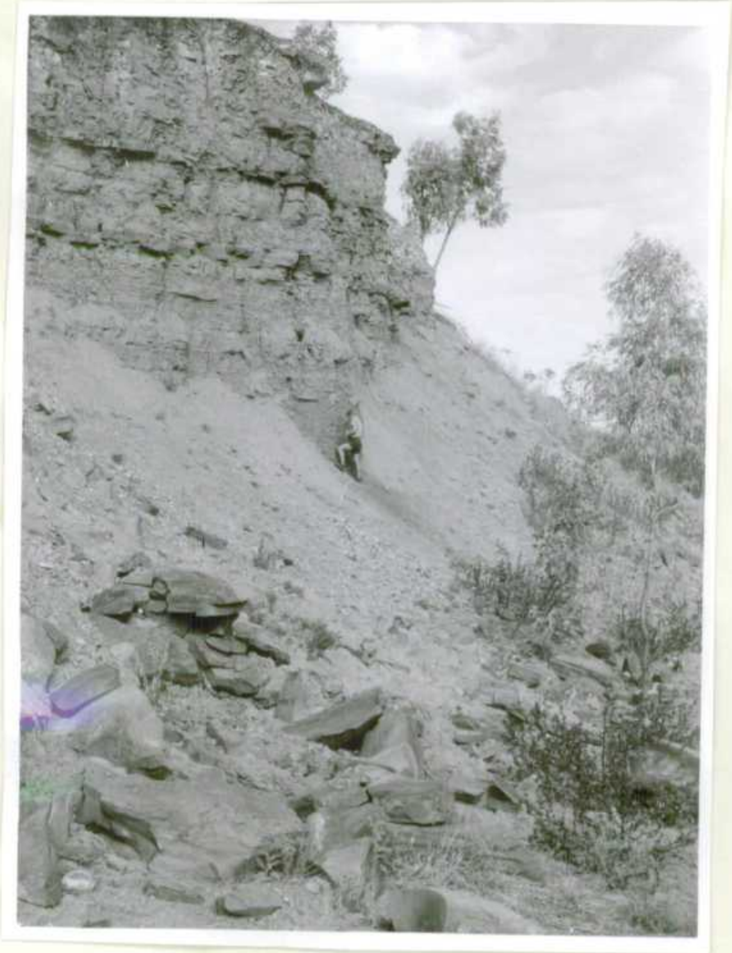


Fig. 2. Type section of Jones Valley Member, two miles south of Strath Stewart Homestead, showing three prominent beds of silty limestone in siltstone. Base of member is level with man's head.

BMR Neg. M/250.

(Cloud, 1955). The absence of wave ripple marks is not contradictory to the shallow depth, as Evans & Ingram (1943) have noted that ripple marks are developed smaller under a given wave strength, for finer grain size of sediment. Thus the claystones, which are by far the most common sediments in the unit, might not show ripple mark of a size normally noticed. On the other hand the glauconitic claystones show in their common patchy rolled structures, that thin sediment layers were broken up and rolled about by wave action.

Jones Valley Member:

Jones Valley Member (defined Vine, 1963) overlies the Doncaster Member of the Wilgunya Formation. It is named from Jones Valley Creek, a tributary of the Flinders River in the eastern Richmond area and western Hughenden area about 20 miles north-west of Hughenden. The type section is at 20°26' S, 144°06' E, in a river cliff of a small tributary of Jones Valley Creek, beside the track to Strath Stewart Homestead, 200 yards north of the southern boundary of Strath Stewart Station.

The unit is distributed in a narrow belt across the central part of Richmond Sheet area, extending from south of Bald Hills Homestead east-south-eastwards to south of Sherwood Downs Homestead, then eastwards to the valley of Porcupine Creek. It is exposed discontinuously in valleys between plateaus of the Sturgeon Basalt north of Hughenden, such as the valleys of Jones Valley Creek, Soda Valley Creek and Betts Gorge Creek. The easternmost outcrops mapped in 1962 were west of Mount Canterbury 13 miles north of Hughenden.

Jones Valley Member is a very thin unit, only 25 feet thick in the type section (Plate 9, fig.2) but it forms valley benches and the cappings of small table-topped hills in areas of active erosion. It is commonly seen as a secondary bench low on valley flanks beneath Sturgeon Basalt plateaus and it can be easily recognised on air photos in that area. Its topographic expression westwards from the plateaus is weaker, and benches and hills of the unit are isolated by stretches of low "downs" country in which it can only be traced by lines of floaters. Hills of the unit are littered with slabs weathered out from its limestone and calcareous siltstone beds.

The lithology consists of thin-bedded and friable khaki siltstone and medium to thick bedded calcareous siltstone, commonly cross-bedded, micaceous, and with beds of tough silty fine-grained limestone, medium-bedded and concretionary, and rather irregular in thickness. The unit develops three of these tough limestones in the type area, forming minor small benches, and there is a suggestion of rhythmic features in the type section, in that each limestone bed is a culmination of a zone which is increasingly calcareous upwards.

At a creek crossing of Jones Valley Creek about one mile north-west of Jones Valley Homestead a scour-and-fill channel trending at 330° was found in one of the impure limestone beds. It was lined with pebbles, fossils and large fossil fragments but gave no evidence of which way the scour went.

In thin section the calcareous siltstone contained some glauconite (about 3%) and lithic grains (about 10%) many of which show fine volcanic textures, in addition to quartz, plagioclase and micas. The only thickness figure is the 25' measured in the type section, as it cannot be recognised from water bore drillers' logs. The unit overlies Doncaster Member of the Wilgunya Formation conformably and with a gradational contact, and is overlain conformably by the Ranmoor Member.

Jones Valley Member has rare marine fossils, and only a few pelecypods, belemnites, gastropods and crinoids have been collected. Day (Appendix A) suggested an Aptian age for one of the fossil collections from the unit, based on the occurrence of <u>Maccoyella corbiensis</u>. Other collections, while containing no positively identified Aptian elements, suggested an Aptian age. Evidence for this included an Isocrinus sp, a genus which has been previously collected from the Aptian in the Roma Formation and at White Cliffs in N.S.W., the negative evidence afforded by the absence of Inoceramus, and belemnite guards which suggest possible reference to the Aptian genus Peratobelus.

The unit was laid down under a shallow marine environment like its predecessor the Doncaster Member, as shown by the fairly low maturity sediment and the presence of glauconite. The tendency to a rhythmic alternation of calcareous beds suggests an environmental control of carbonate precipitation. These limestone beds did not suffer brecciation as in the Doncaster Member, probably because of a somewhat greater depth of water; a general deepening of basin heralding the claystones of the Ranmoor Member might be inferred. An alternative to this would be a sharp recession of sediment due to other factors affecting the source area; and there is not enough evidence to prove either alternative.

Ranmoor Member:

Ranmoor Member (defined Vine, 1963) overlies the Jones Valley Member of the Wilgunya Formation. It is named from Ranmoor Homestead, 20°34' S, 143°10' E, 12 miles north of Richmond, Queensland. The type area is on Ranmoor Station; no type section is measurable due to poor exposures.

The unit is distributed in a broad belt extending from Cambridge Creek, north of Cambridge Downs Homestead, eastwards through Hazlewood, Ranmoor and Compton Downs Stations and along the Flinders River to north of Hughenden. Further east it disappears under the plateau of Cainozoic sediments a few miles west of Prairie township.

The topography is typically gently undulating grassland. This dominantly argillaceous unit weathers easily to form clay soils and outcrops are only found where there has been some recent gullying. Its relative weakness compared with the rather resistant Toolebuc belt to the south has caused the Flinders River to run along the Ranmoor belt for part of its course west of Hughenden. There is a virtually complete absence from this member of the thin bands of impure limestones and calcareous siltstones which commonly form lines of floaters in each of the other Wilgunya clay members.

As a result of these factors good outcrops are rare. Where seen they are almost entirely blue-grey to dark grey and black cleaved claystone and silty claystone, locally carbonaceous. Near the top of the unit there are locally white and yellow calcareous shales and calcareous siltstones, with thin coquinite bands of flattened Inoceramus plates and fragments, gradational towards the overlying Toolebuc Limestone member. Some drillers' logs record oily shale from intervals approximating to the Ranmoor Member, and in some outcrops the claystones are quite dark and greasy. Thin section examination of a silty claystone from the unit shows low maturity detritals with glauconite, in a very carbonaceous clay (Bastian, 1963). The rock has a fine lenticular texture caused by masses of small flattened clay pellets, having a lower silt content than elsewhere, crowding bedding planes. No complete section of the unit has been seen. The thickness is estimated from water-bore drillers' logs as about 200 feet and appears to be quite consistent over a wide area. Although Jones Valley Member cannot be confidently identified, there is commonly a general change in drillers' descriptions at about 400 to 500 feet above the base of the Wilgunya Formation. Drillers generally, have picked a brown, dark brown or even black "shale" above this figure, and the change is the most reliable one within the "shale" sequences that has been seen in the logs. Below, there are differently coloured shales with other lithologies and, in particular, occasional green beds.

PLATE 10.

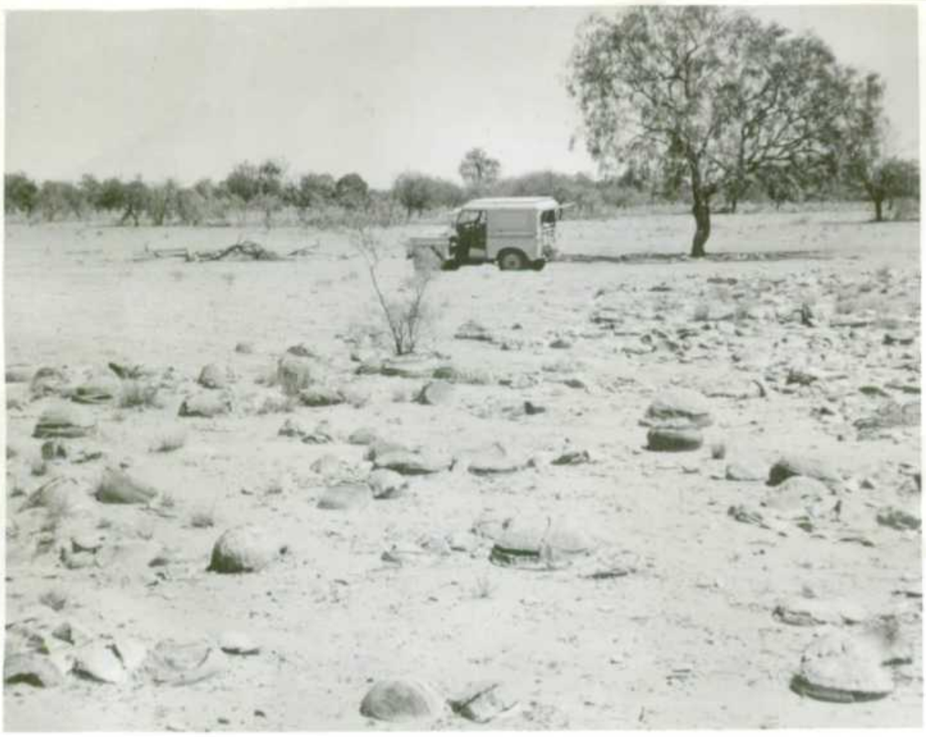


Fig. 1. Toolebuc Member on Silver Hills Station, showing typical boulders of white concretionary limestone weathered out of host rock.

BMR Neg. G/5588.

Fig. 2. Allaru Member in Sloane's Creek about 2 miles south-west of Tamworth Homestead. Calcareous siltstone with foresets dipping to the south (left in photo). Gentle angle of dip (12°) and arcuate patterns of truncated strata give false appearance of ripple marking.

BMR Neg. G/5587.

From stratigraphic relationships the age of Ranmoor Member is Lower Cretaceous. Only very few fossil collections have been made from the unit; they are marine forms (pelecypods and small ammonites) but the determinations have not yet been completed. Day (pers.comm.) states that one collection, from the bank of the Flinders River at Hughenden, has a Tambo (Albian) fauna, and the ammonite Beudanticeras has been collected from other localities just north of Hughenden. These are all probably collexted from the upper part of the Ranmoor Member. A specimen of the Aptian ammonite Tropeum, said to have been collected on Ranmoor Station, is lodged in the Queensland Museum, but there is doubt as to its exact locality. It possibly came from the Ranmoor Member, and would thus conflict with the other determination. The problem is not at this stage resolved. The unit overlies Jones Valley Member conformably and is conformably overlain by Toolebuc Member of the Wilgunya Formation.

The high organic content of the unit, plus its very poor faunas, suggest a silled or barred basin environment, and strongly reducing conditions were probably prevalent.

Toolebuc Member:

Toolebuc Member was defined by Casey (1959) from outcrops near Toolebuc Homestead in the Boulia Sheet area. The unit has been traced continuously, except where covered by Cainozoic deposits, from west of Bedourie northwards around the north-western margin of the Eromanga Basin, then eastwards along the northern margin to as far east as Hughenden, a total distance along its outcrop of over 500 miles.

The outcrops of Toolebuc Member form a rather narrow belt rarely in excess of five miles in width. From the Julia Creek Sheet area, mapped in 1961, outcrops were found extending into the Richmond area on Trivalore Station, about 50 miles north-west of Richmond, thence east-south-eastwards in a nearly straight belt to Hughenden, and a short distance beyond. There are good outcrops over much of this belt, particularly on Lilyvale and Silver Hills Stations north of Richmond, Stewart Park, Telemon and Sylvania Stations between Richmond and Hughenden, and Mount Devlin Station south-east of Hughenden. Outcrops finally disappear beneath the extensive plateau of Cainozoic rocks east of Hughenden. On the eastern part of Richmond Sheet, there are many outlying remnants of Toolebuc Limestone on the flanks of valleys cut into the basalt plateau, because of correspondence between the flat southerly dips and a general topographic rise to the north. On Dunraven Station there are small outliers preserved under the Sturgeon Basalt as much as 20 miles north of the main outcrop.

Topographically and in outcrop Toolebuc Member is easily distinguished from other parts of the Wilgunya Formation. It forms a fairly continuous north-facing escarpment with a very gentle undulating slope southwards down-dip. The escarpment itself is always a rather gentle rise rarely exceeding fifty feet in height, but fairly prominent above flatter "downs" country to the north. Isolated outlying hillocks are common within a few miles north of the main escarpment. On air photos the pattern is an area of white or light-toned mottlings or arcuate patches, due to lighter coloured soils than the surrounding downs clay soils, and a generally lighter grass cover. There are usually scattered trees and scrub, much more than on either side of the Toolebuc belt. Large chalky white limestone concretions commonly litter the surface, in numerous isolated patches of several acres extent. They are particularly prominent in the vicinity of Silver Hills Station where there is an almost continuous spread of remarkably symmetrical boulders up to 5 feet in diameter (Plate 10, fig.1). Outcrops otherwise are confined to gullies where there are platy and flaggy limestones and calcareous shales.

The lithology consists of interbedded concretionary white, cream, pale pink or grey, finely crystalline oolitic limestone mainly made up of large massive concretions, abundantly fossiliferous; and platy or flaggy fine crystalline limestone with common fossils and bands of Inoceramus coquinite, plates and fragments. The platy type forms the major part of the unit, but is less resistant than the concretions and less obvious. The hard concretionary limestones have a recrystallized oolitic texture in thin section (Bastian, 1963) with a fine calcite matrix, and are rich in Globigerina. Concretions are commonly banded, suggesting an originally thin or medium-bedded limestone. They are possibly secondary features developed near the surface, as drillers have never recorded striking boulders when drilling through Toolebuc Member and only rarely recorded limestone.

A section measured about 2 miles north-north-east of Silver Hills Homestead gave a thickness of 34 feet. The lithology is as follows (section X7):-

Top of Hill

TOOLEBUC MEMBER	47'-52'	Poor exposure. Grey crystalline limestone, flaggy, few Inoceramus fragments.
	43'-47'	Pink, white, cream and grey finely crystalline limestone, large concretions, abundant fossils.
	33'-43'	Concealed.
	25'-33'	Finely crystalline limestone, platy and flaggy, interbedded with calcareous shale. Numerous fragmentary fossils including Inoceramus and some whole shells; fossils badly contorted.
	18'-25'	Cream finely crystalline limestone, massive concretions, abundant fossils.
RANMOOR MEMBER	0'-18'	White to yellow soft calcareous shaley claystone with thin coquinitic bands of Inoceramus plates, and fragments.

Base concealed.

The thickness elsewhere, where measurable in outcrop, has always been very close to 30 feet, which is quite remarkable in view of its wide extent. Drillers' logs commonly do not give figures near this, and in fact usually they have missed the limestone altogether.

Drillers' logs seldom record limestone, however very frequently a "grey shale" section is described about 200 feet or so above the clearly defined base of Ranmoor Member. This is usually succeeded by alternations of blue and grey beds of the Allaru Member, and is tentatively thought to contain the Toolebuc Member. Occasional descriptions of limestone occur which give a position of Toolebuc Member in rough accordance with the expected point. In Corfield Town Bore (Reg. No. 14125) Toolebuc Member is 37 feet thick and its base is 658 feet above Gilbert River Formation, again consistent with interpretations from the descriptive logs.

Toolebuc Member contains abundant marine fossils, both microfossils and vertebrate and invertebrate macrofossils. Collections made in many localities in the Hughenden and Richmond areas, have yielded numerous species of ammonites, many species of pelecypods, nautiloids, belemnites, a few gastropods, two species of dragonflies, and worms. Vertebrate fossils have included dinosaurs such as Austrosaurus and Kronosaurus, Plesiosaurs, Ichthyosaurs, turtles and fishes, fish scales and teeth. Globigerina and radiolaria are common microfossils (Terpstra, 1963). In 1962 some wood was seen on Yan Yean Station and an Ichthyosaur (as yet unidentified) was collected from Dunluce Station. No detailed determinations have yet been made of the fossil collections made during 1962, but the fauna has Tambo affinities of Albian (Lower Cretaceous) age (Day, pers.comm.). It is conformable and gradational above Ranmoor Member of the Wilgunya Formation, and overlain conformably by the Allaru Member of the Wilgunya Formation.

Allaru Member:

Allaru Member (defined Vine, 1963) overlies the Toolebuc Member of the Wilgunya Formation. It is named from Allaru Homestead, three miles south of Richmond, and the type area is along the main Richmond- Winton road, from Richmond south to Twenty-Mile Creek. There is no type section because of poor outcrops.

The unit is distributed along a belt at least 20 miles wide extending from south of Hughenden west-north-westwards across the north-east of the Manuka area, and the southern and western parts of the Richmond area. It forms typical rolling downs country, a gently undulating grassland with clay soils. The soils are dark grey, very prone to swelling and cracking and very hard when dry. Trees are scanty and small, growing mostly along outcrops of the few thin silty or sandy beds in the unit. Some outcrops may be found on those beds, but mostly they develop only lines of floaters, and reasonable exposures are only seen in watercourses usually where resistant beds form rock bars.

The lithology consists of grey to blue-grey laminated claystone and silty claystone, weathering to olive grey and khaki; they are non-fissile and closely cleaved. Interbedded with the claystone are medium to thin-bedded or flaggy, grey to brown, very lithic and felspathic siltstone grading to very fine calcareous felspathic sandstone. These are tough when fresh, but friable on exposure. There are thin seams of cone-in-cone limestone along bedding planes of some siltstones, and very occasional coquinas, mainly near the base. Cross-bedding and ripple marks are seen, the latter mostly of oscillation type. One locality on Sloane's Creek near Tamworth Station, gave remarkably consistent current directions, ranging from 185° to 215°, on a 150 yards continuous exposure of low-angled foresets in thin-bedded calcareous siltstone (Plate 10, fig.2). Elsewhere ripple marking suggests current movements generally from the north-west quadrant. Claystone is predominant for the unit as a whole, but the coarser lithologies tend to occur in composite groups, with the claystone locally subordinated.

Thin-section examination (Bastian, 1963) shows the calcareous siltstone to be well sorted with a high percentage of calcite cement. It is rich in lithics, chiefly andesite, and plagioclase derived from breakdown of this material. Quartz is subordinate, glauconite common and occurring usually in partial replacement of andesite fragments. It may be either developed under marine conditions or possibly be celadonite from volcanic rocks.

Allaru Member is conformable and gradational with the Toolebuc Member and overlain conformably by the Mackunda Beds. No measured thicknesses for the unit are available, but from bore logs it is estimated to have a thickness of about 700 feet over the eastern part of Manuka Sheet area. Bore logs of Corfield No.1 Bore (Jewell, 1960b) show a section of very uniform electrical character and lithology from 995 feet to the Toolebuc Member at 1680 feet, a total of 685 feet, and thick sections of uniform shales in many water bores of the Corfield to Stamford area show very similar thicknesses. In the west of the Manuka area, however, many bores have similar thick uniform sections, but show these sections going up to 300 feet higher than the expected base of Mackunda Beds as extrapolated from outcrops. It is thought that relatively thin sandstone beds which occur in the lower part of the Mackunda Beds further east, may have lensed out, giving here a thickness of about 1000 feet for Allaru Member. The base of the unit is difficult to pick on bore logs, but has been found approximately by putting the Toolebuc Member in a "grey shale" section commonly seen about 200 feet above the base of Ranmoor Member, and then taking the base of Allaru Member 30 feet above this level. The strong consistency of results tends to confirm this interpretation.

Marine fossils occur sparsely, either isolated or in few thin coquinas associated with the coarser beds. There is also a calcareous transitional zone just above Toolebuc Member in which there are shell beds

PLATE 11.

Fig. 1. Mackunda Beds in Alick Creek. Limestone concretions in cross-bedded lithic sandstone, with thin ribbon-like interbeds of calcareous siltstone and sandstone. BMR Neg. M/250.

Fig. 2. Mackunda Beds in Alick Creek, showing horizontal worm(?) tracks on a ripple-marked bedding plane of calcareous siltstone. BMR Neg. M/250.

rich with Inoceramus and commonly with ammonites, nautiloids and turtles. No palaeontological determinations have yet been made on the material, but the fauna has affinities with that of the Tambo (Day, pers.comm.) which is of Albian (Lower Cretaceous) age.

The environment is marine and the presence of wave ripple marks indicates it must have been fairly shallow. Because of the abundance of volcanic derivatives the source-rocks are probably the same volcanic province (Lower Bowen Volcanics) as for the overlying Mackunda Beds and Winton Formation. This is discussed further below.

Mackunda Beds

Mackunda Beds (defined Vine, 1963) overlie the Allaru Member of the Wilgunya Formation. They are named from Mackunda Creek, a major tributary of the Diamantina River; the type area is on the headwaters of Mackunda Creek in the Mackunda Sheet area. The unit is regarded as transitional between the marine mudstones of the Wilgunya Formation and the non-marine arenites and lutites of the Winton Formation.

The Mackunda Beds are distributed in a broad belt roughly 35 miles wide, across the central parts of the Manuka area, and into the south-western corner of Richmond area.

Mackunda Beds form extensive undulating grasslands, with straggling lines and clumps of trees along outcrops of thin sandstone and coarse siltstone beds. There are noticeably more trees than on Allaru Member to the north, and perhaps more than on Winton Formation. The sandstones, and particularly those with appreciable lime content, form lines of floaters with some lines of outcrop, but rarely are thick enough to form even small scarplets. Outcrops are commonly found in watercourses. Clay soils are generally rather lighter in colour and less prone to swelling and cracking than those developed from the Wilgunya Formation.

The most prominent rock types are light-yellow-brown to brown and buff very fine-grained lithic and feldspathic sandstones, mostly calcareous and in part micaceous, thin to medium bedded; and with developments of hard calcareous concretionary bands, and grading to minor blue-grey silty limestones in isolated thick beds. Non-calcareous types are friable, the calcareous types tough but liable to break down on exposure. Interbedded with the sandstones are light brown and buff, thin-bedded, calcareous coarse siltstone, lithic and feldspathic; blue-grey laminated claystone; and thin seams of cone-in-cone limestone. Coquinas are common, sufficiently so to be regarded as a characteristic lithology of the Mackunda Beds in this area.

Lithologically the Mackunda Beds are similar to the Winton Formation but characterised by generally finer sands and thinner interbedding. Although no figures are available to show the relative abundance of the different lithologies, there seems to be a rather greater proportion of sand and silt beds to clay beds than in the Winton. Drillers' logs record frequent bands of rock, usually only a few feet in thickness, which are probably the thin limestone beds. Intraformational conglomerates occur sporadically but increasingly towards the top.

Ripple marking, mainly of interference type, and cross-bedding, are common in the coarser beds. On Alick Creek, at the crossing of the Richmond-Winton road, an excellent section displaying a wide range of these lithologies (Plate 11) had cross-bedding with currents ranging from 60° to 130°, and in the same beds common interference ripple marks with some asymmetry had current directions ranging from north-east through north to south-west, but dominantly from north. A possible explanation for this is that sediment was building out a shoreline to the east from a northward spreading delta tongue, and longshore currents came from north. Similar and contrasting readings were taken elsewhere but not enough to indicate whether this Alick Creek shore was a purely local configuration or reflecting a regional picture.

Thin-section examination (Bastian, 1963) shows the siltstones and sandstones are made up of well sorted and angular detritus with high percentages of calcite cement. There is an abundance of lithic material almost entirely of volcanic origin, and calcic plagioclase in the andesine to labradorite range, derived from breakdown of this material. Glauconite is common, but much of it may be celadonite, a type of glauconite found in volcanics.

The unit is conformable upon the Allaru Member and overlain conformably by Winton Formation, with a very broad transition in each case. Drillers' logs of bores suggest that it may be divided into two distinct portions: a lower section of mainly clays and silt with relatively thin sandstone beds, and a higher section with much more and thicker sandstone beds. Corfield Town Bore (Reg. No. 14125) shows this break at about 540 feet, below which is 455 feet of claystone and siltstone with thin sandstone beds, but the top of the unit where it grades into Winton Formation cannot be picked from the logs. No measured thicknesses are available for the unit, but from bore logs it is estimated to vary in thickness from about 700 feet in the east to about 500 feet in the west of the Manuka Sheet area, and westwards thinning is also suggested by estimates of the order of 300 to 500 feet in the Mackunda and McKinlay Sheet areas to the west (Vine, 1962, Vine and Jauncey, 1962a). Considerable difficulty was found in the interpretation of drillers' logs. In particular many show thick sections, particularly over the western half of Manuka area, described under the one term such as blue shale or grey shale, which by rough extrapolation from outcrops overlap by several hundred feet the expected base of Mackunda Beds in the bores. Possibly the relatively thin hard beds have been missed by the drillers. On the other hand the hard beds may be genuinely absent, in which case the Allaru Member has indeed thickened south-westwards by 200 to 300 feet at the expense of the Mackunda Beds.

Mackunda Beds are of Lower Cretaceous age, and have recently been shown (Day, 1963) to have a Tambo (Albian) fauna, on the basis of palaeontological work on the material from the Mackunda and McKinlay Sheet areas. Marine fossils occur in thin coquina beds, which are most abundant around the middle of the unit, steadily decreasing in amount and variety of fauna towards the top. Fossils include many species of pelecypods, gastropods, belemnite guards, a few ammonites, fish scales and bones, sharks' teeth and other teeth, starfish, and occasional wood and plant fragments. On Rookwood Creek, 5 miles south-west of Aireworth Homestead, a fauna including many perfectly complete starfish was found as a thin lens with an intraformational conglomerate of mud pebbles, and almost certainly was brought about by sudden burial of a living assemblage. <u>Inoceramus</u> prisms are locally so abundant as to comprise a large part of a rock.

A shallow marine environment is apparent for this unit, and the steady decrease in faunas suggests that water became gradually fresher as the basin continued to shallow, and contacts with the sea were gradually cut off. However, as noted for the Winton Formation, there is no reason to suspect that the area became eventually converted to a large lake, or inland sea, but may have finally drained altogether apart from transitory floodwaters and isolated lakes and swamps. Source rocks for the sediments are probably the Lower Bowen Volcanics, 300 miles or so to the east, as for the Winton Formation that followed. Whitehouse (1954) cited the presence of clear and angular feldspars in Roma and Tambo Formations as contributing evidence for cold waters at the time. It is not felt that the freshness of material here is a reliable indication of cold water, but may simply be due to rapid erosion and transport of material from the source area.

LOWER TO UPPER(?) CRETACEOUS

Winton Formation

Dunstan (1916) proposed the name "Winton Series" for the upper or freshwater section of the "Rolling Downs Formation". Whitehouse (1954) renamed it the Winton Formation and indicated its type area as "the blue shales and sandstone with intercalated coal seams met with in the bores in and around Winton", still specifying it as a freshwater unit.

In the area mapped, Winton Formation occupies an area of about 2300 square miles in the southern and western portions of the Manuka Sheet area. The boundary with the Mackunda Beds is placed only approximately. In detail the cessation of marine fossils is used as a guide, although the Mackunda Beds are on the whole finer in grain and thinner bedded.

Winton Formation forms extensive undulating grasslands with scattered trees growing mostly on the outcrops of thin sandstone beds. The sandstone beds form lines of floaters or lines of outcrop, but only rarely are they thick enough to form even small scarplets.

The most prominent rocks are beds of cream to buff and reddish brown, very fine to fine and medium-grained lithic and feldspathic sandstones, medium to thick bedded, laminated, and in part calcareous. These are interbedded with an approximately equal proportion of cream, yellow and brown coarse siltstone, grey when fresh, also in part calcareous; and with some thicker beds of yellow to grey claystone, blue-grey when fresh. Hard calcareous concretionary bands are common and characterised by large smoothly rounded yellow to light brown concretions. Intraformational pebble-conglomerates are fairly common; they contain rounded clay pebbles, partly reworked lenses and boudinaged laminae. Cross-bedding and ripple marking of oscillation and current type are rather common in the lower beds. Fossil wood is common, and a few beds are rich in plant debris. Drillers' logs of water bores in the south of the area record coal or carbonaceous shales, usually in beds about 20 feet thick, but no coal was seen outcropping in the area.

Thin sections show that Winton Formation contains a high percentage of detritus derived from a volcanic terrain, (Bastian, 1963), including plagioclase, andesite and hornblende. Grains are fairly well sorted, angular to sub-angular. A pale green or yellow-brown mineral doubtfully identified as glauconite, which may possibly be celadonite, a type of glauconite found in volcanics, is also present. A marine origin for these rocks is not indicated by this glauconite(?) because other evidence such as the plant remains, coal beds, freshwater molluscs and the absence of marine fossils clearly indicates their terrestrial origin.

No figures are available for the relative abundance of the different lithologies, but there seems to be a roughly equal proportion of sandstone and coarse siltstone beds to claystones. The maximum thickness of the unit in the area mapped is probably about 1000 feet in the south-west corner of the Manuka Sheet area. The top is an erosional surface, so the preserved thickness increases southwards down the regional dip, towards the centre of the basin, and no complete thickness is known. Winton Formation lies conformably and gradationally on the Mackunda Beds.

Apart from its wood and plants, freshwater molluscs have been reported from the unit (Dunstan 1920, Day 1963). Whitehouse (1954) stated that the age of Winton Formation was probably early Upper Cretaceous (Cenomanian or later), because it followed conformably on the Tambo of Albian age. However, M.E. White (1962) has identified plant fossils from the lower part of the formation in the Mackunda area as Lower Cretaceous in age. As fossil evidence indicates an Albian age for the Mackunda Beds, the Winton Formation probably ranges from late in the Albian to Cenomanian. Some time variation in the

Winton/Mackunda boundary is likely as the change to terrestrial conditions probably represents a lateral infilling of a very shallow sea. It is postulated that the source of the sediments of both the Mackunda Beds and the Winton Formation was volcanics of the Bowen Basin; the infilling of the Eromanga Basin would therefore have been from the east. Available cross bedding directions in the northern Eromanga Basin indicate sedimentation from the south; this is explicable if they are regarded as representing foresets from the northern margin of a major system of deltas extending westwards into the Eromanga Basin.

Whitehouse described conditions at the time as lacustrine. The environment is certainly freshwater but it is questionable how much of it was lacustrine, as sediments could have been laid down from floods which left them exposed between each flooding. There is no real evidence to suggest that the area was ever completely enclosed. Petrological work shows quite fresh material, fairly angular and fairly well sorted. As noted above this more likely indicates rapid transport than cold conditions. The alternations of sharply defined beds seen in outcrop plus the lack of intermixed size grades, suggests that the material received its sorting from the transporting currents en route to the area. A large lake or inland sea would be conducive to reworking of the sediments, but there is no evidence of this. Especially under deeper conditions the development of "barred basin" reducing conditions with dark organic clays, pyrite or other sulphides would be expected. The presence of coal seams suggests on the other hand that at best local swampy conditions were attained, and the intraformational conglomerates made up of clay pebbles, provide further clear evidence for exposure and drying out of the clays. It would be extremely hard to conceive of such material being eroded and transported as pebbles if it had not dried out.

Absence of saline beds or other related phenomena is not at all contradictory to the idea of exposure; they are only developed under arid conditions, and even then only on land with very poor or internal drainage. The salt lakes Buchanan and Galilee have no counterparts in all the Queensland Channel Country because they are in areas of internal drainage. Our conclusion is that the area was at least fairly well drained with only temporary lakes but this would not imply that drainage was too strong to allow deposition of clays. Today the Channel Country is too well drained for salt lakes at a net regional gradient of about 2 feet per mile, but nevertheless sufficiently flat in gradient to allow deposition of broad alluvial clay plains. Thus the postulated environment, very similar to the present one but with probably a much greater mountain range nearby, can meet all the characteristics of the Winton Formation.

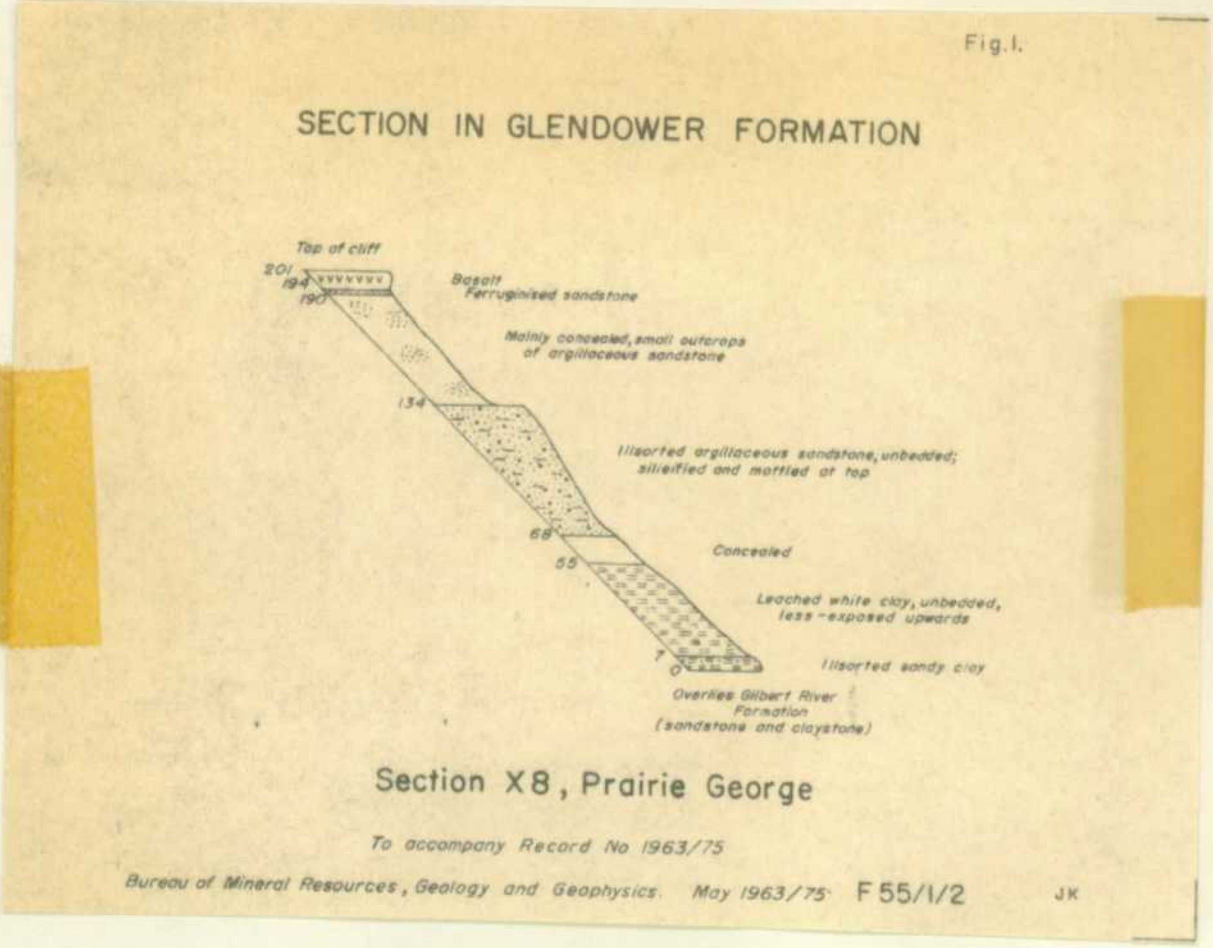
TERTIARY

Glendower Formation

The Glendower Formation comprises illsorted Tertiary sediments, ranging from conglomerate to claystone, deeply weathered and locally overlain by late Tertiary to Quaternary basalts, and resting unconformably on the Lower Cretaceous sequence. It was originally named the Glendower Series by Whitehouse (1940) and renamed by him (1954) the Glendower Formation. The type section is specified as on the road from Prairie to Glendower, 1 mile south of Glendower Homestead. Little can be seen along the actual road, but a well exposed section along a creek running parallel to the road and 200 yards north of it at latitude 20°46' S, longitude 144°30' E corresponds with Whitehouse's description.

Glendower Formation is extensive. It forms the resistant capping of Mount Walker and the plateau east of Hughenden, it underlies basalt flows in the Hughenden area and east of the Richmond area, forms a low plateau south of the Stawell River and approximately parallel with it, and, in the north of the Richmond area, forms a discontinuous capping to the Gilbert River Formation and the lower parts of the Wilgunya Formation. Although of wide extent the Glendower Formation has relatively few outcrops, and they

PLATE 12.



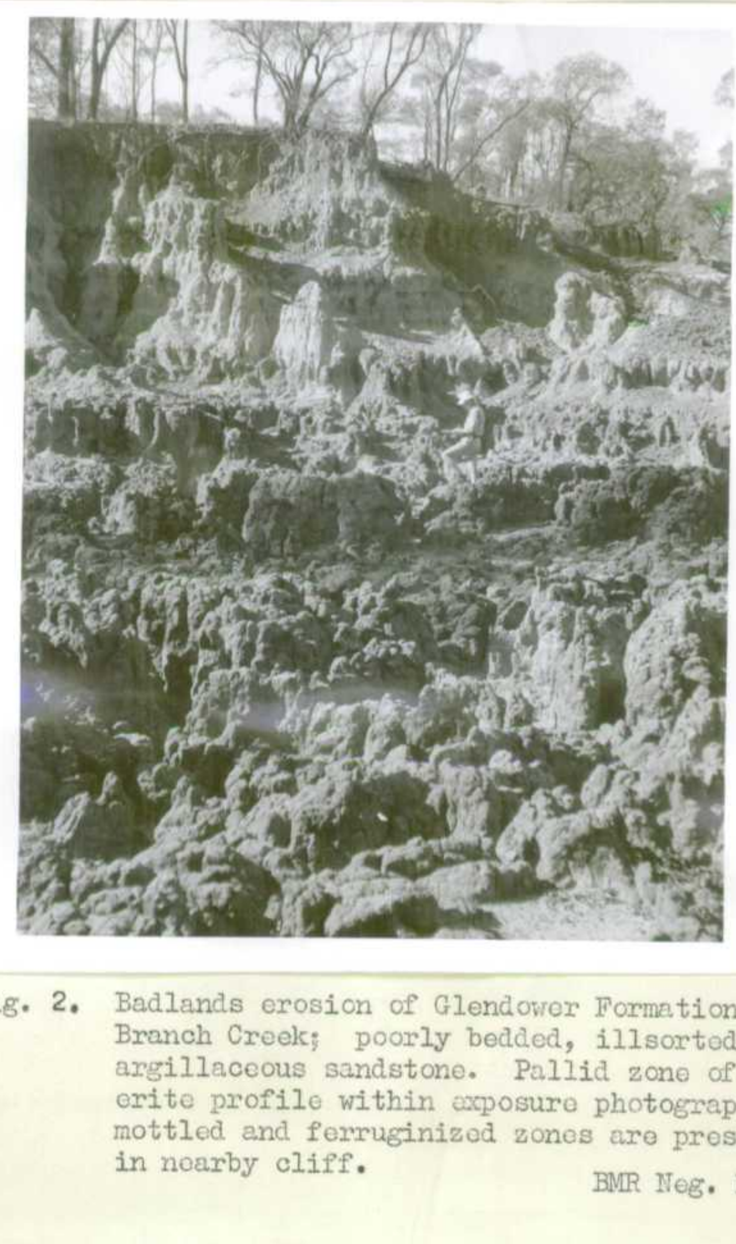


Fig. 2. Badlands erosion of Glendower Formation, North Branch Creek; poorly bedded, illsorted, argillaceous sandstone. Pallid zone of laterite profile within exposure photographed, mottled and ferruginized zones are preserved in nearby cliff.

BMR Neg. M/250.

are mainly in the faces of cliffs and scarps. A large part of the unit is covered by basalts, but its existence is indicated by drillers' logs. Most of the remainder has a thin veneer of later unconsolidated sand, gravel and clay. Where the later sediments overlie areas of sandstone of either the Gilbert River Formation or the Glendower Formation identification of the concealed formation is dependent upon the location of outcrops in gullies. Interpolation between traverses by photo interpretation has to be based upon slight differences of topographic expression and becomes somewhat unreliable. It is recognised, therefore, that the Glendower Formation may be more extensive in the north of the Richmond area than shown.

Lithologically the Glendower Formation is extremely variable, ranging from cobble conglomerate to sandy claystone and siltstone. The most common lithologies are illsorted pebbly, argillaceous sandstone and sandy siltstone, and the unit as a whole is characterised by poor sorting and poor bedding. Locally the rocks are well sorted, apparently where the source material was restricted to well sorted sand.

Pebbles and cobbles in the conglomerate are vein quartz, quartzite, schist, gneiss, sandstone and acid volcanics. Thin sections show that sand grains are almost all angular to sub-angular quartz, many with quartzite textures. Rare cherty grains, **feldspar,** muscovite and biotite, with accessory tourmaline, zircon and sillimanite are sometimes present (Bastian, 1963). No fresh rocks were examined in thin section; the matrices of the rocks examined are extensively altered by silicification or lateritization.

Thicknesses are extremely variable. In the elongated plateau south of the Stawell River an estimated 20 feet is present, whereas east of the mapped area over 200 feet of the unit underlies basalt at the northern end of Galah Gorge, and a section X8, 194 feet thick (Plate 12, fig.1), was measured in Prairie Gorge. All these sections have complete, or nearly complete laterite profiles.

Whitehouse (1940), in his original naming of the Glendower, noted that the type section was lateritized (with mottled zone preserved) but that the conglomerate contained boulders of "billy" which he regarded as of lateritic origin:

> 'With one exception the pebbles in the conglomerates do not exceed six inches in diameter. But here and there are "nests" of large boulders of "billy", the typical quartzite formed at the base of the laterites in western Queensland. These boulders are up to three feet in diameter and appear not to have been transported far. They have smooth, polished and dimpled surfaces so characteristic of the material in places where it has been weathered out <u>in situ</u>.' (op.cit., p.59)

It was therefore postulated that the Glendower sediments were later in age than the

> "main period of lateritic action, for they contain boulders of billy, from the siliceous zone of laterite." (Whitehouse, 1954, p.12.)

The description is accurate, but the hypothesis derived from it is questionable. For the following reasons the present authors disagree with this interpretation:

a) To provide a local source for the "billy" it would be necessary to postulate the previous existence of a sandstone in the area, which after lateritization and formation of billy was eroded sufficiently to expose its "billy" zone to erosion. As no other reworked lateritic material is present in the Glendower Formation all the higher parts of the lateritic profile must have been completely removed from the area. There is no evidence that such a sandstone ever existed. It is impossible to derive this silcrete by silicification of the local rocks, which are all of the Wilgunya Formation.

b) "Billy" in the Glendower Formation is a silcrete in which fine to medium grained, extremely angular quartz grains are set within a groundmass of amorphous or cryptocrystalline silica, and these composite masses of silcrete have the external form of rounded boulders. Such a rock could only have been formed either by silicification of a sandstone containing sand grains of the same size and angularity, or by incorporating and fracturing rounded grains from a much coarser sandstone or conglomerate. The extreme angularity of the quartz grains is unusual for second generation quartz such as would be found in a reworked sandstone, but is what would be expected if as suggested above coarse quartz grains or pebbles had been broken up in place during the formation of a silcrete.

c) Whitehouse claims that the "billy" could not have developed within the conglomerate which houses it since it is a silicified sandstone and not a silicified conglomerate. However in the type section of the formation a very few boulders of "billy" show how the appearance of having been originally a sandstone can be achieved. In some billy formation has only partly encroached on a cobble of vein quartz. The part of the cobble which is outside the "billy" is completely unaltered; the part which is inside is no longer recognizable as a cobble but is represented as a mass of angular quartz fragments. This effect has been noted previously in lateritized or silicified Tertiary sediments in north-west Queensland (Paten & Reynolds, pers.comm.).

d) The Glendower Formation is strongly lateritized. Although this is not clearly evident at the type section, where only part of the mottled zone is preserved, sections further north show profiles of the order of 200 feet. In the north-east of the Richmond area, in the low plateau south of the Stawell River, and in Whitecliff and Galah Gorges the higher parts of the laterite profile, including the ferruginous zone with pisolites, are preserved in outcrops of the Glendower Formation. Thus Whitehouse's contention that the Glendower Formation post-dates the main lateritization is not valid.

e) Whitehouse regards "billy" as having been formed at the base of the laterite profile (1940, p.59) and naturally occurring as nodules, i.e. with rounded form by accretion, not mechanical rounding by transport. Because the Glendower Formation was strongly lateritized the occurrences here are in the right situation for an origin in situ. The boulders of billy are completely unmarked by travel and are considerably larger than the surrounding cobbles in the conglomerate, even though this is a part of the Glendower Formation with better sorting than most (see below). Any appreciable distance of transport is, therefore, ruled out as a possibility, yet no local source, <u>other than the Glendower itself,</u> is available. The difficulty of having these boulders made up of silicified sand-size grains (and thus seemingly derived from an older silcrete) is removed by supposing that during silicification concomitant fracturing of the original pebbles or cobbles took place.

Location of the "billy" within the conglomerate is possibly facilitated by the porosity of the conglomerate, although the presence of plentiful interstitial argillaceous material, which was easily silicified and became the matrix for the angular fragments, appears to be a controlling factor. It was noted that silicified sandy clay near the base of a laterite profile is also recorded in section X8 (Fig.1), and there parts of the silicified rocks have developed the smooth polished and dimpled surface of the boulders in the type section of the Glendower Formation.

For the reasons given above the present authors regard the Glendower Formation as essentially pre-lateritic in age. It is, therefore, broadly comparable in age with the rocks of the many Tertiary basins of north-west Queensland, some of which were shown (Vine, 1962) to have been formed as a result of Tertiary movements on major faults in the Eromanga Basin.

Two environments of deposition are implied by the lithologies of the Glendower Formation. The extensive spreads of the unit, with illsorted sandstone as the dominant lithology, are the deposits of sheet flooding, and are derived mainly from erosion of existing outcrops of Gilbert River Formation to the north. Most are piedmont deposits of great flood plains fringing the hills of the Gilbert River Formation, and partly cloaking them.

Locally, better sorted fluviatile deposits are present, showing more distinct bedding and containing markedly lenticular conglomerate beds, as in the type section of the formation. The main fluviatile deposits approximate the position of the Flinders River and its tributaries, although some are only suggested by the descriptions contained in water bore drillers' logs. Within the deposits of the fluviatile environment are found cross-bedded and well bedded sandstone indicative of current deposition. The distribution suggests that the river systems have been long-lived although locally modified by the basalts, many of which flowed down the earlier valleys.

CAINOZOIC

(Undifferentiated)

Duricrust

The term "duricrust" is used in this report in the sense originally given by Woolnough (1928, p. 892):

> 'A hard crust or "armor-plate" of chemically formed material. This crust may be aluminous, ferruginous, siliceous or calcareous; but always reflects in its composition the nature of the underlying bed-rocks.'

Thus the term includes both the ferruginous zone of a laterite profile and a silcrete cap. This is a particularly useful term in western Queensland since most of the plateaus and hills of Cretaceous rocks show evidence of lateritization but now have incomplete laterite profiles protected by a silcrete cap. The term may be used without a firm genetic significance because the origin of the silcrete is not vital to the definition. Whitehouse (1954, p.12) suggested that there is a siliceous zone near the base of the laterite profile. But it has also been noticed that some Tertiary sediments which included reworked laterite (ferruginous zone) commonly have a silcrete cap. Thus the formation of silcrete is possibly a separate, and generally later, process than the lateritization. Much more study and field examination is necessary to resolve this problem.

Silcrete forms the protective capping of the Ayrshire hills in the south-west of the Manuka area. An incomplete laterite profile, up to 120 feet thick, is preserved there, mainly of pallid zone, with some mottled zone. Some iron staining in the pallid zone due to downward percolation of iron rich solutions gives a false appearance of mottled zone material.

Duricrust in the Richmond and Hughenden areas is mainly concealed by superficial sand; exposures are only seen in faces of scarps or cliffs or where a creek has cut a shallow channel. Complete, or nearly complete, laterite profiles are widespread and roughly correspond to the extent of the Glendower Formation. Silcrete appears to be restricted to the parts of the laterite profile which have not been protected by basalt, and also hills like the Burraway Hills, where basalt has been partly stripped and Glendower exposed round the scarp edge for what appears to be appreciable time. Silcrete forms the protective caps of the plateau east of Hughenden and some of the erosional residuals south of the town - Mounts Walker and Devlin. Mounts Castor and Pollux are hills from which the duricrust has been recently removed; lacking a protective cap they are being rapidly eroded.

PLATE 13.

Fig. 1. Successive lava flows on lip of Galah Gorge, 25 miles north of Wongalee Homestead. In this area successions of up to seven lava flows are exposed. BMR Neg. G/5590.

Fig.2. Fluviatile deposit of red sand and gravel, forming part of superficial deposits overlying basalt and Glendower Formation north of Wongalee Homestead.

BMR Neg. M/250.

Basalts

Twidale (1956b) described and named the basalt provinces of north Queensland; of these only the Chudleigh and Sturgeon Basalts are within the area mapped. The Chudleigh basalt is restricted to a tongue of a valley flow, and only residuals of the flow remain, forming a dissected bench in the gorge of Cambridge Creek about 30 feet above the present valley floor.

The Sturgeon basalt is extensive. It forms the plateau and erosional residuals of most of the mapped part of the Hughenden area north of 20°45' S, extending westwards into the Richmond area as the dissected plateau between the Dutton and Flinders Rivers. It also forms tongues at lower topographic levels along Pine Tree and Porcupine Creeks.

A third basalt forms a sand covered plateau between Cambridge and Yanko Creeks. It was not recorded by Twidale (loc.cit.) and does not appear to have been connected on the surface to either the Chudleigh or Sturgeon Basalts. Pending further investigation it is mapped as a separate, unnamed basalt.

Only slight lithological variations, attributable to a small degree of differentiation, are evident from thin section examination. No significant differences between the three basalts are apparent; all are dominantly porphyritic olivine basalt. Some samples are aphanitic or include glassy material, others are coarser and are classified as olivine dolerite. The typical rock consists of 7 - 10% olivine, 30 - 35% augite, 45 - 55% plagioclase, minor magnetite and with calcite in vesicles. Olivine is commonly in phenocrysts or nests of small crystals and partly altered to bowlingite. Augite is normally restricted to the groundmass, and only rarely does it form phenocrysts. Plagioclase is labradorite, and characteristically forms laths in the groundmass; some are coarse and range up to 2.5 mm.long.

The main differentiates are:

a) a less basic rock, with decrease in ferromagnesian minerals and increase in plagioclase,

b) an olivine-magnetite rich rock, containing 14% olivine, in three generations, and 7% magnetite,

c) magnetite rich rocks, containing 10% magnetite in very fine euhedra.

Only seven thin sections were made from basalt samples, so any conclusions drawn from the distribution of the differentiates must be regarded as tentative. With this qualification, it is noted from field evidence that (b) came from a later flow than(a) but both apparently came from the same vent. (c) (two samples) came from the vent at Mount Desolation, and from a very late stage valley flow. Both samples can therefore be regarded as from late stage extrusives, as can(b) which is also magnetite rich. Contradictory evidence is given by another sample from further down the valley flow, which has only 3% magnetite.

Twidale (1956b), referring to the Sturgeon Basalt, suggested that there has been a "vast amount of peripheral dissection", and that the basalt was extruded during the earliest phase of the Cainozoic vulcanicity in north Queensland, but only in this earliest phase. This dating was based mainly on the amount of dissection. He also suggested that the basalt has a general domelike form. There is an element of truth in each contention but each is an oversimplification. These three points are dealt with separately below.

Thicknesses near the margins of outcrops, except in Galah Gorge, are almost invariably small - normally less than 20 feet and commonly less than 10 feet. Yet drillers record much greater thicknesses of basalt when drilling water bores, some in excess of 150 feet. In Galah Gorge greater thicknesses can be seen, some manifestly due to the piling of one flow on another (Plate 13). The thinning towards the margins of existing outcrops is not erosional, for the surfaces of the basalt are flat right to the edge of the scarp. A more reasonable explanation is that, with the exception of the area north-east of Hughenden, erosion has not been as great as suggested by Twidale, but rather has affected the less resistant areas at the edges of numerous valley flows. Thus the many long tongues of basalt on the margin of the Sturgeon Province have not suffered much erosion and approximate the original extent of valley flows in an area of low relief. Extrusion of the basalt displaced the old streams which have since cut down where there was least resistance, i.e. along the margins of the basalt tongues, and thus along the pre-basalt divides. It is difficult to otherwise explain the strong linear nature of basalt outcrops north of the Flinders River between Hughenden and Richmond.

Confirmatory evidence of this is given by the basalt tongue between Jones Valley and Spring Valley Creeks. Here two flows abut; traced uphill towards their source at Mount Desolation the northern one can be seen to have flowed over the southern one, forming a scarp approximately 30 feet high. The northern flow must therefore be a later flow than the southern. Where the two flows abut the later flow is very slightly lower than the older. Evidently it flowed down a valley that was being cut on the margin of the older flow.

When examined in detail each of the southern basalt tongues can be seen to have corresponding courses. Each runs south or south-westwards to near the present course of the Flinders River, and then swings sharply west or north-westwards. This pattern shows that numerous flows were concentrated along old tributary valleys of the ancestral Flinders River and eventually flowed along it. Near Marathon are several smaller tongues which apparently never reached the ancestral Flinders and do not show the westerly swing.

It is not so evident that Galah Gorge is near an old valley, but locally individual flows can be seen to be dipping westwards as though filling an old trough on the west side of the gorge. An indication can also be obtained from drillers' logs or bores in the area, several of which record basalt about 100 feet thick, with thick "river wash" below. North of Wongalee are hills of sandstone east of Galah Gorge which overtop the basalt surface forming the lip of the Gorge. Near Mount Sturgeon further hills are present on the west side of the gorge. These observations can best be interpretated as indicating that a steep sided valley existed in pre-basalt time in the approximate position of Galah Gorge or slightly west of it, and that it formed a major channel of flows coming from the north.

Evidence that the extrusion of the Sturgeon Basalt took place over a prolonged period is given by the amount of erosion that has taken place on the margins of the province. It has already been shown above that the basalt north of the Flinders between Richmond and Hughenden is not extensively dissected. The area north-east of Hughenden is much more so, and the basalt outliers there (Mounts Wongalee and Beckford, Burraway Hills, etc.) are erosional residuals of a once more extensive basalt plateau. Since that erosion took place and the valley of Porcupine Creek had been lowered by about 200 feet to almost its present level, more valley flows followed an old course of Porcupine Creek. These now form long sinuous basalt outcrops north of Hughenden and east of Mount Canterbury. There is a similar low-level valley flow along Pine Tree Creek in the north-west of the Hughenden area. The low-level valley flows are at almost the present day valley floors and so must be much younger even than the valley flows east of Richmond.

Three phases of eruption can, therefore, be suggested for the Sturgeon Province. The first probably came from the large main vents in the north: eastern Mount Pleasant, Mount Emu, Mount James, and possibly Mount Sturgeon - and supplied basalt for the flows which travelled down the ancestral Galah Gorge and the Flinders River as far as Mount Beckford and Mount Arthur. There was also extrusion at this time or slightly later from Mount Desolation and from Bald Hill and western Mount Pleasant, but the lava from the two northerly vents partly overlapped the flows from Mount Desolation to form the scarp extending east from Colindale. The western flows are regarded as probably slightly later than the eastern for they are not as extensively dissected as the area north-east of Hughenden.

The second phase consisted mainly of extrusion from Mount Stewart, forming almost all the basalt of the Richmond area, although some flows from the first phase may have travelled a long distance south-westwards, and since covered by flows of the second phase. Mount Stewart is the best preserved of all the vents, with a well defined crater rim approximately ¼ mile across, breached at the eastern side and with the last basalt flowing through the breach.

The final phase was the extrusion of the low-level valley flows, and a much smaller volume of lava was involved than in previous phases. The vents for these cannot be identified; quite possibly they came from reactivation of older vents. In this connection Mount Sturgeon is unique in the area of older vents in that it is small and retains a semblance of circular crater form. It is possible that this was the vent for a late stage small eruption which provided the valley basalts north of Hughenden.

As noted earlier (see Physiography) the regional slope of the basalt surface is a simple slope from north to south and south-west. The surface of the basalt varies in elevation by approximately 2000 feet, but the thickness seldom exceeds 200 feet except at the vents. Each of the larger vents is surrounded by an area with a general dome shaped surface, but no regional doming, or a general dome shape due to piling of lavas as postulated by Twidale, is evident. The regional slope is clearly an inherited one, modified by the vulcanicity only in the vicinity of the larger vents.

The recognised vents of the Sturgeon Basalt are listed above. There are no vents of the Chudleigh basalt within the area mapped; only the end of a valley flow enters the area. The origin of the unnamed basalt south of Cambridge Creek is problematical. There is no sign of any vent, but there is no obvious connection, either past or present with any other basalt. Twidale (ibid. p.14) noted that six centres of eruption in the Chudleigh Province occur along a south-west trending line. A south-westerly continuation of the line passes through the outcrop of the unnamed basalt and the main elongation of the basalt is roughly along this line. The most likely explanation is that it is a fissure eruption, from which only a very small amount of basalt was extruded.

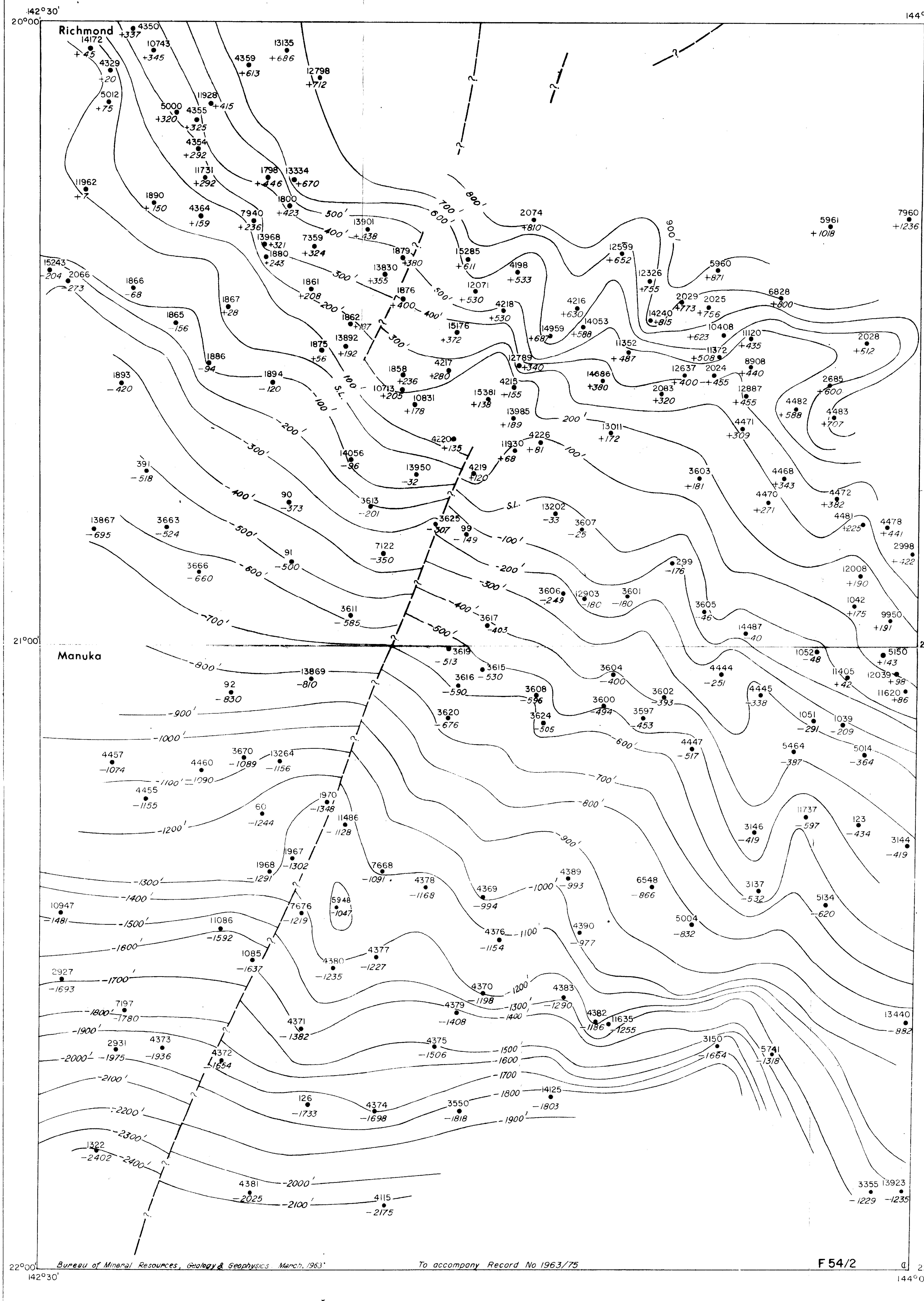
Twidale (ibid. p.19) suggested that the Sturgeon Basalt and the older Chudleigh Basalt were late Pliocene to early Pleistocene in age, and that the newer Chudleigh Basalt was early to mid Pleistocene in age. It has already been shown above that the basis for a single early age for the Sturgeon Basalt is erroneous; nevertheless the oldest parts of the Sturgeon Basalt have the features regarded as diagnostic by Twidale. Both the tongue of Chudleigh Basalt and the unnamed basalt postdate most of the erosion of the gorge of Cambridge Creek and are therefore comparable in age with the last phase of the Sturgeon Basalt. Yet the unnamed basalt is overlain by superficial sand, and near its southern limit has been appreciably eroded and left as isolated residuals above plain level. In our opinion the oldest part of the Sturgeon Basalt has more antiquity than suggested by Twidale, and the latest parts, together with the tongue of Chudleigh Basalt and the unnamed basalt, are no younger than Pleistocene.

<u>Superficial deposits</u>

A veneer of sand, with some gravel and clay, is widespread in the northern half of the Richmond area, and all except the south-west of the mapped part of the Hughenden area. The sediments represent the outwash material from the erosion of older rocks; the environments are similar to those of the Glendower Formation, but the deposits are younger, and post-basalt in age.

Erosion of the Gilbert River and Glendower Formations released sand and gravel, and large amounts have been redeposited as an apron surrounding and partly cloaking these units.

Plate 14



CONTOURS ON THE BASE OF THE WILGUNYA FORMATION

(interpreted from water bore drillers' logs)

5014 *Registered number*

• *Bore position*

−364 *Elevation of base of Wilgunya Formation*

—?— *Inferred fault*

Datum – Mean sea level

Contour interval 100 feet

Scale

5 0 5 10 15 Miles

Ferruginous material from the laterite profile has been distributed as a red dust; it forms a ferruginous coating on sand grains where the dominant lithology is sand. Further south distribution has probably been largely by wind, and large areas of basalt are covered with red dust in which a few fine quartz grains are scattered. The red dust has stained the surface of the basalt to give what the local inhabitants call "red basalt".

Clay areas within extensive superficial sand deposits on the plateau east of Hughenden were referred to by Whitehouse (1954, p.13) as Pleistocene black silts. They are black in colour, in marked contrast to most of the alluvial clays derived from the Rolling Downs Group which are characteristically grey. The only similar coloured clays are the soils derived from the weathering of basalt, and it is possible that these clay areas represent outwash from basaltic areas.

Most of these sediments were deposited by sheet flooding, but locally some are fluviatile (Plate 13, fig.2), usually near present day stream courses.

QUATERNARY

Sand

In the north-west of the Richmond area is a small area of relic sand dunes, now vegetated and partly eroded. They represent a period slightly more arid than the present, during which reworking by wind of the Cainozoic undifferentiated sand and gravel took place.

Alluvium and soil

Alluvium occurs along all major watercourses. Throughout most of the area it is silt and clay, derived from the Wilgunya Formation. Streams crossing outcrop areas of the Gilbert River Formation or draining valleys cut through the Glendower Formation carry large amounts of sand, and the largest ones have wide sandy beds (Flinders and Dutton Rivers and Cambridge Creek) and sandy alluvial plains. Downstream they cross outcrops of the Wilgunya Formation which supplies silt and clay to the rivers. Gradually the sandy alluvium becomes more argillaceous, until sand is restricted to the stream channels and the alluvial plain is almost entirely of silt and clay deposited by the receding waters of the major floods.

A depositional soil overlies a large proportion of the Toolebuc Member west of the junction of the Flinders River and Cambridge Creek. Topographically it forms a typical alluvial plain but has no present-day streams large enough to have provided the alluvium. The soil occurs in a linear belt which is a direct continuation of the Flinders River near Richmond, leading north-westwards to the alluvial belt of Express Creek and the Saxby River. This soil belt probably represents an old course of the Flinders River.

STRUCTURE

The area mapped is within the northern part of the Eromanga Basin (Mott, 1952), the largest structural division of the Great Artesian Basin (Whitehouse, 1954, fig. 37; Whitehouse refers to the Eromanga Basin as the Thomson Basin). The Euroka Shelf was originally named the Euroka Ridge by Hill (1951) but renamed Shelf by Mott (1952); Whitehouse (1954, fig.34) extended its meaning to include most of the outcrop of the Gilbert River Formation within the Richmond area.

Interpretation of the drillers' logs of water bores (which are assembled as Appendix B) shows that the base of the Wilgunya Formation dips very gently to the south (Plate 14); this is consistent with a basinal shape for the Eromanga Basin. Southward thickening of the Doncaster Member of the Wilgunya Formation and the Gilbert River Formation is also suggested by the interpretation of the bore logs. In the north, Precambrian crystalline basement is overlain directly by the Gilbert River Formation; to the south, sediments older than the Gilbert River Formation are present, as shown by the palynological work on Corfield Town Bore (Evans, 1962).

Contours on the base of the Wilgunya Formation (Plate 14), drawn from the interpretations of the bore logs, indicate a marked linear displacement extending north-north-east across the area. This can best be interpreted as a major fault, at least at depth, which possibly grades to a monocline in the argillaceous rocks of the Wilgunya Formation near the surface. Displacement is downwards to the west, with a throw of 300 feet in the south, varying to less than 100 feet in the north, before losing its character.

A parallel fault or monocline eight miles to the west is also indicated from the contours; it has a displacement of approximately 50 feet, also with downthrow to the west. Confirmatory evidence for the westerly fault is given by a sharp swing in the outcrop of the Jones Valley Member of the Wilgunya Formation over the structure; a northward continuation is evident from photo interpretation. Photo interpretation also reveals two other small faults in the north of the Richmond area. These three faults show on air photos within areas with a superficial cover of sand in which are long, very narrow lines of vegetation much denser than in surrounding areas. Northwards they are aligned with faults mapped in the inlier of Archaean rocks of the Woolgar Goldfield, and in the south-east of the Gilberton area (White, 1962a).

It was noted earlier that the unnamed basalt south of Cambridge Creek is roughly aligned with several vents of the Chudleigh Basalt in the Clarke River area. A continuation of this line south-westwards, with a slight curve to follow the trends of the fault to the north, passes through an area of marked irregularity of the sub-surface contours, to join the major fault. The north-easterly continuation of the line is the northern margin of the Broken River Rift (White, 1961); the southerly continuation is the Cork Fault (Vine, 1962). A claim that there is one major fault extending from the Broken River Rift to the Cork Fault is unwarranted on the present evidence, i.e. interpretations of bore logs, correspondence of trends, alignments of fractures, and locations of basalt flows and vents. However it is clear that there has been a linear belt or zone of weakness, which has resulted, at least locally, in fracturing or sharp folding. This belt was active during some at least of Palaeozoic time, when it was a controlling factor in sedimentation in the Broken River Rift; and again in Cainozoic times, when it formed a control for the formation of the Old Cork Basin (Vine, 1962) and for basalt extrusion. It can confidently be predicted, therefore, that evidence will be forthcoming, from geophysical or drilling activity, that it was a controlling factor in sedimentation during some at least of Mesozoic time.

The section that follows can only be regarded as speculation, based as it is on the apparent coincidence of several small pieces of evidence, most of which can be interpreted in other ways. It is suggested that a second major structural line is present east of the Cork-Broken River line, and generally having the same regional trend. The evidence is as follows:

a) Faulting is indicated by seismic work by the B.M.R. north-west of Winton, but not on the Cork-Broken River line.

b) Faulting is indicated by both gravity and aeromagnetic results north-eastwards from the seismic faulting in (a) above, extending as far as Corfield (Plate 1).

c) A coal bearing sequence of late Permian age outcrops east of the Cork-Broken River line, and although bore logs suggest this sequence persists into the subsurface east of the line, it does not appear west of it (e.g. Plate 4). (The sequence in Corfield Town Bore, which is close to the line, is less than half the thickness reported by Reid (1918) from the Oxley Creek area.)

d) Mount Canterbury (14 miles north-north-east of Hughenden) appears to be an upthrust block, because it is capped by thin basalt about 200 feet higher than the basalt plateau nearby. It is also necessary to infer faulting at Mount Canterbury to explain what would otherwise be an abnormal thickness (over 350 feet) of the Ranmoor Member of the Wilgunya Formation. Photo interpretation reveals two sets of "distinct alignments" which intersect at a very obtuse angle at Mount Canterbury; one set is parallel to the direction of the postulated structural line.

e) Galah Gorge is markedly linear (Plate 2), and in the northern end Permian sediments were seen in an eroded anticline plunging eastwards at about 45°.

f) The belt of near vertical metamorphics which forms the Great Dividing Range north-west of Pentland is not recognisable west of the line.

g) Isolated gravity traverses by the B.M.R. (unpubl.) to the north and east of the area mapped indicate a very sharp gravity gradient east of the line, and roughly corresponding with the Great Dividing Range; west of the line the gravity gradients are irregular (A. Flavelle, pers.comm.).

h) Several aligned faults (White, 1962b) cross the Broken River Rift in the Clarke River area.

It must be emphasised again that this is speculation, but it is offered as a line of thought worthy of further consideration if more evidence is forthcoming as a result of geophysical surveys or stratigraphic drilling.

GEOLOGICAL HISTORY

Precambrian crystalline rocks in the north of the area are part of the Georgetown Inlier (White, 1961); the geological history of the inlier, together with the events resulting in the formation of the Permian acid igneous rocks, is ably described by White (loc.cit.).

The southern continuation of the crystalline rocks is not known. They possibly form basement to a large part of the northern Eromanga Basin, although their relation to Proterozoic igneous and metamorphic rocks of north-west Queensland (Carter, Brooks & Walker, 1961) cannot yet be determined. There is the possibility that Palaeozoic igneous and metamorphic rocks underlie some of the basin, and an age of 273 million years obtained from granite basement in Mornington Island No. 1 Well (age determination by Australian National University) suggests possible Palaeozoic tectonism in that area. Palaeozoic sediments of the Drummond Basin are probably present in the sub-surface to the east. Apart from areas near outcropping crystalline basement in the north only Corfield Town Bore (Reg. No. 14125) and Narollah Homestead Bore (Reg. No. 4375) reached basement; the logs of both bores record granite.

During the period from late Permian to the Jurassic sedimentation was almost entirely terrestrial, interrupted by periods of erosion or non-deposition. Permian sediments were deposited in a lagoonal or swampy environment, resulting in the formation of carbonaceous shales and coals, with interbedded arenites. The extent of early Mesozoic sedimentation is not known, but the bore logs suggest that it was thicker and possibly more continuous in the south. Evans (1962), from the occurrence of hystrichospheres in core 1 (2892 - 2902 feet) of Corfield Town Bore, suggested that conditions were brackish or marine for a short time in the Lower or Middle Jurassic.

The first sedimentation that was known to be laterally continuous in the northern Eromanga Basin was the deposition of the Gilbert River Formation in Upper Jurassic to Lower Cretaceous times. Conditions were still mainly terrestrial, except at a very late stage, and the Gilbert River Formation was a blanket sand deposit. Early source areas were probably fairly local, as indicated by variable current directions, but were mainly to the north.

Later currents were much steadier and indicative of a main source area to the west. Finer sediments form Member 4 of the unit and possibly indicate the levelling of this western source area. Member 5 was coarser, and received sediment mainly from the south.

Marine conditions did not start until late in the period of deposition of the Gilbert River Formation, in Cretaceous times. In the marginal areas of outcrop marine fossils were only found in the beds transitional to the Wilgunya Formation, and there it appears that sediments began to come from a new source at the same time as the start of marine conditions. Marine fossils are recorded from a slightly lower horizon in the Croydon area, and in the Corfield Town bore (although there it is possible that they might be contained in cavings).

In the northern Eromanga Basin the Cretaceous sea was probably not deep at any time. Plentiful glauconite, shell-beds, and wave-rolled mud pebbles are common in the Doncaster Member, which was the first unit deposited in this sea, when it was possibly shallowest. Coarser sedimentation in the Jones Valley Member probably indicates tectonic activity in the source areas of the sediments. This tectonism was possibly reflected subsequently within the basin by the development of barred basin environments, suitable for the deposition of dark, commonly carbonaceous, claystones of the Ranmoor Member.

The Toolebuc Member was deposited in lime-rich water, with conditions conducive to the development and preservation of a rich fauna. The remarkable uniformity and large areal extent of the unit, although so thin, suggests that the member reflects a tectonic or climatic control of the source area, which reduced the amount of mud entering the sea, accompanied by a basinwide environmental change marked by increased stability.

The lithic sandstone and siltstone beds in succeeding Cretaceous units show that volcanics, probably the Lower Bowen Volcanics to the east assumed an important role in supplying sediments for the Eromanga Basin. It must be assumed that at this time there was folding or uplift of parts of the Bowen Basin, to provide conditions suitable for the rapid transport of slightly altered detritus from the eroding Bowen Basin into the Eromanga Basin. The gradual withdrawal of the sea resulted from the partial filling of the Eromanga Basin. During the late marine stages only an impoverished fauna remained. This was commonly preserved in coquinas, which reflect sudden extinction with quick burial of communities. Late in this phase few fossils were able to survive, and Inoceramus appears to have been the most hardy of them.

Terrestrial sedimentation was resumed in Winton times, but the types of sediment are very similar to those in the Mackunda Beds - fresh, fairly well sorted lithic sandstone and claystone. There was local development of lakes and swamps or peat bogs, but generally the terrestrial basin was well drained; evaporite sequences have not been found.

The duration of Winton sedimentation in the area is not known, but it was more prolonged further south towards the centre of the Eromanga Basin. Eventually deposition was replaced by erosion and the very gently dipping sediments were planed off to a land surface which truncated all the Mesozoic units.

Near outcrops of the Gilbert River Formation the Glendower was formed by fluviatile deposition of sheet and river types, and the whole of this new surface was lateritized.

Fracturing took place, mainly along north-north-east trending lines. Basalts were extruded through some of the fractures; mainly through isolated vents, but some fissure eruption took place.

Erosion had meanwhile been proceeding since the formation of laterite, and eroded laterite profiles were buried by lava; earlier lava flows were also eroded before later flows were extruded. The basalt surface has only been slightly affected by subsequent erosion, other than the cutting of a few deep gorges, but it has removed large quantities of the surrounding Cretaceous rocks, leaving the basalt preserved as a plateau capping.

Contemporaneous with some of the late Cainozoic erosion there has been widespread deposition of some of the detritus. The residues from the erosion of the Gilbert River and Glendower Formations were redeposited as a superficial sand cover, and more recently some has been deposited as a sandy alluvium. Clay and silt derived from the Rolling Downs Group have formed the extensive alluvial plains of the western part of the area.

ECONOMIC GEOLOGY

Underground Water

The most dependable and abundant supplies of underground water come from Mesozoic sandstones. These include the Gilbert River Formation and unnamed older units below, usually unrecognisable from the drillers' logs. Several aquifers are present in these sandstones. Commonly the drillers record an aquifer at the top of the sandstone sequence, probably corresponding to Member 5 of the Gilbert River Formation; below this there is up to 300 feet of dry strata, followed by several aquifers. The lower aquifers possibly represent Members 2 and 3 of the Gilbert River Formation and older units.

Water from these aquifers is described as fresh and where analysed is usually potable (analyses are available from the Irrigation and Water Supply Commission, Brisbane). Supplies are generally good, due to the good permeability of the aquifers. In low lying parts of the Manuka and Richmond areas the head is sufficiently high to produce flowing bores. Flows range up to several hundred thousand gallons per day, although some were flowing at rates in excess of one million gallons per day during the early part of the century. On higher ground where water is obtained from these aquifers by pumping, supplies are always in excess of the capacities of the pumps. The depth of this group of aquifers increases from surface in the north of the Richmond and Hughenden areas (intake areas) to about 3000 feet (approximately 2500 feet below sea level) in the southern part of the Manuka area.

Some supplies are obtained from thin coarser beds in claystones of the Doncaster Member, within a few hundred feet of the Gilbert River Formation. These are probably derived from leakages from the main aquifers below; they are most common and have largest supplies in areas of fracturing or faulting.

In the southern part of the Manuka area it is no longer economical to drill to the deep aquifers, and most station owners now prefer either to sink large earth tanks or drill for shallow supplies (less than 600 feet) from the Mackunda Beds or the Winton Formation. These units contain aquifers in thin lensing sandstone beds and several aquifers are generally intersected in any bore. The general distribution of shallow holes shows however, that the main aquifers of the Mackunda Beds are in the upper half of the unit. None of the bores is flowing and supplies are generally small. A few aquifers produce more than 10,000 gallons per day, but most produce considerably less; more than one aquifer is usually needed to provide sufficient water to make a bore useable. Water is variable in quality, ranging from fairly fresh to saline. As a result of these factors many bores have not yielded a sufficient supply of useable water; these are called "dud bores". Some bores, once in use, have subsequently been abandoned either because of a technical failure of the bore (silted up, casing collapsed) or the water supply has decreased to a marked degree or become saline.

The poor supply, and possibly also the poor quality are due to low porosity and low permeability of the sandstones. Slow replenishment results in large draw-downs, and pumps may be as much as 100 feet below the standing water level. The slow water movement also allows time for the water to dissolve calcium carbonate and other salts from the host rocks, particularly sodium chloride included during sedimentation.

The Glendower Formation provides shallow aquifers below basalt in the Hughenden and eastern Richmond areas. They produce potable water, commonly giving supplies in excess of the capacities of the windpumps. The water rises only slightly in the bores. The beds are usually described by the drillers as "drift sand" or "river wash", and have good permeability with little draw-down. Supplies, though generally good, decrease after prolonged droughts, indicating that the total volume of sandstone forming the aquifers is not large. The most abundant supplies are probably related to old stream channels, and some are evident in the drillers' logs where an unusually thick sequence of coarse sand and gravel was encountered.

Petroleum

The petroleum prospects of an area depend on four factors:

a) suitable source beds to generate petroleum,

b) suitable reservoir rocks with suitable cap rocks to receive the petroleum,

c) suitable structures to trap and store the petroleum,

d) a suitable geological history to prevent the loss of the petroleum before reaching the reservoirs.

With the information at present available the prospects of the area are not encouraging.

Source beds: Suitable source beds are at present restricted to the Lower Cretaceous marine beds, many of which are richly fossiliferous. Most are now exposed to weathering.

Reservoir rocks: Most of the pre-Wilgunya Mesozoic sequence contains beds with good reservoir characteristics. Sandstone beds are also recorded from the Permian sediments. Sandstone beds in the Mackunda Beds and the Winton Formation are probably lenticular and not very permeable, but they are the only ones suitably located to receive migratory fluids from Cretaceous source beds.

Structures: Folding and faulting is evident within the area, but detailed mapping would be necessary to indicate closure. Tertiary faulting could have brought reservoir rocks against Cretaceous source beds.

Geological history: The only part of the sequence regarded as conformable is the Cretaceous. Most of the potential reservoir sequences are disconformable on older rocks, with considerable periods of time between units. These may not be excessive if source beds were releasing petroleum over a prolonged period.

Prospects: It would seem that the area would only have petroleum prospects if source beds of early Mesozoic or Palaeozoic age can be proved. Occasional reports of gas appear in water bore drillers' logs, but the actual beds producing gas, **are probably in the Cretaceous units.** It is suggested above (see Structure) that major structural lines crossing the area may have controlled sedimentation to the extent that there are sediments in the subsurface which have not yet been recognised in outcrop. If such sediments do exist, and they contain source beds the petroleum prospects of the area will be considerably enhanced. The main possibilities for this are:

a) that sediments of the Drummond Basin continue in the subsurface to the west and contain marine elements,

b) that the marine Permian of the Bowen Basin extends into the area. Marine Permian is recorded in S.P.L. No. 1 (Birkhead), but not in Magellan Corfield No. 1, or Exoil Brookwood No. 1.

The area is favourably situated hydrodynamically, with regional down-dip flow towards the centre of the basin.

Gold

Some gold has been produced from the Mount Emu Plains Goldfield, near the junction of the Flinders River and Range Creek. The field was worked from 1910 to 1915 and again from 1939 to 1942, for a total recorded yield of about 400 oz of gold. The ore occurs in quartz reefs in the Dumbano Granite, near its contact with Precambrian metamorphics.

In the first phase of the field's production, the main reef worked was the east-west trending Granite Castle lode which is about 1,300 feet long (Cameron, 1910). Only a small section of this lode, the Granite Star West Mine, was worked in the second phase of mining (Ball, 1941).

Some gold has been recorded from a mine near the junction of Cambridge and Crusoe Creeks in the Richmond area. From local residents' reports alluvial and reef gold and some gold-bearing conglomerates have been mined. Whitehouse (1954) records that "where Upper Blythesdale beds rest on Precambrian they have a basal conglomerate carrying alluvial gold" and gives the Woolgar Goldfield as an example. The Cambridge - Crusoe Creek mine is possibly another example of this type of occurrence.

The existence of basalt caps over old pre-basalt valleys suggests the possibility of deep-leads containing alluvial gold in the Glendower sands, particularly in the north-eastern part of the Sturgeon Basalt Province near to the Mount Emu Plains Goldfield.

Other Metallic Minerals

Approximately 4,500 oz of silver were produced from the Mount Emu Plains Goldfields; copper, lead and antimony were also found but not in commercial quantities.

Coal

Coal has been recorded from Permian sediments at several localities in the Hughenden area, outside the mapped part. These will be investigated during the 1963 field season. Coal seams are also recorded in drillers' logs of some bores in the southern part of the Hughenden area near Prairie and Torrens Creek.

Dam sites

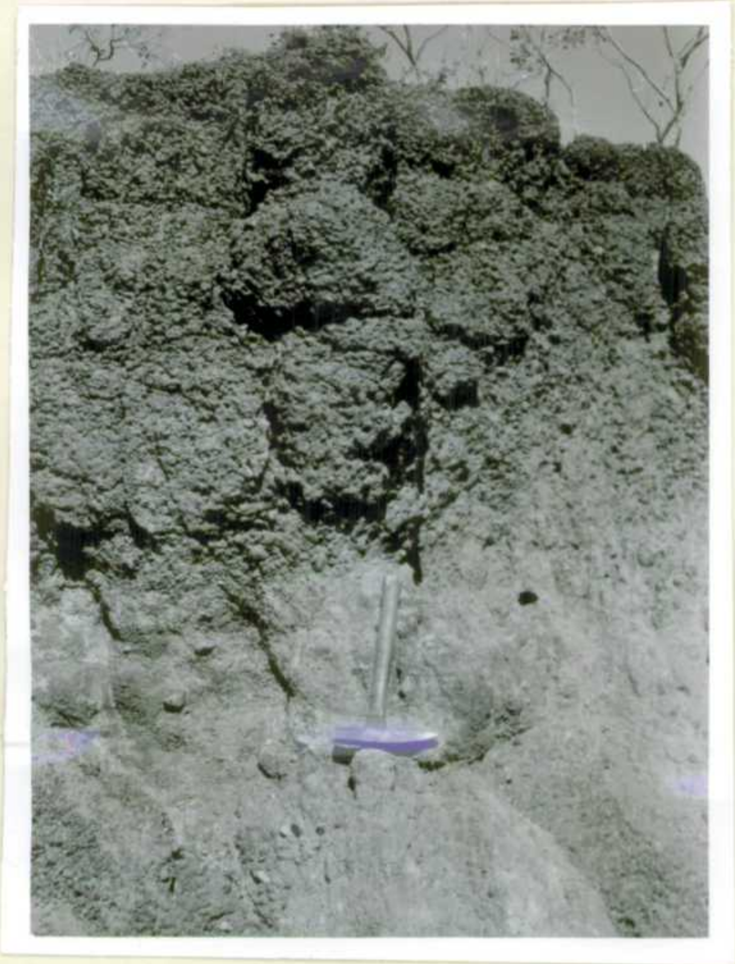
The existence of steep-walled and narrow gorges in the basalt plateau has for many years prompted local suggestions of the possibility of damming them for water and more recently, for hydroelectric power. The present study yielded some evidence on the geological factors involved, and these are discussed briefly. Narrow constrictions suitable for dam sites are located at a number of places in the Hughenden and Richmond areas, as follow (elevations refer to base of possible sites):

a) Flinders River, 15 miles north of Blantyre Homestead. Elevation about 1,550', catchment area about 650 square miles.

b) Porcupine Creek in Galah Gorge, at many points 10 to 20 miles north of Wongalee Homestead. Elevation about 1,600', catchment area about 220 square miles.

c) Prairie Creek in Prairie Gorge, 12 miles north-north-east of Wongalee Homestead. Elevation about 1,600', catchment area about 60 square miles.

PLATE 15.



Pisolitic ferruginous zone of laterite profile, developed in pebbly argillaceous sandstone of the Glendower Formation, 8 miles north-east of Doncaster Homestead.

BMR Neg. M/250.

d) Betts Gorge Creek, $1\frac{1}{2}$ miles west or $1\frac{1}{2}$ miles east of Alston Vale Homestead. Elevation about 900', catchment area about 350 square miles.

e) Jones Valley Creek, 5 miles south of Strath Stewart Homestead. Elevation about 1,200', catchment area about 90 square miles.

f) Stewart Creek, 3 miles north of Expressman Downs. Elevation about 1,050', catchment area about 140 square miles.

g) Dutton River, 6 miles north-west of Dutton River Homestead. Elevation about 1,150', catchment area about 520 square miles.

h) Cambridge Creek, 20 miles east of Stawelton Homestead. Elevation about 1,450', catchment area about 440 square miles.

Of these sites a, b, c and h are all situated over highly permeable intake beds of the Eromanga Basin, which would lead to considerable leakage. This leakage would contribute to raising the piezometric surface and increase the yield of some bores. Whether the leakage would be low enough for the dams to be used in the normal way, or the rise in piezometric surface high enough over an appreciable area to be worthwhile, is a matter for considerable quantitative hydrologic and economic study. Also the dams would lead to some silting of the intake beds, and care would be needed to ensure that water was not lost by strong spring action to any nearby topography.

Dutton River Gorge (site g) is situated over impermeable Cretaceous rocks, but its main catchment is in the intake area of the aquifers. However it has the advantage of a particularly narrow gorge.

Sites d, e, and f are all situated over tight Cretaceous rocks, but which include swelling clays dipping downstream, and with gorges walled by the Cretaceous rocks. Leakage would therefore be at a minimum. The catchment areas are mainly basalt covered, with good run-off; water penetrating the basalt through joints percolates through to the Glendower Formation below and mainly issues through springs in the gorge walls, thus giving a slight stabilising effect to the strong seasonal variations in run-off. Of these sites Betts Gorge Creek has the largest catchment area and is ideally suited for supplying water for irrigation of nearby flat-floored valleys to the west.

Iron

Thin lateritic cappings of Glendower Formation are numerous through the Hughenden and Richmond areas. In general the pisolitic zone is about three feet thick (Plate 15), but may locally be thicker. The most extensive sheet of laterite forms a low plateau south of Cambridge Creek, but it has a very thin cover of later sand.

Glendower Formation, before lateritization, was an argillaceous pebbly sandstone, and most of the quartz grains and pebbles retain their original composition and shape in the laterite, and so could presumably be removed mechanically. Samples of laterite analysed in the Bureau of Mineral Resources laboratory by S. Baker gave the following results:

	SiO_2	Fe_2O_3	Al_2O_3	TiO_2	Loss on ignition
GAB 868 (from the plateau)	54.7	26.5	8.8	0.60	8.10
GAB 1011 (from near Yanko Bore)	51.3	25.2	13.0	0.50	8.20

If approximately half the rock consists of sand grains the silica portion should be almost entirely removable mechanically, and the proportion of iron would, in consequence, be doubled. This is still too poor to be considered an iron ore prospect, but is a possibility for use in cement making, if that industry is established in the region.

Construction Materials

Suitable material for road making is a major problem because vast areas of the area mapped are underlain by argillaceous rocks. Materials that have been used are:

a) sand from the Glendower Formation - mainly for road construction over basalt plateaus,

b) platy limestone from the middle part of the Toolebuc Member - after rain this sets to give a hard, smooth road surface, which stands up to traffic better than the normal unimproved earth surface,

c) sand from the superficial sand veneer, but this mainly occurs a long way from where it is needed. As the area has low traffic densities it is seldom considered worth transporting,

d) sand from the sandy beds of the largest northern rivers, but with the same qualifications as in c).

Sand and gravel for aggregate are also available from the river beds; material from the superficial sand is mainly ferruginous and would probably be unsuitable.

Limestone from the Toolebuc Member is suitable for the manufacture of lime, but deposits are thin although widespread.

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APPENDIX A

PALAEONTOLOGICAL DATA

PART 1 - PREVIOUS PUBLISHED DETERMINATIONS

Locality	1:250,000 Sheet	Fossils	Reference	Age
Base of Walker's Table Mountain	Hughenden	Inoceramus carsoni, Inoceramus sutherlandi, Belemnites canhami, Ammonites flindersi, Ammonites sutherlandi, Ancyloceras flindersi, Ichthyossaurus australis, Plesiosaurus macrospondylus.	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Base of Walker's Table Mountain	Hughenden	Beaudanticeras flindersi	Whitehouse 1928	Lower Cretaceous (Tambo fauna)
Marathon Station	Richmond	Inoceramus carsoni, Inoceramus pernoides, Inoceramus marathonensis, Inoceramus elongatus, Ammonites sutherlandi, Plesiosaurus macrospondylus.	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Marathon Station	Richmond	Ichthyosaurus australis, Plesiosaurus sutherlandi, Plesiosaurus macrospondylus, Ammonites sutherlandi, Ammonites flindersi, Belemnitella diptycha, Ancyloceras flindersi, Inoceramus carsoni, Inoceramus sutherlandi, Inoceramus marathonensis.	Daintree 1872	Lower Cretaceous (Tambo fauna)
Marathon Station	Richmond	Inoceramus pernoides, Inoceramus maximus, Inoceramus constrictus.	Etheridge 1901	Lower Cretaceous (Tambo fauna)
Marathon outstation, Marathon	Richmond	Haploceras flindersi	Etheridge 1901	Lower Cretaceous (Tambo fauna)
7 miles above Marathon Station on Flinders River	Richmond	Aeschna flindersensis, Aucella hugnendenensis, Inoceramus pernoides	Etheridge 1892	Lower Cretaceous (Tambo fauna)

Locality	1:250,000 Sheet	Fossils	Reference	Age
Marathon Station	Richmond	Beaudanticeras sutherlandi	Whitehouse 1928	Lower Cretaceous (Tambo fauna)
Flinders River near Hughenden	Hughenden	Belemnites canhami	Etheridge 1892	Lower Cretaceous
Flinders River near Hughenden	Hughenden	Inoceramus constrictus, Haploceras daintreei	Etheridge, 1901	Lower Cretaceous (Tambo fauna)
Hughenden	Hughenden	Aspidorhynchus, Belonostomus sweeti, Ammonites daintreei	Etheridge 1892	Lower Cretaceous
Hughenden	Hughenden	Hartoceras daintreei, Ancyloceras sp. ind.	Etheridge 1901	Lower Cretaceous (Tambo fauna)
Hughenden	Hughenden	Beaudanticeras spp.	G.S.Q. Museum	Lower Cretaceous (Tambo fauna)
Hughenden	Hughenden	Desmoceras ? sp., Beaudanticeras mitchelli, Boliticeras perlatum	Whitehouse 1928	Lower Cretaceous (Tambo fauna)
Hughenden	Hughenden	Kronosaurus queenslandicus	Longman 1924	Lower Cretaceous
Hughenden Station	Hughenden	Aucella hughendenensis, Ammonites flindersi	Etheridge 1892	Lower Cretaceous (Tambo fauna)
15 miles south-west of Hughenden on Winton road	Hughenden	Labeceras trifidium	Longman 1915	Lower Cretaceous (Tambo fauna)
Warianna bore 28 miles from Hughenden on Winton road. At 351' depth (R.N. 1052).	Hughenden	Ammonites inflatus	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Maxwelton	Richmond	Nautilus hendersoni	Etheridge 1901	Lower Cretaceous (Tambo fauna)
Maxwelton 20°45' S, 142°48' E.	Richmond	Nautilus hendersoni	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Maxwelton	Richmond	Nucula	G.S.Q. Museum	Lower Cretaceous (Tambo fauna)

Locality	1:250,000 Sheet	Fossils	Reference	Age
Whitewood Ridge Sesbania	Manuka	Crioceras flindersi	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Upper Flinders	Hughenden	Inoceramus maximus	Etheridge 1892	Lower Cretaceous (Tambo fauna)
3 miles above Richmond Downs Station	Richmond	Inoceramus carsoni, Inoceramus sutherlandi	Etheridge 1892	Lower Cretaceous (Tambo fauna)
13½ miles below Richmond Downs Station	Richmond	Inoceramus carsoni	Etheridge 1892	Lower Cretaceous (Tambo fauna)
21 miles below Richmond Downs	Richmond	Inoceramus sutherlandi	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Flinders River 35 miles below Richmond Downs	Richmond	Ichthyosaurus australis	Etheridge 1892	Lower Cretaceous
Cambridge Downs 6 miles from Richmond Downs	Richmond	Belemnites canhami	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Glendower, Upper Flinders	Hughenden	Ichthyosaurus australis	Etheridge 1892	Lower Cretaceous
Redan	Richmond	Crioceras	Etheridge 1892	Lower Cretaceous (Tambo fauna)
Sylvania Station	Richmond	Cratochelone berneyi, Aucella hughendenensis, Portheus australis	Longman 1915	Lower Cretaceous (Tambo fauna)
Galah Creek 12 miles from Hughenden	Hughenden	Ichthyosaurus australis, Lamna appendiculata, Aucella hughendenensis, Turritella(?) microlinea	Longman 1922	Lower Cretaceous (Tambo fauna)
Clutha Station	Richmond	Austrosaurus mckillopi, Beaudanticeras sp., Inoceramus	Longman 1953	Lower Cretaceous (Tambo fauna)
1 mile east of Telemon homestead in a paddock on a hill towards woolshed	Richmond	Ichthyosaurus australis	Longman 1935	Lower Cretaceous
1 mile east of Richmond	Richmond	Flindersichthys denmeadi Aucellina gryphaeoides	Longman 1932	Lower Cretaceous (Tambo fauna)

Locality	1:250,000 Sheet	Fossils	Reference	Age
Alderley Homestead	Hughenden	Flindersichthys denmeadi	Longman 1932	Lower Cretaceous
Betts Gorge Creek	Hughenden	Beaudanticeras flindersites, Myloceras	G.S.Q. Museum	Lower Cretaceous (Tambo fauna)
Fairlight Station, Betts Gorge Creek	Hughenden	Goniomya	G.S.Q. Museum	Lower Cretaceous
Flinders River near Hughenden	Hughenden	Belemnites selheimi	Etheridge 1892	Lower Cretaceous (Roma fauna)
Fairlight Station, Upper Flinders	Hughenden	Mytilus palmerensis	Etheridge 1901	Lower Cretaceous (Roma fauna)
Upper Flinders	Hughenden	Cyprina clarkei	Etheridge 1892	Lower Cretaceous (Roma fauna)
Hughenden	Hughenden	Pinna australis	Etheridge 1901	Lower Cretaceous (Roma fauna)
Upper Flinders	Hughenden	Cyronopsis meeki, Fissilunula clarkei, Macrocallista ? plana, Belemnites selheimi, Dentalium sp., Natica variabilis	G.S.Q. Museum	Lower Cretaceous (Roma fauna)
Upper Flinders	Hughenden	Pseudavicula anomala	G.S.Q. Museum	Lower Cretaceous (Roma fauna)
Army Downs	Richmond	Kronosaurus	Longman 1935	Lower Cretaceous (Roma fauna)
Grampian Valley	Richmond	Maccoyella, Purisophonia, Australiceras	Queensland Museum	Lower Cretaceous (Roma fauna)

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PART 2 - REPORTS ON 1962 COLLECTIONS

by

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Report on marine Cretaceous fossils collected from Jones Valley and from near Alderley, Richmond 1:250,000 Sheet area.

Locality : GAB 687; first hill north of Alderley on road to Dunraven.
In fine-grained, silty, glauconitic sandstone.

Determinations : *Camptonectes* sp. indet.
Nuculana sp. indet.
"*Dentalium*" sp. indet.
Indet. gastropod fragments

Age : Possibly Aptian.

Remarks : *Camptonectes* sp. indet. is represented by several internal moulds of left and right valves. They differ from typical specimens of the Aptian species *Camptonectes socialis* (Moore) from Wallumbilla (Roma Formation), in that the umbo is more central. Below the anterior ear of the right valves there is a well developed subauricular notch, and in both valves the anterior ear is much larger than the posterior. Unfortunately none show auricular ornament. On the body portions of some of the internal moulds there is a delicate ornament of radiating and divaricating lines, but others are apparently smooth. In addition there are fragmentary external impressions of a *Camptonectes* displaying well developed cancellate and somewhat punctate ornament. However, none of these can be associated with the internals and it is not possible to say whether one species or two are represented in this collection.

Nuculana sp. indet. is represented by several weakly convex, elongate and slightly rostrate internal moulds. They are referred to this genus on account of their shape as the specimens show neither hinge teeth nor pallial characters.

The two small scaphopods referred to "*Dentalium*" sp. indet. are thin shelled and possess an ornament of fine growth lines. However, they show no apical features and a more refined determination is not possible.

In view of the indeterminate nature of this material it is difficult to assess its age, and further collections from this locality will be necessary before a definite age can be assigned to it. A possible Aptian age is suggested on the negative evidence afforded by the absence of *Inoceramus*.

Locality : GAB 689 A and B; Jones Valley about 2 miles W. of Jones Valley homestead.
In fine-grained, silty, glauconitic sandstone, in part conglomeratic with calcilutite pebbles, shell fragments and rolled belemnite guards.

Determinations : Maccoyella sp. (juvenile)
Maccoyella fragments
Camptonectes sp. indet.
"Dentalium" sp.
Belemnite gen. and sp. indet. (?Peratobelus)
Isocrinus sp.

Age : Probably Aptian.

Remarks : The sole specimen of Maccoyella sp. is a small left valve 4 mm. in length. The anterior ear is proportionately much larger than that in mature specimens of this genus, while the ornament consists of 6 radial ribs of equal size crossed by delicate concentric lines. However, specific determination is not possible. Indeterminate fragments of larger Maccoyella shells are common.

Camptonectes sp. indet. is represented by several left valves and one right valve. The left valves present only interior views, and neither auricular ornament nor that on the body of the shell is visible. They are quite convex and seem comparatively thick shelled. The anterior ear is much larger than the posterior, its shape comparing closely with that of specimens from GAB 687. In the single right valve the central portion of the body of the shell is missing, but the margins retain traces of quite strong radiating lines. The anterior ear is quite large with a deep and narrow notch below. It may or may not be conspecific with specimens from GAB 687.

"Dentalium" sp. differs from "Dentalium" sp. indet. from GAB 687 in its larger size and thicker shell. One specimen exhibits an ornament of strong annular rings, but on most the exposed surface is exfoliated, and as they are tightly bonded to the matrix it has not been possible to develop the unexposed surfaces. As mentioned below the form could well be conspecific with those from GAB 699.

None of the numerous belemnite guards show sufficient features to be determined generically. Portions of the apical regions are present in some specimens, the apical angle being small ($10^\circ - 15^\circ$), although the pieces available for measurement are quite short. In so far as they are preserved their shape is cylindrical rather than clavate, suggesting possible reference to the Aptian genus Peratobelus.

Isocrinus sp. is represented by several arm branches, numerous isolated brachials and a few isolated pentagonal columnals. Unfortunately no calyx is preserved, and there are no stem elements other than the isolated columnals. A few of the branches show axillaries and the branching is isotomous. Several are distal portions and bear numerous pinnules, the overall branching being endotomous. Pentagonal columnals coupled with this type of branching are characteristic of the long ranged (Triassic-Tertiary) genus Isocrinus von Meyer. Crinoids have previously been described from sediments of the Roma Formation at Wallumbilla and the Amby River at Mitchell Downs by Moore (1870, pl.17, fig.3; pl.18, fig.1) as Pentacrinus australis, and from the Maranoa River by Etheridge Jnr. (1901, pl.1, fig.4; pl.3, figs.1-3), who referred Moore's species to the genus Isocrinus. I. australis has also been described from White Cliffs in N.S.W. by Etheridge Jnr. (1902, pl.4, figs.7-10; 1904, pl.28, figs.1-4). All of these occurrences are of Aptian age. While the present specimens are not unlike the figured Aptian species, there is insufficient material preserved for comparison to be made.

While the collection contains no positively identified Aptian elements, the available evidence is suggestive of an Aptian rather than an Albian age. The negative evidence afforded by the absence of Inoceramus supports this.

- - - - - - - - - -

Locality : GAB 699: Creek crossing just north of Jones Valley homestead, on road to Dunraven.
In fine-grained, silty, glauconitic, conglomeratic sandstone, with calcilutite pebbles, shell fragments and rolled belemnite guards.

Determinations : Maccoyella corbiensis (Moore)
Maccoyella fragments
"Dentalium" sp.
Belemnite gen. and sp. indet. (?Peratobelus)

Age : Aptian.

Remarks : The Aptian age of this collection is based on the occurrence of Maccoyella corbiensis. This species is represented by one left valve which, although incomplete dorsally, shows the multicostate radial ornament characteristic of this Aptian species. This ornament is quite different from that of the somewhat similarly shaped Albian species Maccoyella rockwoodensis, figured by Etheridge Jnr. (1892, pl.24, fig.15) from Rockwood Station, Landsborough River, as Oxytoma rockwoodensis. In addition there are several indeterminate fragments of Maccoyella shells.

The specimens designated "Dentalium" sp. are very similar to those from GAB 689 and could be conspecific with them.

As with collection GAB 689 none of the numerous fragmentary belemnite guards are determinate generically; their shape, though incomplete, suggesting reference to the Aptian genus Peratobelus.

Reference :

ETHERIDGE, R., Jnr., 1892 : in JACK, R.L., and ETHERIDGE, R., Jnr. : The geology and palaeontology of Queensland and New Guinea. Geol.Surv.Qld Publ., 92, 2 vols.

—————————, 1901 : Additional notes on the palaeontology of Queensland. Geol.Surv.Qld Publ., 158, 5-37.

—————————, 1902 : A monograph of the Cretaceous invertebrate fauna of New South Wales. Mem.Geol.Surv. N.S.W., Palaeont. 11, 1-98.

—————————, 1904 : Notes on Australian Cretaceous fossils. Rec.Aust.Mus., 5, 248-252.

MOORE, C., 1870 : Australian Mesozoic geology and palaeontology. Quart.J.Geol.Soc. (London), 26, 226-261.

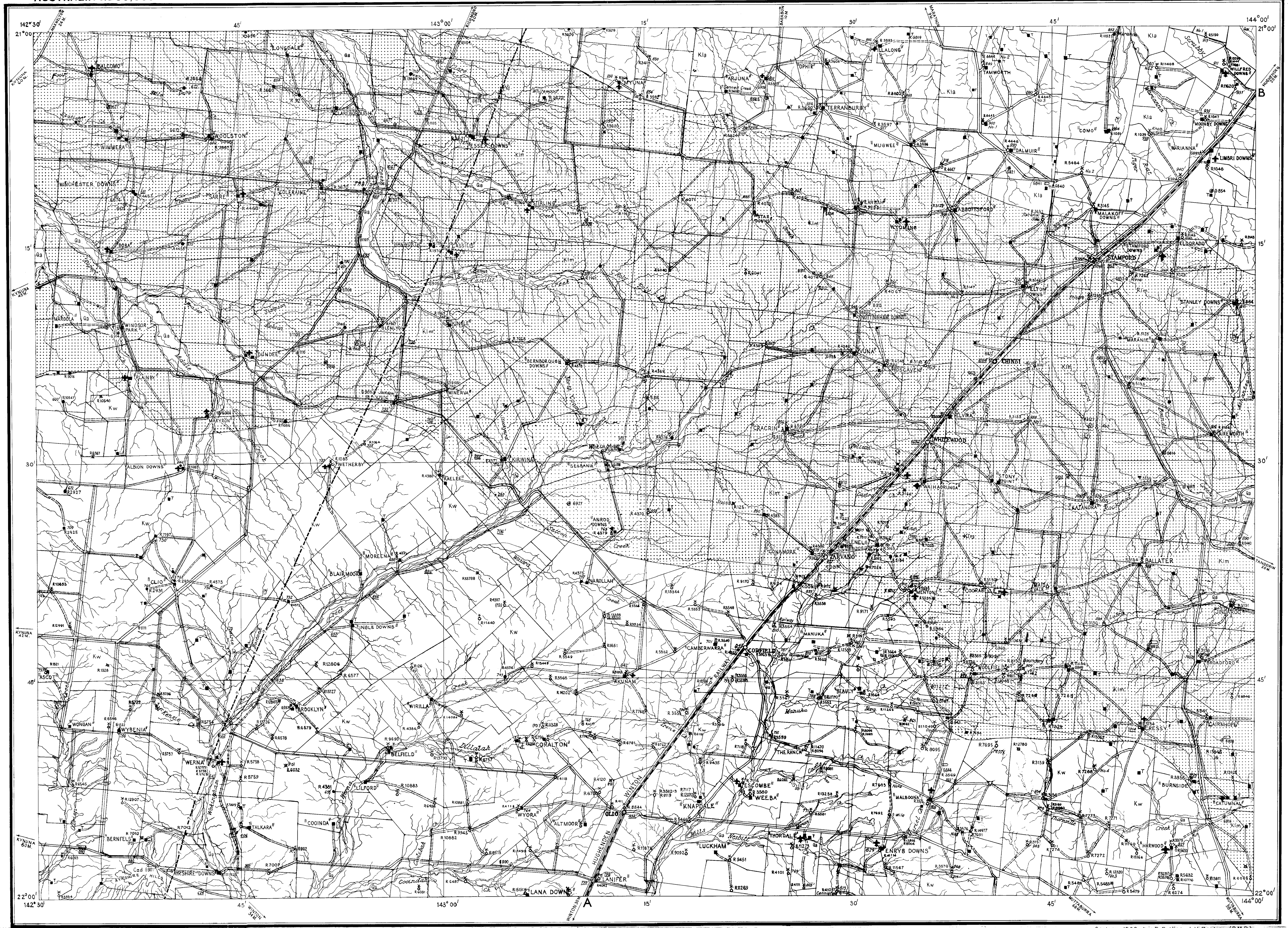
PRELIMINARY EDITION, 1963
SUBJECT TO AMENDMENT

AUSTRALIA 1:250,000

MANUKA

QUEENSLAND

1:250,000 GEOLOGICAL SERIES SHEET SF 54-8



CAINOZOIC	QUATERNARY		Qa	Alluvium
	UNDIFFERENTIATED		Czd	Duricrust (Silcrete, laterite)
MESOZOIC	LOWER-UPPER CRETACEOUS	Winton Formation	Kw	Lithic sandstone, siltstone, claystone, sandy limestone
	LOWER CRETACEOUS	Mackunda Beds	Klm	Lithic sandstone, siltstone, claystone, sandy limestone
			Kla	Claystone, siltstone, silty limestone
		Wilgunya Formation	Klw	Claystone, siltstone, limestone (Section only)
	UNDIFFERENTIATED		M	Sandstone, conglomerate, shale (Section only)
PALAEOZOIC	PERMIAN		P	Sandstone, coal, shale (Section only)
?	PRE-PERMIAN		?Pzg	Granite (Section only)

Geological boundary
Fault

Where location of boundaries, folds, and faults is approximate, line is broken; where inferred, queried; where concealed, boundaries and folds are dotted, faults are shown by short dashes

- × Specimen locality
- Macrofossil locality
- Microfossil locality
- Plant fossil locality
- Fossil wood locality
- G742 Locality reference number

- Flowing bore
- Non-flowing bore
- Dud bore
- Abandoned bore, previously productive

R3131 refers to bore registered number of Queensland Irrigation and Water Supply Commission records

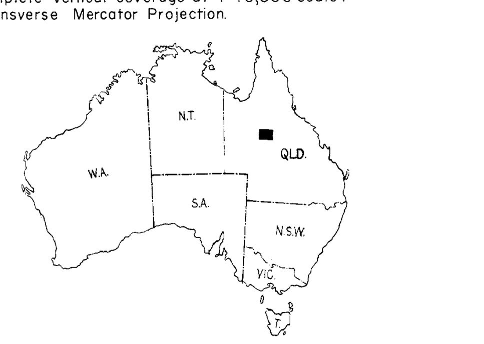
- Dam
- Earth tank
- Windpump

- Road
- Vehicle track
- Railway with siding
- Fence
- Dog netting fence
- "BURNSIDE" Homestead
- Landing ground
- Yd. Yard
- 1056' Height in feet, instrument levelled
- 991' Height in feet, barometric

Datum, mean sea level

- PD Position doubtful

Compiled and issued by the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Topographic base compiled by the Division of National Mapping and the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Aerial photography by the Royal Australian Air Force; complete vertical coverage at 1:46,500 scale.
Transverse Mercator Projection.



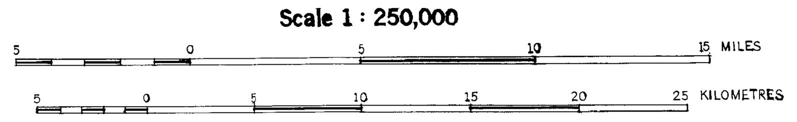
INDEX TO ADJOINING SHEETS

Showing Magnetic Declination

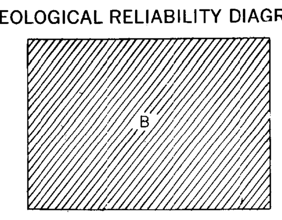
DOBBYN	MILLUNGERA	GILBERTON	CLARKE RIVER	TOWNSVILLE
CLONCURRY	JULIA CREEK	RICHMOND	HUGHENDEN	CHARTERS TOWERS
DUCHESS	McKINLAY	MANUKA	TANGORIN	BUCHANAN
BOULIA	MACKUNDA	WINTON	MUTTABURRA	GALILEE
SPRINGVALE	BRIGHTON DOWNS	MANEROO	LONGREACH	JERICHO

Annual Change 2'30"E

Scale 1 : 250,000

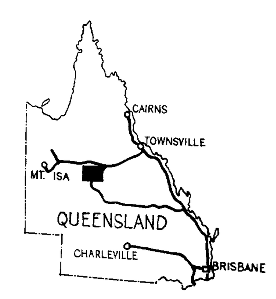


GEOLOGICAL RELIABILITY DIAGRAM



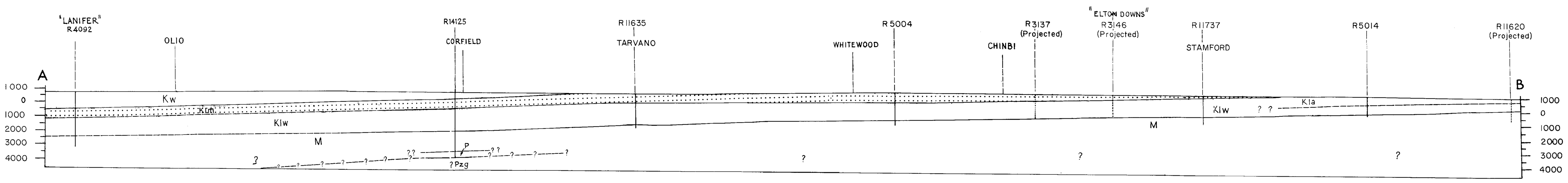
B Detailed reconnaissance – numerous traverses and air-photo interpretation

Geology, 1962, by: R.R. Vine, L.V. Bastian, (B.M.R.)
D.J. Casey (Q.G.S.)
Compiled, 1962, by: R.R. Vine, L.V. Bastian, D.J. Casey.
Drawn by. I. Chertok.



Section A-B

(along railway line)
Scale $\frac{V}{H} = 4$
(Alluvium omitted from section)



MANUKA SF 54-8

AUSTRALIA 1:250,000

RICHMOND

QUEENSLAND

1:250,000 GEOLOGICAL SERIES SHEET SF 54-4

PRELIMINARY EDITION, 1963

SUBJECT TO AMENDMENT

Reference

CAINOZOIC	QUATERNARY		Qa	Alluvium, soil
			Qs	Drift sand
			Qc	Basalt scree
	UNDIFFERENTIATED		Czs	Sand, gravel
		Chudleigh Basalt	Czc	Basalt
			Czy	Basalt
		Sturgeon Basalt	Czm	Basalt
	TERTIARY	Glendower Formation	Tg	Sandstone
MESOZOIC	LOWER CRETACEOUS	Mackunda Beds	Klm	Lithic sandstone, siltstone, claystone, sandy limestone
		Wilgunya Formation	Klw	
		Allaru Member	Kla	Claystone, siltstone, silty limestone
		Toolebuc Member	Klo	Limestone, calcareous shale
		Ranmoor Member	Klq	Claystone, siltstone
		Jones Valley Member	Klj	Siltstone, calcareous siltstone
		Doncaster Member	Kld	Claystone, siltstone, glauconitic claystone, limestone
	UPPER JURASSIC TO LOWER CRETACEOUS	Gilbert River Formation	Klg	Sandstone, conglomerate, siltstone
	UNDIFFERENTIATED		M	Sandstone, conglomerate, shale (section only)
PRECAMBRIAN	UNDIFFERENTIATED		p€	Schist, gneiss, granite, rhyolite

Geological boundary

Fault

Where location of boundaries, folds, and faults is approximate, line is broken; where inferred, queried; where concealed, boundaries and folds are dotted, faults are shown by short dashes

Joint pattern

Fossil wood

Macrofossil locality

Microfossil locality

Specimen locality

G932 Locality reference number

Au Mine

Au Gold

Flowing bore

Non-flowing bore

Location of bore, no other information available

Dud bore

Abandoned bore, previously productive

(R3002 refers to bore registered number of Queensland Irrigation and Water Supply Commission's records)

Spring

Dam

Earth tank

Windpump

Road

Vehicle track

BOREE Railway with siding

Fence

Dog netting fence

"OBAN" Homestead

Airfield

Landing ground

Yd. Yard

•907′ Height in feet, instrument levelled

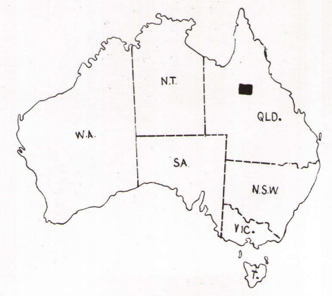
•750′ Height in feet, barometric

(datum: mean sea level)

PD. Position doubtful

Compiled and issued by the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Topographic base compiled by the Royal Aust. Svy. Corps, the I.F.P. and the Bureau of Mineral Resources, Geology and Geophysics, Department of National Development. Aerial photography by the Royal Australian Air Force; complete vertical coverage at 1:46,500 scale.

Transverse Mercator Projection.



INDEX TO ADJOINING SHEETS

Showing Magnetic Declinations

DONORS HILL	CROYDON	GEORGETOWN	EINASLEIGH	INGHAM
DOBBYN	MILLUNGERA	GILBERTON	CLARKE RIVER	TOWNSVILLE
CLONCURRY	JULIA CREEK	RICHMOND	HUGHENDEN	CHARTERS TOWERS
DUCHESS	McKINLAY	MANUKA	TANGORIN	BUCHANAN
BOULIA	MACKUNDA	WINTON	MUTTABURRA	GALILEE

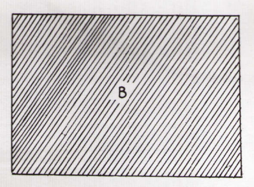
Annual Change 2′ 30″E

Scale 1:250,000

5 0 5 10 15 MILES

5 0 5 10 15 20 25 KILOMETRES

GEOLOGICAL RELIABILITY DIAGRAM



B Detailed reconnaissance – numerous traverses and air-photo interpretation.

Geology, 1962, by: R.R. Vine, L.V. Bastian (B.M.R.), D.J. Casey (Q.G.S.)

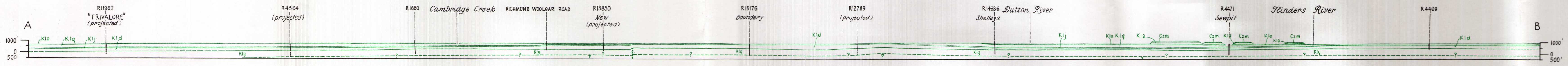
Original photo-interpretation by: J.Y. Scanvic, B. de Lassus Saint-Geniès (I.F.P.), W. Perry (B.M.R.)

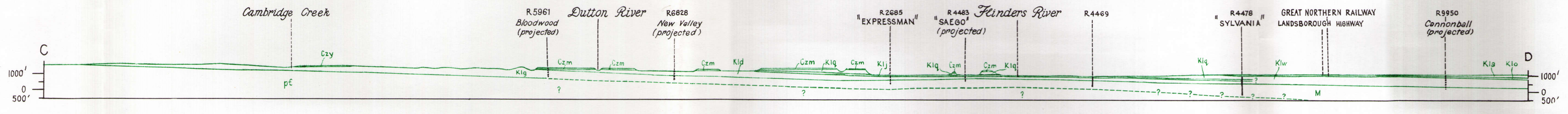
Compiled 1962, by: R.R. Vine, L.V. Bastian, D.J. Casey and I. Chertok

Drawn by: I. Chertok

Sections AB and CD

(Post basalt rocks omitted)





RICHMOND

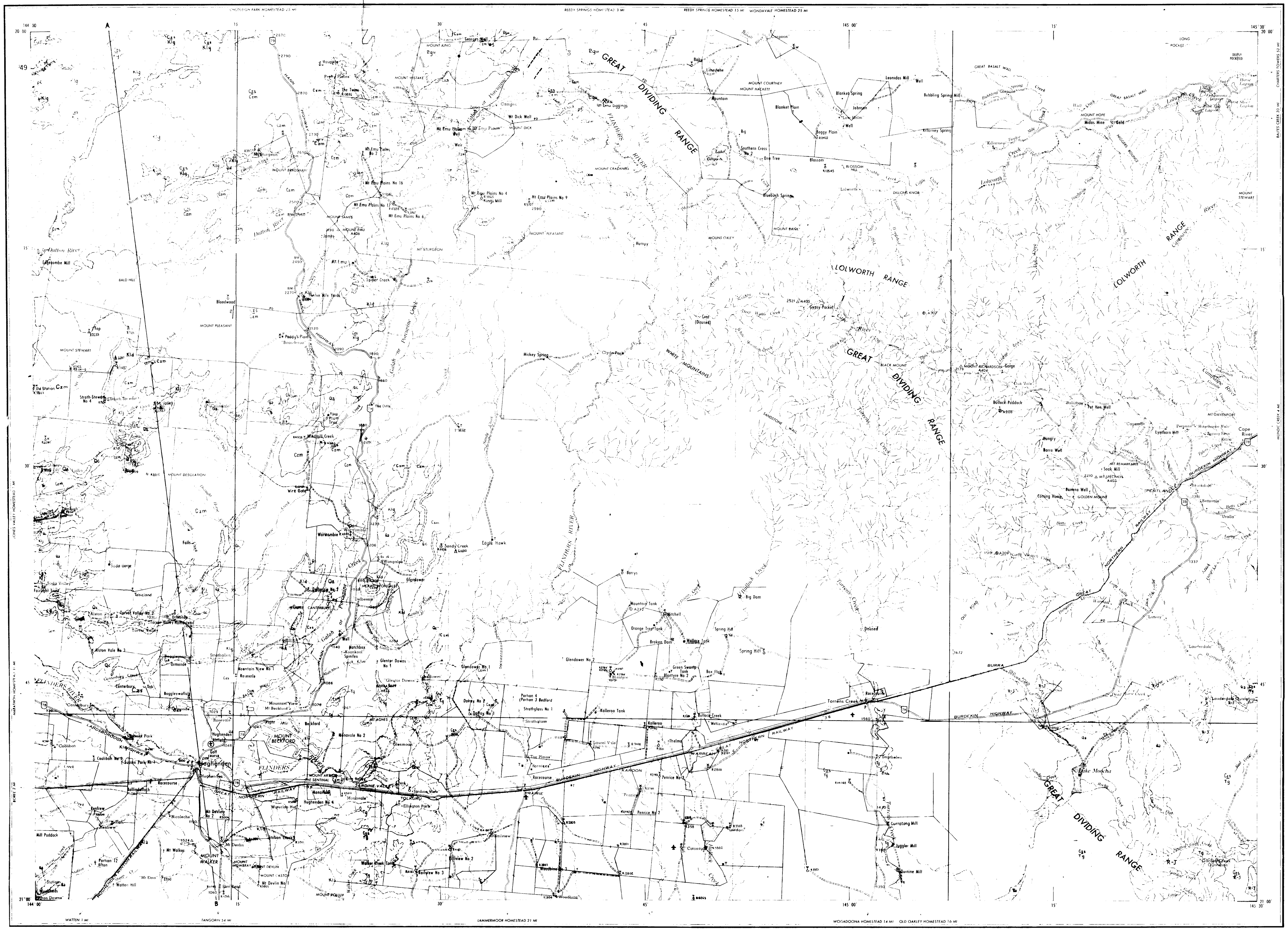
SHEET SF54-4

PROGRESS MAP MAY 1963

AUSTRALIA 1:250.000

HUGHENDEN

1:250.000 GEOLOGICAL SERIES SHEET SF 55-1



Reference

CAINOZOIC	QUATERNARY		Qa	Alluvium
			Qc	Basalt scree
	UNDIFFERENTIATED		Czs	Sand, gravel, clay
		Sturgeon Basalt	Czm	Olivine basalt
			Czd	Duricrust (silcrete, laterite)
	TERTIARY	Glendower Formation	Tg	Sandstone, conglomerate, sandy claystone
MESOZOIC	LOWER CRETACEOUS	Wilgunya Formation	Klw	
		Allaru Member	Kla	Claystone, siltstone, silty limestone
		Toolebuc Member	Klo	Limestone, calcareous shale
		Ranmoor Member	Klq	Claystone, siltstone
		Jones Valley Member	Klj	Siltstone, calcareous siltstone
		Doncaster Member	Kld	Claystone, siltstone, glauconitic claystone limestone
	UPPER JURASSIC TO LOWER CRETACEOUS	Gilbert River Formation	Klg	Sandstone, conglomerate, siltstone
	TRIASSIC (?) - JURASSIC (?)		R-J	Sandstone, shale
PALAEOZOIC	PERMIAN (?)		P	Sandstone, shale, coal, conglomerate
			Pr	Rhyolite porphyry, rhyolite
PRECAMBRIAN	PROTEROZOIC (?)	Dumbano Granite	Bgu	Biotite granite
	UNDIFFERENTIATED		p€	Schist, gneiss, granite, amphibolite, rhyolite

Geological boundary
Fault

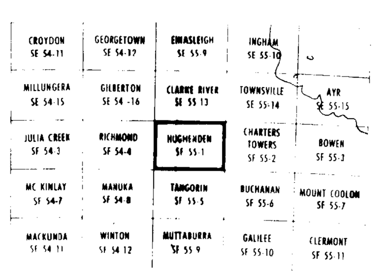
Macrofossil locality
Microfossil locality
Plant fossil locality
Specimen locality

Mine
Gold

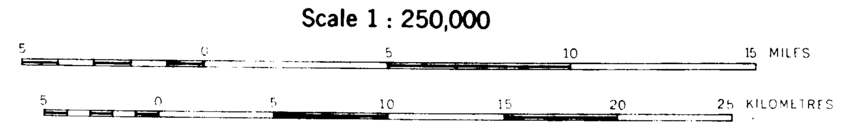
Flowing bore
Non-flowing bore
Dud bore
Abandoned bore, previously productive

Spring
Dam
Earth tank
Windpump

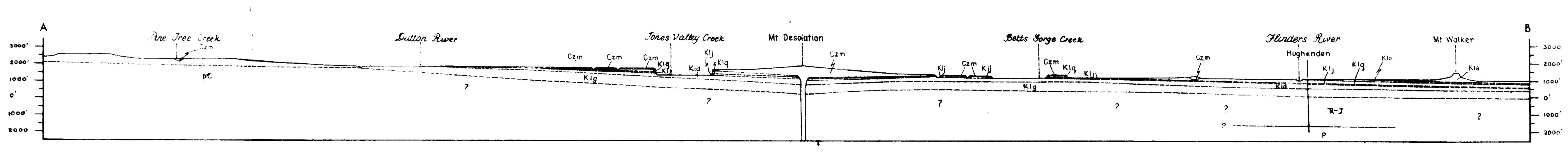
Road
Vehicle track
Railway with siding
Dog netting fence
fence
Homestead
Airfield
Landing ground
Yard
Height in feet, instrument levelled; } Datum: mean sea level
Height in feet, barometric;
Position doubtful



Scale 1 : 250,000



Section A-B
(post-basalt rocks omitted)



COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS.

RECORDS:

1963/75

PROGRESS REPORT ON GEOLOGICAL MAPPING OF THE NORTHERN EROMANGA BASIN, 1962.

APPENDIX "B"

BORE DATA

APPENDIX B TO RECORDS 1963/75

BORE DATA

Information on all bores in the Richmond and Manuka 1:250,000 Sheet areas, collected from the Irrigation and Water Supply Commission, Brisbane, and from property owners and managers, is listed in this appendix.

The order of listing is (a) by map sheets, and (b) numerical by the registered numbers allocated to water bores by the Irrigation and Water Supply Commission.

Abbreviations used in this appendix are listed on page 2. To save needless repetition of column headings throughout the appendix the columns in the body of the appendix are lettered A to K; a specimen bore sheet giving the full headings and the appropriate letter is given on page 3.

ABBREVIATIONS

Water

B	Brackish
F	Fresh
G	Good
P	Potable
S	Salty, saline
Su	Surface.

Drillers Logs

Ba.	basalt
Bd.	bed
Bk.	black
Bl.	blue
Bld.	boulder
Bnd.	band
Br.	brown
Carb.	carbonaceous carboniferous
Choc.	chocolate
Cl.	clay
Cong.	conglomerate
Cs.	coarse
Cv.	cave
Cvg.	caving
Di.	diorite
Dk.	dark
F.	fine
Fm.	formation
G.	grained
Gn.	green
Gr.	granite
Gvl.	gravel
Gy.	grey
Hd.	hard
Ind.	indurated
Lst.	limestone
Lt.	light
Md.	mud
Med.	medium
P.cl.	pipe clay
Pk.	pink
Qtz.	quartz
Qtzite.	quartzite
Rd.	red
Rk.	rock
Rtn.	rotten
S.	sand
Sch.	schist
Sh.	shale
Shy	shaly
Si.	silt
Sk.	streak
Sky.	streaky
Sm.	seam
S.rk.	sandrock
Sst.	sandstone
St.	stone
Stky.	sticky
Su.	surface
Sy.	sandy
T.D.	total depth
V.	very
W.	with
Wd.	weathered
Wh.	white
Y.	yellow

Regd.No. / Name / PROPERTY	Position	Elevation (feet)	Driller / Year completed	Standing water level / Pump depth (feet)	WATER					DRILLERS LOG
					Struck (feet)	Rose to (feet)	Supply (g.p.d.)	Quality	Temp. °F.	
A	B	C	D	E	F	G	H	I	J	K

PART I

R I C H M O N D

B O R E

L O G S

Pages 5 - 60.

A	B	C	D	E	F	G	H	I	J	K
90 - CHATFIELD	143°55'E 20°06S	642	1929		105°	Surface	31800 (1929)			T.D. 1200' 0 - 1015 No info. - 1200 S.rk.
91 - ROSE DOWNS	142°56'E 20°52'S	670	1907		1170 to 1643	Surface	321820 (1930)	F		0 - 1170 No strata - 1643 Sst.
99 MOSELLE TRUST BORE WILBURRA DOWNS	143°14'E 20°49'S	786	1911	Flowing	1008 1042 1480 1567	to Surface	72,000 (1959) 60,000 (est.1962)	F	104°	0 - 4 Soil - 30 Rtn.Sh. - 70 Y&Bl.sh. - 298 Bl.sh. - 367 Soft Bl.Sh. - 423 Shy. Sst. - 562 Br.Sh. - 935 Gy.sh. - 940 Sst. - 1210 F. Sst. - 1220 V.wh.hd. Sst. - 1385 Hd.Wh. Sst. - 1391 P.cl. - 1473 Gy. Sst. - 1567 Hd. Sst. - 1629 Gy. Sst. - 1635 Rd.Marl. - 1724 Sst. - 1729 Gy. Sst. * - 1745 Sst. - 1768 Gn.Sy. Sh. - 1820 Sst. - 1830 Y.Sh. - 1839 Hd. Sst. - 1870 Sst. - 1879 Hd. bnd of rk. - 1893 Rd. marl. - 1925 Sst. - 1960 Y.Sy.Cl. - 2000 Rd. marl. w. bnds. of cl. * - 1760 Cs. Sst.
299 MARATHON RAILWAY	143°35'E 20°52'S	L780		Flowing	804 854	Surface "	11,500 211,715	F	101° 101°	0 - 8 Soil - 64 Y.cl. - 800 Dk.bl.sh. - 804 Sy. sh. - 880 Sst. - 884 Choc.coloured cl. - 941 Lt.gy.sy.sh. w.bnds of p.cl.
360 RICHMOND TOWN	143°8'E 20°44'S				800 to 1100	Surface		F	90°	0 - 80 Rd.soil - 390 Bl.Sh. - 410 Water Sst. - 780 Bl.Sh. - 1090 Sst. & coal Sks. - 1100 Bnd.p. cl. - 1189 Lt. sst.

A	B	C	D	E	F	G	H	I	J	K
391 - MAXWELTON TOWN	143°41'E 20°43'S		1929		1077) 1105) 1253)	Surface	260,000 (1929)	P		0- 5 Su.Soil - 10 Sy.Y.Sh. - 20 Drift s. - 47 Y.Sh. - 59 Sy.Y.sh. - 108 Y.sh. - 270 Gy.sh. - 273 Hd.rk. - 275 Gy.sh. - 276 Rk. - 294 Dk.sy.sh. - 438 Dk. oily sh. - 715 Gy.sh. - 718 Gn.rk. - 1076 Gy.sh. - 1107 Sst. - 1194 Sy.p.cl. - 1205 Marl. - 1206 Rd marl. - 1252 Sy. p.cl. - 1260 Sst.
1042 Cannonball CANNONBALL	143°53'E 20°56'S	847			672	Surface	520,660		98°	0 - 80 Y.sh. - 672 Sh. - 774 Sst.
1053 Sandring- ham AFTON DOWNS	143°59'E 20°54'S	954L	J.V.Kirby 1919	25 50	609-613 639-671 1160-1170 1183-1230	238 119 30 20	 unlimited	F F F F		0 - 4 Bk.soil - 55 Y.sh. - *280 Bl.sh. - 304 Gy.sh. - 481 Bl.sh. - 490 Gn.sh. - 545 Bl.sh. - 550 Gn.sst. - 608 Bl.sh. - 613 Gy.sst. - 639 Bl.sh. - 671 Wh. sst. * - 285 Gy.rk. - 680 Br.cl. - 850 P.cl. - 940 Br.cl. - 1130 Wh.p.cl. - 1160 Gy.sh. - 1170 Sst. - 1183 Hd. p.cl. - 1230 Sst - 1328 Wh.p.cl. - 1335 Gy.sh. - 1359 Rd.marl - 1480 No soil strata
1054 - DUNLUCE	143°51'E 20°53'S	909	1907							T.D. 1405'
1779 House ATHLONE	143°12'E 20°16'S	904	1900	100 120				P		T.D. 904'

A	B	C	D	E	F	G	H	I	J	K
1780 - BURLEIGH	143°8'E 20°17'S		1895							T.D. About 900'
1781 No.3 BURLEIGH	143°8'E 20°14'S		1898	100 130				F		T.D. 837'
1782 Qld No.4 BURLEIGH	143°5'E 20°9'S		1898					B		T.D. 776'
1783 - WALKER'S PARK	no trace	907	1900							T.D. 917'
1784 House RONALD PLAINS	143°12'E 20°13'S		1901	100 120				F		T.D. 771'
1785 - No.7 BURLEIGH	143°9'E 20°3'S		1901	100 140				F		T.D. 517'
1786 Corner RONALD PLAINS	143°9'E 20°10'S		1902	80 100				F		T.D. 600'
1787 Yellow Holes BURLEIGH	143°13'E 20°7'S		1902 deepened 1926	- 170			"good"	F		T.D. 482' (1902) 500' (1926)

A	B	C	D	E	F	G	H	I	J	K
1788 No. 10 BURLEIGH	143°5'E 20°12'S		1900	- 180				F		T.D. 800'
1789 No. 2 BURLEIGH	143°8'E 20°17'S	866	1909	80 100				F		T.D. 900'
1790 No. 12 BURLEIGH	143°4'E 20°20'S	820	1910	18 32			v.good	F		T.D. 900'
1791 No. 13 BURLEIGH	143°2'E 20°o'S		1916	100 180			fair	F		T.D. 500'
1792 Gallipoli WALKER'S PARK	143°15'E 20°18'S	906	1911	15 20		surface	big	F		T.D.1300'
1794 Woolgar BURLEIGH	143°0'E 20°11'S							F		T.D. 700'
1795 No.8 BURLEIGH	143°2'E 20°7'S		1902 (Old No.8) 1931(New No.8)	80 120			v.good	F		T.D. 423' N.B. Old No. 8 was mile closer to Woolgar River than present No.8

A	B	C	D	E	F	G	H	I	J	K
1796 Simplex BYLONG	142°51'E 20°15'S	793	1901	20 30		Surface		F		0 - 60 S. & Gvl. - 340 Bl.sh. - 870 Sst.& p.cl.
1797 - BYLONG	142°50'E 20°10'S	L776			80 235 400 552	Soak Surface	100,000	F		0 - 564 No info. -1006 P.cl. & S.rk. -1044 Rd.marl.
1798 House BYLONG	142°52'E 20°15'S	793	T.Town- send 1911	30 45	653 800 1000	Surface		F		0 - 100 S.gvl.&Y.sh. - 347 Bl.sh. - 553 S.rk.&p.cl. - 555 Coal Sm. - 945 S.rk. - 985 Loose drift S. - 1011 Sst.
1799 - BYLONG	No trace				868 to 1082	Surface	102,000			0 - 864 Rd. marl in strata -1082 P.cl.& S.rk. -1107 Rd.marl.
1800 Old Bylong BYLONG	142°55'E 20°18'S			15 30	234 340 640 787	Surface	 400,000	F		0 - 30 Raw st.& Soil. - 70 Y.cl. - 105 Drift s. - 234 Sst. - 337 Bl.sh. - 397 P.cl.&S. - 427 Sst. - 493 P.cl.& S. - 513 Sst. - 565 Sst.&p.cl. - 605 Sst. - 787 Sst.&p.cl.
1801 Red Mill BYLONG	142°49'E 20°11'S		1926	30 45	360 573	Soak Surface		F		0 - 8 Su.Soil - 80 Y.sh. - 800 Bl.sh.
1802 - OXFORD DOWNS	142°51'E 20°21'S	746	1901							T.D. 950
1803 - OXFORD DOWNS	142°51'E 20°21'S	746	1910							T.D. 900

A	B	C	D	E	F	G	H	I	J	K
1804 - OXFORD DOWNS	142°50'E 20°19'S				220 400 504	Soak Surface	70,000 400,000	B F		0 - 4 Su.soil - 54 Y.sh. - 104 Drift s. - 230 Bl.sh. - 504 Bl.sh. flowing from gn.sh. bds. - 534 S.rk.
1858 Old Redan RANMOOR	143°7'E 20°34'S	736								0 - 40 Alluvium - 490 Shales - 542 Sst.
1859 House OLGA DOWNS	143°12'E 20°25'S	785	1892	flowing	357	Surface	370,000 (1956)	F		A little gas in flow, Bottom in 10' p.cl. T.D. 566'
1861 - CAMBRIDGE DOWNS	142°58'E 20°26'S	740			610	Surface	153,350	P		0 - 20 Alluvium - 532 Sh. - 616 Sst. - 800 No info.
1862 Cambridge Downs 4 HAZLEWOOD	143°2'E 20°29'S	699	1892	flowing	590	Surface	25,000	P		0 - 65 Alluvium - 178 Sh. - 256 Bl.Sst. - 512 Sh. - 597 Sst. - 700 No info.
1863 Fig Tree HAZLEWOOD	143°1'E 20°23'S	755	1892	flowing	540	Surface	18,000	P		T.D. 540' Bottom in Sst.
1864 Boree OLGA DOWNS	143°11'E 20°26'S	810		flowing	599	Surface	110,000	F		T.D. 599' Bottom in Sst. Little gas.
1865 House GRACEDALE	142°44'E 20°29'S	651					856,000	F	103°	0 - 90 Alluvium - 130 Sh. - 195 Lst. - 807 Sh. - 841 Sst.

A	B	C	D	E	F	G	H	I	J	K
1866 – ARTESIAN	142°39'E 20°25'S	663			849	Surface	242,400	F	103°	0 - 85 Alluvium - 130 Sh. - 160 Lst w.fossils - 731 Sh. - 849 Sst.
1867 House LILYVALE	142°49'E 20°27'S	682			412 760	280	421,000	S	103°	0 - 65 Alluvium - 405 Sh. - 417 Bl. Sst. - 654 Sh. - 765 Sst.
1868 Old House TOWRI	143°14'E 20°23'S	838	1898							T.D. 618'
1869 – BALD HILLS	No trace	832	1899							T.D. 664'
1870 – CAMBRIDGE DOWNS	No trace	773	1899							T.D. 600'
1871 – OBAN	142°53'E 20°32'S	696	1899							T.D. 650'
1872 – SILVER HILLS	143°4'E 20°36'S	720	1900				420,000 (1919)			T.D. 600' Water issue from bore in Lst.
1873 – HAZLEWOOD	No trace		1912							Bore determined in rd.marl. T.D. 1287
1874 Whim HAZLEWOOD	143°3'E 20°23'S	780	1912	Surface		Surface	30,000	P		T.D. 704. A little gas in flow

A	B	C	D	E	F	G	H	I	J	K
1875 - YAN YEAN	143°58'E 20°32'S	716	1914		660 1085 to 1165	Surface	10,000 701,800 (1914)	P	0 - 90 Y.cl. - 660 Bl.sh. - 785 Sst.	- 1085 P.cl.&S. - 1165 Sst. - 1207 P.cl.&S.
1876 Hazlewood Creek BALD HILLS	143°7'E 20°26'S		1912	flowing			1,010,000 (1932)	F	Water contains odcurless gas T.D. 882	
1877 Cecil HAZLEWOOD	143°2'E 20°22'S		1912	60 85	125 342 520 to 670		5,000 10,000 increase	F	0 - 75 Y.cl. - 342 Bl.sh. - 395 S.rk. - 520 P.cl.&S.	- 670 Alternate layers of p.cl. &Sst. - 678 Sst. - 721 P.cl.
1878 - CAMBRIDGE	No trace				627 800 1210		670,000	F	0 - 123 Y.sh. - 293 Bl.sh. - 573 Br.sh.	- 627 p.cl. - 1165 S. - 1210 Rd.marl.
1879 House BALD HILLS	143°7'E 20°23'S				540		sub- artesian	F	0 - 30 Sh. - 400 Bk.Ba.	- 1026 S.rk. - 1056 Rd.marl.
1880 - OXFORD DOWNS	142°53'E 20°23'S	733			205 500) 545) 697) 800	15 Surface	424,085 (1919)	F	0 - 4 Su.s - 43 Y.sy.cl. - 100 Y.cl. - 195 Bl.sh. - 205 Br.sh. - 490 Bl.sh. - 590 S.rk.	- 606 P.cl. - 675 Sy.cl. - 695 S.rk. - 790 Sy.cl. - 816 S.rk. - 828 Sy.cl.

A	B	C	D	E	F	G	H	I	J	K
1881 - CAMBRIDGE DOWNS	142°53'E 20°25'S	696	1932		68 636 to 950			B F		0 - 15 Rd.s. - 38 Y.s. - 67 Y.sh. - 68 Drift s.& a little water. - 94 Y.sh. - 118 Bl.sh. - 119 Bl.sh & a little water - 137 Bl.sh. - 360 Gy.sh. - 362 Gn.sh. - 420 Gy.sh. - 421 Hd.gy.bnd. - 432 Gy.sh. - 534 Gy.sh. - 535 Hd.gy.bnd. - 600 Gy.sh. - 636 Hd.gy.sy.sh. - 950 Sst.
1882 - MEADOWLANDS	143°1'E 20°36'S	696								0 - 6 Soil - 60 Y.cl. - 80 Bl.sh. - 100 Cementy st. 1st. No further strata
1883 House ARTESIAN	142°38'E 20°29'S	601	1900							T.D. 1050'
1884 - ARTESIAN	142°40'E 20°25'S				190 400 746 820 995 1045 1138	Soak Soak		S F		0 - 4 Bk.soil. - 90 Y.sh. - 748 Bl.sh. - 870 Dry Sst.& p.cl. - 992 P.cl. & sy.sh. -1045 P.cl.sst. & coal sm. -1135 Cs.sst.
1885 - HARROGATE	142°47'E 20°36'S	679	1900							T.D. 1070'. Gas in flow.
1886 - HARROGATE	142°47'E 20°34'S	686	1909							T.D. 1066'.

A	B	C	D	E	F	G	H	I	J	K
1887 - HARROGATE	142°47'E 20°34'S	686	1922		490 820 900 1000 1050	Soak	570,000	F	0 - 85 Y.sh. - 480 Bk.sh. - 490 Gn.sh. - 700 Bl.sh. - 780 Bl.sh. & S.rk. - 820 S.rk. - 880 P.cl. & S.	- 900 P.cl. - 960 S.rk. - 1000 S.rk. & p.cl. - 1020 S.rk. - 1050 P.cl. & S. - 1092 S.rk.
1888 House RUNNYMEDE	142°38'E 20°21'S	662	1899						T.D. 800'	
1889 - EURABA	142°33'E 20°19'S	634	1906						T.D. 933'	
1890 - RUNNYMEDE	142°42'E 20°18'S		1928		269) 479) 503) 780) 843) 990)	Surface	30,000 50,000 120,000 145,000 212,000	F	0 - 12 Rd.s. - 63 Y.sy.cl. - 75 Drift s. - 78 Y.cl. - 90 Drift s. - 120 Sh.	- 476 Sh. & rk. - 481 Gn. s.rk. - 551 Gy. sh. - 1024 S.rk. & p.cl.
1891 - GRACEDALE	142°47'E 20°31'S		1900						T.D. 1060	
1893 - MOLESWORTH	142°38'E 20°36'S		1916		920	Surface		F	0 - 70 Y.sh. - 240 Bl.sh.w.hd.gn.rk.	- 980 Bl.sh. - 1099 S.rk. & p.cl.
1894 - OBAN	142°55'E 20°35'S		1916		130 561 770) 810)	Soak Surface	 Small 295,000	B	0 - 70 Y.cl. - 240 Bl.sh. - 250 Hd.gn.rk.	- 770 Bl.sh. - 810 S.rk.

A	B	C	D	E	F	G	H	I	J	K
2011 House WALKCEGE	143°40'E 20°33'S	1021	1894	125 150			Good	P		T.D. 1220'
2012 ? GILGUN-YAH	Not located probably beside 2025 143°38'E 20°27'S	957	1894	Abd.						T.D. 900'
2013 Old Camoola DUTTON RIVER	143°43'E 20°24'S	1044	1894	75 100			Good	P		T.D. 2005'
2014 Yellow-wood WALKCEGE	143°40'E 20°30'S	958	1896	Abd. replaced by 10408						T.D. 1000'
2015 No.5 WALKCEGE	143°42'E 20°33'S		1915	Abd. replaced by 8908						T.D. 376'
2016 Valley Basalt DUTTON DOWNS	143°48'E 20°27'S	1035	1896	100 128			Good	P		Originally a well to 60' Deepened as a bore to T.D. 900'
2017 - DUTTON RIVER	143°52'E 20°26'S	1156	1898							T.D. 804'
2018 Big Magney's DUTTON RIVER	143°53'E 20°21'S		1900	160 181			Good	P		T.D. 532'

A	B	C	D	E	F	G	H	I	J	K
2019 Back Creek DALKEITH	143°59'E 20°22'S	1412	1901	166 400 480			17,000+			T.D. 1086 but now cemented back to 500' Bottom in blue & red cl.
2020 House DUTTON RIVER	143°52'E 20°26'S	1161	1908	170 194			Good	P		T.D. 353'
2021 No.10 DUTTON DOWNS	143°50'E 20°28'S	1103	1908	140 150			Good	B		T.D. 545'
2022 — ? DALKEITH or DUNRAVEN	Not located	1247	1908		122	45	2000			0 - 122 Gn.S. T.D. 289'
2023 Sawpit WALKCEGE	142°41'E 20°36'S		1909	Abd replaced by 12887	240 850 926	66				T.D. 938 ' Bottom in p.cl.
2024 No.4 WALKCEGE	143°39'E 20°34'S		1915	125 150	456	75	Good	P		0 - 425 Sh. - 456 Sst. & gvl.
2025 Deepwater GILGUNYAH	143°38'E 20°27'S	956	T.Town- send 1913	flowing	60 210 667	Surface	400,000	B F		0 - 17 Y.sh. - 436 Dry s.vein 0 - 200 Bl.sh - 586 Gy.sh. 0 - 230 S.rk. - 630 Gy.sy.sh. 0 - 430 P.cl. & S. - 743 S.rk.

A	B	C	D	E	F	G	H	I	J	K	
2026 Yanko DUTTON RIVER	143°48'E 20°10'S		J.Kirk 1916	 480	240 441 485-500 508-553		Soak)Good))	 F		0 - 2 Surface - 150 Hd.sst. - 160 P.cl. - 230 Sst. - 240 Drift s. - 300 Wd. Sst. - 400 Hd.gy.sst. - 441 P.cl.	- 465 Sst. - 475 Coal - 485 P.cl. - 500 Sst. - 508 Stky. p.cl. - 553 Sst. - 570 Gy.& br.marl.
2028 Pelican DUTTON DOWNS	143°54'E 20°31'S		J.V.Kirby 1918	180 210	112 180 700	20 180	 Main Supply	B G F		0 - 16 Surface soil - 20 Gy.sh. - 89 Bk.sh. - 130 Gy.sh. - 282 Bl.sh. - 322 Gy.sh. - 348 Bl.sh.	- 388 Gy.sh. - 492 Bl.sh. - 502 Gn.sst. - 644 Bl.sh. - 672 Water sst. - 674 Br.cl. - 700 Water sst.
2029 Cattle Creek GILGUNYAH	143°35'E 20°27'S		J.V.Kirby 1918	30 40	80 100 340) 490)	 20	small small Good	 P		0 - 4 Soil - 50 Y.sh. - 100 Bl.sh. - 106 Gy.rk. - 135 Bl.sh. - 147 Gn.sst. - 157 Free sst. - 169 Sst. & p.cl. - 182 Sst. - 190 P.cl. - 193 Gy.rk. - 242 P.cl. & sst.	- 258 P.cl. - 301 Sst. - 329 P.cl. - 341 Sst. - 404 P.cl. - 443 Br. p.cl. - 464 P.cl. - 620 Sst. - 755 No info. at 755 Rd. marl. - 1102 No info.
2032 Little Magney's DUTTON RIVER	143°51'E 20°23'S		1924	100 126			Good	P		T.D. 526'	
2063 House CLUTHA	142°30'E 20°22'S	624	1899							T.D. 1103'	

A	B	C	D	E	F	G	H	I	J	K
2064 - BETHEL DOWNS	142°33'E 20°35'S	532	1903		1030 1400	Surface		F		Quantity of gas in flow T.D. 1428'
2065 - CLUTHA	142°30'E 20°22'S	624	1903							T.D. 1140'
2066 - CAMMERAY DOWNS	142°34'E 20°24'S		1917		230 873 933 991	Soak		B F		0 - 54 Y.sh. - 769 Bl.sh. - 779 Gn.sh. - 873 Bk.sh. - 933 Sst. - 973 P.cl. - 991 Sst.
2067 - NONDA DOWNS	142°32'E 20°40'S	533	1899		1000	Surface	3,900,000			T.D. 1340' 0 - 1000 S.rk. Gas in flow
2074 Bullock Paddock COALBROOK	143°20'E 20°19'S	900	1916		105 165 505	 55		F F F		0 - 60 Su. soil and cl. - 90 Br.sh. - 105 P.cl. - 165 S.rk. & p.cl. - 350 Sh. & Cl. - 505 Sh.p.cl. & S.rk. - 770 P.cl. & S.rk. - 825 Reddish brown substance.
2081 - COMPTON DOWNS	Not located Probably near 2083	926	1896		601	Surface	365,000	G		Sst 600 - 1200 T.D. 1200'
2082 - COMPTON DOWNS	143°33'E 20°35'S	926	1910	Abd. Replaced by 2083						T.D. 1200'
2083 House COMPTON DOWNS	143°33'E 20°35'S	926	1910	8' 8'		Surface	Good	P		T.D. 1200'

A	B	C	D	E	F	G	H	I	J	K
2084 Yellow- wood COMPTON DOWNS	143°36'E 20°31'S	931	1896	Abd. Replaced by 2088		Surface				T.D. 1000'
2085 Gorman's COMPTON DOWNS	143°35'E 20°36'S	916	1894	Abd. Replaced by 2089		Surface				T.D. 1000'
2086 Plains VILLA DALE	143°32'E 20°38'S	889	1902	Flowing		Surface				T.D. 1020' Met w. drift s. in bore.
2087 - TORQUAY	143°34'E 20°42'S		1898	14-15 16-20		Surface (Ceased flowing before 1920)	Good			T.D. 611'.
2088 Yellow- wood COMPTON DOWNS	143°36'E 20°31'S	932	1912	Flowing	795 1000	Surface Surface	150,000 (1962)	P		0 - 975 No info. -1000 S.rk. -1016 Rd. marl.
2089 Gorman's COMPTON DOWNS	143°35'E 20°36'S	930	1913	Flowing	1000	Surface	35,000 (1962)	P		0 -1000 No info -1065 Rd. marl. "flow at 1000 feet in sandrock"
2090 Dribbling Bore RAINSCOURT	143°32'E 20°30'S	912	Knox & England 1899	10 15	170 370 696	Soak Surface	900,000	F		T.D. 996'
2091 Old House RAINSCOURT	143°30'E 20°31'S	907	1910		500 738	30 Surface				T.D. 902'

A	B	C	D	E	F	G	H	I	J	K
2092 Campbell's RAINSCOURT	143°31'E 20°29'S			60 80				F		T.D. 352'
2680 SPRING VALLEY	143°58'E 20°35'S	966	1899	30 45			34,000 (1962)	G		T.D. 460'
2681 House JONES VALLEY	143°59'E 20°32'S	987	1900	Flowing		Surface	small flow	P		T.D. 826'
2682 House SPRING VALLEY	143°59'E 20°35'S	953	1900	18 22		Surface	Good	P		T.D.1050'
2683 - SPRING VALLEY	143°57'E 20°34'S		1914	Flowing		Surface	small flow	G		T.D. 600'
2685 House EXPRESSMAN	143°50'E 20°35'S		G.Pirie 1915	Flowing	70 315 420) 450) 490)	4 Surface	30,000	S		0 - 70 Y.cl. - 400 Bl.sh. - 420 P.cl.& s.rk. - 490 Mostly s.rk. T.D. 499
2998 - GUNNERSIDE	143°59'E 20°52'S	948	1905	below surface	780 940 1002	30 Surface				0 - 46 No info - 227 Bk.sh. - 526 Sh. - 1341 S.rk.
3002 - ROKEBY	143°57'E 20°45'S		1898							T.D. 524'
3584 Marathon No. 1 MARATHON SOUTH	143°34'E 20°55'S	800	Abt.1893	flowing			140,000	F		T.D. 1471'

A	B	C	D	E	F	G	H	I	J	K
3587 Codfish Creek MARATHON	143°35'E 20°43'S	808	1893	flowing			119,000 (1957)	F		T.D. 714'
3588 - MARATHON)	) 143°36'E) 20°50'S		1902	flowing			6,000	F		T.D. 1300'
3589 - MARATHON)	)"Woolshed) Bores"		1907	flowing			6,000	F		T.D. 1380'
3590 - MARATHON)	) 143°36'E) 20°50'S		1911	35 -				F		T.D. 993'
3591 Tralee TRALEE	143°21'E 20°53'S	832		10 -				F		T.D. 1719'
3594 Old Marathon No.9 MARATHON SOUTH	143°41'E 20°50'S	871	1899				seepage	F		T.D. 1387'
3595 Marathon No.9 MARATHON SOUTH	143°42'E 20°50'S	875	Leitch 1916	flowing	230 780) 1246) 1310) 1360) 1410)	90 surface	93,000 (1954)	F		T.D. 1480'
3596 - CANNUM DOWNS	143°25'E 20°57'S	840	1901	11 20		surface				T.D. 1800'
3598 House THORNHILL	143°43'E 20°56'S	895	1909	13 30	815 1115 1210 1512	15 surface " "	60,000 (1962)	F		T.D. 1597' Bottom in red clay.

A	B	C	D	E	F	G	H	I	J	K
3599 - KILLARNEY	143°32'E 20°59'S	876	1911		1880	surface				T.D. 2066' Bottom in granite
3601 - MORVADA	143°30'E 20°52'S	820	1914		1003 1447	surface "	80,000 1,080,000			0 - 79 Y.sh. - 1000 Bl.sh - 1056 S.rk. - 1110 P.cl. & S. - 1250 Wh.p.cl. - 1320 Choc. p.cl. - 1447 Wh.p.cl. - 1689 S.rk.
3603 - TORQUAY	143°37'E 20°43'S	809	1915		120 628 840 1019	soak 20 surface "	180,000 (1962)	B		0 - 46 Y.sh. - 540 Bl.sh. - 546 Bk.hd.rk. - 552 Gn.hd.rk. - 628 Bl.sh. - 680 S.rk. - 750 Br.sh.& S. - 842 P.cl.& S. - 882 S.rk. - 1022 P.cl.& S. - 1086 S.rk.
3605 Marathon No. 19 MARATHON SOUTH	143°38'E 20°56'S		1925		889 927 1287 1342 1396	surface " " " "	small 50,000 100,000 150,000 400,000	F		0 - 3 Soil - 97 Y.cl. - 235 Lt.coloured sh. - 886 Bk.sh. - 1030 Sst. - 1203 P.cl. & Sst. - 1231 Br.cl. - 1440 Sst.
3606 House HILLTOP	143°23'E 20°55'S	870	1910	28 -	1120 1780	surface		F		0 - 4 Bk. Soil. - 96 Y.cl. - 520 Bl.sh. - 700 Br.sh. - 740 Br.sh.& hd. bars. - 904 Br.sh. - 1104 Bl.sh. - 1119 Sy.sh. - 1132 S.rk. - 1276 Sy.cl. - 1320 Gy.sh. - 1410 Sy.sh. - 1510 Rd.cl. - 1780 Sy.cl. - 1808 S.rk. - 1855 S.&p.cl. - 1880 Rd.marl.
3607 Riverdale RIVERDALE	143°25'E 20°49'S		1922	flowing	625 725 1100	soak surface	25,000 (1962)	P		0 - 20 Su. Soil. - 30 S. - 60 Y.sh. - 200 Bl.sh. - 230 Br.sh. - 610 Bl.sh. - 725 Gy.sh. - 825 S.rk. - 1075 P.cl.& S. - 1120 S.rk.

A	B	C	D	E	F	G	H	I	J	K
3610 - TWEEDSMUIR	143°9'E 20°54'S	L759	1906		1100 1400 1700					T.D. 2585 Gas in flow
3611 - PATROY	143°2'E 20°57'S	694	1919		1062 1292) 1352) 1384) 1509)	soak surface	40,000 160,000 140,000	F		0 - 3 Soil - 63 Y.sh. - 83 Lt.sh. - 267 Dk.sh. - 269 Hd.bnd. - 630 Dk.sh. - 700 Dk.sh. - 740 Br.sh. - 970 Dk.sh. - 1040 Gy.sh. - 1042 Gn.Sst. - 1128 Dk.Sh. - 1188 Gy.sh. - 1277 Dk.sh. - 1279 Hd.sm. - 1294 S. - 1324 P.cl. - 1353 Sst. - 1373 P.cl. - 1384 Sst. - 1500 P.cl.& Sst. - 1510 Sst. - 1711 P.cl.& Sst. - 1725 Br.p.cl.
3612 - VERNON DOWNS	143°4'E 20°47'S	739	1899					F		T.D. 1517'
3613 - VERNON DOWNS	143°4'E 20°47'S	739	1915		350) 418) 940) 1120) 1166) 1272) 1434) 1534)	soak surface	802,000	F		0 - 65 Y.sh. - 600 Bk.sh. - 940 Bl.sh. - 1120 P.cl. & S. - 1560 S.rk. - 1571 P.cl.
3614 House MOSELLE DOWNS	143°18'E 20°52'S	807	1910				v.small flow	P		T.D. 1747' Gas in flow.
3617 - ROWEN LYNN	143°15'E 20°58'S	L797	1918		1240 1750	485 surface	300,000(1918) not flowing (1962)			0 - 3 Soil - 80 y.sh. - 1200 Bl.sh. - 1350 Sy.sh. - 1730 Br.& wh.p.cl. - 1850 Sst. - 1980 Br.& wh.s.w. coal strata

A	B	C	D	E	F	G	H	I	J	K
3618 Woolshed MOSELLE DOWNS	143°20'E 20°49'S		1924				600,000 (est.)	F		
3623 - MARATHON	No trace		E. Brown & H Leitch 1912		776 to 800) 840 to 855)	surface	80,000 135,000	F		0 - 60 Y.cl. - 733 Bl.sh. - 736 Gn.Sst. - 776 Bl.&gy.sh. - 800 Sst. - 840 P.cl.& S. - 855 Sst. - 880 Gy.p.cl. - 980 P.cl.& S. - 993 Wh.p.cl.
3625 Allaru ALLARU	143°10'E 20°48'S		R.Keats 1930	flowing	977 1018 1040 1070 1135 1200 1250 1430 1450		460,000 (1962)	F		0 - 82 Y.cl. -1077 Gy.sh. -1526 S.rk. & p.cl.
3658 - EMLYN	142°45'E 20°50'S		1892		1290	surface	900,000 (1902)	F		T.D. 1850'
3661 - LUCINDALE	142°56'E 20°58'S	664	1894		1330	surface	123,456			T.D. 1434' Little gas.
3663 - MAXWELTON	142°43'E 20°49'S	583	1894		1107					Bottom in 300' Sst. T.D. 1407'

A	B	C	D	E	F	G	H	I	J	K
3666 - OLIVE DOWNS	142°46'E 20°53'S		1924		1270 1305 1470 1484 1696 1706 1730 1765 1812 1842	 surface	30,000 75,000 100,000 125,000 150,000 250,000 325,000 450,000 600,000 637,000	F		0 - 4 Soil - 32 Y.cl. - 224 Gy.sh. - 244 Gy.sh.w.hd.bnds. - 245 Hd.gy.rk. - 251 Gy.sh - 254 Hd.gy.rk. - 704 Gy.sh. - 753 Bk.sh. - 1031 Gy.sh. - 1112 Hd.gy.sh. - 1200 Gy.sh. - 1265 Bk.sh. - 1532 Sst. - 1551 Cl. - 1765 Sst. - 1766 Sm.of gvl. - 1880 Sst. - 1890 Hd.rk.
3668 - BUNDORAN	142°33'E 20°49'S	557	1899				512,000			T.D. 1800'
3669 - SCOTTSBURN	142°31'E 20°41'S	517	1909							T.D. 2000'
3974 - CHUDLEIGH PARK	No trace		1916							T.D. 308'
3975 - CHUDLEIGH PARK	No trace		1917							T.D. 80'
4193 - STEWART PARK	143°25'E 20°41'S	799	1891							T.D. 690'
4194 Carrick GRAMPIAN VALLEY	143°21'E 20°28'S		1909					P		Gas in flow. T.D. 640'.
4195 - SHERWOOD DOWNS	No trace		1891							T.D. 1000'

A	B	C	D	E	F	G	H	I	J	K
4196 - HAZLEWOOD	No trace		1891							T.D. 975
4197 - ARMY DOWNS	143°19'E 20°23'S	881	1892							Abt. 950'
4198 Homestead GRAMPIAN VALLEY	143°19'E 20°24'S	869	1925	flowing	576	Surface	50,000	F	85°	0 - 3 Su.soil. - 13 Y.sh. - 41 Bl.sh. - 42 Gn..rk. - 102 Bl.sh. - 104 Gn.rk. - 203 Gy.rk.hd. - 206 Sst.w.water - 336 Bl.sh. - 436 S.rk. - 506 P.cl.br.&wh. - 576 Sst. - 600 P.cl.
4199 Back Doncaster DONCASTER	143°27'E 20°23'S		Abt.1890	80 100		Surface		F		T.D. 750'
4200 - GRAMPIAN VALLEY	No trace		1892							T.D. 850'
4201 Rocky AMMAROO	143°35'E 20°22'S		1892							T.D. 660'
4202 - RICHMOND DOWNS	143°24'E 20°34'S		1894							T.D. 602'
4203 - RICHMOND DOWNS	143°21'E 20°35'S		1894				151,000			T.D. 598'

A	B	C	D	E	F	G	H	I	J	K
4204 House TORONTO PARK	143°14'E 20°41'S		1892	flowing			90,000	F		
4205 House REVENUE DOWNS	143°14'E 20°37'S	721	1889	flowing			69,000	P		T.D. 647'
4207 - HAZLEWOOD	No trace		1895							T.D. 757'
4209 Windmill AMMAROO	143°31'E 20°20'S									T.D. 64'
4210 - KARA	143°30'E 20°43'S		1910							T.D. 1409'
4211 Carrick CARRICK	No trace		1908	flowing			120,000 (est.)	P		T.D. 700'
4212 House DONCASTER	143°23'E 20°23'S		abt.1890	flowing			68,000	F		Abt. 800' - 900'
4213 - DAMPER	143°28'E 20°26'S	900	1910							T.D. abt. 700'
4214 - KARA		857	1910							T.D. 690'

A	B	C	D	E	F	G	H	I	J	K
4215 - RICHMOND DOWNS	143°18'E 20°35'S		Browhall & Co. 1914		278 625) 925) 1120)	Soak 2		B	0 - 10 Su.s. - 120 Y.sh. - 625 Bl.sh. - 655 Sst. - 855 P.cl. - 915 Sst.	- 1070 P.cl. - 1276 Sst. - 1290 Rtn. p.cl. - 1291 Bedded on rd.marl.
4216 Upper Thums SHERWOOD DOWNS	143°25'E 20°27'S		1916		35 240 425 547 697 722	20 surface	 little water " " flow increased mainflow 500,000(1916) 117,000(1954)	F	0 - 30 Y.cl. - 240 Bl.sh. - 271 Sst. - 294 Cl.& s. - 318 Br.p.cl. v.sy. - 362 Wh.p.cl. - 424 P.cl.&s. - 460 P.cl.	- 512 Br.p.cl. - 515 Hd. sst. - 522 P.cl. - 540 P.cl.&s. - 570 Sst. - 695 P.cl.&s. - 722 Sst.
4217 Trust MAADI	143°12'E 20°33'S	782	1920	flowing			213,000(1959)	P	T.D. 811' 0 - 44 Y.cl. - 502 Bl.sh.	- 530 Sst. - 806 No info. - 811 Gy.sh.
4218 Langboyd Mill GRAMPIAN VALLEY	143°17'E 20°27'S		1922	18 —	95 365 383) 600) 635) 905) 920)	Soak " surface	 large	 F	0 - 61 Y.cl. - 318 Bl.sh. - 400 S.rk. - 445 Sy.cl. - 620 Gy.sh. - 640 S.rk. - 680 Br.sh. - 710 Sy.cl. - 740 F.sst.	- 752 Gy.sh. - 784 Sy.cl. - 809 Gy.sh. - 820 S.rk. - 905 F.sst. - 920 S.rk. - 967 Gy.sh. - 977 Rd.marl.
4219 - ROWENA	143°15'E 20°43'S	750	1923		830 870 912	surface " "			0 - 23 Su.soil - 92 Y.sh. - 115 Bl.sh. - 220 Dk.sh. - 284 Bl.sh.	- 310 Dk.sh. - 560 Gy.sh. - 630 Sh. - 1107 P.cl. & sst.

A	B	C	D	E	F	G	H	I	J	K
4220 House LUCERNE	143°12'E 20°41'S		1920	flowing	610 700	surface "	180,000 (1956)	P		0 - 6 Soil - 24 Y.sh. - 26 S. - 53 Y.sh. - 600 Bl.sh. - 610 Water rk. - 650 Dry.s.rk. - 700 S.rk. & p.cl. - 860 No info.
4221 - WYANGERIE	142°55'E 20°41'S	722	1906							T.D. 1458 '
4222 - CARRAR	143°5'E 20°45'S	712	1899		1410		600,000			T.D. 1410'
4223 - TALMOI	142°44'E 20°43'S	589	Maulder 1912		1042	surface	200,000	F		0 - 10 S - 80 Y.cl. - 103 Hd.y.sh. - 1017 Bl.sh. - 1105 Sst.
4224 - BOREE PARK	143°2'E 20°39'S		1903							T.D. 1068'
4225 - MAJUBA	142°42'E 20°41'S	571	1910							T.D. 1383'
4226 - STEWART PARK	143°21'E 20°40'S	811	1914		226 730 1040	soak surface "		B		0 - 8 Soil - 62 Y.sh. - 226 Bl.sh. - 229 Gn.rk. - 730 Bl.sh. - 775 Sst. - 835 P.cl. - 850 Sst. - 1040 P.cl. - 1050 Sst.& rk.
4227 - ACTON	143°17'E 20°31'S		1925		125 760	50 surface	 257,000	S F		0 - 70 Y.sh. - 125 Gn. - 300 Bl.sh. T.D. 760'

A	B	C	D	E	F	G	H	I	J	K
4228 Front Army Downs ARMY DOWNS	143°20'E 20°23'S		Abt 1932	28 45				F		T.D. 350'
4329 No.1 SAXBY DOWNS	142°37'E 20°5'S	L645	1893	flowing	630	surface	316,000	F	104°	0 - 70 Sy. loam - 625 Sh. - 698 Sst. - 772 Wh.cl.
4332 Old Homestead PIALAH	142°47'E 20°4'S		1900							T.D. 606'
4341 - PIALAH	No trace	L754	1909							T.D. 660'
4342 No.14 SAXBY DOWNS	142°34'E 20°8'S		1909	flowing				F		T.D. 560'
4350 No.22 SAXBY DOWNS	142°39'E 20°1'S	L687	1921	flowing	350 550 800	surface " "	small flow	F		0 - 6 Su.s. - 69 Y.sh. - 350 Bl.sh. - 400 S.rk. - 500 P.cl.& s. - 550 S.rk. - 600 P.cl. - 800 Cs.s.rk.
4351 - SOMERVILLE	No trace	L776	1901							T.D. 690'
4352 Homestead SOMERVILLE	142°43'E 20°11'S	L675	1900	flowing			90,000 (est.)	F		T.D. 508'
4353 - SOMERVILLE	No trace	L776	1906				600,000			0 - 40 Lst.rk. - 105 Rd.sh. - 423 Bl.sh. - 589 Sst. & p.cl. - 897 S.rk. - 940 S.rk.& Cong.

A	B	C	D	E	F	G	H	I	J	K
4354 - SOMERVILLE	142°46'E 20°12'S	762	1913	30 60	109 450 700	Soak "	300,000	B F		0 - 46 S.& p.cl. - 102 Y.sh. - 110 Bl.st. - 450 Bl.sh. - 470 Gy.sh. - 536 S.rk. - 586 P.cl.& s. - 660 S.rk. - 700 Sst. - 840 S.& p.cl. -1021 S.rk.
4355 - SOMERVILLE	142°46'E 20°9'S		1914		150 425 700	Soak surface "	250,000	B		0 - 78 Y.sh. - 146 Bl.sh. - 152 Hd.gn.st. - 302 Bl.sh. - 320 Sy.sh. - 425 Bl.sh. - 545 S.rk. - 720 P.cl.& s. - 791 Sst.
4356 - SOMERVILLE	142°44'E 20°15'S		1928	flowing	230 490 565	surface	90,000 (est.) (1962)			0 - 17 Hd.cl. - 57 Y.cl. - 210 Dk.sh. - 230 Rk.& gn.sst. - 445 Sh.& rk. - 490 Sy.sh. - 502 Water fm. - 505 Qtz. - 565 Hd.s.rk. - 570 Water fm. - 573 Ba. - 623 V.hd.s.rk.
4357 House ELMORE	142°54'E 20°2'S	L839	1902	60 80				F		T.D. 860'
4358 Old Express Ck. North ELMORE	142°55'E 20°3'S	L831	1910							T.D. 480'
4359 Express Creek South ELMORE	142°51'E 20°4'S	L787	1913	30 50	70 200 400	soak " surface	 200,000	B F F		0 - 46 Y.sh. - 92 Bl.sh. - 100 Gn.st.& sh. - 134 Bl.sh. - 174 S.& sh. - 200 Sst. - 240 F.& Cs.s. - 411 S.& p.cl. - 710 Sst.
4360 - ELMORE	142°54'E 20°2'S	842	1915							T.D. 290'
4361 - ELMORE	No trace	L835	1902							T.D. 860'

A	B	C	D	E	F	G	H	I	J	K
4362 Cudgie Mill ELMORE	142°52'E 20°6'S	835	1915	60 80				F		T.D. 400'
4363 - RUNNYMEDE	No trace		1906							T.D.1030'
4364 - RUNNYMEDE	142°46'E 20°19'S		Frund? 1919		210 339) 584) 693) 967)	24 surface	996 277,000			0 - 5 Su.soil - 15 Iron st. - 80 Y.sh. - 242 Bl.sh. - 249 Gn.rk. - 329 Bl.sh. - 339 Gn.rk. - 466. Bl.sh. - 482 Gy.sh. - 566 Bl.sh. - 584 S.rk. - 610 p.cl. - 663 P.cl.& S. - 677 Choc.p.cl. - 693 S.rk. - 716 P.cl. - 753 Sy.p.cl. - 777 S.rk. - 825 Sy.p.cl. - 836 Choc. cl. - 870 P.cl. - 928 Sy.p.cl. - 943 Choc. p.cl. - 967 Sy.p.cl. - 996 S.rk.
4365 Old Trivalore TRIVALORE	142°35'E 20°16'S	635					545,000			T.D. 800' Sh. & s. Gas flow.

A	B	C	D	E	F	G	H	I	J	K
4448 — KILLARNEY	143°44'E 21°00'S	854	1914				213,000(1915) 111,700(1934) 43,000(1956)			T.D. 2000'
4468 Woolshed TELEMON	143°46'E 20°44'S	L843	1895		595	surface	293,700(1893)		94½$^{\circ}$	0-45 Y.calcareous sh. -495 Bl. Sh. -500 Gn.sst -609 Water sst -812 Cs & f.sst -840 Rd sh.
4469 — TELEMON	143°54'E 20°42'S	L884	1895		450	surface	427,000 small flow (1962)	F	92°	0-340 No info. -553 sst.
4470 Telemon TELEMON	143°44'E 20°46'E	915	1896	20 20	644 860 1205	Soak Surface	453,600	F	104°	0-4 Y calc Sh -80 Bl sh -610 Gn sst -644 Rd sst -840 Fgr dry sst -880 Wh water rk -910 Dry sst -1005 Rd sh -1016 Fgr. sst -1205 Sst
4471 Sawpit BOREMBA	143°42'E 20°39'S	859	1896	Flowing	550 965	Surface	865,400		103°	Surface gravel 0-80 Y & bl sh -550 Gn sst -720 Water sst -840 Rd sh -975 Cs sst
4472 — TELEMON	143°51'E 20°49'S	L992	1897		810 1278	72' 4'				0-72 Alluvium -580 Bl sh -610 Bl sh -810 Sst -985 Mixed sh -1278 Sst -1293 No info.
4473 Dribbling BOREMBA	143°44'E 20°37'S	893	1898	Flowing		Surface				T.D. 989'

A	B	C	D	E	F	G	H	I	J	K
4474 - TELEMON	143°54'E 20°44'S	927	1899				flow	F		T.D. 1036'
4475 - TELEMON	143°50'E 20°41'S	897	T Lindsay 1910		800 to 833	Surface	flow large	F		T.D. 883'
4476 House BOREMBA	143°44'E 20°38'S	864	1910	Flowing	485 820 930 1070	Surface	250,000 (1962)	F		T.D. 1070
4477 Mistake TELEMON	143°44'E 20°48'S		1914	Flowing	600 to 640 998		400,000 (1962)	F		T.D. 1,119'
4478 House SYLVANIA	143°56'E 20°50'S	L961	1895		520 1030	Surface "	202,400 on completion		97°	0-520 No info -760 Sst -900 Bk. & Rd.sh. -1042 Sst. -1297 No info.
4479 Annandale TELEMON	143°49'E 20°48'S	L925	1895		600 800 1000 1195	360 10 Surface "	178,600 on completion		104½°	0-600 No info -800 Sst. -1000 No info. -1195 Sst.
4480 - SYLVANIA	No Trace	951	1911		180) 900) 1140) 1240)	Soak Surface				0-10 Sy.Sh. -515 Bl.sh.w.hdsks. -590 Sst -595 Pcl -800 Gy.sh.p.cl & S -1010 Sst. -1175 S.w.little p.cl. -1240 Br.p.cl.&S -1280 Blood rd cl
4481 - SYLVANIA	143°53'E 20°50'S		1917		720 996	Surface	flow increased			0-5 Bk.soil -63 Y.cl. -230 Bl.sh. -720 Gy.sh. -730 S.rk. -850 Choc.p.cl. -996 Sy.choc,p.cl. -1199 S.rk.

A	B	C	D	E	F	G	H	I	J	K
4482 Boree SAEGO	143°47'E 20°37'S		E.A.Emblem 1918	Flowing	140 310) 399)	Surface	Small	F		0-50 Y.sh ; -117 Bk.sh. -130 Sy.sh -140 Gn.s. -189 Bl.sh. -272 V.hd.bl.sh. -302 Sy.sh. -315 Gn.s. -385 Bl.sh. -397 V.hd.bl.sh. -463 Wh.s.
4483 House SAEGO	143°51'E 20°38'S		H. Bode 1929	Flowing	50 100 132 163 268-300	 Surface	Soak Soak Soak Soak 80,000	F F F F P		0-25 Y.sh -50 Apple gn.sh. -99 Hd.gy.sh. -100 Rk. -132 Hd.gy.sh. -140 Rk. -163 Gy.sh - 165 Rk. - 205 Gy.sh. -206 Rk. - 268 Gy.sh. -300 No.info.
5000 - SOMERVILLE	142°44'E 20°9'S		1935		326 350 410 525 565	Surface	90,000 (est.) (1962)			0-2 Su Soil -16 Hd.Y.Sy.Cl. -70 Y.sh. -72 Rd.rk -78 Y.rk -145 Gy.sh. -150 Gn.rk. -180 Gy.sh. -181 Rd.rk. -221 Gy.sh.in bars of rk, -223 Gn.rk. -326 Gy.sh. -332 Gn.rk. -347 Gy.sh. -350 Bk.rk. -410 Gy.Sh.w bars of rk -430 Sst. -502 Sy.p.cl. & rk -505 Coal -525 P.cl & rk -565 Sst.&p.cl. -580 Cs.sst. -583 Coal - 585 F.hd.sst.
5012 No. 23 SAXBY DOWNS	142°37'E 20°8'S		1935	Flowing	300 600 660	Soak Surface	 80,000	F		0-40 y.cl -140 Bk.sh. -200 Gy.sh. -300 Bk.sh. -303 Gn.s. rk -311 Bk.ba. -313 Gn.s.rk. -463 Gy.sh. -590 Bk.sh -595 Sy.sh -635 S.rk. -645 P.cl. -665 S.rk -675 P.cl. -695 S.rk. -700 p.cl.

A	B	C	D	E	F	G	H	I	J	K
5020 House SOLWAY DOWNS	142°42E 20°6'S		1935	20 40	150 366	Soak Surface		F		0-40 Y.sst -110 Y.cl. -160 Bl.sh. -350 Bk.sh. -354 Bk.ba -366 Gn sst.
5434 Back Army Downs ARMY DOWNS	143°20'E 20°20'S		1927	20 30				P		T.D.407'
5799 House DALKEITH	143°54'E 20°25'S		J.V.Kirby	85 90			12,000+	Sweet		T.D. 135'
5800 Shed DALKEITH	143°54'E 20°25S			90 110			5,000	Sweet		T.D. 130'
5801 Rig(Dud) DALKEITH	143°58'E 20°21'S		J.V.Kirby				NIL			T.D.460'
5802 Spring Creek DALKEITH	143°58'E 20°24'S		A.Golden 1936	Vari- able 208	40' 180'		Small Good (but decreases to nil in dry years			0-40' badly caving T.D. originally 120', but later deepened to 208'
5958 Valley DUTTON RIVER	143°49'E 20°24'S		1920	? 90			Good	P		T.D. 283'
5959 New Camoola	143°43'E 20°22'S		1926	135 160			V.Good	P		T.D.341'
5960 Ironstone GILGUNYAH	143°39'E 20°24'S		H.BODE 1934	50 70	65 150) 205)) 660)	46	Soak Good	P		0-14 Soil.sh. -26 Y.sl. -130 Wh.sy.p.cl. -150 Cs.sst. -180 Sy.p.cl. -182 Hd.sst. -184 Gy.sh. -205 Sy.p.cl. -210 Cs.sst. -250 Sy.p.cl. -336 Sy.lt.gy.sh. -346 V.Sy.p.cl. -363 Stky p.cl. -449 Stky.sy.p.cl. -490 V.soft sst -500 Cs.sst -660 F.sst. -680 Hd f.sst. -694 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K
5961 Bloodwood DUTTON RIVER	143°51'E 20°19'S		H. BODE 1930	295 320	233		Excellent	P		0-20 Y.sh. -70 Ba. -144 Y.sh -150 Hd.Sst -163 Hd.Gy.sh. -169 Ind.sst -232 Hd.gy.sh. -254 Sst -256 Hd Sst -266 Gy.sh -286 Cs.sst. -338 Sst. -340 Sh.Fm. -480 Sy.sh. -510 F.sst.
5962 Bush Pelican DUTTON RIVER	143°31'E 20°6'		1932	? 280	217-223 227-266 285-290 310-314			F F F F		0-12 Soft y.rk -18 Soft rd.rk -43 Soft Pk.rk -72 P.cl. -215 Varying soft rk. -217 Hd rk -223 Water absorbing S. -227 Dk.choc.s. -266 Sst -270 Water bearing S. -285 Coal -290 Water bearing S. -310 S. At 300 coal. -314 Water Bearing S. -324 P.cl.
6322 WEST COOLIBAH	143°58'E 20°50'S		1920	40 50				F		T.D. 950'
6828 New Valley DUTTON DOWNS	143°45'E 20°26'S		J.C. JAMES 1938	70 90	80 270	43	6000 G	P		0-20 Y.cl. -24 Drift S. -40 Y.cl. -45 Ba. -55 Y.cl. -78 Bl.sh. -80 Gvl. water pebbles -100 Bl.sh. -134 Hd.gy.sh. -170 Bl.sh. -183 Gy.sh. -209 Bl.sh. -235 Hd.gy.sh. -256 Bl.sh. -266 Hd.Gn.rk. -276 Gn.sst. -406 Water bearing sst.
7122 – TWEEDS MUIR	143° 5'E 20°51'S		1938		1070)) 1100)	Surface	8000 50000	F		0-45 Y.sh. -410 Gy.sh.w. bds of rk -558 Br.sh. -707 Gy.sh. -764 Br.sh. -788 Dk.sh -872 Br.sh. -916 Dk.sh. -986 Br.sh -1060 Gy.sh. & bds of rk -1070 sst -1073 Hd sst. -1098 Hd p.cl. -1139 Sy.p.cl.& sy.gy.sh.

A	B	C	D	E	F	G	H	I	J	K
7306 - CAMBRIDGE DOWNS	No trace									
7350 Homestead BURLEIGH	143° 6'E 20°16'S		1914	100				F		T.D.496'
7351 Rocky BURLEIGH	143°14'E 20° 2'S		1920	80 110				F		T.D.325'
7352 Waitalong BURLEIGH	142°58'E 20°10'S		1920				good			T.D.400'
7353 Tindish BURLEIGH	143° 4'E 20°17'S		1934	42 80			poor	F		T.D. 298'
7354 - BURLEIGH	No trace		1914							T.D.704'
7359 - CAMBRIDGE DOWNS	142°58'E 20°21'S		H.M.BODE 1939		171 800) 939)	Soak Surface	163039	S		0-56 Y.sh. -65 Bl.sh -67 Rk. -159 Bl.sh -171 Sh. -194 Gn.sst -209 Hd.gy.sh. -249 Hd.sh. -264 Sh. -277 Hd.gy.sh. -292 Dk.sh. -337 Gy.sh. -339 Rk -456 Gy.Sh. -542 P.cl. & Sst. -545 Hd.rk. -645 Hd.wh.f.s. rk. -671 Cs.wh.S Rk. -692 Hd wh.s. rk. -704 Gy marl -713 Gy marl & s.rk. -720 F.s.rk -733 Marl & s.rk. -748 S.rk. -754 Marl & f.S.rk. -795 Hd S.rk. -861 Marl -917 Sst. -1168 S.rk -1177 Sst -1186 Sst & Br Marl.

A	B	C	D	E	F	G	H	I	J	K
7376 - PIALAH	142°44'E 20° 7'S		H. BODE 1935	Flowing 12	392 to 424		barely flows	F		0-2 Su.soil -62 Y.sh -242 Gr.sh. -392 Dk.sh. -424 Dk.sh. w intermittent bnds of gn.rk. probably waterbearing.
7650 Red Mill PIALAH	142°48'E 20° 2'S		1914	65 80				F		T.D.720'
7651 Spring PIALAH	142°46'E 20° 0'S		1930	60 74				F		
7940 - OXFORD DOWNS	142°53'E 20°21' S									0-65 Y.cl. -274 Lt.sh. -306 Gn.rk. -430 Dk.sh. -456 Bk.rk.w iron pyr. -524 Br.sh. -641 S.rk. & gvl.
7960 Cummerstone DALKEITH	143°59'E 20°18'S		W.H.JAMES 1940	S.A.	161	154	10,500	F		0-4 Bk.soil -15 Bk.ba -33 Rd.ba. -62 Bk.ba. -70 Rd.ba. -82 Bk.ba. -88 Rd.ba. -112 Bk.ba. -127 Rd.ba. -152 Br.ba. -161 Y.sh. -167 Water bearing sst -170 Y.sticky cl. -220 F.wh.sst. -245 Gy.sh. -310 Sy y.sh. -384 Gy.sh. -390 Hd.wh.rk. -391 Cave -405 S st -423 Gy.sy.sh. Bore filled back to 206' as water running away in cave at 390'.
8001 Hazelwood WALKER'S PARK	143°17'E 20° 20'S		1927	7 14			abt 60,000	F		T.D.345'
8002 Back WALKER'S PARK	143°15'E 20° 9'		1927	160 200			abt 60,000	F		T.D. 460'

A	B	C	D	E	F	G	H	I	J	K
8003 Wetting WALKER'S PARK	143°15'E 20°15'S		1930	60 100			60,000	F		T.D.430'
8908 No.5(new) WALKCEGE	143°42'E 20°33'S		J.JAMES 1942	275 300	318 555	196	soak unlimited	P		0-3 Soil -120 Bl.metal -318 Gy.sh. -320 Gn.rk -512 Gy.sh. -530 Gn.sst. -545 Gy.sh. -555 Sy.sh. -600 Sst. -616 Sst.w.sms.p.cl. -650 Sst
9774 Rachel AMMAROO	143°39'E 20°17'S		1925	Abd in 1962 but is to be brought back into operation						T.D. 800'
9775 Duffers AMMAROO	143°36'E 20°18'S		1925	S.A.						T.D.1080'
9776 Fish Holes AMMAROO	143°38'E 20°19'S		1925	S.A.						T.D. 1100'
9950 - CANNONBALL	143°57'E 20°57'S	868	J.JAMES 1944		295 690	soak 6	43,000+			0-3 Soil -50 Y.sh. -107 Dk.sh. -120 Hd.gy.sh. -295 Dk.sh. -300 Sy.sh. -500 Dk.sh. -550 Hd.gy.sh. -580 Dk.sh. -600 Hd.gy.sh. -620 Hd.rk. -630 Hd.gy.sh. -645 Dk.sh. -665 Hd.gy.rk. -677 Dk.sh. -690 Water bearing sst. -693 Hd.S.rk. -700 Hd S.rk.
10408 Yellowwood (new) WALKCEGE	143°40'E 20°30'S	958	J.C.JAMES 1945	140 160	345 410		24,000 (1945)	B (1962)		0-10Soil -20 Sy.cl. -28 Drift s. -45 Gvl &bldrs. -56 Y.cl -70 Gy.sh. -80 Hd.rk -270 Gy.sh. -275 Sy.sh. -305 Gy.Sh. -330 Gn.rk. -335 Gy.sh. -345 Sst. -385 P.cl. & s. -410 S & Sh.

A	B	C	D	E	F	G	H	I	J	K
10456 — ?Dutton River	Not located.		J.C.JAMES 1945	S.A.			72,000 (Engine Test)			0-6 Soil -30 Cl. -40 Drift S. -55 Cl. -75 Gy.sh. -80 Hd.rk. -162 Gy.sh. -180 Gn.rk. -200 Sst w. narrow sms.choc.sh. -238 Water bearing sst -250 Hd.sst. -265 Water bearing sst
10533 Woolshed DUTTON RIVER	143°49'E 20°26'S		J.C. JAMES 1945	120 140	200	89	22,000			0-15 S.,gvl.& bldrs. -95 Y.cl -155 Dk.sh. -160 Hd.gn.rk. -200 Sy.sh. -236 Water bearing sst.
10713 — SILVER HILLS	143° 7'E 20°35'S	805	GODFREY BROS 1946		434 544 637 710 870	424 surface	soak 2,500 11,000 24,000 34,000			0-28 Rtn.rk. -30 Y.cl. -289 Gy.sh. -290 Rk -318 Gy.sh. -328 Bl.sst. -378 Gy.sh. -381 S.rk. -434 Gy.Sh. -438 S.rk. -468 Sh. -470 Rk. -515 Sh. -517 Rk. -541 Sh. -544 Gn.rk. -560 Sh & rk. -600 Gy.Sh. -660 Sst. -665 Wh.cl. -710 Cs.sst. -744 Hd.sst. -753 Br.sh. -870 Sst. -910 Hd.sst. -920 Cs.s. -948 Puggy sst.
10743 — SOLWAY DOWNS	142°42'E 20° 3'S		G.PIRIE 1947	flowing	355 430 445	surface	24,000	F		0-5 Subsoil -15 Y.sst. -70 Y.cl. -114 Bl.sh. -130 Rk. -195 Bl.sh. -203 Gy.sh. -208 Bk.sh. -218 Gy.sh. -230 Bk.sh. -240 Bl.sh. -247 Gy.sh. -265 Bk.sh. -283 Bl.sh. -290 Gn.sst. -310 Bk.sh. -320 Bl.sh. -328 Gy.sh. -340 Bl.sh. -350 Gn.sst. -355 Bk.sh. -360 S.rk. -420 P.cl. & S. -445 Sst. -450 Hd.rk -475 P.cl. -500 P.cl. & S.

A	B	C	D	E	F	G	H	I	J	K	
10831 Valley Downs VALLEY DOWNS	143° 8'E 20°37'S	770'	GODFREY BROS 1947	Surface	307 592) 652) 865)	15 Surface	153,000 (1959)	P		0-2 Rtn.rk -38 Y.cl. -286 Gy.sh. -287 Rk -330 Gy.sh. -333 Rk -380 Gy.sh. -382 Rk.	-418 Sh. -420 Rk. -518 Sh. -521 Gn.sst. -592 Sh. -640 Cs.sst. -652 Cl. -870 Sst
10868 Cunnar Dribbly REVENUE DOWNS	143°11'E 20°38'S	713	1947	Surface	244 264	Surface	1,500	F but soda		0-3 Su.soil -42 Y.cl. -65 Br.cl. -244 Gy.sh. -245 Sst.	-246 Rk -258 Gy.sh. -264 Gn.sst. -275 Gy.sh.
11120 No.6 WALKCEGE	143°42'E 20°30'S		J.C.JAMES 1948	325 350	565	218	12,000	P		0-3 Soil -18 Bl.Metal -32 Porous ba. -45 Gy.Diorite -57 Rd.ba. -65 Ba.blds. -74 Bk.ba. -85 Rd.ba. -93 Porous ba. -98 Rd.ba. -107 Creek wash -114 Drift S. -220 Dk.sh. -280 Gy.sh.	-305 Dk.sh. -310 Rk. -345 Dk.sh. -348 Gn.rk. -380 Dk.sh. -385 Blds. -500 Dk.sh. -530 Sy.sh.&p.cl. -540 Choc.sh & S. -565 Sst. -585 P.cl.S. -595 Choc.sh. -600 P.cl.S.

A	B	C	D	E	F	G	H	I	J	K
11352 House RAINSCOURT	143°30'E 20°31' S	907	G.PIRIE 1950	flowing	70 412	60 40	100,000 (1962)	F		0-74 Y.cl. -90 Y & bl.sh. -115 Bl.sh -127 Sy.sh.& s. -155 Bl.sh. -163 Hd.bl.sh. -400 Bl.sh. -420 Bl.sh.& s.rk. -435 P.cl. -450 P.cl & s. -480 P.cl. -495 Sy.p.cl. -502 P.cl. & S -516 P.cl. -530 Br.p.cl. -590 P.cl. -608 P.cl.& S. -630 P.cl. -658 P.cl. bl -680 Wh.p.cl. -695 Hd.sst. -703 P.cl. -708 Hd.sst. -720 S. -735 Hd.p.cl. -751 Mdst. -760 Mdst.cl. -775 P.cl. -787 Sy.p.cl. -800 P.cl. -820 Sy.p.cl. -835 patches of sy.cl. -855 Sy.cl. -875 Patches of s.rk -900 Hd.cl. -915 P.cl. & S. -935 Patches w.s.& p.cl. -950 P.cl. & S. -960 Hd.bars rk & cl. -970 Sy.cl.
11372 No.7 WALKCEGE	143°39'E 20°32'S		J.C.JAMES 1949	140 160	241 472	126	soak 12,000	P		0-5 Soil -15 Ribbon st. -30 Y.cl. -95 Slippery back cl. -240 Gy.sh. -242 Gn.rk -335 Gy.sh. -340 Hd.bk.rk. -420 Gy.sh. -430 Gn.rk. -445 Bk.rk. -459 Bk.sh. -467 Sy.sh. -472 Sst. -518 water bearing sst. -520 Choc sh.
11731 Abagoola SOMERVILLE	142°47'E 20°15'S		G.PIRIE 1950	flows 84	150 453 493	40 200 surface	small natural flow (1962)	F		0-70 Y.cl. -450 Bk.sh. -458 Bk.sh.w.sst. -470 sst.& p.cl. -480 P.cl. -490 Sst. & p.cl. -496 P.cl.

A	B	C	D	E	F	G	H	I	J	K	
11928 - SOMERVILLE	142°47'E 20°8'S		W.H.JAMES 1951	30 75	79 360	22 9	 1,000 (1954)	B G		0-2 Sy.soil -10 Sy.cl. -70 Y.cl. -79 Gy.sh. -85 Gy.gn.rk. -95 Gy.rk. -106 Gy.sh. -136 Hd.gy.sh. -165 Sh.& sms of gy.rk. -194 Sh. & rk.	-271 Hd.gy.sh. -274 Gn.rk. -297 Sh.&rk. -301 Bk.sh. -351 Sy.sh. -360 Bk.sh. -365 Sst. -378 Sst. -398 Sst & p.cl.
11930 - KILLEEN	143°19'E 20°40'S		G.PIRIE 1952		395 712) 724) 734)	200 surface	 149,000	B		0-15 Subsoil & y.cl. -90 Y.cl. -105 Bl.sh. -220 Bk.sh. -300 Gy.sh. -340 Bk.sh. -450 Gy.sh. -610 Bk.sh.	-650 Gy.sh. -660 Bk.sh. -668 Gy.sh. -680 Bk.sh. -690 Gy.sh. -700 Bk.sh. -712 Sh.& S. -734 S
11959 - DUNLUCE	143°51'E 20°53'S		J.C.JAMES 1952		650) 710) 1030)	 surface	 50,000	 F		0-7 Soil -75 Y.cl. -245 Dk.sh. -253 Sy.sh. -360 Dk.Sh. -400Gy.sh. -430 Dk.sh. -550 Gy.sh. -560 Gn.rk -625 Gy.sh. -635 Bk.sh.	-665 Gy.sh. -675 Gn.rk.&bk.sst -700 Dk.sh. -710 Stky sh. -900 Sst -950 Br.sh. -965 P.cl.& sst -975 Sst. -985 Dk.sh. -1030 Sst. -1100S.

A	B	C	D	E	F	G	H	I	J	K
11962 Trivalore TRIVALORE	142°35'E 20°16'S	635	S.JAMES 1952	Flowing	360 630 650 700 835 848		200,000 (est)			0-30 Cl.&gvl. -539 Hd.gy.sh. -60 Slippery back-546 Waddy sh.& rk.gvl. -69 Y.sh. -576 Sh. & rk. -79 Gy.sh -625 Waddy sh. -80 Gy.rk -628 Rk & sh. -95 sh. -706 Sst. -238 Gy.sh. -718 Mdy sst. -309 Sh. -758 Tight mdy.sst. -320 Sh.&rk.sms-765 V.hd.rk. -340 Sh. -767 Sst. -372 Sh.&gn.rk-782 Sst & br.cl. -465 Sh -793 Sst & p.cl. -487 Waxy Sh. -835 Dry sst -526 Sh. -850 Sst.
11975 - EXPRESSMAN	143°46'E 20°32'S		1916	270						T.D.560'
11986 - SOMERVILLE	142°47'E 20°11'S	760		flows 33	78 301 384	54 40 24	small flow (1962)	B G		0-1 Soil -281 Gy.sh. -20 Sy.cl -291 Sy.sh. -60 Y.cl. -301 Bk.waddy sh. -78 Gy.sh. -330 Water bearing -80 Gn.rk. sst -175 Gy.sh. -384 P.cl.& sst. -213 Gy.sh. & -395 Sst. rk.sms. -400 Sst. & cl. -219 Hd.gy.rk.
12008 Gunnerside (2) GUNNERSIDE	143°54'E 20°53'S		J.C.JAMES 1952		675 710 1030	25 surface "	 50,000			0-8 Soil -665 Gy.sh. -30 Y.cl. -675 Gn.rk.& bk.sst. -75 Y.cl. -700 Dk.sh. -248 Dark sh. -710 Stky sh. -255 Sy.sh. -715 Water sst. -360 Dk.sh. -900 Sst. -400 Gy.sh. -950 Br.sh. -430 Dk.sh. -965 P.cl.& sst. -550 Gy.sh. -975 Sst. -560 Gn.rk -985 Dk.sh. -625 Gy.sh. -1030 Water bearing sst -635 Bk.sh. -1100 Water sand.

A	B	C	D	E	F	G	H	I	J	K
12071 Kenmac KENMAC	143°15'E 20°26'S		G.PIRIE 1953	flowing	25 310) 585) 600) 610) 620)	18 Surface	 395,000	B F		0-10 Subsoil -20 Y.cl. -29 Hd.gn.srk. -40 Hd.gy.sh. -180 Gy.sh. -195 Bk.sh. -200 Gy.sh. -250 Bk.sh. -270 Bk.sh.&srk -310 Srk. -375 Srk.& p.cl. -385 Hd. S. -470 P.cl. -485 P.cl. & S. -515 P.cl. -525 P.cl. & s. -540 P.cl. -560 P.cl & Srk. -570 Hd.srk. -600 Srk -620 P.cl.&S.
12326 Yanko YANKO	143°33'E 20°24'S		G. PIRIE 1953	44 56	420 430 650	20 30 35	 unlimited	F		0-15 Subsoil & y.cl. -35 Y.cl. -40 Hd.gy.sh. -70 Bk.sh. -90 Gy.sh. -110 Bk.sh. -149 Gy.sh. -185 Bk.sh. -220 Sy.sh -250 p.cl -270 P.cl.& s. -355 P.cl -363 Hd.p.cl. -392 P.cl. -400 Hd.p.cl. -412 p.cl. -420 P.cl. & s. -430 S. -435 P.cl. & s. -445 P.cl. -453 Hd.p.cl. -460 Hd.cl. -470 P.cl. -480 Sy.p.cl. -490 P.cl & s. -520 Sy.sh. -550 S.rk. -560 P.cl. -650 S.rk.
12545 – DONCASTER	143°32'E 20°22'S		R.TOOLE 1954	57	497 624 739	200 100 57	4800 24,000 33,600			0-160 y.cl. -200 Y.cl.& bl sh. -248 Bl.sh. -293 Sst. -311 Br.sh. -335 Bl.sh. -365 Gy.sh. -400 Sst. -450 Br.sh. -497 Gy.sh.& Sst. -522 Gy.sh. -570 Sst. -600 Br.sh. -624 Br.sh.& Sst. -689 Gy.sh. -739 Sst. -787 Br.sh. -802 Sst. -864 Br.sh.

A	B	C	D	E	F	G	H	I	J	K
12599 New GRAMPIAN HILLS	143°29'E 20°22'S		R.TOOLE 1954	45 55	630) 653) 676)	47	36,000	F		0-5 Bk.soil -20 Y.cl. -50 Sst. -70 Gy.sh. -102 Sst. -345 Gy.sh. -380 Sst -415 Br.sh. -498 Gy.sh. -513 Sst -530 Br.sh. -565 Gy.sh. -570 Sst -580 Br.sh. -590 Sst. -700 Br.sh.
12637 Royal COMPTON DOWNS	143°36'E 20°34'S		J.C.JAMES 1954	150 200		150	17,000	V.G		0-2 Soil -16 Gvl -50 Y.cl. -75 Dk.cl. -120 Gy.sh. -135 Ba.rk.& blds -292 Dk.sh. -294 Sy.sh. -520 Dk.sh. -523 Gn.rk. -534 Hd.bk.s.rk. -560 Dk.sh. -590 Sst. -660 Water bearing sst. -615 Hd.sst. -645 Water Bearing sst -650 P.cl.&sst.
12711 Richgar BURLEIGH	143° 6'E 20° 5'S		W.H.JAMES 1955	95	45 195 563	42 75 95	23,000	F		0-5 Pk.cl. -7 Cl -25 Sy.cl -35 River s. -45 Sy.cl. -50 Sy.si. -95 Drift s. -105 Bl.sh. -115 Hd.gy.sst -195 Gy.srk. -201 Blds w.srk -250 Hd.gy.rk. -252 Hd.gy.srk -275 Sy.sh. -287 Gy.rk. -313 Sy.sh. -314 Gy.srk. -329 Gy.sh.sms.rk. -339 Sy.sh.rk.sm. -367 Sy.sh. -430 Sy.sh.rk.sms -480 Sy.sh. -550 Gy.sy.sh.rk.sms. -560 Gy.sy.sh. -563 Gy.sst. -602 sst -603 P.cl.
12789 - RICHMOND DOWNS	143°19'E 20°36'S		1954		450 756 790) 828)	20 6 Surface	87,000	F		0-5 Bk.soil -55 Y.cl -480 Gy.sh. -560 Sy.p.cl. -680 Gy.sh. -750 Sy.sh. -756 Br.sh. -800 Sy.p.cl. -828 Sst.

A	B	C	D	E	F	G	H	I	J	K	
12797 No.4(new) BURLEIGH	143° 5'E 20° 9'S		G.PIRIE 1951	60 100	70 690	60 65	100 2,500	B G		0-30 Y.cl. -75 Y.sh -85 Hd.reef qtz -145 Bk.sh. -210 Sh -250 Sy.sh -275 Sh. -300 Sy.sh. -425 Sh.	-440 Srk. -460 Srk.& p.cl. -580 P.cl. -600 Srk.& P.cl. -632 P.cl. -665 P.cl. & S. -690 Srk. -710 Srk & pcl.
12798 No.19 BURLEIGH	142°58'E 20°6'S		1954	80 120	138	50	28,800	F		0-14 Rd.su.soil -25 Cs.mdy.gvl	-138 Wh.sy.cl. -148 Cs.sst -200 F.sst.
12799 No.18 BURLEIGH	143°7'E 20°2'S		1954	60 100	184	90	24,000	F		0-4 Su.soil -20 Rd.cl. -75 Y.sy.cl. -110 Y.cl. -163 Gy.sh. -184 Sst.	-196 Cs.sst. -255 Wh.sst. -260 Cs.sst. -286 Wh.sst. -298 Cs.br.sst. -300 Gy.cl.
12887 Sawpit (new) WALKCEGE	143°41'E 20°36'S		J.C.JAMES 1955	140 160	445) 465)	53	14,400			0-5 Soil. -16 Y.cl. -240 Dk.sh. -265 Dk.sh.w narrow sms rk. -280 Hd.bk.rk. -343 Hd.bk.sh. -380 Dk.sh. -385 Hd.bk.sh.	-415 Dk.sh. -425 Gn.rk. -445 Dk.sh. -452 Wh.sst. -457 S.&sh. -465 Sst. -493 water bearing sst. -495 Sy.sh.

A	B	C	D	E	F	G	H	I	J	K	
12903 - HILLTOP	143°26'E 20°56'S		WESTERN DRILLERS 1955	flowing	1000 1409 1444 1473	Surface " " "	5411 13000 118000 272000	G P P P		0-4 Gy.soil -46 Y.sh. -146 Gy.sh. -187 Gy.sh.bars s.rk. -224 Gy.sh. -231 Sy.sh.s.rk -246 Gy.sh.s.rk -318 Gy.sh. -330 Gy.sh.&sst -360 Gy.sh. -375 Gy.sst. -388 Gy.sh.&sst -405 Gy.sh. -407 Gy.sst. -475 Gy.sh. -476 Ls. -526 Hd.br.sh.	-621 Gy.sh. -655 Gy.sh.bars s.rk. -696 Gy.sh. -729 Gy.sh.bars rk -778 Gy.sh.bars rk -792 Gy.sst. -819 Gy.sh. -833 Gy.sst. -843 Bl.sh. -1008 Semi rk.sh.fm. -1010 S.water. -1164 Wh.sst. -1166 Crs river gvl -1299 Wh.sst. -1378 Br.marl -1492 Wh.sst. -1494 Wh.p.cl.
13011 - VILLADALE	143°28'E 20°39'S		J.JAMES 1956	50	680	50	14,400 (1956)	G		0-5 Soil -75 Y.cl -80 Br.sh. -85 Bk.sh.	-678 Dk.sh. -695 Sst. -700 Sst w sms of choc.sh.
13135 Express Creek north ELMORE.	142°55'E 20° 3'S		G.PIRIE 1956	16 60	300 420 450 460	40	48,000	F F		0-10 Y.cl. -50 Y.sy.cl. -52 Drift S. -60 Gvl & Sh. -105 Sh -125 Bk sh. -145 Gy sh.	-200 P.cl. -230 P.cl.& s. -260 P.cl. -310 P.cl. & S. -410 Sy.sh. -450 Sy.sh. & S. -460 Sy.sh.
13195 Abandoned COALBROOK	No trace		P.SIMONS 1956		157	148	72,000	P		0-22 Rd.sy.su soil -30 Rd.sy.cl. -62 Pk.sy.cl -68 Wh.sy.cl. -167 Wh.&Pk.sst.	-218 Gn.sy.cl. -234 Hd.gn.sst. -315 Rd.gr. -322 Bk.sst. -344 Rd.gr.

A	B	C	D	E	F	G	H	I	J	K
13202 Cape Horn Reserve on water reserve near RIVERDALE	143°22'E 20°47'S		HALL 1956	Flowing	733) 765) 1081) 1101)	Surface	334100	F		0-3 Su.soil -10 Y.sst -100 Gy.sh. -110 Gy.sy.sh. -190 Gy.sh. -200 Gy.sh.sms lst. -205 Lst. -218 Lst.& br.sh. -265 Br.sy.sh. -300 Gy.sy.cl. -375 Gy.sh. -420 Gy.sy.sh. -423 Rk -545 Gy.sh. -561 Gy.sh.& gn sst. -578 Gy.sy.sh. -650 Gy.sh. -652 Gy.rk. -670 Gy.sh. -677 Gy.rk. -730 Gy.sh. -733 Gy.rk. -780 Gy.sst. -790 Hd.gy.sst. -800 Br.sy.sh. -830 Gy.sst. -860 Gy.&br.sh. -890 Gy.sst. -900 Cs.gy.sst. -910 Gy.sst. -940 F.gy.sst. -950 Lt.gy.sh. -1030 F.gy.sst. -1040 Br.sh. -1055 Br.&gy sh. -1065 Br.sh.& coal -1100 Br.sh.& sst. -1120 Gy.sst. -1131 Wh.sst.
13334 new BYLONG	142°56'E 20°15'S		G.PIRIE 1956	30 -	150 to 160 340 to 400	35	24,000	F		0-20 Y.cl. -40 Sy.cl -65 Bl.sy.sh. -150 Bl.sh. -160 S. -300 P.cl. & S. -340 Sy.sh. -400 Srk.
13349 - ARTESIAN	142°33'E 20°28'S									
13400 New MAADI	143°15'E 20°33'S		G.PIRIE 1960	2 20	145	Surface	16,000	F		0-20 Y.cl. -52 Blsh. -65 Bk.sh. -72 Bk.sh. -112 Gy.sh. -120 Bk.sh. -140 gy.sh. -200 Bk.rk -205 Bk.rk.blds. -227 Bk.rk.

A	B	C	D	E	F	G	H	I	J	K
13830 New BALD HILLS	143° 5'E 20°24'S		JAMES 1958	Flowing	92 405 430) 442) 521) 539)	60 40 surface	50,000	F		0-3 Soil -22 Y.sh. -49 Gy.sh. -51 Sh.& rk -92 Gy.sh. -94 Gy.rk -110 Gy.sh. -118 Sh.& rk. -132 Sh.& gn.rk -159 Gy.sh. -231 Sh. & rk. -398 Hd.gy.sh. -405 Sy.sh. -444 Wh.sst. -510 Gy.sst. -522 Gy & br.sst. -523.Hd.br.rk. -531 Br.sst. -539 Wh.sst.
13867 - LANGDALE	142° 35'E 20° 49'S		BODE 1959		1255 1320 1365 1410 1440	surface	500 30,000 70,000 100,000 260,000	F		0-2 Soil -81 Y.sh. -132 Gy.sh. -172 Sy.gy.sh. -174 Hd.bnd. -403 Gy.sh. -405 Rk. -585 Gy.sh. -600 Br.sh. -608 Rk. -1230 Gy.sh. -1232 Qtzy. -1240 Gn.rk. -1255 Sy.br.sh. -1450 sst.
13892 Redan on Stock Route near YAN YEAN	143° 1'E 20°31'S		W.WELKS 1959	Flowing	118 550	surface	7,000 70,000	F		0-3 Br.cl. -38 Y.cl. -46 S & Gvl -66 Y.cl. -177 Bl.sh. -179 Sst. -381 Bl.sh. -382 Gn.sy.sh. -478 Bl.sh. -485 Sst. -565 Srk.
13901 Whim(Stock Route) on stock route near HAZLEWOOD.	143° 3'E 20°20'S		W.WELKS 1959	90 110	152) 274) 362 to 444	Soak 87	40,320	F		0-31 Rd gvl.& cl -51 Y.sst -114 Y.cl. -137 Gy.sh. -256 Bl.sh. -362 Gy.sh. -415 Srk. -427 Cs.srk. - 443 Srk. -459 P.cl. -476 P.cl.&s. -494 Br.p.cl.&s. -542 Wh.p.cl.& S. -580 S.& p.cl. -607 P.cl.

A	B	C	D	E	F	G	H	I	J	K	
13950	143° 8'E		SHELLEY		219			S		0-1 Soil	-778 sst.
-	20°44'S		1959		759	Surface	213,000	P		-42 Y.cl.	-833 Wh.sst.
RICHMOND					1083					-44 Sst.	-838 Hd.wh.sst.
TOWN					1199					-55 Y.cl	-840 Rk.
										-57 Y.sst.	-861 Wh.sst.
										-72 Y.cl.	-862 Rd.sst.
										-88 Gy.sh.	-867 Wh.sst.
										-89 Rk.	-868 Rk
										-209 Gy.sh.	-893 Wh.sst.
										-217 Br.sh.	-895 Rk.
										-219 Rk.	-899 Br.sst.
										-236 Br.sh.& flakes	-942 Wh.sst.
										of wh. rk.& water	-944 Rk.
										-287 Br.sh.	-1081 wh.sst.
										-750 Gy.sh.	-1083 Br.sst.
										-759 Gy.sy.sh.	-1135 Sst.
										-767 Wh.sst.	-1163 Cs.wh.sst.
										-769 Rk.	-1199 Wh.sst.
										-771 sst.	-1212 Sst.
										-772 Rk.	
13968	142°51E	746	W.WELK		475	Surface	56,400			0-14 Y.cl.& S.	-370 Gy.sh.
-	20°21's		1959							-28 Y.cl.	-425 Br.sh.
OXFORD										-78 Y.cl.& s.	-545 Sst.
DOWNS										-241 Gy.sh.	-602 P.cl.& S.
										-246 Sst.	
13985	143°18'E		K.SHELLEY		100	Soak	35,000	B		0-10 Bk.sh.	-310 Gy.sh.
Thum's Creek	20°38'S		1959		561	Surface		F		-15 Y.cl	-312 Rk.
TORONTO PARK					604			F		-20 Y.s.& cl	-367 Gy.sh.
										-48 Y.cl.	-368 Rk.
										-100 Gy.sh.	-429 Gy.sh.
										-109 Srk.	-556 Gy.sh. rk.bnds
										-241 Gy.sh.	-561 Sy.sh.
										-242 Rk.	-579 Water sst.
										-277 Gy.sh.	-620 Sst.
										-288 Gn.sst.	-630 Sy.sh.
14004	143°24'E									T.D. 400'	
Savage's	20° 9'S										
COALBROOK											

A	B	C	D	E	F	G	H	I	J	K
14005 Brady's COALBROOK	143°21'E 20° 2'S									T.D. 300'
14006 No.4 COALBROOK	143°24'E 20° 6'S									T.D. 200'
14007 No.2 COALBROOK	143°30'E 20° 9'S									T.D. 250'
14008 No.3 COALBROOK	143°26'E 20° 8'S									T.D.200'
14009 No.1 COALBROOK	143°33'E 20°10'S									T.D. 300'
14010 Hughenden COALBROOK	143°24'E 20°20'S									T.D. 400'
14012 No.20 BURLEIGH	143°17'E 20° 5'S		W. WELK 1959	below surface	260 to 330	61	1750	F-B		0-85 Y.cl.& s. -120 Sst. -180 P.cl.& S. -195 Br.sh. -286 P.cl. & S. -330 Sst. -341 P.cl. & S.

A	B	C	D	E	F	G	H	I	J	K	
14053	143°26'E	850	K.SHELLEY		75	50		P		0-4 Bk.soil	-236 Rk.
Sherwood	20°29'S		1959		273			P		-30 Y.cl	-262 Gy.sh.
SHERWOOD					433	30		P		-39 Y.sy.cl.	-273 Sst.
DOWNS					530	Surface	6,000	P		-49 Y.sy.cl.w.gvl. st.	-285 Water sst
					612	"	30,000	P			-333 Wh.sst.
					684	"	180,000	P		-53 Gy.sh.	-343 Sy.cl
										-54 Rk.	-364 Sst.
										-72 Gy.sh.	-383 Sy.cl
										-78 Sst.	-384 Rk.
										-96 Gy.sh.	-395 Sst.
										-102 Gy.sy.sh.	-408 Sy.cl
										-103 Rk.	-409 Rk.
										-106 Gy.sh.	-433 Sst.
										-108 Rk.	-457 Water sst.
										-112 Gy.sh.	-500 Wh.sst.
										-115 Sst.	-501 Rk.
										-120 Gy.sh.	-513 Wh.sst.
										-121 Rk.	-529 Br.sst.
										-129 Gy.sh.	-530 Rk.
										-130 Rk.	-549 Water sst.
										-150 Gy.sh.	-605 Wh.sst.
										-158 Sst	-612 Br.cl.
										-182 Gy.sh.	-636 Water sst.
										-192 Sst	-680 Wh.sst.
										-197 Gy.sh.	-684 Br.sst.
										-198 Rk.	-780 Water sst.
										-212 Gy.sh.	
										-235 Gy.sh.& water.	
14054	143°27'E		K.SHELLEY	20	46			F		0-5 Soil	-76 Gy.sh.w.water
Fred's	20°28'S		1959	32	73			F		-23 Y.cl.	-97 Gy.sh.
SHERWOOD					97	17	44,000	F		-43 Gy.sh.	-98 Gy.sy.sh.w. water
DOWNS										-46 Gy.sh.w.water	
										-73 Gy.sh.	-100 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K
14056 - MALVERN PARK	143° 2'E 20°42'E		SHELLEY 1959		185 842) 866)		12,000	S		0-2 Soil -66 Y.cl. -82 Gy.sh. -84 Sst. -172 Gy.sh. -185 Br.sh. -197 Br.sh.&flaky rk. -318 Br.sh. -338 Gy.sh. -339 Rk. -442 Gy.sh. -443 Rk -457 Gy.sy.sh. -554 Gy.sh. -566 Gn.sy.sh. -598 Gy.sh. -600 Rk. -622 Gy.sh. -623 Rk. -646 Gy.sh -647 Rk. -816 Gy.sh. -826 Gy.sy.sh -842 sst. -846 Rk. -866 Sst.
14058 House PIALAH	142°47'E 20° 4'S			33 40			53,000	F		T.D. 401!
14098 - COALBROOK	No trace		Robinson & Oliver 1959							0-17 Su dry S. -24 Rd.cl -40 Coloured cl -74 Qtz & Ironst. -234 Gy.cong. -239 Rd.gr.& qtz -240 Rd.gvl. -280 Rd.gr.
14099 No.6 COALBROOK	143°22'E 20° 7'S		Robinson & Oliver 1960		163	158	17,280			0-3 Rd.soil -14 Hd br.sst. -23 Br.cl -40 Y.cl -41 Rd.cl. -92 Y.cl. -163 Gy.cl. -320 Wh.s.
14108 - COALBROOK	143°25'E 20°17'S		1960		166	164	7,200			0-1 Rd.soil -8 Rk. -21 Y.cl. -35 Pk.cl. -87 Y.cl -90 Wh.cl -108 Y.cl. -131 Br.cl. -172 Gy.cl. -204 Gy.sh. -214 Gy.cl. -216 Wh.sh. -300 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K	
14164 House MALVERN PARK	143° 6'E 20°44'S		SHELLEY 1960		772 809 820 839 847			F		0-2 Bk.soil -33 Y.cl. -36 Y.sst. -62 Y.cl. -88 Gy.Mudst. -103 Gy.sy.Mudst. -162 Gy.Mudst. -242 Br.mudst. -366 Gy.mudst. -367 Rk. -401 Gy.mudst. -416 Gy.sy.mudst. -434 Gy.mudst. -435 Rk -467 Gy.mudst. -474 Gn.sst. -568 Gy mudst. -569 Rk.	-622 Gy.mudst. -623 Rk. -635 Gy.mudst. -636 Rk. -696 Gy.mudst. -697 Gy.rk. -754 Gy.Mudst. -762 Gy.sy.mudst. -766 Sst. -792 Hd.sst. -809 Water sst -811 Hd.sst. -820 sst. -822 Hd.sst. -839 Sst. -844 Wh.sst. -847 Sst. -851 Wh.sst.
14172 No.26 SAXBY DOWNS	142°35'E 20° 2'S		W.WELK 1960	flowing	420 525) 625) 760)	Soak Surface	640,000	F		0-10 Cl.&gvl -15 Sst -60 Y.cl. -85 Br.cl -163 Br.sh. -525 Gy.sh.	-550 Rk. -625 Gy.sh -645 Sst. -760 P.cl. & S. -765 Sst. -770 P.cl.&S,
14214 Spinifex GILGUNYAH	143°37'E 20°25'S		M.J. ROBINSON 1960	48 52	72 225	48	26,400	B		0-48 Br.sy.soil -112 Qtz.s. -116 Gy.sy.cl	-190 Qtzs. -196 Gy.sy.cl. -250 Qtz.s.
14215 No.4 GILGUNYAH	143°40'E 20°25'E		M.J. ROBINSON 1960	75 100	98	75	18,000	P		0-5 Rd.su.soil -16 Y.sy.cl. -55 Coloured cls -72 Hd.gy.sh.	-98 Gy.cl. -99 S.& pebbles -104 Gy.cl. -105 Rk -200 Gy.sh.
14240 Robinson RAINSCOURT	143°33'E 20°28'S		ROBINSON & OLIVER 1960	- 86	85	82	18,720	G		0-3 Bk.soil -84 Y.cl. -85 Cs.rd.s.	-137 Sy.cl. -200 gy.sh.

A	B	C	D	E	F	G	H	I	J	K
14266 - CLOVERLY	143°9'E 20°43'S		1960		757	Surface		P		0-37 Sy.cl. -40 Sy.gvl. -43 S. -69 Y.cl -98 Gy.mudst. -172 Br.mudst. -334 Gy.mudst. -350 Gn.sy.mudst. -373 Gy.mudst. -374 Rk. -398 Gy.mudst. -399 Rk. -453 Gy.mudst. -463 Gn.sy.mudst. -636 Gy.mudst. -640 Sy.mudst. -709 Gy.sy.mudst. -745 Gy.mudst. -757 Gy.sy.mudst. -764 sst.
14487 House KILLARNEY	143°42'E 20°58'S		H.BODE 1961		938-940 995-1015 1085-1088 1319-1325 1400-1415	Surface	637,000	F		0-4 su.soil -40 Y.s.rk. -41 Rk -60 Bl.cl. -65 Rk. -72 Bl.cl. -74 Rk. -85 Gn.sh. -90 Rk. -120 Gn.sh. -320 Gy.sh. -342 Dk.oily gy.sh -770 Gy.sh.water bds -913 Gritty gy.sh -915 Gn.rk. -938 Gy.sh. -940 Sst -945 F.hd.sst. -966 Gy.marl -972 Sy.gy.sh. -995 Sy.p.cl. -1088 Sst. -1098 F.hd.rk -1156 Siy.cl. -1170 Stky cl. -1187 Gy.marl -1208 Sy.cl. -1221 Sticky marl -1235 Marl w sst. sms. -1265 Cl.w marl sms -1300 Gy.marl -1319 Cl.w marl sms -1440 Sst. -1448 Cong. -1486 Sst.

A	B	C	D	E	F	G	H	I	J	K
14686 Shelley's RAINSCOURT	143°28'E 20°36'S		ROBINSON SHELLEY & MANNION 1961		239 274 503) 608) 806)	126 80 Surface	 250,000	 P		0-2 Bk.soil -56 Y.cl. -57 Gy.sh. -83 Y.cl -106 Gy.cl -239 Gy.sh. -240 Bl.sst. -274 Gy.sh. -275 Qtz s. -294 Gy.sh. - 295 Gy.rk. -352 Gy.mdst. -353 Rk. -395 Gy.mdst. -396 Gn.sst. -486 Gy.mdst. -501 Sy.mdst. -513 Sst -579 Wh.sst. -580 Rk. -599 Br.cl. -608 Wh.sy.cl. -618 Water rk. -650 Wh.mdy sst. -678 Wh.sst. -682 Cs.wh.sst. -771 Wh.sst. -781 Br.sy.cl -806 Wh.sst. -833 Sst.
14959 Victor's SHERWOOD DOWNS	143°22'E 20°30'S		K.SHELLEY 1961	6 45	36 133 199	 18 6	 44,000			0-4 Bk.soil -8 Y.cl. -14 Sst. -18 Cl. -36 Gy.mdst. -39 Sy.mdst.& water -90 Sy.mdst. -91 Rk. -110 Gy.mdst. -111 rk. -139 Sy.mudst. -154 Gy.mudst. -156 Rk -174 Gy.mdst. -199 Gy.sy.mdst. -213 Mdy.sst. -214 Rk. -253 Gy.sy.mdst. -257 Mdy.sst.
15176 Boundary KENMAC	143°12'E 20°30'S		K.SHELLEY 1962		289 368) 442)	6 Surface	 86,000 450,000	 G		0-4 Soil -14 Y.sst. -59 Y.cl -289 Gy.mdst. -296 Mdy.sst. -354 Gy.mdst. -362 Sy.mdst. -368 Mdy.sst. -402 Sst. -440 Gy.sst. -442 Rk. -450 Sst.

A	B	C	D	E	F	G	H	I	J	K	
15243 – CAMMERAY DOWNS	142°31'E 20°24'S		R.BEAUCHAMP 1962		772 864) 916) 972) 981)	20 Surface	 20,000 30,000 300,000 450,000			0-4 Br.soil -22 Br.cl. -94 Y.cl. -108 Bl.s & sh. -572 Bk.sh. -620 Gy.sh.	-768 Bl.sh. -780 Bl.sh.& gy.s. -804 Gy.cl.& s. -816 Wh.cl. -864 Wh.cl.&s. -981 Wh.sst.
15285 House TOWRI	143°14'E 20°23'S		K.SHELLEY 1962		58 229) 285) 486) 526) 568) 637)	30 Surface	102,000	P		0-1 Bk.soil -58 Gy.mdst. -82 Sy.mdst. -132 Gy mdst. -136 Rk -185 Gy.mdst. -191 Sy.mdst. -223 Gy.mdst. -229 Sy.mdst. -295 Sst. -468 Mdy.sst.	-472 Rk -486 Mdy.sst. -524 Sst -526 Rk. -565 Sst -568 Rk. -592 Sst. -637 Mdy.sst. -649 Sst. -652 Sy.mdst.
15288 – MOLESWORTH	Not Located.		K.SHELLEY 1962		44	44	5760			0-44 Gy.sy.cl -51 Sy.gvl & water -60 Y.sy.cl.	
15361 – WALKERS PARK	Not Located		MANNION 1962		90	32	57,992	P		0-14 Sy.cl. -26 S -50 Sy.cl.	-85 Drift S. -90 Cs.sst. -108 Gy.sst.
15362 – BOREMBA	Not Located		M.MANNION 1962		602	Surface	100,000	P		0-4 Soil -10 Sst -55 Y.cl. -126 Gy.mdst. -154 Br.mdst. -210 Gy.mdst.	-320 Gy.mdst.rk.sms -560 Gy.mdst. -565 Sst. -595 Gy.mdst. -602 Sy.mdst. -625 Sst.
15375 – MOLESWORTH	Not Located		K.SHELLEY 1962							0-60 Y.sy.sh.	

A	B	C	D	E	F	G	H	I	J	K
15381 Muddan RICHMOND SHIRE	143°16'E 20°37'S		H.BODE 1962		612) 748)	Surface	84,359	G		0-3 Soil -36 Y.sh -75 Dk.sh. -590 Gy.sh. -612 Sy.sh. -629 Cs.sst. -633 Marl -638 Sy.cl. -700 Sst.cl in layer -735 Sy.cl -739 Br.cl. -748 Sy.cl. -770 Sst. -773 F.sst.
15387 - [illegible]	143°15'E 20°22'S		K.SHELLEY 1962		36 72	26	58,752	G		0-2 Soil -14 Y.sy.cl. -36 Sy.mdst. -60 Gy.mdst. -64 Sy.mdst. -72 Gy.mdst. -74 Sy.mdst. -79 Gn.sst. -105 Gy.mdst.
U/R. Dud DALKEITH							NIL			T.D. 300'approx. Struck cave.
U/R. Dud DALKEITH				38 -						T.D. 300' approx. Tools lost in hole.
U/R. Scrubby Bore RONALD PLAINS				180 200				F		About 500'
U/R. Back Athlone ATHLONE			About 1920	160 180				P		T.D. 750'
U/R. House Well DUNRAVEN	143°57'E 20°28'S		1959					B		0-40' Dirt -74 Hd.bl oil sh.
U/R Scrubby BOREMBA										

PART II

M A N U K A

B O R E

L O G S

A	B	C	D	E	F	G	H	I	J	K
1 - MOONBY DOWNS	Not located.									T.D. 482'
60 - GLENLYON	E142°53' S21° 17'	700	1918		155 1944) 1966) 1979) 2033) 2106) 2266) 2276) 2431) 2476) 2500) 2543) 2905) 2950)	Soak Surface	42774 85548 410853 491951 505980 (1918)	P	140	0 - 3 Subsoil - 33 Y.cl. - 405 Bl.sh. - 614 Gy.sh. - 705 Dk.bl.oily sh. - 730 Br.sh. - 1011 Lt.br.sh. - 1068 Gy.sh. - 1268 Gy.sy.sh. - 1324 Gy.sh. - 1424 Br.sh. - 1944 Gy.sh. - 2055 Sst. - 2060 P.cl. - 2096 Gy.sh. - 2220 Sst. - 2236 V.f.wh.sst. - 2265 P.cl. - 2543 Sst. - 2643 Sst.w.small sh.bnds. - 2704 Gy.& rd. marl. - 2734 Y.cl. - 2757 Gy.sh. - 2765 Rd.marl. - 2777 Y.cl. - 2822 Sst. - 2853 Y.cl.w.bnds of marl. - 2875 Rd.marl. - 2905 Sst. - 2926 P.cl. - 2950 F.wh.sst. - 3000 S.& p.cl.
92 - LONSDALE	E142°50' S 21°5'		1915		1515) 1765) 1820) 1980) 2020) 2040) 2073) 2085) 2123)	Surface	264991 (1961)	P	130	0 - 3 Subsoil - 75 Y.cl. - 200 Bl.sh. - 202 Hd.Sk. - 910 Bl.sh. - 1035 Bk.sh. - 1430 Bl.sh. - 1460 Gn.s.rk. - 1490 Dk.bl.sh. - 1519 Sst. - 1756 Gy.sh. - 1761 Hd.sk. - 2230 S.rk. - 2245 Choc.sh. - 2264 Sst.w.hd.sk. - 2280 Sy.sh. - 2321 S.rk. - 2350 Y.cl.& s. - 2362 S.& gy.rk. - 2417 S.rk.w.cl.bnds. - 2430 F.s.rk. - 2444 F.s.rk.& p.cl. - 2465 Hd.s.rk. - 2504 F.s.rk.

A	B	C	D	E	F	G	H	I	J	K
123 Trust Bore STAMFORD DOWNS	E143°54' S21°17'	966	1918		1400	152		F		0 - 1 soil - 50 Y.cl. - 51 Hd.sst. - 60 Br.sh. - 61 Hd.sst. - 82 Bl.sh. - 95 Sst.& sh. - 110 Bl.sh. - 174 Sy.Bl.gy.sh. w.hd.sks. - 228 Gradually merging into bl.sh. - 260 Dk.bl.sh. - 261 Hd.sk. - 304 Lt.col.sh. - 410 Dk.oily sh. - 414 Sst. - 528 Lt.gy.sh. - 650 Lt.gyish.sh. w.hd.sks. - 672 Gy.gn.sh. - 837 Gy.sh. - 964 Br.sh. - 1180 Bl.sh. - 1184 Gnish gritty sh. - 1215 Gy.bl.sh. - 1262 Gy.bl.sh.w sks of gn.s. - 1329 v.dk.sh. - 1344 Dk.sh. - 1357 Gn.sh.& s. - 1399 Dk.gy.sh. - 1421 S.rk. - 1425 p.cl.& s. - 1466 S.rk. - 1650 Sst.& p.cl. - 1662 Sst. - 1678 p.cl. - 1682 Gy.& br.sh. - 1711 S.rk. - 1736 Bl.gy.sh. - 1739 Strata v.stky. - 1766 Cl. - 1807 Gy.sh. - 1819 Sst. - 1918 Sst.& sh. - 1942 Sy.sh. - 1960 Sst. - 1970 Sy.cl. - 2017 Sst. - 2021 V.hd.bnd. - 2041 Bl.sh. - 2081 Sst. - 2090 Br.sh.& rd.marl. - 2103 Gy.sh. - 2185 Sst.& cl. - 2200 Rd.marl.
125 Stacks CONAMORE	E143°21' S21°33'		1885		120) 217) 317)	Soak	-	-		0 - 317 Cl.bl.sh.w.hd.bnds. - 895 Bl.sh.bnds of rk.& cl. - 927 Flinty bnds rk.& gy.sh. - 947 Strong sh.slatey sst. - 971 Gy.sh.flinty bands rk. - 986 Strong gy.sh.slaty sst.

A	B	C	D	E	F	G	H	I	J	K
126 - WIRILLA	E142°58' S 21°44'	749	1916		185 586) 2614) 2774) 3256) 3508)	 Surface	 7000 40000 60000 613500 480854	S P		0 - 12 Flagstone - 32 Y.cl. - 36 Rk. - 49 Y.cl. - 54 Br.rk. - 135 Bl.sh. - 251 Bl.& br.sh. - 316 Gy.sy.sh. - 324 Hd.rk. - 586 Bl.sh.sy.sh.& hd.rk. - 596 Hd.rk. - 681 Gn.sy.sh. - 793 Gy.& bl.sh. - 1120 Bl.sh. - 1322 Bk.sh. - 1342 Gy.sh. - 1614 Bk.sh. - 1651 Bl.sh. - 1666 Br.sh. - 1742 Bl.sh. - 1759 Hd.bk.sh. - 1836 Bk.sh. - 1935 Br.sh. - 2142 Bl.sh. - 2174 Gy.sh. - 2195 Gn.sy.sh. - 2279 Bl.sh. - 2295 Gn.sy.sh. - 2305 Wh.sy.sh. - 2456 Bl.sy.sh. - 2464 S.rk. - 2482 Sy.gn.sh. - 2500 S.rk. - 2536 Sy.cl. - 2594 P.cl. - 2774 S.rk. - 2934 P.cl. - 3069 S.rk. - 3256 P.cl. - 3345 S.rk. - 3467 S.& br.sh. - 3508 Hd.s.rk.
411 - OLIO RLY STN	E143°12' S21°54'		Wemyss 1918	168 250 (1918)	168 360) 440)	168	13000 (1918)	F		0 - 504 Sh.& Sst.
1039 Knob MOONEY DOWNS.	E143°52' S21° 7'	L938	1895	50 -	1215) 1840) (app.)	flow 21' head.	184400 (1895)	F	114.1° (1895)	0 -1146 no info. - 1350(approx.) Sst. - 1560 no info. - 1880 Sst.
1044 - WILLFRED DOWNS	E143°57' S21° 2'	911								T.D. 1345'.

A	B	C	D	E	F	G	H	I	J	K
1046 - LIMBRI DOWNS	E143°57' S21°10'		1913	50 120				F		T.D. 1185'
1047 - MOONBY DOWNS	E143°56' S21° 6'	935	1906	surface			100000+	F		T.D. 1572'.
1051 Como DUNLUCE	E143°49' S21° 7'	894	1907		1185 1550 1852 2245 2745	20 surface	20000	F		0 - 40 Y.sh. - 610 Gy.sh. - 719 Bk.sh. - 1185 Gy.sh. - 1190 S.rk. - 1380 S.& cl. - 1550 Choc.sh. - 1852 S.rk. - 1860 Y.sh. - 2000 Rd.sh. - 2012 Y.sh. - 2168 Rd.sh. - 2224 S.& p.cl. - 2748 S.rk. - 2851 Hd.gy.s.cl. & rd.sh.
1052 Warianna DUNLUCE	E143°29' S21° 1'	852	1914		900 1325 1465	surface	775000 (1914)	F		0 - 43 Y.cl. - 350 Gy.sh. - 460 Bk.sh. - 900 Gy.sh. - 1025 S.rk.w.sh.sks. - 1129 P.cl.w.s.rk.sks. - 1323 Choc.sh. - 1433 S.rk. - 1446 Bk.sh. - 1466 S.rk. - 1494 Bk.sh. - 1511 S.rk. - 1526 Bk.sh. - 1607 S.rk.& Bk.sh. - 1619 P.cl. - 1655 Bl.sh.& p.cl.
1053 - ALBION DOWNS	E142°41' S21°30'	644	1899			surface	500000 (1960)	F		Gas in water. T.D. 3033'.

A	B	C	D	E	F	G	H	I	J	K
1084 - WETHERBY	E142°54' S21°29'	705	1909							T.D. 2600'
1085 House WETHERBY	E142°52' S21°30'	723	1917		156 2360 3027	130 130 surface (1917)	 359060	 F	157	0 - 100 Y.sh. - 156 Bl.sh.& rk. - 166 Sst. - 220 Bl.sh.& rk. - 226 Y.hd.rk. - 441 Bl.sh.& hd.sk. - 445 Hd.bl.rk. - 1150 Bl.sh.& hd.sks. - 1500 Bl.sh. - 2225 Gy.sh. - 2360 Gy.sh.& s. - 3148 S.rk.& p.cl. - 3150 Rd.marl.
1321 - ASCOT	E142°30' S21°44'	751	1899							T.D. 3721'. Reported gas in flow.
1322 - WYBENIA	E142°36' S21°49'	756	1900		463) 828) 3246) 3529) 3889)	Soak Surface		F		0 - 77 Cl. - 250 Hd.rk. - 340 Sh. - 463 Hd.rk. - 568 Sy.sh. - 697 Sh. - 828 Sst.& sh. - 1587 Sh. - 1632 Hd.sk. - 2696 Cvg.Sh. - 2765 Cvg.stky.sh. - 2808 Sh. - 2830 Rtn.sh. - 2903 Sh. - 3158 Hd.sh. - 3983 Hd.& soft sst.
1328 - WONGAN	E142°35' S21°44'		1919							T.D. 520'.

A	B	C	D	E	F	G	H	I	J	K
1365 - WOOLFIELD	E143°42' S21°42'									T.D. 520'
1486 - CASSILIS	E143° 1' S21°17'									
1961 - CASSILIS	E143°10' S21°17'	807	Knoz & England 1895.		2325	Surface	765000 (1895)			Bottom in S.rk. 2325'.

A	B	C	D	E	F	G	H.	I	J	K
1962 House CASSILIS	E143° S21°15'	775	1898							T.D. 2700'.
1963 - EXMOOR	E143°13' S21°12'	880	1899							T.D. 2550'.
1964 Coleraine Ck. STIRLING	E143°10' S21°12'	787								T.D. 1642'
1965 - CASSILIS	E143° 3' S21°17'					40				T.D. 2000'.
1966 House STIRLING	E143° 6' S21°12'		1923				1320000 (1962)	P		T.D. 1690'
1967 House GLENLYON	E142°55' S21°20'	763	1901	Flowing	2065) 2610) 2810) 2967)	Surface		P		0 - 1500 Sh. - 2065 Bk.oily sh. - 2610 Sst.w.sks.of p.cl. - 2810 Sst. - 2967 No strata.

A	B	C	D	E	F	G	H	I	J	K
1968 - GLENLYON	E142°54' S21°22'	L724	1919		212 2080) 2650) 2684) 2763)	120 Surface	 405000 (1919)	B F		0 - 2 Bk.soil - 80 Y.cl. - 136 Br.sh. - 291 Sy.sh. - 355 Br.sh. - 455 Gy.sh. - 970 Br.sh. - 1057 Lt.sh. - 1392 Gy.sh. - 1615 Br.sh. - 2015 Dk.sh. - 2171 Sst. - 2259 Br.sh. - 2270 Sst. - 2345 P.cl. - 2440 Gy.sh. - 2570 Br.sh. - 2875 Sst. - 2891 Gy.sh. - 2902 Rd.marl.
1969 - [illegible]	E143° S21°20'	742	1918							T.D. 2100'.
1970 House HANWORTH	E143° S21°15'	735	1924		240 2083 2645 2672			S)) P)	 131	0 - 2 Soil - 58 Cl. - 86 Sh.& rk. - 487 Sh. - 491 Rk. - 2083 Sh. - 2097 S. - 2510 Sh. - 2621 P.cl. - 2702 S.rk.
2925 - ROBYN DOWNS	E142°32' S21°34'	709	1895		450 2524) 2700) 3100)	Soak Surface		 F		0 - 100 Cl. - 450 Sh.w.wh.sks.sst. - 550 Sh.& S.rk. - 1100 Sh. - 1350 Sh.& sks.of sst. - 1415 Sh.& Bk.s. - 1710 Sh. - 1731 Sh.mud. - 2382 Bl.sh. - 2412 Bk.sy.sh. - 3301 No info.

A	B	C	D	E	F	G	H	I	J	K	
2927	E142°32'	672	1914		180	Soak		S		0 - 20 Hd.s.rk.g.cl.	- 2365 Gy.sh.
-	S21°32'				2386)					- 97 Y.cl.	- 2604 Sst.
JUDITH ROYL					2436)					- 417 Bl.sh.	- 2737 Sst.& p.cl.
					2685)	Surface		F		- 596 Bk.& br.sh.	- 2841 Gy.sst.
					2720)					- 786 Br.sh.	- 2891 Sst.p.cl.
					2816)					- 946 Bl.sh.	- 2971 S.rk.
					2936)					- 1017 Gy.sh.	- 3032 Sst.
					2971)					- 1089 Bl.sh.	- 3105 Sh.
					3011)					- 1101 Gy.sh.	- 3144 Rd.marl.
					3290)					- 1204 Bl.sh.	- 3182 P.cl.
					3395)					- 1740 Gy.sh.	- 3253 Rd.marl.
					3430)					- 1813 Br.sh.	- 3373 Rd.marl & s.rk.
										- 1848 Gy.sh.	- 3556 S.rk.
										- 1858 Br.sh.	
2930	E142°40'	762								T.D. 3745'.	
-	S21°38'										
CLIO											
2931	E142°38'									0 - 7 Bl.rk.	- 1434 Gy.sh.
-	S21°38'	765	1918	Flowing	233	Soak				- 42 Y.sh.	- 1702 Bl.sh.
CLIO					630			S		- 52 Rk.	- 1732 Gy.bl.sh.
					850			S		- 70 Y.sh.	- 1789 Bl.sh.
					2740	100	)			- 120 Sst.	- 2079 Bl.sh.
					2960	11	)	F		- 122 Coal	- 2159 Br.sh.
					3110	Su.	)			- 157 Bl.sh.	- 2161 Rk.
					3230	Su.	)			- 180 Sy.gy.sh.	- 2700 Bl.sh.
					3462	Su.				- 230 Bl.sh.	- 2740 S.
										- 255 Bl.rk.	- 2780 S.sh.
										- 292 Sy.br.sh.	- 2900 P.cl.
										- 460 Sy.gy.sh.	- 2952 Lt.br.sh.
										- 604 Br.sh.	- 3100 P.cl.
										- 804 Gy.sh.	- 3160 S.rk.
										- 860 Gy.sh.Gn.sst.	- 3262 Water fm.
										- 930 gy.sh.	- 3325 P.cl.
										- 980 Gy.sh.& s.	- 3380 Lt.br.sh.
										- 1043 Gy.sh.	- 3440 Sy.sh.
										- 1073 Gy.bl.sh.	- 3495 S.rk.
										- 1100 Stky.gy.sh.	- 3506 Cl.
										- 1130 Br.sh.	

A	B	C	D	E	F	G	H	I	J	K
3127 Katandra (1) KATANDRA	E143°48' S21°28'	L971	1896	100 180				F		T.D. 3980'.
3128 Katandra (2) MARANIE	E143°53' S21°21'	L981	1896	70 -						T.D. 3723'.
3129 Abbottsford ABBOTTSFORD	E143°38' S21°13'	938	1897	93 160			10000	F		T.D. 2600'.
3130 - BALLATER	E143°49' S21°11'	934	1907					F		T.D. 3999'.
3131 Jinderoo JINDEROO	E143°58' S21°40'	L871	1910		1793 1956 2265					T.D. 2467'.
3132 Saranac ELTON DOWNS (SARANAC)	E143°44' S21°13'	936	1910							T.D. 1466'.
3133 Katandra(7) KATANDRA	E143°43' S21°27'	988	1912	100 180				F		T.D. 2000'.
3134 House BALLATER	E143°51' S21°37'	988	1912					F		T.D. 2000'.

A	B	C	D	E	F	G	H	I	J	K
3135 Katandra (9) KATANDRA	E143°48' S21°33'	939	1913	100 180				F		T.D. 1956'.
3136 House AIREWORTH	E143°57' S21°28'	909	Ferguson 1914	70 80				F		T.D. 2165'.
3137 Katandra (11) KATANDRA	E143°44' S21°23'	1016	1914	100 180	1548 1690			F		0 - 1548 No info. - 1690 S.rk. - 1744 No info.
3138 Katandra(12) BROADFORD	E143°56' S21°44'	940	1915		1990 2375	50 50		P		T.D. 2512'.
3139 Katandra(13) KATANDRA	E143°53' S21°32'	978	1916	80 120		flow.		F		T.D. 1785'.
3140 - STAMFORDHAM.	E144° S21°26'		1918		1440 - 1445	80				T.D. 1474'.
3141 House CAIRNHOPE	E143°57' S21°48'		1914	150 170						T.D. 2350'.
3142 House ELDORADO	E143°54' S21°15'	1010		30 120				F		T.D. 1892'.

A	B	C	D	E	F	G	H	I	J	K
3143 - ELDORADO	E143°59' S21°15'		1918	10 140	1286	75		F		T.D. 1304'.
3144 House STANLEY DOWNS	E143°59' S21°19'	971	Boyle 1924		1360 1400			F		0 - 1000 Y.sh. - 1390 Slatey bl.sh. - 1417 S.rk.
3145 House MALAKOFF DOWNS	E143°48' S21°12'			100 120				F		T.D. 1503'.
3146 No.1 ELTON DOWNS	E143°43' S21°18'	973	1911					P		0 - 1570 No info. - 1629 Sst. - 1632 S.cl.
3147 No.2 ELTON DOWNS	E143°38' S21°18'		1916		1653					T.D. 1750'.
3148 No.3 ELTON DOWNS	E143°36' S21°23'		1917		1858					0 - 1570 No info. - 1892 S.rk. - 1894 Sh. - 1924 S.rk. - 1934 Sh.
3149 House VELLUM DOWNS	E143°34' S 21°31'		1912	80 120			10000 (est.)	F		T.D. 2670

A	B	C	D	E	F	G	H	I	J	K
3150 - COORABELLE	E143°40' S21°38'	1027	Ferguson & Anning 1915	230 250	230-250 2370 2680	 333 200	soak 2000	B F		0- 2689 No info. - 2691 S.rk. - 3095 No info. - 3100 Bottom in 5' of sst.
3151 - WOOLFIELD	Not located									T.D. 373'.
3152 Boundary WOOLFIELD	E143°43' S21°44'	909	1914				10000	G		T.D. 508'.
3153 - WOOLFIELD	E143°39' S21°45'	929					5000	G		T.D. 500'.
3154 House CRESSY	E143°51' S21°48'	1014	1901	80 (1938) abt.400	1950 2400	 80	small good			T.D. 2960'.
3155 - CRESSY	Not located									T.D. 332'.
3156 - CRESSY	E143°44' S21°53'	934	1914		192 230		13000			0 - 200 No info. - 230 Bl.s. - 258 No info.
3157 - CRESSY	E143°43' S21°56'	948	1914							T.D. 350'.

A	B	C	D	E	F	G	H	I	J	K
3158 - CRESSY	Not located	878								T.D. 400'.
3161 - CRESSY	Not located									T.D. 240'.
3159 - CRESSY	E143°45' S21°51'									T.D. 192'.
3160 - CRESSY	E143°45' S21°54'	959								T.D. 210'
3162 House (No.1) GLENELG	E143°32' S21°35'		J.Ryan 1913	100			3000 (1913) 1000 (1962)	G		T.D. 300'.
3163 No.2. GLENELG	E143°32' S21°36'		R.J.McLean 1917	100	157 225	157	5600 (1923) 600 (1962)	G		T.D. 400'.
3164 No.4. GLENELG	E143°33' S21°37'		R.J.McLean 1915	100			5300 (1915) 500 (1962)	B		T.D. 350'
3165 No.3 Ewes Paddock GLENELG	E143°32' S21°36'		R.J.McLean 1925	80			3100 (1925) 1000 (1962)			T.D. 400'.
3166 - WAIHAORUNGA	E143°34' S21°32'									T.D. 300'. Bl.sh.

A	B	C	D	E	F	G	H	I	J	K
3355 Burnside BURNSIDE	E143°55' S21°52'	L895	I.B.Coy. 1898	52' -	2130 2930 3153 3429 3460	100 60 18 Su. Su.	 -increase	F		0 - 45 Rd.cl. - 258 Bl.sh.w.hd.sks. - 470 Hd.rk. - 612 Bl.sh. (hd.sk. at 585') - 658 Rk.-sh. - 1530 Bl.sh. - 1583 Bk.sh. - 1739 Bl.sh. - 1804 Sy.sh. - 1905 Bl.sh. - 1937 Hd.rk. - 2124 Sh. - 2190 S.rk. - 2209 Sh. - 2247 S.rk. - 2389 P.cl. - 2434 S.rk. - 2638 P.cl. - 2690 Sy.& p.cl. - 2803 P.cl. - 2916 S.rk. - 2967 Hd.rk.& sh. - 3010 Hd.rk. - 3105 Bk.sh. - 3153 S.rk.pk.sh. - 3225 Pk.sh. - 3250 S.rk. - 3297 Rd.sh.& s.rk. - 3511 P.cl.
3375 - HARWOOD	E143°54' S21°57'	921	1913	--- 260				F		T.D. 490'.
3376 - HARWOOD	E143°54' S21°59'			--- 260				F		T.D. 300'.
3549 - CAMBERWARRA	E143°20' S21°42'	701								T.D. 4309'.
3550 House AKUNAM	E143°14' S21°45'	842	1910		2760) 3848)	Surface		P		0 - 45 Y.sh. - 460 Sh. - 2411 Bl.sh. - 2443 Gn.sh. - 2700 Sh. - 3848 Sh.S.& p.cl. - 3874 Siliceous S.

A	B	C	D	E	F	G	H	I	J	K
3551 Old Homestead MANUKA	E143°25' S21°43'	787	I.B.C. 1906		78 190		12000 (1906)	S. -		0 - 16 Sh. - 25 Y.cl. - 70 Hd.sks. - 78 S.rk. - 146 Hd.sks.& lt.cl. - 188 Rk. - 219 Rk.
3552 Sledmere GRIFFO	E143°27' S21°46'	788	I.B.C. 0 -203 (1907) Brown - 385 (1962)		93 163 200		20000 (1907)	S S G		0 - 52 Bl.cl.rk.y.cl. hd.gy.rk. - 104 Gy.cl.s.rk. - 197 Bl.cl.rk. - 203 No info. - 219 Bl.pug - 229 Br.sh. - 241 Bl.pug. - 260 Gy.sh. - 271 Bl.sy.sh. - 306 Gy.sh. - 372 Br.sh. - 385 Gy.slate.
3553 - CAMBERWARRA	E143°18' S21°47'	784	I.B.C. (0 -228) A.Stower (-346) 1907(0-228) 1957(- 346)		98 160 203 305	 108 110	 16000 7900			0 - 34 Y.cl. - 46 Cl-rk.cl. - 76 Bl.sh. - 104 Cl.& hd.rk. - 145 Cl. - 228 Rk.sst.hd.rk.cl. - 285 Gy.sh. - 288 Bk.rk. - 305 Gy.sh. - 310 Gy.sst. - 311 Gy.rk. - 320 Sy.sh. - 346 Gy.sh.
3554 Railway MANUKA	E143°24' S21°41'	810	I.B.C. 1907	60 120	120 162 184	 40	 8000	 B		0 - 76 Cl.y.cl.rk.& bl.cl. - 163 Bl.cl.& rk. - 227 Bl.cl.
3555 - CAMBERWARRA	E143°21' S21°45'	793	1909							T.D. 256'.

A	B	C	D	E	F	G	H	I	J	K
3556 - BEAULY	Not located.	814			148	75				0 - 148 16'Sst. - 173 No info.
3557 - MENTONE	E143°34' S21°39'	910	1909	130 200			11000	B		T.D. 217'.
3558 - IO	E143°27' S21°39'	833	1912							T.D. 300'.
3559 - THE RANCH	E143°24' S21°49'	755	1912	115 200			10000 (est)	S		T.D. 245'.
3560 - MANUKA.	E143°27' S21°43'	810	1912							T.D. 305'.
3561 - MENTONE	E143°36' S21°41'	937	1913							T.D. 327'.
3562 - MANUKA	E143°34' S21°48'	863	1916		120 435 490	120				0 - 435 No info. - 490 Bl.sst. - 497 No info.
3563 - MANUKA	E143°24' S21°43'		1917							T.D. 320'.

A	B	C	D	E	F	G	H	I	J	K
3564 - MANUKA	E143°34' S21°43'		1918	80 220				B		T.D. 405'.
3565 - AKUNAM	E143° 8' S21°45'		1919							T.D. 360'.
3566 - CAMERWARRA	E143°20' S21°48'		1919							T.D. 256'.
3567 - GRIFFO	E143°25' S21°46'		1919							T.D. 225'.
3568 House BEAULY.	E143°31' S21°46'		1919							T.D. 300'.
3569 - MALBOONA	E143°38' S21°52'	L922	1910	160 200						T.D. 4032'.
3570 Salt MALBOONA	E143°38' S21°58'	868	1911	140				S		T.D. 305'. deepened to 450' in 1918.
3575 No.9 MALBOONA	E143°36' S21°54'	868	1911	89 -	140 250					T.D. 280'. deepened to 320'.
3576 No.8 MALBOONA	E143°38' S21°56'		1912							T.D. 435'.

A	B	C	D	E	F	G	H	I	J	K
3577 No.9 MALBOONA	Not located	L864			250					T.D. 273'. Water in drift sand, 250'.
3578 No.10 MALBOONA	Not located	L935								T.D. 400'.
3579 No.11 MALBOONA	Not located									T.D. 350'.

See next page for 3580 and 3581.

A	B	C	D	E	F	G	H	I	J	K
3582 - KNAPDALE	E143°15' S21°53'		1914							T.D. 430'.
3583 - KNAPDALE	E143°15' S21°53'		1914							T.D. 380'.
3585 House ARJUNA	E143°24' S21° 3'	811	1895	20		surface	50000 (1895)	F		T.D. 1497'.
3586 - MUGWEE	E143°35' S21° 8'	900	1899	70 (1906 - 8') (1915 -33') (1923 -64') (1950 -54') (1962 -70')		surface	630000			T.D. 2340'.
3592 - MYUNA	E143°15' S21° 5'	854	1898							T.D. 1898'.

A	B	C	D	E	F	G	H	I	J	K
3580 - WEEBA	E143°22' S21°53'	743	1915							T.D. 400'
3581 - WEEBA	E143°27' S21°54'	771	1915							T.D. 350'

A	B	C	D	E	F	G	H	I	J	K
3593 - ILLALONG	E143°32' S21° 1'	882	1918	60 80			750000 (1918) 110000 (1962)	P		T.D. 2029'.
3597 - MUGWEE	E143°32' S21° 6'	927	1910	50 (1915) 80 (1923) 90 (1941) 100 (1962) --	1380					0-1380' No info. - 1500' S.rk. - 1800 No info. - 2000 S.rk. - 2242 R.cl.& sh.
3600 House TERRANBURBY	E143°28' S21° 5'	856	1914	36 39	1350 1790 1920 1980	surface (ceased) (flowing) (1915)	140000	F		0 - 3 Soil - 60 Y.sh. - 760 Bl.sh. - 1000 Br.sh. - 1160 Bl.sh. - 1340 Br.sh. - 1350 Bl.sh. - 1440 S.rk. - 1490 P.cl. - 1677 Pcl.w.s. - 1780 Choc.sh. - 2085 S.rk. - 2105 Rd.marl.
3604 - OPHIR	E143°28' S21° 2'		1916		1260 1682 1760 1850	 surface	 Just flows	 F		0 - 45 Y.sh. - 480 Bl.sh. - 640 Gy.sh. - 780 Bk.sh. - 1260 Bl.sh. - 1330 S.rk. - 1390 P.cl.w.s. - 1620 Choc.sh. - 1650 P.cl.w.s. - 1930 S.rk. - 1976 Marl.
3602 - ILLALONG	E143°34' S21° 5'	863	1919	17 -	1265 1740 1860 1920	14 surface surface surface	 60,000 60,000 30,000 Total flow 150,000	F F P		0 - 80 Y.sh. - 200 Bl.sh. - 500 Gy.sh. - 700 Bk.sh. - 1256 Bl.sh. - 1365 S.rk. - 1450 P.cl.& s. - 1670 Choc.cl. - 1702 P.cl.& s. - 1970 S.rk. - 2040 P.cl.& s. - 2046 Rd.marl.

A	B	C	D	E	F	G	H	I	J	K
3608 O'Connell Creek ARJUNA	E143°21' S21° 4'		1925		1416 1440 1900 1930 2000 2066 2390		))100000 175000 300000 309670 (1925)	F		0 - 60 Y.cl. - 80 Lt.coloured sh. - 272 Gy.sh. - 274 Hd.sk. - 285 Gy.sh. - 347 Sy.sh. - 350 Hd.sm. - 380 Sh. - 383 Hd.sm. - 490 Gy.sh. - 528 Bk.sh. - 640 Sms.of sst.&sh. - 644 Hd.gn.sst. - 715 Sms.of sst.&sh. - 920 Bk.sh. - 998 Hd.sms &gn.sst. - 1131 Bk.sh. - 1140 Gn.sst. - 1200 Bk.sh. - 1249 Sms.of sh.& gn. sst. - 1416 Bk.sh. - 1420 Sst. - 1436 Br.cl. - 1446 Sst. - 1461 Sy.cl. - 1516 Sst. - 1539 Wh.cl. - 1561 Sms.of wh.& bl.cl. - 1581 Sy.cl. - 1590 Wh.cl. - 1600 Sy.cl. - 1601 Cs.gvl. - 1606 Sy.cl. - 1740 Sst. - 1774 Br.sh. - 1836 Sy.cl. - 1844 Hd.rk. - 1876 Sky.cl. - 1901 Sst. - 1922 Sst.& cl. - 2034 Sst. - 2046 Choc.cl. - 2072 Sst. - 2075 Hd.rk. - 2090 Sst.
3615 - MYUNA	E143°15' S21° 2'	830	1909		1360 2060) 2270) 2500)	surface		F		2050' Second Sst terminated in hd.rk at 2880'.
3609 - CLARE VALLEY	E143° 9' S21°	723	1898		900	surface	2,000,000			Bottom in sst. Large qty. of inflammable gas in flow. T.D. 1900'.

A	B	C	D	E	F	G	H	I	J	K	
3616	E143°13°	820	1912		1410)					0- 60 Su.cl.	- 2150 Hd.bnd.of coal.
House	S21° 3'				2150)	surface				- 965 Hd.bl.sh.w.	- 2310 Cs.s.& water.
MYUNA.					2317)					bnds of rk.	- 2472 S.rk.
					2512)					- 1410 Hd.cvg.sh.w.	- 2474 Hd.pk.rk.
					2601)					bnds of rk.	- 2510 Sy.p.cl.
					2684)					- 1500 Sst.	- 2720 S.rk.& water.
										- 2100 Wh.p.cl.hd.&	- 3000 S.rk.
										soft w.sks.of s.	
3619	E143°12'		1925		1330	10				0 - 5 Bk.soil	- 1758 S.& cement.
-	S21°				1800	surface	flow			- 85 Y.cl.	- 1803 Pk.sh.
GLENALVON					1900	"	flow inc.			- 700 Gy.sh.	- 1823 S.rk.
					2110	"	" "			- 725 Br.sh.	- 2043 S.& cement.
					2290	"	" "			- 1017 Gy.sh.	- 2053 Coal & sh.
					2340	"	200000(1925)			- 1117 Br.sh.	- 2148 S.& cement.
							52000(1957)			- 1333 Gy.sh.	- 2158 R.sh.
										- 1435 S.rk.	- 2203 R.wh.bk.y.& bl.sh.
										- 1494 P.cl.	- 2527 S.& cement.
										- 1588 P.cl.& s.	
3620	E143°12'	890	1926		1501)					0 - 4 Surface soil	- 1700 Br.cl.
-	S21° 7'				2050)	surface	100000	F		- 49 Y.sh.	- 1710 Gy.cl.
MYUNA					2365)		(1926)			- 50 Hd.gy.rk.	- 1780 Sy.cl.
					2790)					- 54 Y.sh.	- 1802 Br.cl.
										- 74 Dk.sh.	- 1914 Sy.cl.
										- 88 Bl.sh.	- 2080 Sst.
										- 100 Hd.bl.sh.	- 2128 Sy.cl.
										- 150 Lt.sh.	- 2244 Hd.crystallized sst.
										- 161 Hd.bl.rk.	- 2274 Br.coal.
										- 184 Lt.sh.hd.gy.sh.	- 2278 Hd.sst.
										- 186 Hd.& lt.sh.	- 2343 Hd.sst.
										- 627 Lt.sh.	- 2344 Soft sst.
										- 630 Hd.sh.	- 2419 Cl.rk.
										- 1046 Dk.sh.	- 2466 Sst.
										- 1203 Gy.rk.	- 2501 V.hd.sst.
										- 1506 Lt.sh.	- 2674 Sst.
										- 1528 Sst.	- 2710 V.hd.sst.
										- 1550 P.cl.& sst.	- 2714 Sst.
										- 1560 Sst.	- 2738 Sms.cl.& soft rk.
										- 1562 P.cl.	- 2748 crystallized sst.
										- 1582 Br.p.cl.	- 2756 Qtz.rk.
										- 1612 P.cl.& s.	- 2816 Sst.
										- 1632 Sy.cl.	- 2830 Hd.rk.
										- 1680 Gy.cl.	- 2836 Sst.

A	B	C	D	E	F	G	H	I	J	K
3621 - ESSEX DOWNS	E143° 2' S21° 7'	727	1911	Flowing						T.D. 2459'.
3622 - ESSEX DOWNS	E143° 7' S21° 5'	751	1898							T.D. 2750'.
3624 Bellvue ARJUNA	E143°21' S21° 7'	870	Murtagh & Piree 1915	56'	1375 1440	750 63		F		0 - 70 Y.cl. - 1000 Bl.sh. - 1175 Bk.sh. - 1180 Bl.s.rk. - 1375 Bl.sh. - 1378 P.cl. - 1382 Bl.s.rk. - 1440 Bk.sh. - 1500 S.rk.
3660 - CLAREBOROUGH	E142°48' S21° 4'	654	1892	Flowing	1500	Su.	Main 100000 (1960)	P		T.D. 1590'.
3664 Delta BALCOMO	E142°41' S21° 4'	622	1901	Flowing						T.D. 2039'.
3667 House WOOLSTON	E142°42' S21° 7'	650	1899	Flowing	Approx. 1950	Su.	Main	P		T.D. 2000'.
3670 House COLERAINE	E142°51' S21°11'	723	Original not known Re-drilled by L.Perry & P.Mann 1958.	15 38 (1962)	1498 1506 1812 1822 2295 to 2450		Main	P		Originally T.D. approx. 2250'. 0 - 80 or 90 Y.sh. - 1506 Gy.sh.w.w hd.layers. - 1822 Bk.sy.cl.v.greasy Two small explosions. - 2295 Br.sh. - 2450 Sst. - 2458 Rd.marl.
3659 MERRIULA	E142°46' S21°	605	1892							T.D. 1474'

A	B	C	D	E	F	G	H	I	J	K
4066 - NOTTINGHAM DOWNS	E143°30' S21°19'	958	1912							T.D. 1850'
4067 - NOTTINGHAM DOWNS	E143°33' S21°18'	991	1915							T.D. 1880'.
4068 Wyoming WYOMING	E143°31' S21°12'	907		- 200				F		T.D. 1000'
4069 Nottingham No.4 WEANBAH	E143°26' S21°11'	862	— 1915							T.D. 1000'
4070 - STAR DOWNS	E143°23' S21°12'	885								T.D. 1600'
4071 - STAR DOWNS	E143°18' 21°14'									T.D. 1699'.
4074 - NOTTINGHAM DOWNS	E143°28' S21°17'	945	1916							T.D. 1770'.

A	B	C	D	E	F	G	H	I	J	K
4092 - LANIFER	E143°11' S21°58'	798								T.D. 3800'.
4101 - THORDALE	E143°25' S21°58'	769	1906							T.D. 294'.
4103 Canniefield ENRYB DOWNS	E143°29' S22°	813	1906	210 280						T.D. 370'
4111 - THORDALE	E143°27' S22°	805	1914							T.D. 345'.
4114 House ENRYB DOWNS	E143°32' S21°57'	829	1912	160 220						T.D. 377'.
4115 House WYORA	E143° 5' S21°54'	764	1900		2950 3542	surface				0- 1625 No strata - 2939 Cvg.sh. - 3542 S.rk. - 3600 Sh.
4116 - CORALTON	Not located		1909							T.D. 244'.
4117 - CORALTON	E143°10' S21°48'	768	1909							T.D. 293'.

A	B	C	D	E	F	G	H	I	J	K
4118 - WYORA	E143° 8' S21°52'		1909							T.D. 297'
4120 - KNAPDALE	E143°12' S21°52'		1909							T.D. 301'.
4369 - VUNA	E143°15' S21°24'	851	1896		1845	surface				0 - 35 Cl. - 189 Sh. - 452 Sh.& rk. - 583 Bl.sh. - 915 Sh. - 942 Bl.sh. - 1034 Wh.sh. - 1075 Sh. - 1181 Wh.sh. - 1296 Sh. - 1392 Bl.sh. - 1424 Bk.sh. - 1460 Bl.sh. - 1514 Bk.sh. - 1540 Bk.sh.& rk. - 1570 Bk.sh.P.cl. - 1704 Bk.sh. - 1843 Rk.& sh. - 1845 Rk. - 1940 S.rk. - 2134 Sh.& rk. - 2227 Rk. - 2289 Sh. - 2315 Rk. - 2509 S.rk. - 2702 No details.
4370 Vellum West VELLUM DOWNS	E143°15' S21°33'	858	I.B.Coy 1898		2010 2882	2 Su.				0 - 40 No info. - 388 Gy.sh.w.sks. hd.rk. - 675 Bl.stky.sh. - 1032 Gy.sh. - 1267 Bl.sh. - 1882 Gy.sh. - 2056 Cvg.sh. - 2232 S.rk. - 2572 Sst.& p.cl. - 2805 S.rk. - 2840 Rd.sh. - 3029 Hd.sst.& p.cl. - 3060 S.sh.& hd.s.rk. - 3160 P.cl.sh.hd.s.rk. - 3252 Hd.sst.
4371 - MOREENA	E142°57' S21°36'	685	I.B.Coy 1899		2124	Su.				0 - 125 Y.cl. - 245 Bl.sh. - 357 Sh. - 360 S.rk. - 2067 Sh. - 2147 Sh.w.sks.sst. - 2536 S.rk. - 2785 P.cl. - 2941 Sst.

A	B	C	D	E	F	G	H	I	J	K	
4372 - CLIO	E142°48' S21°39'	732	1910	Flowing	2415) 2587) 2812) 2986)	 surface		 F		0 - 61 No strata - 630 Sh. - 680 Hd.gy.sh. - 1274 Gy.sh. - 1375 Rtn.sh. - 1500 Bk.sh. - 1525 Rk.sh. - 1591 Bk.sh.cvg. - 1687 Gy.sh. - 1853 Bk.sh. - 1879 Rk. - 2098 Cvg.gy.sh.	- 2110 Rtn.gy.sh. - 2215 Rtn.gy.sh. - 2386 Cvg.sy.& rtn.sh. - 2415 S.rk. - 2587 Sh.& s.rk. - 2741 P.cl.& s.rk. - 2812 S.rk. - 2860 P.cl. - 2986 S.rk. - 3105 Hd.rk.
4373 - CLIO	E142°43' S21°38'	730	1924	Flowing	200 2666 2920)) 3016)) 3148)) 3264)	soak 7 surface	 60000 (1924) 200000 (1924) 203000 (1924) 277910	 F		0 - 19 Cl. - 176 Sh. - 208 Bl.sh. - 226 Br.sh. - 235 Bl.sy.sh. - 283 Bl.sh. - 303 Sy.sh. - 450 Gy.& bl.sh. - 520 Bl.sh. - 635 Bl.sy.sh. - 640 Sy.sh. - 1260 Bl.sh. - 1407 Bk.sh. - 1508 Choc.sh. - 1518 Bl.sh. - 1528 Choc.sh.	- 1608 Bk.sh. - 2237 Bl.sh. - 2540 Gy.sh. - 2630 Hd.bnds rk.& gy.sh. - 2666 Gy.sh. - 2718 S.rk. - 2850 Sms.s.rk.& sh. - 2964 Hd.s.rk.& sms. dry sts. - 3190 Hd.s.rk. - 3248 Sy.sh. - 3294 Br.cl.& sy.bars. - 3301 Hd.s.rk.

A	B	C	D	E	F	G	H	I	J	K
4374 - ROSEBURN	E143° 4' S21°45'	743	1902	Flowing	200 317 2458) 2680) 2890) 3024) 3082)	soak soak SURFACE	)))))))	F		0 - 20 Y.cl. - 240 S.& cl. - 393 Hd.s.rk.& cl. - 482 Stky.sh. - 572 Rtn.sh.& s.rk. - 1175 Waxy sh. - 1245 Sy.sh. - 1454 Rtn.sh.& sy.sks. - 1548 Rtn.oily sh. - 1620 Rtn.sh.w.s.sks. - 1831 Cvg.sh. - 1865 Gy.sh. - 1887 Dense bk.sh. - 2000 Cvg.sh. - 2204 Cvg.sh.hd.gy.sh. sy.sh. - 2251 Hd.gy.sh. - 2283 Waxy sh. - 2369 Sy.sh. - 2407 Cvg.sh. - 2440 Cvg.p.cl. - 2470 Hd.sst. - 2626 S.rk.& p.cl. - 2700 Br.sh. - 2815 Sst.& p.cl. - 2961 Hd.sst. - 3024 Oily p.cl. - 3186 Sst.
4375 - NAROLLAN	E143°10' S21°38'	757	1909		2240 2285 2530 2694 3008	Surface		F		0 -120 No info. - 2263 Bl.sh. - 2365 S.rk. - 2513 Cong. - 2694 Hd.sst. - 2805 Sy.sh. - 3100 Sst. - 3182 Gr.

A	B	C	D	E	F	G	H	I	J	K
4376 North Ck. SESBANIA	E143°17' S21°28'	797	1913		1960 2050 2528 3086	 surface	400000 (1930)	 F		0 - 20 Y.cl.& sts. - 66 Y.cl.& bl.metal - 214 Bl.sh. - 292 Br.sh. - 304 Rk. - 372 Lt.br.sh. - 579 Bl.sh. - 582 Rk. - 619 Bl.sh. - 883 Br.sh. - 926 Gy.sh. - 976 Br.sh. - 1007 Gy.sh. - 1193 Br.sh. - 1198 Rk. - 1226 Stky.sy.cl. - 1239 Dk.bl.sh. - 1296 Bk.sh. - 1450 Br.sh. - 1560 Bk.sh. - 1619 Stky.dk.bl.sh. - 1629 Br.sh. - 1858 Bl.sh. - 1865 Gn.s.rk. - 1884 Gn.s.rk.& sh. - 1951 Bl.sh. - 2119 Sst. - 2190 S.rk.& sh. - 2206 P.cl. - 2282 Gy.sh. - 2314 S.rk. - 2335 Sy.cl. - 2350 S.rk. - 2378 Br.sh. - 2398 F.sst. - 2432 Br.sh. - 2516 Bl.s.rk. - 2595 Wh.s.rk. - 2630 Wh.s. - 2723 Wh.s.rk. - 2752 Gn.sst. - 2822 Y.sh. - 2845 Sy.sh. - 2856 Hd.gy.sh. - 2865 Rd.sh. - 2881 Y.sh. - 2889 Rd.marl & rk. - 2923 Sh.& wh.cl. - 2978 Sst. - 3129 Wh.s & p.cl. - 3302 S.w.bnds of rk. - 3500 S.w.sh. - 3661 Hd.s.rk.& gy.sh. - 3722 Dross coal. - 3783 S.rk. - 3805 Bk.lignite - 3917 S.rk.& sh. - 4016 Gn.sh.

A	B	C	D	E	F	G	H	I	J	K
4377 House KIRIWINA	E143° 6' S21°30'	756	1914	- 12	1992 2027 2500 2560 2596 2620	surface	700000 (1914)	P		0 - 4 Rk. - 14 Rd.gritty cl. - 24 Rk. - 62 Rd.cl. - 71 Rk. - 94 Bl.sh. - 105 Bl.sh.& rk. - 232 Bl.sh. - 239 Rk. - 245 Wh.cl. - 321 Bl.sh. - 348 Gy.sh. - 356 Dk.bl.rk. - 475 Bl.sh. - 486 Rk. - 500 Br.sh. - 1376 Bl.sh. - 1489 Br.sh. - 1516 Dk.gn.sh. - 1588 Bl.sh. - 1597 Cy.sh. - 1606 Rk. - 1907 Bl.sh. - 1983 Bk.sh. - 1997 S.rk. - 2021 S.rk.& sh. - 2034 Cs.s.& s.rk. - 2049 S.& p.cl. - 2060 Gy.sh. - 2076 Hd.f.s. - 2245 S.rk.& p.cl. - 2303 Hd.gy.sh. - 2328 S.& sh. - 2405 Hd.gy.sh. - 2459 Choc.sh. - 2487 Sy.cl. - 2497 Rk. - 2510 Gy.sh. - 2734 S.rk. - 2752 Bl.sh. - 2802 Sy.sh. - 2849 Y.cl. - 2856 Rk. - 2878 Sh.& p.cl. - 2899 S & p.cl. - 2905 S. - 2925 Sy.sh. - 2939 S.& p.cl. - 3003 S. - 3131 F.wh.s.rk. - 3346 Cs.s.rk.
4378 House BERNBOROUGH	E143° 9' S21°23'		1925		198 1970 2030	190 100 80		P		0 -1106 not known. - 1458 Gy.& bl.sh. - 1486 Hd.rk. - 1697 Gy.& bl.sh. - 1718 Gn.sy.sh. - 1865 Gy.& bl.sh. - 1890 Gn.sy.sh. - 1988 Bl.sh. - 2032 Sst.& s.rk. - 2052 Sy.sh. - 2120 Sst.& p.cl. - 2170 Sst.P.cl.& s.rk. - 2194 Sst. - 2255 Sy.sh. - 2350 Sst. - 2430 Wh.& br.sh. - 2473 P.cl.

A	B	C	D	E	F	G	H	I	J	K
4379 House ANROD	E143°12' S21°35'	765	1926		2175 2260 2580	100 55 40		P		0 - 3 Soil - 10 Hd.y.sst. - 23 Y.cl. - 33 Y.sst. - 53 Blds. - 61 Hd.bl.rk. - 71 Y.sst. - 81 Y.sst.& blds. - 118 Bl.cl.bars - 126 H.rk. - 229 Gy.sy.sh. - 376 Gy.sh. - 1021 Gy.& bl.sh. - 1315 Gy.sh. - 1340 Bl.sh. - 1385 Gy.sh. - 1402 Bl.sh. - 1485 Gy.sh. - 1590 Br.& bk.sh. - 1715 Gy.sh. - 1917 Gy.& bl.sh. - 2037 Gy.& bl.sh.w. hd.bars. - 2127 Gy.& bl.sh.w. sy.bars. - 2144 Gy.sy.sh. - 2154 S.& rk. - 2173 Wh.sy.sh. - 2193 S.rk. - 2271 Sst.& p.cl. - 2282 S.rk. - 2442 Sst.& p.cl. - 2448 Wh.sh. - 2471 Lt.gy.sh. - 2483 Hd.f.sst. - 2550 P.cl. - 2557 Sst. - 2609 Br.sh.
4380 - MINERVA	E143° S21°31'	740	1926		1925 2530) 2580) 2585)	50 surface		F		0 - 43 Y.cl. - 100 Y.sst. - 102 Gy.rk. - 340 Gy.sh. - 343 Hd.rk. - 473 Gy.sh. - 805 Bl.sh. - 909 Gy.sh. - 1039 Bl.piggy sh. - 1259 Gy.sy.sh. - 1323 Gy.sh. - 1400 Bl.sh. - 1444 Bk soil - 1550 Bl.sh. - 1605 Gy.sh. - 1646 Bl.sh. - 1689 Gy.sh. - 1713 Bl.sh. - 1975 Gy.sh. - 2121 Sst.& p.cl. - 2220 Sst.& p.cl. - 2268 Sy.wh.sh. - 2390 S.rk.& p.cl. - 2456 Sy.br.sh. - 2514 Sst.& p.cl. - 2530 S.rk. - 2580 Hd.sst. - 2645 S.rk. - 2720 Hd.sst. - 2800 Sst.p.cl.& rd.sh. - 2825 S.rk.& p.cl. - 2873 Hd.sst. - 2903 P.cl.sst.

A	B	C	D	E	F	G	H	I	J	K
4381 - COOINDA	E142°52' S21°53'	655	1899		2740	Surface		F		0-2085 Sh. - 2154 Bk.sh. - 2532 Sh. - 2580 Sh.& wh.s. - 2680 Sh. - 2912 Wh.s. - 3289 V.hd.sst.
4382 - CONAMORE	E143°27' S21°36'	878	Kirby 1913		2296	30		F		0 - 8 Soil - 88 Y.sh. - 518 Bk.sh. - 522 Gn.sst. - 1132 Bl.& gy.sh. - 1644 Gy.sh. - 1684 Choc.sh. - 2064 Gy.sh. - 2296 P.cl.& s. - 2386 Sst. - 2396 Wh.p.cl.
4383 - CONAMORE	E143°24' S21°34'	890	1924		2180	70		F		0 - 9 Surface soil - 60 Y.cl. - 235 Bl.sy.sh. - 243 Hd.blds. - 273 Bl.sy.sh. - 281 Blds. - 469 Bl.sy.sh. - 636 Lt.gy.sh. - 1050 Gy.sh. - 1521 Dk.gy.sh. - 1620 Dk.br.sh. - 2085 Dk.gy.sh. - 2105 Gn.sst. - 2180 Gy.sh. - 2235 water bearing sst. - 2240 Coal sm. - 2250 P.cl.& s.
4384 - BELFIELD	E142°58' S21°48'		1914							T.D, 364'.
4387 - AKUNAM	E143° 5' S21°40'		1914							T.D. 414'.

A	B	C	D	E	F	G	H	I	J	K
4388 - VUNA	E143°30' S21°22'	969	1906							T.D. 2970'.
4389 - VUNA	E143°24' S21°22'	867	1913		1760					110' SSt. at 1760'. T.D. 1884'.
4390 - CRACRIN	E143°25' S21°27'	856	1915		1833	10				70' Sst. at 1853'. T.D. 2700'
4443 No.1 TAMWORTH	E143°40' S21° 7'	900	1897	50 80			545000 flow (1897) 260000 (1907) ceased flow, 1910.	F		T.D. 2323'.
4444 No.2 TAMWORTH	E143°40' S20° 2'	869		6 18			500000	F		0 - 6 Soil - 90 Y.sh. - 500 Bl.sh. - 620 Br.sh. - 700 Bl.sh. - 900 Bk.sh. - 904 Gn.rk. - 1120 Bk.sh. - 1196 S.rk. - 1300 P.cl.& s. - 1450 Pk.cl. - 1530 P.cl.& s. - 1560 Layers of br.sh. & s.rk. - 1660 P.cl.w.s. - 1680 Layers br.sh.& s.rk. - 1854 P.cl.& s. - 1864 Rd.marl.
4445 No.3 TAMWORTH	E143°44' S21° 4'	880	1913	est. 60 80	1218	10		F		0 - 70 Y.sh. - 600 Bl.sh. - 780 Bk.sh. - 1218 Bl.sh. - 1310 S.rk. - 1335 Pk.cl.

A	B	C	D	E	F	G	H	I	J	K
4446 House DALMUIR	E143°42' S21° 8'	893		60 70			20000	F		T.D. 1600'.
4447 - DALMUIR	E143°37' S21°10'	918		84 280	1435		v poor	B		T.D. 1475'. 1435 - 1470 Bl.s.rk.
4455 - BORA	E142°41' S21°15'	575			1730					0 - 294 No strata - 528 Sh. - 534 Sh.w.sks of rk. - 1124 Sh. - 1132 Rk. - 1240 Sh. - 1251 Sh.w.sks of s.rk. - 1406 Sh. - 1830 No strata.
4457 House WINCHESTER DOWNS	E142°37' S21°11'	L 581	1919	Flowing	147 1649) 1720) 1838) 1909)	Su.	soak 509000 (1919) 350000 (1954)	P		0 - 70 Rd.cl. - 266 Bl.sh. - 388 Bl.sh & rk. - 667 Br.sh. - 1039 Bl.sh. - 1167 Bk.sh. - 1655 Bl.sh. - 1725 S.rk. - 1740 Y.sh. - 1812 Y.sh.& wh.cl. - 1848 S.rk. - 1930 S.rk.& qtz. - 1960 Sy.cl. - 1998 S.rk. - 2035 P.cl.& sh.
4460 - SARRE.	E142°47' S21°12'	670	B.Lincoln 1923	Flowing	1789) 1924) 1960) 2084) 2230) 2280) 2340)	Su.	551381 (1932) 395158 (1928) 454087 (1936) 435680 (1943) 415000 (1955)	F	136	0 - 2 Bk.soil - 51 Y.cl. - 221 Bl.sh. - 661 Br.sh. - 962 Gy.sh. - 1400 Br.sh. - 1506 Gy.sh. - 1511 Hd.sk. - 1760 Bk.sh. - 1779 S.rk. - 1792 P.cl. - 1847 S.rk. - 1960 Wh.cl. - 2085 P.cl. - 2119 S.rk. - 2198 P.cl. - 2218 Br.sh. - 2350 S.rk.

A	B	C	D	E	F	G	H	I	J	K
5004 - WHITEWOOD STOCK ROUTE	E143°37' S21°27'		H.Bode 1936		1944	280	8640	F		0 - 27 Sy.y.rk. - 67 Y.sh. - 187 Gy.sh. - 201 Wh.rk. - 293 Gy.sh. - 429 Gy.sh.& bnds of rk. - 494 Sy.gy.sh. - 1371 Gy.sh. - 1406 Dk.sh. - 1446 Lt.gy.sh. - 1512 Dk.sh. - 1597 Lt.gy.sh. - 1664 Gy.sh. - 1780 Hd.gy.sh.& gn.rk. - 1800 Dk.rk. - 1832 Gritty gy.sh. - 1946 Gy.sh.& sst. - 2000 Cs.sst. - 2022 P.cl. - 2040 F.sst. - 2049 Hd.sst. - 2080 P.cl.& sh. - 2212 Gy.sh.
5014 Nine-mile STOCK ROUTE	E143°54' S21°11'	940	1936	115 (1936) 133	1304	115	12000 (1936)			0 - 4 Bk.soil - 53 Y.cl. - 59 Hd.y.rk. - 71 Bl.sh. - 76 Gy.sh.hd.sks. - 91 Bl.sh. - 106 Bl.& gy.sh.sks. - 112 Bl.sh. - 126 Gy.sh. - 132 Bl.sh. - 383 ? - 439 Gy.sh. - 481 Br.sh. - 526 Gy.sh. - 625 Br.sh. - 630 Hd.gy.sh. - 715 Br.sh. - 825 Dk.br.sh. - 1060 Gy.sh. - 1065 Gn.sy.sh. - 1110 Gy.sh. - 1132 Sy.sh. - 1135 Gn.s. - 1150 Gy.sh. - 1230 Br.sh. - 1254 Gy.sh. - 1260 Gn.s. - 1304 Gy.sh. - 1330 Sst. - 1332 Br.sh. - 1363 Sy.p.cl. - 1365 Br.sh. - 1372 Sy.p.cl.
5134 Woodberry STOCK ROUTE	E143°51' S21°25'	955	1936		1575-1615	120	11000 (1936)			0 - 5 Bk.soil - 15 Y.sh. - 23 Gy.rk. - 75 Y.sh. - 506 Gy.sh. - 516 Br.sh. - 536 Dk.sh. - 615 Br.sh. - 889 Gy.sh. - 1035 Br.sh. - 1150 Bk.sh. - 1250 Bl.sh. - 1520 Gy.sh. - 1525 Gn.sst. - 1575 Gy.sh. - 1580 S. - 1600 Hd.sst. - 1612 S. - 1619 Sh. - 1655 Sy.p.cl.

A	B	C	D	E	F	G	H	I	J	K
5150 No.1 HAZELWOOD	E143°56' S21° 1'	913	J.C.James 1938	flowing	201 770 915 1072 1230 1240	 Su. Su.	50000 (1962) 168000 (1938)	F		0 - 5 Soil - 65 Y.& dk.cl. & blds. - 100 Gy.sh. - 110 Bld.& dk.cl. - 770 Gy.bk.& dk. stky.sh. - 795 Sst. - 840 Sst. - 915 Br.sy.& gy.sh. - 932 Sst. - 935 Hd.rk. - 947 Sy.p.cl. - 1073 Br.choc.sh. - 1087 S.rk.sms.br.sh. - 1097 P.cl. - 1131 S.rk.& sh. - 1226 P.cl.& sy.sh. - 1285 Sst. - 1311 Sst.& narrow sms br.coal, sh. - 1389 Sst. - 1432 Dry sst. - 1437 Rd.sh.
5464 No.2 MALAKOFF DOWNS	E143°47' S21°10'		H.Bode Snr 1936	100 120				F		T.D. 1375'. 1307 - 1375 S.rk.
5466 - KNAPDALE	E143°18' 21°55'		Blackwell 1942		170 248 495	90	23040 (1942)	P		0 - 75 Y.cl. - 125 Bl.sh. - 237 Sy.sh. - 248 S.rk. - 348 Gy.sh. - 364 Gn.p.cl. - 382 Gy.sh. - 385 Rk. - 490 P.cl.& s. - 495 Gn.rk.& crumbly rk. - 520 P.cl.& s. - 525 Sy.sh.
5479 - EYRIEWALD	E143°51' S22°		1925	- 280			8000	B		T.D. 450'.
5481 - EYRIEWALD	E143°47' S21°59'		1925	- 280			6000	B		T.D. 450'.
5483 - EYRIEWALD	E143°49' S21°59'		1925							T.D. 428'.

A	B	C	D	E	F	G	H	I	J	K
5534 - NAROLLAH	E143°13' S21°41'									
5544 - OLIO RLY.STN.	E143°13' S21°54'		Blackwell 1942	195	275 351 665 682	soak soak 195	1440 (1942)	S F		0 -124 Y.cl. - 212 Sst. - 266 Puggy bl.sh. - 273 Sy.sh. - 341 Sst. - 351 Rk.s.sks. - 421 Gy.sh. - 471 Bk.sh. - 545 Gy.sh. - 582 P.cl.& s. - 602 Gy.sh. - 612 P.cl.& s. - 647 Gy.sh. - 665 Bk.sh.& p.cl. - 682 S.& sh. - 700 P.cl.wh.rk.& gy.sh.
5548 - VENTURE DOWNS	E143°21' S20°40'									T.D. 450'.
5549 - VENTURE DOWNS	E143° 9' S21°43'									T.D. 350'.
5550 - VENTURE DOWNS	E143°12' S21°40'									T.D. 372'.
5551 - VENTURE DOWNS	E143°12' S21°43'		Mclean 1942		510	142	7000 (1942)			0 - 337 No info. - 349 Bk.sh. - 362 Bl.sh. - 400 Sy.sh. - 426 Puggy sh.& rk. Sy.bl.sh. - 452 Lt.sy.pug. - 470 Bl.sh.& bl.rk. - 494 Sst. - 510 Bl.sh.& sst.

A	B	C	D	E	F	G	H	I	J	K
5552 - VENTURE DOWNS	E143°17' S21°43'									T.D. 408'.
5553 - VENTURE DOWNS	E143°18' S21°40'									T.D. 305'.
5554 - VENTURE DOWNS	E143°15' S21°40'									T.D. 506'.
5593 - MENTONE	E143°33' S21°40'		1923	130 250			2000	B		T.D. 350'.
5594 - MENTONE	E143°36' S21°39'		1924	130 250			2500	B		T.D. 330'.
5595 House MENTONE	E143°35' S21°39'		1926	80 120			11000	F		T.D. 200'.
5631 - HARWOOD	E143°54' S21°57'		1918	- 260				F		T.D. 350'.
5632 - HARWOOD	E143°54' S21°59'		1915		345					T.D. 545' Slippery back reported.
5633 - HARWOOD	E143°54' S21°59'		1918							T.D. 350'.

A	B	C	D	E	F	G	H	I	J	K
5722 - WYBENIA	E142°37' S21°47'		1923							T.D. 620'.
5741 Maida Vale COORABELLE	E143°45' S21°39'	1057	Ferguson 1922	200 -	2375			F		0-2375 Hd.& cvg. - 2475 Sst.
5753 - WERNA	E142°43' S21°51'		1912							T.D. 319'.
5754 - WERNA	E142°52' S21°48'		1912							T.D. 325'.
5755 - WERNA	E142°45' S21°51'		1914							T.D. 319'.
5756 - WERNA	E142°39' S21°46'		1915							T.D. 470'.
5757 - WERNA	E142°40' S21°50'		1915							T.D. 378'.
5758 - WERNA	E142°43' S21°51'		1912							T.D. 200'.
5759 - WERNA.	E142°45' S21°52'		1933							T.D. 350'.

A	B	C	D	E	F	G	H	I	J	K
5763 - WERNA	E142°43' S21°51'		1925							T.D. 200'.
5948 - MINERVA	E143° S21°22'	790	Keats 1923		700 1837	50		B F		0 - 90 Cl. - 1837 Sh. - 1845 S.rk. - 1863 Lt.br.sh.
5884 AMELIA DOWNS	E142°32' S21°59'		1924							T.D. 711'
6031 - DIDJERIDOO	E142°58' S21°59'		1924							T.D. 408'.
6032 - COOINDA	E142°48' S21°51'		1924							T.D. 646'.
6040 - STAR DOWNS	E143°17' S21°17'		1923							T.D. 1867'.
6041 - NOTTINGHAM DOWNS	E143°22' S21°17'		1924							T.D. 1847'.
read 6069 here. 6081 - WEEBA	E143°28' S21°51'		1922							T.D. 398'.
6082 - WEEBA	E143°25' S21°52'		1919							T.D. 700'
6093 - MT.CAMPBELL	E142°32' S21°56'		1919							T.D. 509'.

A	B	C	D	E	F	G	H	I	J	K
read before 6081 6069 - CHESTERFIELD	E144° S21°59'		1923							T.D. 350'.
6274 - ADIREL DOWNS	E143°54' S22°		1934	120 180			3500	B		T.D. 450'.
6484 - LILFORD	E142°59' S21°53'		1924	- 252	640	190	14400 (1960)			T.D. 699'.
6487 - LANA DOWNS	E143° 2' S21°59'		1937							T.D. 418'.
6545 - WONGAN	E142°32' S21°52'		J.Murtagh 1924	- 290 (1945)	788	250	14000 (1945)			T.D. 788'.
6546 - WONGAN	E142°35' S21°48'		1924							T.D. 810'.
6548 Roscaven ROSCAVEN	E143°33' S21°23'	990	Dia.Drill Co. 1916	150 -	1856	139		F		0 - 30 cl.& sst. - 64 Sst. - 108 Cl. - 120 Cl.& rk. - 140 Bl.rk.cl. - 165 Rk.& cl. - 184 Rk. - 195 Rk.& cl. - 240 Cl.& rk. - 312 Sh. - 640 Bl.sh. - 863 Bl.cl. - 950 Bl.sh. - 1000 Bl.sh.w.bnds bl.rk. - 1035 Bl.sh. - 1038 Bl.cl. - 1082 Bl.stky.cl. - 1313 Bl.sh. - 1330 Bl.drift. - 1376 Bl.sh. - 1435 Bl.sh. - 1460 Bl.cl. - 1692 Bl.sh. - 1712 Gn.sh. - 1736 Bl.sh.& gn.sh. - 1777 Bl.sh.& gn.sh. - 1790 Bl.sh. - 1820 Gn.sh. - 1856 Bl.sh. - 1864 Wh.sh. - 1865 Bl.sh.

A	B	C	D	E	F	G	H	I	J	K
6576 - BROOKLYN	E142°49' S21°47'		1925							T.D. 601'.
6577 - BROOKLYN	E142°52' S21°45'		1925							T.D. 466'.
6578 - BROOKLYN	E142°47' S21°49'		1924							T.D. 533'.
6579 - BROOKLYN	E142°51' S21°48'		1923							T.D. 577'.
6757 - CORALTON	E143° 2' S21°50'		1914							
6758 - CORALTON	E143° 6' S21°49'		1915							T.D. 425'.
6759 - CORALTON	E143° 8' S21°49'		1924							T.D. 400'.
6760 - CORALTON	E143°11' S21°53'		1916							T.D. 560'.
6761 - CORALTON	E143°13' S21°49'		1923							T.D. 590'.
6762 - CORALTON	E143°15' S21°50'	-	1923							T.D. 590'.

A	B	C	D	E	F	G	H	I	J	K
6846 - CAIRNHOPE	E143°58' S21°46'		1926	140 180						T.D. 2711'.
7007 - TALKARA	E142°47' S21°58'		1919							T.D. 422'.
7009 - TALKARA	E142°45' S21°53'		1923							T.D. 624'.
7010 - BERNFELS	E142°38' S21°56'		1923							T.D. 750'.
7012 - BERNFELS	E142°42' S21°55'		Murtagh 1928		60 690) 755)	Soak 220	14400 (1928)	S B		0 - 5 Soil - 55 Y.sh. - 65 Y.sst. - 185 Hd.bk.sh. - 190 Rk. - 275 Bl.sh. - 279 Rk. - 359 Sy.cl. - 595 Bk.sh. - 685 Bl.sy.sh. - 695 Sst. - 755 Bk.sh. - 780 Water strata bk.sh.
7017 No.6 GLENELG	E143°32' S21°35'		L.Bode to 600' 1912 R.McLean to 900' 1925			100	600			T.D. 900' 0 - 600 Bl.sh. - 800 Slippery back.
7019 No. 10 GLENELG	E143°33' S21°34'		R.J.McLean 1925			80	300			T.D. 300'.

A	B	C	D	E	F	G	H	I	J	K
7020 No.8 GLENELG	E143°35' S21°35'	1000	R.J.McLean 1925			100	200			T.D. 300'.
7021 No.9 GLENELG	E143°34' S21°34'		R.J.McLean 1925			80	200			T.D. 300'.
7022 No.11 GLENELG	E143°29' S21°34'		R.J.McLean 1925			100	200	B		T.D. 300'.
7018 No.7 GLENELG	Not located		R.J.McLean 1925			100	200			T.D. 300'.
7028 No.5 GLENELG	Not located	1000	A.Bode 1912			80	500			T.D. 600'.
7023 No.12 GLENELG	E143°30' S21°34'		C.Lobdale 1929			100	300			T.D. 350'.
7024 No.13 GLENELG	E143°31' S21°34'		C.Lobdale 1929			100	200			T.D. 280'.
7025 No.14 GLENELG	E143°29' S21°37'		C.Lobdale 1929			146	600			T.D. 375'.
7026 No.15 GLENELG	E143°31' S21°37'		R.J.McLean 1927			100	600			T.D. 400'.

A	B	C	D	E	F	G	H	I	J	K
7027 No.16 GLENELG	Not located		R.J.McLean 1919			100	600	B		T.D. 350'. Tested 3,100 g.p.d. dropped to 600 g.p.d. in 12 months.
7116 - WERBA	E143°22' S21°52'		1920							T.D. 260'.
7117 - KOONDI	E143°18' S21°53'		1922							T.D. 420'.
7118 - KOONDI	Not located		1938							T.D. 500'.
7197 - CLIO	E142°39' S21°35'	730	M.C.Fallon 1939	Flowing	490 2582 2830 2996 3042 3157 3236 3291	Soak 70 18 Su. Su. Su. Su. Su.	))) 120000) 190000) 217000) 240000)	S F		0 - 5 Br.soil - 20 Y.cl.&.bld. - 52 Y.cl. - 91 Sy.y.cl. - 93 Hd.wh.rk. - 111 Y.cl. - 181 Hd.gy.rk. - 239 Carb.sh. - 260 Gy.sh. - 262 Hd.gy.rk. - 288 Gy.sy.sh. - 349 Sy.sh. - 418 Gy.sh. - 420 Hd.gy.rk. - 454 Gy.sy.sh. - 457 Hd.gy.rk. - 468 Gy.sy.cl. - 490 Gy.sh. - 520 Gy.sy.sh. - 540 Waddy sh. - 562 Gy.sy.sh. - 565 Hd.gy.rk. - 692 Gy.sh. - 730 Gy.sy.sh. - 744 Gy.sh. - 750 Gy.sy.sh. - 780 Gy.sh. - 784 Hd.gy.rk. - 868 Gy.sh. - 1086 Gy.sh.w. hd.bnds. - 1164 Gy.sh. - 1166 Hd.gy.rk. - 1208 Gy.sh. - 1299 Dk.gy.sh. - 1539 Stky.sh. - 1627 Tough br.cl. - 1730 Gy.sh. - 1786 Bl.sh. - 1905 Gy.sh. - 2015 Br.sh. - 2242 Gy.sh. - 2500 Dk.gy.sh. - 2510 Gy.sy.sh. - 2544 Gy.sst. - 2590 Wh.sy.cl. - 2600 Hd.bnds of rk. - 2645 Wh.p.cl. - 2653 Wh.sy.cl. - 2741 Gy.sy.cl. - 2743 Hd.gy.rk. - 2780 Wh.sy.cl. - 2824 Lt.br.cl. - 2860 Sst.w.hd.bnds of f.s.rk. - 3000 F.sst.hd.bars. - 3003 Cs.sst. - 3042 F.sst. - 3049 Cs.sst. - 3078 Lt.br.cl.sms of s. - 3086 F.sst. - 3109 Water bearing sst. - 3309 Cs.sst. - 3355 Hd.sst. - 3364 Hd.gy.sh. - 3375 Hd.pk.rk.

A	B	C	D	E	F	G	H	I	J	K
7262 Pirie STAMFORD DOWNS	E143°51' S21°17'							F		T.D. 1470'.
7263 Private STAMFORD DOWNS	E143°48' S21°19'							F		T.D. 1000'.
7264 Stamford Rly.	E143°48' S21°16'	963	Royb Bros. 1923		1560 - 1575	150				0 - 2 Soil - 180 Y.sy.sh. - 700 Gy.sh.w.hd.bars. - 740 Br.sh. - 1340 Gy.sh.& hd.bars. - 1342 Hd.gy.rk. - 1474 Bk.sh.& 4' gn.s. - 1510 Bk.sh. - 1524 Gn.sy.sh. - 1554 Bk.sh. - 1575 6' sy.sh.& sst.
7265 - STRATHTEE	E143°46' S21°46'						1800			T.D. 502'.
7266 No.4 STRATHTEE	E 143°42' S21°46'									T.D. 381'.
7267 - STRATHTEE	E143°43' S21°44'									
7268 - CRESSY	E143°48' S21°51'									
7271 - CRESSY	E143°49' S21°55'									
7269 - CRESSY	Not located									T.D. 240'.

A	B	C	D	E	F	G	H	I	J	K
7270 - CRESSY	Not located									T.D. 500'.
7275 - CRESSY	Not located									
7276 - CRESSY	Not located									
7277 - CRESSY	Not located									T.D. 500'.
7278 - CRESSY	Not located									T.D. 350'.
7279 - CRESSY	Not located									T.D. 350'.
7272 No.8 CRESSY	E143°48' S21°57'									T.D. 370'.
7273 No.9 CRESSY	E143°47' S21°54'									T.D. 420'.
7274 No.10 CRESSY	E143°45' S21°56'									T.D. 370'.

A	B	C	D	E	F	G	H	I	J	K
7668 - KINGLE	E143° 5' S21°21'		1923		1851 2013	30				0 - 40 y.sh. - 2053 Bl.sh.
7676 Jackdaw WETHERBY	E142°54' S21°26'	773	H.Bode 1940	20	1952 2025	40 20	20160 (1940)	F		0 - 2 Su.soil - 6 Y.sh. - 26 Y.sy.sh. - 51 Y.sy.sh.w.bnds of rk. - 103 Y.sh.& rk. - 111 Gn.rk. - 133 Y.sh. - 150 Gy.sh.& rk. - 175 Gy.sh. - 205 Gn.sy.sh. - 235 Gy.sh. - 240 Lt.gy.sh. - 282 Gy.sh. - 285 Lt.gy.rk. - 957 Gy.sh. - 960 Rk. - 1092 Gy.sh. - 1248 Lt.gy.sh. - 1332 Dk.sh. - 1335 V.dk.sh. - 1387 Dk.sh. - 1952 Gy.sh. - 1958 Sst. - 1975 Stky.sh. - 2030 Sst. - 2066 Stky.sh.
7691 4-mile MALBOONA	E143°39' S21°56'		1920							T.D. 591'.
7692 3-mile MALBOONA	E143°33' S21°54'		1919	125 -	137 300 494 620					T.D. 642'.
7693 Nuka MALBOONA	E143°33' S21°52'		1924	157 -	197 277					T.D. 690'.
7694 - MALBOONA	E143°39' S21°49'		1921		195 363					T.D. 590'.
7695 Cressy MALBOONA	E143°41' S21°50'		1924	195 -	230 288					T.D. 728'.

A	B	C	D	E	F	G	H	I	J	K
7768 - AKUNAM	E143°15' S21°47'		1920							T.D. 450'.
8004 Old Nesbit MALBOONA	E143°34' S21°56'		1915							T.D. 400'.
8094 - THE RANCH	E143°27' S21°50'		1918							T.D. 340'.
8095 - ANZAC	E143°35' S21°50'		1933							T.D. 535'.
8096 - MENTONE	E143°30' S21°49'		1883							T.D. 248'.
8097 - MANUKA	E143°30' S21°42'		1883							T.D. 260'.
8385 North WOOLFIELD	E143°40' S21°43'		1914				6000	F		
8386 House WOOLFIELD	E143°39' S21°44'		1914				2000	B		
8387 - PLAINBY	E142°34' S21°28'		H.Bode 1930		296 509 579		8000 (1930)			T.D. 700'.

A	B	C	D	E	F	G	H	I	J	K	
8913	E143° 3'		L. Blackwell		157		1008	F		0 - 4 Soil	- 199 Rk.
-	S21°57'		1942		190		(1942)			- 14 Y.cl.	- 288 P.cl.& s.
WYORA										- 65 Y.sst.	- 330 Bk.sh.
										- 67 Gy.rk.	- 333 Rk.
										- 107 Sy.sh.	- 353 P.cl.& s.
										- 122 Gy.sh.	- 355 Rk.
										- 125 Rk.	- 375 P.cl.& s.
										- 147 Gy.sh.	- 390 Br.sh.
										- 157 Sy.sh.	- 395 Sy.sh.
										- 160 Gy.rk.	- 426 Gn.s.w.sh.sks.
										- 195 P.cl.& s.	- 441 Bk.sh.
9014	E142°33'		L. Blackwell		294		1500	S		0 - 3 Soil	- 172 Gy.rk.
-	S21°24'		1941		392		(1941)			- 11 Y.sh.	- 233 Gy.sh.
WINDSOR PARK										- 62 Y.cl.	- 248 Sy.sh.
										- 82 Bl.sst.& y.sh.	- 278 Gy.sh.
										- 88 Gy.sst.	- 280 Rk.
										- 93 Gy.rk.	- 290 Gy.sh.
										- 99 Gy.sst.	- 300 Sst.
										- 151 Gy.sh.	- 520 Gy.sh.
										- 157 Gy.rk.	- 540 Sy.sh.
										- 167 Gy.sst.	- 600 Gy.sh.
9092	E143°18'		L. Blackwell		82	Soak		F		0 - 3 Soil	- 172 Coal
-	S21°57'		1942		256)	150	21000			- 7 Rd.rk.	- 178 Br.sh.
LANIFER					319)					- 20 Y.st.	- 184 Gn.rk.
										- 28 Y.sst.	- 194 P.cl.s.
										- 48 Y.st.	- 198 Gn.rk.
										- 82 Bl.sh.	- 256 P.cl.& s.
										- 85 Gn.s.	- 266 Sy.sh.
										- 90 Wh.rk.	- 319 P.cl.& s.
										- 99 Gn.sh.	- 369 Sy.sh.w.sks of s.
										- 152 Sy.sh.	- 379 Sy.sh.
										- 158 Coal	- 391 Choc.sh.
										- 162 Sy.sh.	- 399 Sy.sh.
											- 408 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K
9119 - KNAPDALE	E143°15' S21°53'		L.Blackwell 1942		160 522	Soak 205	14000 (1942)	F		0 - 6 Soil - 26 Y.cl. - 28 S.rk. - 97 Y.sst. - 99 Gy.rk. - 131 Sy.sh. - 200 Sy.sh.w.sks. of free s. - 295 Sy.sh. - 343 Sy.p.cl. - 355 Choc.sh. - 357 Gy.rk. - 409 Sy.p.cl. - 411 Bk.rk. - 460 Bk.sh. - 488 Gy.sh. - 490 Sk.rk. - 516 Br.sh. - 522 Mud rk. - 535 Sy.p.cl. - 536 Bk.rk. - 561 Bk.sh.
9170 - CONAMORE	E143°23' S21°38'		1925							T.D. 350'.
9171 - CONAMORE	E143°32' S21°40'		1923							T.D. 500'.
9172 - CONAMORE	E143°29' S21°39'		1922							T.D. 350'.
9173 - CONAMORE	E143°26' S21°38'		1917							T.D. 500'.
9174 - CONAMORE	E143°24' S21°39'		1919							T.D. 400'.

A	B	C	D	E	F	G	H	I	J	K		
9435	E143°19'		A.Blackwell	145	115	Soak				0 - 4 Su.soil	- 185 Rk.	
-	S21°51'		1943	165	206	100	13440	F		- 55 Y.cl.	- 195 Sh.	
KNAPDALE					245	95				- 66 Sy.sh.	- 206 Gn.sst.	
										- 68 Rk.	- 211 Rk.	
										- 88 Sy.sh.	- 238 Gn.sst.	
										- 90 Rk.	- 245 Sy.sh.	
										- 152 Sh.	- 250 Sh.	
										- 163 Sy.sh.	- 253 Rk.	
										- 166 Rk.	- 265 Gn.sst.	
										- 182 Sy.sh.	- 275 Sh.	
9451	E143°21'		1943		275	105	10160			0 - 3 Su.soil	- 263 Sh.	
-	S21°57'				425					- 20 Cl.& sst.	- 265 Rk.	
LUCKHAM										- 60 Y.cl.	- 295 Sy.sh.	
										- 65 Dk.y.cl.	- 325 Sh.	
										- 70 S.rk.	- 345 Br.sh.w.st.	
										- 120 Sy.sh.	- 360 Br.sh.	
										- 150 Sh.	- 365 Sy.sh.	
										- 170 Br.sh.	- 380 Sh.	
										- 180 Sh.	- 382 Sy.sh.	
										- 182 Rk.	- 387 Rk.	
										- 190 Sy.sh.	- 425 Sh.	
										- 196 Sh.	- 430 Gn.sst.	
										- 198 Rk.	- 433 Rk.	
										- 211 Sh.	- 450 Sh.	
										- 240 Br.sh.		
9690	E142°56'		A.Blackwell		110	Soak	17280	S		0 - 3 Su.soil	- 205 Rk.	- 483 Gy.sh.
-	S21°80'		1943		317	100	(1943)	F		- 30 Y.cl.	- 315 Br.sh.	- 485 Rk.
BELFIELD					400					- 46 Y.sst.	- 317 Rk.	- 505 Gy.sh.
										- 48 Rk.	- 337 Gn.sst.	- 517 Sh.
										- 65 Y.sy.cl.	- 343 Sy.sh.	- 520 Sy.sh.
										- 70 Sy.sh.	- 357 Br.sh.	- 522 Rk.
										- 110 Sh.	- 390 Gy.sh.	- 538 Sh.
										- 116 Rk.	- 395 Sy.sh.	- 550 Sy.p.cl.
										- 155 Sh.	- 400 Gy.rk.	- 580 No info.
										- 158 Rk.	- 425 Sy.p.cl.	- 581 Rk.
										- 170 Gy.sh.	- 427 Rk.	- 590 Gy.sh.
										- 202 Br.sh.	- 445 Sy.p.cl.	

A	B	C	D	E	F	G	H	I	J	K
9945 - WYORA	E143° 2' S21°55'		A.Blackwell 1944		150-200 245-263	130	25000 (1944)			0 - 1 Su.soil. - 28 Y.cl. - 30 Choc.cl. - 63 Y.cl. - 67 Rk. - 85 Y.cl. - 125 Sy.sh. - 133 Br.sh. - 150 sy.sh. - 200 Gy.sst. - 202 Gy.sh. - 204 Rk. - 235 Sy.sh. - 245 Gy.sh. - 263 Gy.sst. - 264 Rk. - 285 Sy.sh. - 315 Gy.sh.
10540 - PLAINBY	E142°35' S21°26'		H.Bode 1930	170	300	170	5000 (1945)			T.D. 300'.
10653 - WANORA DOWNS	E142°31' S21°39'		J.Murtagh 1920				11000 (1920)			0 - 80 Y.sst. - 390 Bl.s.rk.
10776 - HARWOOD	E143°54' S21°59'		A.&E.Blackwell 1946	- 300	217-257	162	2000			0 - 12 Soil & Cl. - 64 Y.sst. - 85 S.rk.& sy.sh. - 101 S.rk. - 109 Sh. - 125 Sh.& rk. - 157 Sy.p.cl. - 171 Br.& sy.sh. - 188 1' rk.& sy.p.cl. - 209 3' rk.& sy.sh. - 217 2' rk.& sy.p.cl. - 257 Sy.sh. - 277 Sh. - 285 S.rk.& sy.sh. - 315 Sh. - 335 Sy.p.cl.& sh. - 354 Sh.& 1' rk. - 370 Sy.p.cl. - 430 Sh. - 450 Sy.p.cl.& sh.
10796 - BEAULY	Not located									T.D. 400'.

A	B	C	D	E	F	G	H	I	J	K
11048 Well Bore WOOLFIELD	E143°41' S21°45'		P.V.North 1947	171 (1947) 260	180 391-407		Soak 10000(1947) 6000(1962)	F		0 - 32 Sh. - 57 Y.sst. - 160 Gy.sh. - 165 S.rk. - 201 Gy.sh. - 204 Wh.rk. - 220 Gy.& sy.sh. - 261 Gy.cl. - 264 Wh.rk. - 290 Gy.cl. - 292 Wh.rk. - 321 Gy.cl. - 323 Wh.rk. - 336 Gy.cl. - 350 Gy.sst. - 353 Wh.rk. - 389 Gy.cl. - 391 Wh.rk. - 407 Sst.
11049 Dayborough WOOLFIELD	E143°36' S21°48'		W.G.North 1947	- 336	273 395 574		10000(1947 2000(1962)			0 - 22 Soil & Sh. - 80 Y.sh. - 99 S.rk.& sst. - 114 Y.sst. - 136 Hd.y.sst. - 158 Y.sst. - 177 S.rk.& sst. - 197 Rk.& sst. - 217 Gy.sst. - 239 Hd.gy.sst. - 263 Gy.sst. - 269 Gy.cl. - 347 Gy.sst. - 351 Gy. cl. - 405 Gy.sst. - 569 Gy.cl. - 580 R.& sst. - 600 Gy.cl.
11069 - MENTONE additional area	E143°30' S21°49'		P.V.North 1947		200 410	183 145	2000 12400	G G		0 - 25 Y.sh. - 28 Bld. - 77 Y.sst. - 139 Gy.cl. - 143 Gy.rk. - 166 Gy.cl. - 168 Gy.rk. - 180 Gy.cl. - 183 Hd.s.rk. - 240 Gy.sst. - 251 Gy.cl. - 259 Choc.cl. - 268 Gy.sst. - 286 Gy.cl. - 291 Gy.sst. - 306 Gy.cl. - 313 Gy.sst. - 315 Hd.wh.rk. - 324 Gy.cl. - 330 Gy.sst. - 348 Gy.cl. - 363 Hd.gy.sst. - 375 Gy.cl. - 391 Gy.sy.cl. - 411 Gnish sst. - 418 Gy.cl.

A	B	C	D	E	F	G	H	I	J	K
10881 - WYORA	E143° 2' S21°54'		A.Blackwell 1947	130 170	270-283	130	17000 (1947)			0 - 4 Su.soil. - 60 Y.cl. - 62 Rk. - 70 Y.cl. - 100 Y.sst. - 130 Sh. - 142 Gy.sst. - 148 Rk. - 180 Gy.sst. - 201 Br.& sy.sh. - 204 Rk. - 277 Br.& sy.sh. - 279 Rk. - 350 Sy.p.cl., sy.& br.sh.
10882 - LILFORD	E142°59' S21°56'		A.Blackwell 1947	92 — 112 1960	105-145	92	23000 (1947)			0 - 4 Su.soil. - 70 Y.cl. - 86 Sh. - 95 Br.sh. - 149 Gy.sst. - 150 Rk. - 153 Sh. - 165 Sy.p.cl. - 212 Br.sh. - 230 Cl.& br.sh. - 285 Sh. - 320 Sy.p.cl.
10883 - LILFORD	E142°57' S21°53'		A.Blackwell 1947	115 260 (1960)	155 200-225 530-541	Soak	9000 (1960)	F		0 - 3 Su.soil & rk. - 23 Y.sst. - 48 Y.& br.cl. - 76 Sh.& bars rk. - 153 Sh.& sy.sh. - 155 Rk. - 180 Sy.p.cl. - 200 Br.sh. - 245 Sy.p.cl. - 295 Sh.& br.sh. - 453 Sh. - 530 Sh.& bars rk. - 541 Sy.p.cl. - 581 Sh.w.bars of rk.
10947 - WINDSOR PARK	E142°31' S21°26'	600	1947		2081-2150 2321-2500		80000 520000 (1947)			0 - 6 Bk.soil. - 40 Y.cl. - 80 Y.sst. - 106 Y.cl. - 110 Gy.cl. - 140 Hd.rk. - 160 Gy.sh. - 199 Gy.sh. - 394 Gy.sh.& hd.bds. - 710 Gy.sh. - 900 Gy.sh.w.hd.bds. - 1490 Gy.sh. - 1688 Br.sh. - 1908 Gy.stky.sh. - 1909 Cl. - 2081 Gy.stky.sh. - 2150 Sst. - 2162 Hd.dry rk. - 2199 Dk.cl. - 2202 Stky.cl. - 2250 F.sy.cl. - 2275 Sst.& cl. - 2290 Cs.sy.cl. - 2321 Br.sy.cl. - 2504 Sst.& coal seams.

A	B	C	D	E	F	G	H	I	J	K	
11086	E142°48'	690	1948		2270		423,000	F		0 - 14 Cl.	- 1568 Bl.sh.
-	S21°27'				2340	Surface	(1948)			- 78 Bld.cl.	- 1576 Hd.stk.
DUNDEE					2455					- 90 Blds.	- 1660 Bl.sh.
					2640					- 132 Bl.sh.	- 2023 Bl.sh.w.gy.slate.
					2863					- 138 Gn.sy.sh.	- 2032 Gy.rk.
										- 178 Sy.sh.	- 2090 Bl.sh.
										- 212 Bl.sh.	- 2100 Br.sh.
										- 240 Sy.sh.	- 2159 Bl.sh.
										- 260 Bl.sh.	- 2267 Bk.sh.& slate
										- 286 Dk.sh.	- 2282 Bk.sh.
										- 326 Sy.sh.	- 2336 Sst.
										- 332 Br.sh.	- 2348 Cl.
										- 364 Bl.sh.	- 2418 Sst.
										- 386 Gy.sh.	- 2432 Br.sh.
										- 530 Bl.sh.	- 2508 Sst.
										- 610 Gy.sh.	- 2588 S.& p.cl.
										- 640 Dk.sh.	- 2700 Sst.
										- 665 Sy.sh.	- 2711 Sst.& cl.
										- 1292 Bl.sh.	- 2734 V.tough cl.
										- 1303 Hd.sh.	- 2742 Sst.
										- 1323 Gy.sh.	- 2873 Sst.& p.cl.
11202	E143° 9'		W.North		260	156	12000	B		0 - 2 Bk.soil.	- 250 Gy.sh.
-	S21°46'		1948		406					- 6 Rk.	- 260 Dk.gy.sst.
AKUNAM										- 36 Y.sh.	- 266 Hd.wh.rk.
										- 41 Rk.	- 278 Gy.sh.
										- 80 Y.sh.	- 290 Dk.gy.sst.
										- 115 Gy.sh.	- 310 Gy.sh.
										- 118 Gy.rk.	- 355 Gy.cl.
										- 150 Gy.sh.	- 376 Gy.sh.
										- 153 Gy.rk.	- 380 Dk.gy.sst.
										- 167 Gy.sh.	- 390 Gy.sh.
										- 178 Br.sh.	- 392 Gy.rk.
										- 180 Gy.rk.	- 400 Dk.gy.sst.
										- 188 Gy.sst.	- 420 Gy.sst.
										- 190 Gy.s.rk.	- 422 Sy.cl.
										- 205 Gy.sh.	- 430 Gy.sh.
										- 207 Rk.	- 445 Dk.gy.sst.
										- 212 Gy.sh.	- 451 Sy.cl.
										- 215 Gy.rk.	- 453 S.rk.

A	B	C	D	E	F	G	H	I	J	K
11265 Beauly BEAULY	E143°33' S21°47'		P.V.North 1948	- 143	151 421	98	14200 (1948)			0 - 2 Bk.soil. - 17 Y.sh. - 20 Bld. - 53 Y.sst. - 80 Bk.sh. - 130 Gy.sh. - 132 Gy.rk. - 151 Gy.sy.sh. - 165 Dk.gy.sst. - 200 Gy.sst. - 203 Dk.gy.rk. - 211 Gy.sh. - 240 Sy.gy.cl. - 244 Wh.s.rk. - 251 Wh.sy.cl. - 254 Wh.sy.rk. - 275 Gy.cl. - 301 Gy.sy.cl. - 304 Wh.rk. - 321 Gy.sy.cl. - 338 Gy.puggy cl. - 352 Hd.s.rk. - 421 Gy.puggy cl. - 425 Gy.sst.
11269 - LUCKHAM	E143°21' S22°		R.Blackwell 1948	137 180	250 350		14880 (1948)	F		0 - 2 Su.soil. - 5 Top rk. - 23 Y.cl. - 25 Rk. - 50 Y.cl. - 55 Sh.w.coal sms. - 63 Sy.sh. - 67 Sst. - 75 Rk. - 85 S.rk. - 93 Sy.sh. - 176 Sh. - 177 Rk. - 180 Sh. - 190 Sy.sh. - 205 Sh. - 215 Sy.sh. - 230 Sh. - 250 sy.sh. - 268 Sh. - 270 Rk. - 290 Sy.sh. - 329 Sh. - 339 Sy.sh. - 341 Rk. - 350 Sy.br.sh. - 360 Sy.sh. - 368 Sy.p.cl. - 370 Rk. - 380 Sh. - 388 Sy.p.cl. - 398 Sh. - 399 Rk. - 402 P.cl.

A	B	C	D	E	F	G	H	I	J	K		
11272	E143°36'		A.E.& E.M.	60	120					0 - 2 Su.soil.	- 130 Sy.p.cl.	- 275 Sy.p.cl.
-	S21°45'		Blackwell							- 25 Y.cl.	- 155 Sy.sh.	- 290 Sh.
MANUKA			1948	145	155	65	7200(1948)	S		- 27 Sst.	- 165 Gn.sst.	- 297 Rk.
							8000			- 45 Y.cl.	- 166 Rk.	- 306 Sy.p.cl.
										- 60 Sh.	- 177 Sy.p.cl.	- 313 Sh.
										- 70 Sy.sh.	- 180 Sh.	- 314 Rk.
										- 71 Rk.	- 200 Sy.p.cl.	- 318 Sy.p.cl.
										- 73 Sy.sh.	- 228 Sh.	- 320 Sh.
										- 77 Rk.	- 230 Rk.	- 322 Rk.
										- 82 Sy.sh.	- 243 Sh.	- 334 Sh.
										- 83 Rk.	- 245 Rk.	- 338 Sy.p.cl.
										- 92 Sy.sh.	- 253 Sy.p.cl.	- 374 Sh.
										- 94 Rk.	- 255 Rk.	- 383 Sy.p.cl.
										- 120 Sy.sh.	- 260 Sh.	- 384 Rk.
												- 385 Sh.
11273	E143°26'		A.Blackwell	80	190		11420			0 - 2 Su.soil	- 222 Rk.	- 296 Br.sh.
-	S21°57'		1948	160			(1948)			- 65 Sy.y.cl.	- 224 Sy.sh.	- 299 Rk.
THORDALE										- 160 Sy.sh.	- 225 Rk.	- 327 Sh.
										- 190 Sh.	- 228 Sy.sh.	- 329 Rk.
										- 210 Sy.sh.	- 229 Rk.	- 379 Sh.
										- 220 Sh.	- 285 Sh.	- 380 Rk.
												- 400 Sh.
11328	E143° 7'		1949	123	295-310	132	14000			0 - 3 Soil	- 212 Sy.sh.	- 440 Sh.
-	S21°48'				610-628	123	(1949)			- 8 Y.cl.	- 215 Rk.	- 445 Sy.p.cl.
CORALTON										- 10 Rk.	- 225 Sy.p.cl.	- 451 Sh.
										- 35 Y.cl.	- 228 Rk.	- 453 Rk.
										- 38 Rk.	- 238 Sy.p.cl.	- 461 Sh.
										- 45 Y.s.	- 245 Sy.sh.	- 463 Rk.
										- 78 Sst.	- 246 S.& p.cl.	- 555 Sh.
										- 80 Rk.	- 248 Rk.	- 560 Sy.sh.
										- 117 Sy.sh.	- 263 Sy.p.cl.	- 565 Sh.
										- 121 Rk.	- 264 Rk.	- 585 Sy.p.cl.
										- 141 Sh.	- 280 Sy.p.cl.	- 586 Rk.
										- 151 Sy.sh.	- 283 Rk.	- 610 Sh.
										- 156 Bl.sh.	- 300 Sy.p.cl.	- 628 Sy.sh.
										- 166 Sh.	- 361 Sh.	- 630 Rk.
										- 167 Rk.	- 363 Rk.	- 638 Sh.

A	B	C	D	E	F	G	H	I	J	K
11329 - WOOLFIELD	E143°44' S21°48'		1949							
11356 - MENTONE	E143°36' S21°41'		W.G.North 1949		145 200	145	Soak 1200			0 - 3 Bk.soil - 82 Y.sh. - 86 Gy.rk. - 87 Y.sst. - 145 Gy.sh. - 147 Dk.gy.sst. - 151 Gy.rk. - 164 Gy.sst. - 166 Gy.rk. - 180 Gy.sh. - 184 Wh.s.rk. - 201 Gy.sst. - 203 Hd.s.rk. - 219 Gy.sh. - 222 Hd.gy.rk. - 235 Hd.gy.rk.& sst. layers. - 305 Gy.sh. - 308 Gy.rk. - 395 Gy.sh. - 400 Bl.sh. - 410 Bl.cl. - 440 Gy.sh. - 480 Bl.cl. - 490 Bl.sh. - 600 Gy.sh.
11405 No. 2 HAZELWOOD	E143°53' S21° 3'	960	Godfrey Bros. 1949	Su.(1949) 19	928 959-993	300 Su.	900(flow) 22000(pump) (1949)	F		0 - 2 Su.soil. - 40 Y.cl.w.gvl. - 42 rk. - 92 Bl.sh. - 96 Bl.sh.w.lge.sts. - 210 Bl.sh. - 767 Sh.of var.col. - 890 Gy.sh. - 913 Gy.sh.w.lay.s. - 918 Gy.sh.& gn.sst. - 928 S.w.lay.of sst. - 977 Sst.&.s. - 986 Sh.& sst. - 993 Br. ?
11417 - CORALTON	E143°11' S21°49'		A.Blackwell 1949	146 250	500-515	146	7920 (1949)	F		0 - 3 Soil - 60 Y.cl. - 65 Y.sst. - 80 Sy.cl.& coal. - 100 Sh. - 180 Gy.s.rk. - 190 Sy.p.cl. - 215 Sh. - 248 Br.sh. - 249 Rk. - 274 Br.sh. - 335 Sy.sh. - 350 Br.sh. - 485 Sh. - 490 Rk. - 515 Gn.sy.sh. - 550 Sh. - 560 Sy.sh. - 585 Sh. - 605 Br.sh. - 618 Sy.p.cl. - 623 Sh. - 626 Rk. - 650 Sh.

A	B	C	D	E	F	G	H	I	J	K
11440 - ROSEBURN	E143° 3' S21°41'		W.North 1949	168	572	168	12000	B		0 - 3 Bk.soil. - 6 Rk. - 60 Y.sh. - 62 Rk. - 80 Y.sh. - 140 Gy.sh. - 144 Rk. - 162 Gy.sh. - 164 Hd.rk. - 210 Gy.sh. - 212 Gy.rk. - 242 Gy.sh. - 248 Rk. - 283 Gy.sh. - 285 Bl.cl. - 286 Rk. - 321 Gy.sh. - 360 Gy.pug.sh. - 390 Gy.sh. - 400 Gy.cl. - 410 Gy.pug.sh. - 422 Gy.sh. - 426 Gy.cl. - 460 Gy.sh. - 490 Lt.gy.pug.sh. - 538 Bl.puggy cl. - 540 Gy.sh. - 564 Bl.puggy cl. - 572 Gy.puggy cl. - 575 Wh.rk. - 630 Gy.puggy cl.
11444 House STRATHTEE	E143°46' S21°44'		1949		144	133	960			0 - 3 Bk.soil - 51 Y.sh. - 64 Y.sst. - 106 Hd.gy.sh. - 110 Gy.rk. - 140 Hd.gy.sh. - 151 Dk.gy.s. - 170 Dk.gy.sh. - 336 Gy.sh. - 371 S.& gy.sh. - 564 Gy.sh.
11470 "The Ranch" THE RANCH	E143°27' S21°50'		A.&E.Blackwell 1949		185-265	135	7700(1919) 4500(1962)			0 - 3 Su.soil - 45 Y.cl. - 47 Rk. - 70 Y.cl. - 107 Sh. - 109 Rk. - 138 Sh. - 140 Rk. - 179 Sh. - 184 Gy.sst. - 187 Rk. - 198 Sst. - 204 Rk. - 249 Sst. - 251 Rk. - 265 Sst. - 280 Sy.sh. - 295 Sh. - 324 Sy.p.cl. - 325 Rk. - 330 Sst. - 347 Sy.p.cl. - 355 Rk. - 370 Sy.p.cl. - 450 Sh.

A	B	C	D	E	F	G	H	I	J	K
11486 - CASSILIS	E143° 1' S21°17'	760	1950	20 75	1888 1921	20	7200 (1950)	F		0 - 10 Soil - 85 Y.cl. - 1888 Sh. - 1900 Sst. - 2000 Layers cl, sh.& sst.
11490 - WYORA	E143° 6' S21°57'		W.North 1949	107	147-166 419	107	14880 (1950)	B		0 - 2 Bk.soil - 12 Y.sst. - 51 Y.sh. - 86 Gy.sh. - 92 Hd.wh.sst. - 102 Gy.sh. - 119 Gy.sst. - 129 Bk.sh. - 136 Br.sh. - 145 Dk.gy.sh. - 146 Gy.sh. - 166 Gy.sst. - 256 Gy.sh. - 258 Bk.rk. - 266 Bl.cl. - 280 Bl.sy.cl. - 285 Hd.wh.rk. - 286 Bl.sy.cl. - 291 Hd.wh.rk. - 308 Hd.gy.sh. - 312 Hd.wh.rk. - 328 Hd.bk.sh. - 337 Hd.sst. - 339 S.rk. - 350 Gy.sh. - 360 Lt.br.sh. - 385 Br.sh. - 415 Lt.br.sh. - 426 Dk.gy.sst. - 433 Gy.sh. - 435 Gy.rk. - 456 Gy.sh.
11567 - ENRYB DOWNS	E143°33' S21°58'		W.G.North 1949	160 198						0 - 3 Bk.soil. - 31 Y.sh. - 35 S.rk. - 53 Y.sh. - 72 Bl.sh. - 76 Hd.bl.rk. - 125 Gy.sy.sh. - 129 Gy.s.rk. - 151 Gy.sy.sh. - 153 Gy.s.rk. - 189 Gy.sy.sh. - 193 Hd.s.rk. - 210 Gy.sst. - 231 Gy.sy.sh. - 232 Hd.s.rk. - 263 Gy.sst. - 264 S.rk. - 280 Gy.sst. - 293 Br.sh. - 294 Wh.rk. - 335 Lt.br.sh. - 336 Gy.s.rk. - 355 Gy.sy.sh. - 436 Gy.pug.sh. - 438 Wh.s.rk. - 476 Gy.sst. - 477 Gy.sy.sh. - 503 Gy.sst.

A	B	C	D	E	F	G	H	I	J	K
11620 - WILFRED DOWNS	E143°59' S21°21'	931	Western Drillers 1950	SA.	845-850) 1280-1290) 1337-1340)	Su.	22000 (1950)	F		0 - 3 Bk.subsoil. - 67 Y.cl. - 230 Gy.sh. - 395 Br.sh. - 810 Gy.sh. - 825 Gn.sst. - 845 Gy.sh. - 850 S. - 1030 Gy.sst. - 1155 Br.& gy.sh. - 1230 Gy.sst. - 1235 Br.& gy.sh. - 1280 Gy.sst. - 1290 Sst. - 1337 Gy.sst. - 1340 S. - 1405 Gvly.br.sh. - 1435 Br,sst. - 1440 Wh.sst. - 1450 Wh.cl. - 1500 Br.& gy.sh.
11635 Tarvano TARVANO R'WAY SIDING	E143°28' S21°36'	877	1954	82 210	2132 2167 2185	100 90 82	43200 (1954)			0 - 3 Su.soil. - 30 Y.sh. - 33 Blds. - 60 Y.sh. - 102 Gy.sh. - 137 Gy.sy.ch. - 1106 Bl.sh. - 1137 Hd.bk.sh. - 1213 Bl.sh. - 1260 Bl.gy.sh. - 1350 Gy.sh.sms.sst. - 1465 Gy.sh. - 1485 Puggy gy.sh. - 1505 Gy.& br.sh. - 1600 Gy.sh. - 1660 Tough gy.sh. - 1730 Gy.sh. - 1750 Gy.sy.sh. - 1860 Crumbly gy.sh. - 1865 Gn.sst. - 1950 Gy.sh. - 1965 Crumbly sh. - 2032 Gy.sh. - 2036 Hd.gy.rk. - 2090 Gy.sh.thin bds.sst. - 2132 Gy.sh. - 2140 F.wh.s. - 2167 S.cl. - 2185 Sst. - 2220 Rd.marl. - 2280 Sy.cl. - 2290 Wh.sst. - 2309 Wh.honeycomb sst. - 2328 Sy.p.cl.
11681 - WILLFRED DOWNS	E143°57' S21° 2'		Western Drillers 1952					F		0 - 12 Cl. - 60 Cl.& sh. - 812 Sh. - 885 Sst. - 1008 Sh. - 1088 Marl. - 1165 Soft sst. & sh.

A	B	C	D	E	F	G	H	I	J	K
11737 Stamford Railway –	E143°48' S21°16'	963	Western Drillers 1951		1550-1703	132				0 – 3 Cl. – 52 Sst.& y.cl. – 59 Gy.rk. – 70 Gy.sh. – 94 Gy.rk. – 107 Gy.sh. – 109 Sst. – 200 Gy.sh. – 211 Hd.gy.sh. – 920 Gy.sh. – 1020 Dk.sh. – 1400 Gy.sh. – 1536 Bk.sh. – 1550 Choc.sh. – 1567 Sst. – 1588 Wh.sst. – 1600 Bk.sst. – 1630 Br.sh. – 1710 Gy.sst. – 1850 Br.sh.
11760 No.20 CRESSY	E143°51' S21°56'		W.G.North 1951	100 224	109-112 545	 100	2000 6000			0 – 1 Soil – 60 Y.sh. – 62 Rk. – 80 Y.sh. – 106 Gy.sh. – 109 Gy.rk. – 112 Gy.s. – 543 Gy.sh. – 545 Gy.rk. – 571 Dk.gy.s.
11761 No.21. CRESSY			W.G.North 1950	71	110-120 202-211 360-374	 71	2000 600 1900			0 – 3 Bk.soil. – 32 Y.sh. – 34 Bld. – 54 Y.sh. – 110 Gy.sh. – 120 Gy.sst. – 122 Gy.rk. – 172 Bl.sh. – 183 Gy.sh. – 198 Bl.cl. – 202 Gy.sh. – 211 Soft gn.sst. – 241 Bl.cl. – 302 Bl.cl. – 360 Gy.cl. – 374 Soft sst. – 376 S.rk. – 400 Gy.marl.
11875 – LANIFER	E143°14' S21°57'		A.Blackwell 1951	121	350 475	121 121	12960 (1951)			0 – 2 Su.soil. – 75 Y.cl. – 77 Rk. – 165 Sy.sh. – 168 Rk. – 177 Gy.sh. – 178 Rk. – 265 Gy.sh. – 294 Sy.sh. – 296 Rk. – 315 Br.sh. – 347 Sy.sh. – 348 Rk. – 400 Sy.sh. – 442 Gy.sh. – 444 Rk. – 460 Gy.sh. – 500 Sy.sh.

A	B	C	D	E	F	G	H	I	J	K	
12039 No. 3 WILLFRED DOWNS	E143°57' S21° 2'	911	Western Drillers 1952		812 1165 1270 1320	50 30 30	151710 (1952)	F		0 - 3 Bk.soil. - 50 Y.cl. - 195 Bl.sh. - 812 Gy.sh. - 850 Sst. - 970 Hd.sst. - 1045 Marl. - 1082 Marl - 1102 Marl - 1110 Sst. - 1120 Gy.sh.	- 1140 Sst. - 1160 P.cl. - 1165 Sst. - 1180 Gy.sh. - 1210 Sst. - 1230 P.cl. - 1270 S.cl. - 1330 Sst. - 1320 Br.sh. - 1335 Sst. - 1345 Gy.sh.
12070 - KNAPDALE	E143°18' S21°53		A.Blackwell 1951	110 200	125 480	115 110	11520 (1951)			0 - 3 Su.soil. - 55 Y.cl. - 56 Rk. - 70 Y.cl. - 72 Rk. - 130 Bl.sst. - 155 Sy.sh. - 165 Gy.sh. - 198 Br.sh. - 205 sst. - 208 Wh.sst. - 225 Gy.sh.	- 245 Sst. - 250 Br.sh. - 255 Hd.gy.sst. - 270 Sy.sh. - 290 Gy.sst. - 310 Sy.sh. - 320 Sst. - 415 Gy.sh. - 450 Br.sh. - 480 Gy.sy.sh. - 520 Sy.sh. - 550 Gy.sh.
12086 - CAMBERWARRA	E143°20' S21°45'		A.Blackwell 1951	140 200	145 285	 140	Soak 11520	F		0 - 3 Su.soil - 65 Y.cl. - 70 Rk. - 85 Y.cl. - 87 Rk. - 105 Y.cl. - 110 Rk. - 115 Sy.sh. - 150 Sy.gy.sh.	- 155 Rk. - 165 Bk.sh. - 190 Bk.sy.sh. - 192 Rk. - 205 Bk.s. - 350 Sy.gy.sh. - 351 Rk. - 353 Bl.sh.

A	B	C	D	E	F	G	H	I	J	K
12283 - CAMBERWARRA	E143°21' S21°45'	793	A.Blackwood 1953	150	223) 345) 605)	150	9000	G		0 - 3 Su.soil. - 20 Blds. - 70 Y.sh. - 80 Coal sh. - 100 Sy.sh. - 105 Gy.rk. - 125 Sy.sh. - 145 Gy.sh. - 150 Gy.rk. - 175 Sy.sh. - 180 Gy.rk. - 215 Sy.p.cl. - 223 Br.sh. - 228 Gy.rk. - 265 Gy.sh. - 268 Gy.rk. - 280 Sy.sh. - 290 Sst. - 293 Gy.rk. - 305 Sst. - 345 Gy.sh. - 350 Gy.sst. - 355 Gy.sh. - 363 Gy.rk. - 380 Gy.sh. - 385 Gy.sst. - 415 Gy.sh. - 423 Gy.rk. - 440 Gy.sh. - 445 Gy.rk. - 600 Gy.sh. - 602 Gy.rk. - 605 Sst. - 607 Gy.rk. - 635 Gy.sh. - 640 Gy.rk. - 700 Gy.sh.
12320 No. 3 EYRIEWALD	E143°49' S21°58'		A.& M.Stower 1953	150(1953) 300	283 320 330	250 150	<2000 5760	B		0 - 3 Su.soil. - 14 Y.sh. - 70 Y.slippery back. - 90 Y.sh. - 92 Gy.rk. - 211 Gy.sh. - 215 Gy.rk. - 280 Sy.sh. - 283 Gy.rk. - 290 Gy.sst. - 320 Sy.sh. - 330 Gy.sst. - 370 Sy.sh. - 440 Gy.sh. - 442 Gy.rk. - 466 Gy.sh. - 476 Sy.p.cl. - 525 Gy.sh.
12339 No. 2 MANUKA	E143°30' S21°42'		A.E. & E.M. Blackwell 1953	- 155	117-180	83	11520	B		0 - 4 Su.soil. - 12 Cl. - 13 Rk. - 30 - 55 Y.cl. - 100 Gy.sh. - 105 Gy.sst. - 115 Sy.sh. - 117 Rk. - 180 Sy.sh. - 197 Gy.sh. - 199 Rk. - 209 Sy.p.cl. - 217 Gy.sh. - 219 Rk. - 230 Sy.p.cl. - 253 Gy.sh. - 256 Rk. - 260 Gy.sh. - 263 Rk. - 267 Sh. - 285 Gy.sh(waddy). - 302 Gy.sh. - 305 - 315 Sy.p.cl. - 336 Gy.sh. - 338 Rk. - 400 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K
12780 - CRESSY	E143°42' S21°50'		A.E. & E.M. Blackwell 1951		406-420	186	5000			0 - 2 Su.soil. - 19 Y.cl. - 22 Rk. - 70 Y.cl. - 94 Br.cl. - 95 Rk. - 100 Br.cl. - 102 Rk. - 130 Sy.sh. - 142 Gy.sst. - 145 Rk. - 178 Gy.sst. - 190 Gy.sh. - 192 Sy.sh. - 193 Rk. - 203 Sh. - 213 Br.sh. - 249 Sy.sh. - 250 Rk. - 272 Gy.sh. - 322 Sy.sh. - 324 Sh. - 326 Rk. - 364 Gy.sh. - 365 Rk. - 370 Sy.sh. - 405 Sh. - 406 Rk. - 420 Sy.sh. - 440 Gy.sh. - 444 Sy.sh. - 449 Rk. - 512 Gy.sh. - 513 Rk. - 527 Sy.p.cl. - 530 Sy.sh. - 548 Gy.sh. - 551 Rk. - 561 Sh. - 570 Sy.p.cl. - 600 Gy.sh.
12806 - BROOKLYN	E142°51' S21°44'		North 1954	108 144	110 435	108	20952 (1954)	B		0 - 1 Br.sh. - 70 Y.sh. - 71 Bld. - 76 Y.sh. - 110 Gy.sh. - 127 Gy.sst. - 130 Gy.rk. - 181 Gy.sh. - 252 Br.sh. - 270 Gy.sh. - 272 Gy.rk. - 434 Gy.sh. - 435 Hd.gy.sh. - 437 Soft gn.s. - 464 Soft gn.s.& cl.

A	B	C	D	E	F	G	H	I	J	K
12807 - BROOKLYN	E142°48' S21°46'		North 1954	124	150 202 454	124	17280	B		0 - 3 Bk.soil. - 23 Y.sh. - 24 Bld. - 28 Y.sh. - 30 Bld. - 37 Y.sh. - 43 Y.sst. - 45 Bld. - 74 Y.sh. - 76 Bld. - 90 Bl.sh. - 97 Gy.rk. - 112 Gy.sst. - 115 Hd.gy.rk. - 118 Hd.gy.sst. - 119 Hd.gy.rk. - 130 Hd.gy.sst. - 150 Gy.sh. - 156 Br.sst. - 158 Hd.gy.rk. - 176 Bl.cl. - 178 Bld. - 198 Bl.rk. - 202 Gy.sh. - 210 Bl.sh. - 213 Gy.rk. - 260 Gy.sh. - 263 Hd.gy.rk. - 278 Gy.sh. - 280 Gy.rk. - 292 Gy.sh. - 302 Gy.rk. - 325 Br.sh. - 328 Gy.s.rk. - 350 Br.sh. - 360 Gy.sh. - 454 Br.sh. - 468 Br.sst. - 470 Gy.rk. - 495 Gy.sh.
12808 Nesbitt MALBOONA	E143°34' S21°56'		Blackall Boring Co. 1955		140 275) 506) 530)	115	Soak 10800	 S " "		0 - 5 Su.soil. - 35 Y.& gy.cl. - 40 Br.& gy.sh. - 55 Fy.sy.sh. - 57 Gy.s.rk. - 140 Gy.sst.& sh. - 148 Gy.sst. - 150 Gy.rk. - 185 Gy.sst.& sh. - 187 Gy.rk. - 237 Gy.sy.sh. - 260 Gy.sst.& sh. - 275 Gy.sy.sh. - 300 Gy.sst.cvg. - 360 Gy.sst. - 361 Gy.rk. - 370 Gy.sst.& sh. - 383 Gy.sh. - 385 Gy.rk. - 430 Br.& gy.sh. - 530 Gy.sst.& sh. - 532 Gy.rk. - 545 Gy.sst. - 560 Gy.sh. - 580 Gy.sst.& sh. - 600 Gy.sy.sh.

A	B	C	D	E	F	G	H	I	J	K
12907 - BERNFELS	E142°36' S21°53'		1955	225 280	280	225	5280	P		0 - 3 Su.soil. - 11 Y.cl. - 34 Y.sst. - 92 Y.cl. - 98 Bl.cl. - 108 Gy.rk. - 120 Gy.sy.sh. - 129 Gy.sh. - 145 Gy.sy.sh. - 149 Br.sh. - 162 Gy.sy.sh. - 166 Gy.rk. - 178 Gy.sy.sh. - 182 Gy.rk. - 220 Gy.sy.sh. - 223 Gy.rk. - 235 Gy.sy.sh. - 275 Gy.sh. - 305 Gy.sy.sh. - 325 Gy.sh.
12991 - WANORA DOWNS	E142°32' S21°41'		H.Stockham 1955		320 465 520	200 200 200	8400 (1955)	P		0 - 2 Su.soil. - 60 Y.cl. - 158 Y.sst.& coal sms. - 160 Bl.cl. - 184 Gy.sy.sh. - 278 Gy.sh. - 290 Gn.sy.sh. - 292 Gy.rk. - 308 Gy.sh. - 320 Br.sh. - 360 Gy.sh. - 400 Gy.sy.sh. - 408 Gy.rk. - 440 Gy.sy.sh. - 460 Gy.sh. - 550 Gy.sy.sh. rk.sms.
13258 - WEEBA	E143°29' S21°53'		Stower 1956	133 196	187 347	133	10824 (1956)	P		0 - 4 Su.soil. - 75 Y.sh.& rk. - 103 Gy.sh. - 105 Gy.rk. - 120 Gy.sh. - 122 Gy.rk. - 183 Gy.sh. - 185 Gy.rk. - 197 Gy.sst. - 242 Gy.sh. - 245 Gy.rk. - 315 Gy.sh. - 327 Sy.p.cl. - 330 Gy.rk. - 347 Sy.p.cl. - 350 Gy.rk. - 436 Gy.sh.
13264 Thalia RICHMOND SHIRE	E142°54' S21°11'	669	Western Drillers 1957	Flowing	1825) 1840) 1850)	Su.	Trickle 12000 62000	F		0 - 8 Bk.soil. - 105 Y.sh. - 156 Gy.sh.hd.sms. - 220 Sy.gy.sh. - 540 Gy.sh. - 570 Sy.gy.sh. - 1020 Gy.sh. - 1035 Sy.gy.sh. - 1205 Gy.sh. - 1250 Gritty gy.sh. - 1340 Br.sh. - 1500 Gy.sh. - 1560 Gn.-gy.sh. - 1820 Gy.sh. - 1825 Sy.gy.sh. - 1900 S.rk. - 1905 Coal. - 1908 S.rk.

A	B	C	D	E	F	G	H	I	J	K	
13344 - VENTURE DOWNS	E143°17' S21°39'		A.Stower 1957		165 325	150 135	11500	P		0 - 2 Su.soil. - 75 Y.sh. - 76 Gy.rk. - 95 Y.sh. - 115 Gy.sh. - 116 Gy.rk. - 165 Gy.sh. - 185 Gy.sst. - 190 Gy.rk.	- 225 Sy.sh. - 288 Gy.sh. - 295 Gy.rk. - 325 Gy.sh. - 340 Gy.sst. - 343 Gy.rk. - 355 Sy.sh. - 383 Gy.sh.
13388 - VENTURE DOWNS	E143°12' S21°40'		A.Stower 1957	120	135 250 362 425	130 130 120 120	11500	B B Fair Fair		0 - 3 Su.soil - 15 Y.sh. - 80 Y.sh.& blds. - 92 Gy.sh.rk.sms. - 115 Br.sh. - 135 Gy sh. - 140 Gy.sst. - 167 Gy.sh. - 173 Gy.rk. - 215 Gy.sh. - 220 Gy.rk.	- 250 Gy.sh. - 255 Gy.sst. - 260 Gy.rk. - 300 Sy.sh. - 315 S.rk. - 360 Sy.sh. - 362 Gy.rk. - 372 Gy.sst. - 400 Gy.sh. - 425 Sy.sh. - 435 Gy.sst. - 440 Sy.p.cl. - 470 Gy.sh.
13440 - SANDALWOOD	E143°59' S21°36'	890	H.Bode 1957	65(1957) 110'	1772 2455	130 65	19200 (1957)	F		0 - 4 Bk.soil - 54 Y.sh. - 270 Gy.sh. - 274 Rk. - 1176 Gy.sh. - 1285 Dk.gy.sh. - 1653 Gy.sh. - 1743 Dk.gy.sh.	- 1772 Gy.sh.& qtz. - 1816 Sst. - 1850 Marl. - 1880 Sy.p.cl. - 2117 Marl. - 2125 Sy.gy.rk. - 2455 Gy.sy.rk. - 2477 Sst.

A	B	C	D	E	F	G	H	I	J	K
13445 - AKUNAM	E143° 6' S21°44'		A.Stower 1957	140	150) 350) 600)	140	1000 8600 10000	B		0 - 4 Su.soil. - 60 Y.sh. - 65 Gy.rk. - 90 Y.sh. - 130 Gy.sh. - 135 Coal sh. - 150 Gy.sh. - 155 Gy.rk. - 175 Sy.sh. - 195 S.rk. - 242 Gy.sh. - 245 Gy.rk. - 297 Gy.sh. - 300 Gy.rk. - 346 Gy.sh. - 350 Gy.rk. - 375 Gy.sst. - 400 Gy.sh. - 415 Sy.sh. - 467 Gy.sh. - 470 Gy.rk. - 485 Sy.p.cl. - 570 Sy.sh. - 598 Gy.sh. - 600 Gy.rk. - 615 Gy.sst. - 656 Gy.sh.
13651 - COORABELLE	E143°42' S21°42'		J.James 1958	150 308	185 360 420		2400 increase 5760	F		0 - 3 Soil. - 13 Cl.& blds. - 105 Y.cl. - 345 Gy.sh. - 375 S.sh.& sst. - 420 Waddy sh. - 435 Hd.rk.& waddy sh.
13726 - BROOKLYN	E142°46' S21°48'		H.Stockham 1958	115	258 450	115	9600	S		0 - 4 Su.soil. - 62 Sy.y.cl. - 88 Sy.y.cl.& sst.seams. - 95 Gy.sy.sh. - 120 Gy.sh. - 129 Gy.sy.sh. - 189 Gy.sh. - 208 Gy.sy.sh. - 258 Gy.sh. - 265 Gy.sy.sh. - 268 Rk. - 288 Gy.sh. - 290 Rk. - 333 Gy.sh. - 345 Gy.sy.sh. - 349 Rk. - 412 Gy.sy.sh. - 450 Gy.sh. - 462 Gy.sy.sh. - 478 Gy.sh.

A	B	C	D	E	F	G	H	I	J	K
13727 - BROOKLYN	E142°51' S21°46'		H.Stockham 1958	133	255 460	133	11040 (1958)	S G		1 - 3 Su.soil. - 70 Y.cl. - 73 Rk. - 92 Sy.y.cl. - 98 Gy.sy.sh. - 110 Gy.sh. - 122 Gy.sy.sh. - 142 Gy.sh. - 150 Gy.sy.sh. - 160 Gy.sh. - 162 Rk. - 223 Gy.sh. - 235 Gy.sy.rk. - 247 Gy.sh. - 265 Gy.sy.sh. - 270 Gy.sh. - 283 Rk. - 309 Gy.sy.sh. - 332 Gy.sh. - 335 Rk. - 370 Gy.sh. - 372 Rk. - 394 Gy.sy.sh. - 423 Gy.sh. - 443 Gy.sy.sh. - 446 Rk. - 492 Gy.sy.sh. - 500 Gy.sh.
13788 - RAELEE DOWNS	E143° 3' S21°37'		P.Mann 1958		155	124	Soak	S		0 - 3 Top soil. - 75 Y.sh. - 82 Gy.rk.& br.cl. - 110 Gy.sh. - 155 Sy.gy.sh. - 160 Sy.gn.sh. - 189 Gy.sh. - 191 Hd.gy.rk. - 214 Soft gy.sh. - 241 Sy.gn.sh. - 257 Hd.gy.sh. - 310 Gn.& gy.sh. - 322 Hd.gy.sh. - 342 Gy.sh. - 346 Hd.gy.rk. - 400 Waddy gy.sh. - 416 Cvg.gy.sh. - 419 Gy.rk. - 453 Cvg.gy.& bk.sh. - 476 Waddy gy.sh. - 479 Gy.rk. - 720 Waddy gy.sh.
13790 - BELFIELD	E142°59' S21°50'		A.Stower 1958	98	130 385 530	98	4000 6000 11520 (1958)	G P B		0 - 4 Su.soil. - 50 Y.sh.& blds. - 130 Gy.sh. - 138 Gy.sst. - 140 Gy.rk. - 195 Gy.sst. - 295 Gy.sh. - 297 Gy.rk. - 371 Gy.sh. - 375 Gy.rk. - 415 Br.sh.& s. - 490 Gy.sh. - 491 Gy.rk. - 520 Sy.sh. - 523 Gy.rk. - 530 Sy.sh. - 535 Gy.sst. - 550 Sy.sh. - 555 Gy.rk. - 570 Sy.sh.

A	B	C	D	E	F	G	H	I	J	K
13811 - HARWOOD	E143°57' S21°59'		H.Bode 1958		180	150	2160 (1958)	G		0 - 4 Bk.soil - 50 Y.sh. - 110 Sy.cl. - 114 Gy.sh. - 170 Sy.cl. - 190 Gy.sy.cl. - 350 Br.sh.
13848 - CATUMNAL	E143°57' S21°51'		Ebner & Bode 1958		204	soak	100	S		0 - 4 Bk.soil - 4½ Rk. - 22 Y.sh. - 25 Rk. - 55 Gy.sst. - 76 Br.sst. - 108 Gy.sst. - 204 Br.sh. - 207 Gy.sst. - 210 Rk. - 320 Br.sh.
13869 - ESSEX DOWNS	E142°58' S21° 3'	710	R.Beauchamp 1959	Flowing	1520) 1550) 1732) 1864) 2040) 2072)	Su.	50000 69000 92000 160000 293000 (1959)	G		0 - 4 Soil. - 32 Br.sh. - 76 Y.sh. - 94 Gy.sh. - 796 Bl.sh. - 902 Bk.sh. - 964 Br.sh. - 1304 Bl.sh. - 1312 Gy.sh.& sst. - 1360 Gy.sh. - 1420 Bl.sh. - 1452 Bl.sh.& s.sms. - 1494 Bl.sh.& sst. - 1520 Bl.sh.& s. - 1560 Wh.sst. - 1620 Wh.sst.& cl. - 1632 Wh.sst. - 1672 Wh.cl.& sst. - 1676 Rd.sst. - 1732 Wh.sst. - 1744 Wh.cl. - 1764 Wh.cl.& sst. - 1920 Wh.sst. - 1928 Bl.sh. - 1938 Purple sh. - 1984 Wh.cl. - 1988 Wh.cl.& sst. - 2072 Wh.sst.
13914 - MANUKA	E143°35' S21°46'		1959		100 240	85	soak 1500	B		0 - 3 Bk.soil - 29 Y.sh. - 30 Rk. - 56 Y.sh. - 57 Rk. med. hdness. - 95 Bl.sh. - 166 Sy.bl.sh. - 167 Rk. - 200 Sy.bl.sh. - 216 Lt.br.sh., wadding. - 221 Gn.sh. - 224 Rk.soft. - 235 Gn.sh. - 275 Gn.sh.sl.s. - 279 Lt.br.sh, wadding. - 303 Br.sh.gn. patches. - 310 Br.sh. - 311 Rk.fairly soft - 329 Bl.sy.sh. - 330 Rk. - 350 Br.sh. clogging. - 360 Gy.sh. - 367 Br.sh. - 368 Rk. - 373 Br.sh. - 375 Rk. - 379 Br.sh. - 380 Rk. - 395 Br.sh.

A	B	C	D	E	F	G	H	I	J	K
13923 Catumnal CATUMNAL	E143°58' S21°52'		J.Stout to 2225 N.Watts to T.D. (1961)		2145 2745	85 55	* 14400 (1961) 67200 * drew down to 400'.	F		0 - 2 Top soil. - 46 Y.cl. - 76 Sy.sh. - 159 Gy.sh. - 168 Gy.rk. - 1590 Gy.sh. - 1630 Lt.br.sh. - 1690 Gy.sh. - 1720 Br.sh. - 2145 Gy.sh. - 2175 Gy sst. - 2225 Br.cl. - 2305 Gy.mudst. - 2375 Br.mudst. - 2470 Gy.mudst. - 2550 Br.mudst. - 2600 Gy.mudst. - 2665 Br.mudst. - 2745 Gy.mudst. - 2946 Gy.sst.
13967 - MANUKA	E143°36' S21°47'		1959		148 207	113 110	7200	P B		0 - 4 Subsoil. - 25 Y.cl. - 58 Y.sy.cl. - 66 Y.sst. - 72 Hd.sst. - 85 Sst. - 148 Bl.cl. - 150 Gy.sst. - 152 Gy.sy.cl. - 159 Sy.sh. - 162 Sst. - 170 Sy.sh. - 204 Sst. - 207 Hd.st. - 224 Sst. - 227 Bl.sh.
13980 - CRESSY	E143°45' S21°54'		Shepherd 1959	110	152 167 198	143 110	7900	B		0 - 18 Sst. - 19 Gy.rk. - 55 Y.sh. - 110 P.cl. - 133 Bk.mud - 136 Soft Rk. - 141 Bk.mud. - 151 Br.sh. - 152 S. - 165 Gy.sy.sh. - 168 Rk.& sst. - 197 Gn.sy.sh. - 201 Rk.& sst. - 224 Gn.sy.sh. - 250 Gy.sh. - 300 P.cl.
14038 - MANUKA	E143°36' S21°44'		Lobby 1959		119 239	82	13200	P		0 - 3 Subsoil. - 5 Y.sy.cl. - 19 Sy.cl. - 29 Sst. - 30 St. - 54 Sy.cl. - 60 Sst. - 62 Cl. - 75 Hd.bl.cl. - 76 Hd.st. - 87 Hd.bl.cl. - 89 Hd.st. - 118 Sst. - 119 Hd.st. - 129 Sst. - 136 Bl.cl. - 145 Sy.sh. - 146 Hd.st. - 187 Sst. - 207 Bl.sh. - 205 V.hd.st. - 210 Sst. - 214 Hd.st. - 221 Sst. - 238 Hd.bl.cl. - 239 Hd.st. - 256 Sst. - 260 Sy.sh. - 300 Bl.sh.

A	B	C	D	E	F	G	H	I	J	K
14084 - WIRILLA	E143° 1' S21°47'		Shepherd 1960	100 280	105 368	100	8640	P		0 - 3 Br.soil - 51 Y.sh. - 103 Gy.sy.sh. - 141 P.cl. - 142 Rk. - 210 Gy.sy.sh. - 242 P.cl. - 288 Gy.sy.sh. - 289 Rk. - 308 Bl.sy.sh. - 318 Br.sh. - 362 Bl.sy.sh. - 365 Rk. - 384 Sst.& sh. - 425 Gy.s.& sh.
14125 CORFIELD TOWN BORE Deepened as Magellan Corfield No.1.	E143°22'30" S21°42'46"	L842	G.Johnson 1960 (to 2630) Magellan Petroleum Corporation (to T.D.)	71 $4\frac{1}{4}$" pump at 100.	170 240 300 1706 2378 3100 4125 4195	) 150) 240) 170) 160) 71) 71) 71)	Tested 2700 g.p.h. with draw down from 71 to 260	G		0 - 4 Qtz.s.dk.br. - 25 Rd.br.qtz.s. - 36 Dk.br.& gy.sst. - 55 Sy.mdst.rd.br. - 74 Y.br.& gy.sy. mdst.minor mica. - 119 Mdst.dk.br. - 135 Dk.gy.calc.sy. mdst. - 160 Dk.gy.mdst. - 210 Sy.mdst.dk.gy. calc. - 300 Lt.& dk.gy.calc. sy.mdst. - 450 Dk.gy.mdst.calc. hd.bnds. - 536 Br.gy.calc.sy. mdst. - 700 Dk.gy.v.calc.mdst. - 850 Dk.gy.calc.sy.mdst. some lst. - 1300 Dk.gy.calc.mdst. - 1716 Minor lst.+ _Inoceramus_. - 2520 Bl.calc.mdst. - 2550 Bk.calc.mdst. _Inoceramus_ - 2570 Bk.calc.mdst. - 2590 Bk.mdst._Inoceramus_. - 2620 Mdy.sst.bk.calc. - 2630 Sy.mdst.bk.non-calc. - 2650 Gy.carb.sh.w.sst. - 2700 Sst.& sist. - 2740 Sist gy. - 2745 Dk.gy.sh. - 2785 Gy.sst. - 2800 Wh.sist. - 2860 Wh.sst. - 2965 Lt.gy.sist. - 2885 Wh.sst. - 2915 Sist.gy.& sh. - 3290 Wh.sst. - 3305 Tan sst. - 3310 Br.& bk.lignite. - 3375 Wh.sst. - 3380 Br.& bk.lignite. - 3415 Wh.sst. - 3450 Bk.lignite & sst. - 3800 Wh.sst. - 3845 Wh.sst.w.rk. fragments. - 4015 Sst.w.sh. - 4035 Sist.& sh. - 4100 Wh.sst.& gn.sh. - 4120 Bk.lignite. - 4135 Wh.sst. - 4155 Coal. - 4195 Wh.sst. - 4250 Sst.& coal. - 4490 Sst.minor coal. - 4505 Gr. T.D. 4507'

<u>Note</u> Report on this bore is given by Evans (1962).

A	B	C	D	E	F	G	H	I	J	K
14479 Dud MANUKA	Not located.		1960		140	123	3300	P		0 - 3 Bk.soil. - 47 Y.sh. - 70 Gy.sh. - 94 Bl.sy.sh. - 170 Gy.sh. - 172 Rk. - 186 Br.sh. - 230 Gy.sh. - 255 Br.sh. - 257 Rk. - 308 Sy.sh. - 330 Gy.sh. - 390 Br.sh. - 392 Rk. - 420 Br.sh. - 422 Rk. - 428 Br.sh. - 436 P.cl. - 506 Bl.sh. - 519 Sy.sh. - 532 Dk.gy.sh. - 533 Rk. - 545 Br.sh. - 563 Gy.sh. - 564 Rk. - 600 Br.mud.
14977 - MALBOONA	E143°39' S21°56'		M.Shepherd 1961	174	172 286 542	174	11520	P		0 - 3 Bk.soil - 58 Y.sh. - 61 Rk. - 79 Y.sh. - 111 Gy.sh. - 115 Rk. - 131 Gy.sh. - 171 Sy.sh.& rk. sms. - 245 Gy.sh. - 286 Br.sh. - 297 Sst. - 307 Gy.sh. - 323 Sy.sh. - 328 Rk. - 379 Sy.sh. - 429 Sy.sh.& rk.sms. - 481 Br.mud. - 530 Sy.sh.& rk.sms. - 558 Sst. - 563 Hd.sy.sh. - 600 Gy.sh.
15060 - MANUKA	E143°34' S21°43'		M.Shepherd 1962	111	159-170 345-354	111 111	4000 13000	F		0 - 3 Bk.soil - 23 Y.sh. - 24 Rk. - 57 Sh.Y. - 126 Sy.sh. - 127 Rk. - 158 Md.sst. - 159 Rk. - 170 Sst.bl.gy. - 171 Rk. - 210 Sy.sh. - 211 Rk. - 320 Gy.sh. - 321 Rk. - 344 P.cl. - 345 Rk. - 354 Sst.bl.gy. - 384 Sy.sh. - 400 Bl.mud.

A	B	C	D	E	F	G	H	I	J	K
15151 House LANA DOWNS	E143° 6' S22°		Brown 1962	137	212 275 321	137		P		0 - 4 Top soil - 56 Y.sy.sh. - 132 Y.sst.& rk.sms. - 140 Gy.sst. - 173 Gy.sy.sh. - 195 Mdst. - 201 Rk. - 210 Gy.mdst. - 212 Rk. - 221 Gy.sst. - 345 Gy.sst. patches of rk.
15363 - CRESSY	E143°48' S21°49'	L.997	H. Bode 1962	140	180 360	140	7200	G		0 - 3 Soil - 60 Y.sh. - 82 Y.sh.rk.sms. - 87 Bl.sh. - 97 Br.sh. - 147 Gy.sh. - 185 Lt.gy.gritty sh. & rk.sms. - 280 Gy.sh. - 299 Sh.& rk.sms. - 330 Sh. - 383 Sy.gn.cl. - 390 Br.sy.cl. - 450 Bl.cl. - 455 Rk. - 550 Gy.sh. - 555 Rk. - 610 Gy.sh.
15364 - CRESSY	E143°51' S21°57'		H. Bode 1962				2400			0 - 4 Soil - 25 Y.sh. - 85 Y.sst. - 90 Rk. - 105 Bl.cl. - 242 Sy.gy.cl.& rk.sms. - 446 Gy.sh.& rk.sms. - 453 Hd.rk. - 463 Sy.gy.cl. - 550 Gy.sh.
U/R - CATUMNAL	E143°57' S21°51'		Ebner & Bode	92 -	149 204 309		380			0 - 3 Bk.soil - 6 Gy.rk. - 24 Y.sh. - 26 Gy.sh. - 28 Gy.rk. - 53 Lt.gy.sst. - 55 Gy.rk. - 110 Gy.sst. - 149 Br.sh. - 159 Gy.sst. - 170 Br.sh. - 174 Gy.rk. - 204 Br.sh. - 208 Gn.sst. - 211 Gy.rk. - 269 Br.sh. - 273 Gy.rk. - 309 Br.sh. - 319 Gy.cl. - 337 Br.sh. - 350 Gy.cl.
U/R House WAIHACRUNGA	E143°35' S21°32'		Ferguson 1922	260 280	abt. 2250.	50	15000 +	F		T.D. 2250'.